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Annual Report

USAID Task Order #807

WAGP Technical Assistance

1st December 2001 to 30 September 2002

Prepared For:
USAID Ghana

Deliverables

Book#2

Contract
LAG-I-00-98-010006-00

Nexant

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A

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Griffin House, 1st Floor South, 161 Hammersmith Road, London W6 8BS, UK
Tel: +44 20 7950 1600 Fax: +44 20 7950 1550

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A PROJECT AGREEMENT made on the [___] day of [_____] 2002

BETWEEN:

(1) **THE REPUBLIC OF BENIN** (***Benin***);

(2) **THE REPUBLIC OF GHANA** (***Ghana***);

(3) **THE FEDERAL REPUBLIC OF NIGERIA** (***Nigeria***);

(4) **THE REPUBLIC OF TOGO** (***Togo***);

(each a "***State***" and collectively the "***States***"); and

(5) **WEST AFRICAN GAS PIPELINE COMPANY** a company incorporated under the laws of Bermuda and having its registered office at [_____ _____] (the ***Company***).

WHEREAS:

(A) On September 5, 1995, the States executed a "Heads of Agreement for the Supply and Transmission of Natural Gas" for the purpose of developing the West African Gas Pipeline project to construct a pipeline to transport natural gas from Nigeria and any other sources along the route of the pipeline, to consumers in Benin, Togo and Ghana, and agreed to select a private developer to build, own and operate the pipeline;

(B) At its meeting of May 6, 1999 in Lomé, Togo, the Steering Committee set up under Article 4.1 of the Heads of Agreement (the ***Steering Committee***) authorised and directed its representatives to negotiate this Agreement;

(C) On August 11, 1999, the States executed a Memorandum of Understanding with Chevron Nigeria Limited, Ghana National Petroleum Corporation, Nigerian National Petroleum Corporation, The Shell Petroleum Development Company of Nigeria Limited, Societé Beninoise de Gas S.A. and Societé Togolaise de Gas S.A. under which it was agreed that a new company would be established by those persons or their successors to be the developer of the Project;

(D) In accordance with the Memorandum of Understanding the Company has been established to be developer of the Project and to build, own and operate the Pipeline System;

(E) The Parties have agreed that, for the establishment of the enabling environment necessary for the Project to be successful, the Agreed Regime should be implemented and maintained;

(F) The States have, contemporaneously with the execution of this Agreement, entered into a treaty (the ***WAGP Treaty***) pursuant to which they have agreed, amongst other things, to implement and respect the terms of this Agreement, to establish the

WAGP Authority and the Fiscal Appeal Tribunal, and to foster a stable and harmonized legal environment in which the Project will operate;

NOW THEREFORE in consideration of the mutual covenants, conditions, representations and warranties set forth herein it is hereby agreed as follows:

1. DEFINED TERMS AND INTERPRETATION

Defined Terms

1.1 The words and expressions defined below and appearing in this Agreement (including the Schedules hereto) shall except where the context otherwise requires have the respective meanings given to them below:

Access Code has the meaning given in Clause 26.1, and includes any amendments thereto agreed in accordance with Clause 26.8;

Access Reference Price means a price for natural gas at the relevant time, stated as a price per MMBtu of natural gas determined in accordance with Schedule 12;

Accounting Principles means the principles for accounting set out in Clause 5.3;

Adjusting Payment has the meaning given in paragraph B.46 of Schedule 8;

Administrative Fees means any fees, charges or other imposts which are imposed or charged for services, materials or rights provided or granted by any State or State Authority;

Affiliate means, with respect to a person, any other person that directly or indirectly through one or more intermediaries, controls, is controlled by or is under common control with that person, or who possesses, directly or indirectly, the power to direct or cause the direction of the management and policies of that person, whether through the ownership of voting securities, by contract, by law or otherwise;

Agreed Design Standards means those design standards set out in Schedule 9;

Agreed Fiscal Regime means the fiscal regime set out in Schedule 8;

Agreed Regime has the meaning given in Clause 7.1;

Allowable Expenses has the meaning given in paragraph B.7 of Schedule 8;

Anti-trust Regime means the regime governing anti-trust issues which is set out in Schedule 21;

Appellant has the meaning given in paragraph F.13 of Schedule 8;

Applicable Person means a WAGP Company and any other person (including Project Contractors, Buyers, Sellers and Shippers) to whom the Agreed Fiscal Regime is intended to apply, as appears from Schedule 8;

Applicable Rate means 15% per annum;

Apportionment Percentage has the meaning given in paragraph B.20 of Schedule 8;

Approval to Operate means an approval given in accordance with Clause 16.5;

Approved Pipeline Development Plan means the Pipeline Development Plan which is approved by the WAGP Authority in accordance with Clause 18.3, as it may be amended from time to time in accordance with Clause 18.4;

Approved Tariff Methodology means the methodology for setting tariffs for transportation of natural gas in the Pipeline System which is set out in Schedule 7, or such other methodology for that purpose as may be agreed from time to time in accordance with Clause 15.2;

Assessable Income has the meaning given in paragraphs B.5 and B.6 of Schedule 8;

Assessment has the meaning given in paragraph B.28 of Schedule 8;

Authorised Expansion means an expansion of the capacity of the Pipeline System beyond the Initial Development, but which does not involve an extension of the Pipeline System, or the laying of additional pipe, beyond that contemplated in the Approved Pipeline Development Plan as originally agreed;

Authorised Expansion Approval Package means a package of information to be provided by the Company in accordance with paragraphs 1 and 2 of Schedule 19;

Balancing Allowance has the meaning given in paragraph B.16 of Schedule 8;

Balancing Charge has the meaning given in paragraph B.17 of Schedule 8;

Benin means either the Republic of Benin or the territory of the Republic of Benin, as the context may require;

Bidding Procedures means the written procedure for awarding contracts by competitive bidding set out in Schedule 11;

British Thermal Unit or its abbreviation ***Btu*** means that amount of heat equal to one thousand and fifty-five decimal zero five six (1,055.056) joules as defined by the eleventh Conference Générale des Poids et Mesures at Paris, France in 1960;

Buyers means the purchasers of the natural gas which has been or is to be transported through the Pipeline System;

Capital Account has the meaning given in paragraph B.11 of Schedule 8;

Capital Allowances has the meaning given in paragraph B.13 of Schedule 8;

Capital Asset has the meaning given in paragraph B.14 of Schedule 8;

Capital Expenditure has the meaning given in paragraph B.14 of Schedule 8;

Capital Service has the meaning given in paragraph B.14 of Schedule 8;

Certification System means the certification system established in accordance with Clause 29.10;

Claimed Reliefs has the meaning given in paragraph B.9 of Schedule 8;

Combined Assessment has the meaning given in paragraph B.28 of Schedule 8;

Commercial Agreements means the agreements listed in Schedule 5;

Commercial Operation Date means:

(a) the first day on which natural gas (other than natural gas which is being transported for the purpose of commissioning the Pipeline System or a Shipper's or a Buyer's facilities) has been continuously transported in the Pipeline System pursuant to a Foundation Gas Transportation Agreement for a period of 24 hours at a volume equal to at least 70 MMscfd; or

(b) such other date as is agreed in writing by the Company and the WAGP Authority to be the Commercial Operation Date;

Company Event of Default has the meaning given in Clause 37.2;

Company Force Majeure Event means any event or circumstance which is unforeseen and beyond the reasonable control of the Company and which materially affects the ability of the Company to perform its obligations under this Agreement, including, without limitation:

(a) acts of war or the public enemy (including blockades), civil war whether war is declared or not and invasion;

(b) public disorder, insurrection, rebellion, act of terrorism, sabotage, riots, demonstrations or protestor activities;

(c) landslides, lightning, floods, storms, tidal waves, perils to navigation, explosions, fires, earthquakes or other natural calamities and acts of God;

(d) strikes, lockouts, labour or other industrial action;

(e) a Regime Failure or an Expropriation Event;

(f) plague, epidemic or quarantine restrictions; and

(g) any event or circumstance which delays the occurrence of the Completion Date or renders it impracticable to achieve the Completion Date without materially increased expenditure;

PROVIDED THAT Company Force Majeure Event does not include:

(i) a lack of funds or the inability to use funds for any reason (save where any of the foregoing is due to a Regime Failure) or events or circumstances resulting therefrom; or

(ii) any wilful misconduct or negligence by the Company (or any officer, servant or agent of the Company) or which has been provoked, instigated or encouraged by the Company, or events or circumstances resulting therefrom; or

(iii) the failure of natural gas to be supplied by Affiliates, other than in circumstances where such Affiliates are excused from liability for such failure under the applicable gas supply contract or events or circumstances resulting therefrom;

Company Valuation means a valuation of the Company established in accordance with Schedule 15;

Completion Date means the day immediately following the date upon which construction of the Initial Development has been completed and all commissioning tests passed (including, if the Initial Development is constructed under a turn key contract, the handing over of the Pipeline System to the Company under that contract) and the Pipeline System is capable of accepting natural gas at the WAGP/ELPS Interconnection Point and transporting such gas to the delivery points agreed under the Foundation Gas Transportation Agreements;

Conceptual Design Package means the package of information to be provided by the Company in accordance with paragraph 5 of Schedule 17;

Consolidated Group has the meaning given in paragraph B.33 of Schedule 8;

Constitution means:

(a) in respect of Benin, the Constitution of Benin enacted in 1990;

(b) in respect of Ghana, the Constitution of Ghana adopted and enacted in 1992;

(c) in respect of Nigeria, the Constitution of the Federal Republic of Nigeria enacted in 1999; and

(d) in respect of Togo, the Constitution of Togo enacted in 1992;

Construction Commitment Date means the date immediately following the day on which each of the conditions set out in Schedule 4 shall have been satisfied or, to the extent not so satisfied, waived by the Company;

Construction Economic Criteria means the criteria set out in Part A of Schedule 13;

Construction Period means any period commencing after the Construction Commitment Date during which Works are in progress;

Co-ordinating Environmental Protection Authority means:

Foundation Gas Transportation Agreement means a Gas Transportation Agreement entered into by the Company which either:

(a) satisfies the following criteria:

(i) executed prior to the date of the Final Investment Decision;

(ii) for a firm transportation service;

(iii) for the transportation of at least 10 MMscfd of natural gas through the Pipeline System; and

(iv) for a term ending at least 20 years after the Completion Date;

or

(b) is agreed in writing by the Company and the WAGP Authority to be a Foundation Gas Transportation Agreement;

Foundation Reference Tariff has the meaning given in Schedule 7;

Foundation Shipper means a Shipper which has entered into a Foundation Gas Transportation Agreement with the Company;

Foundation Tariff has the meaning given in Schedule 7;

Front End Engineering Design Package means the package of information to be provided by the Company in accordance with paragraph 10 of Schedule 17;

Fundamental Force Majeure Event has the meaning give in Clause 34.6;

Further Adjusting Payment has the meaning given in paragraph B.47 of Schedule 8;

Further Appellant has the meaning given in paragraph F.37 of Schedule 8;

Further Hearing has the meaning given in paragraph F.39 of Schedule 8;

Further Hearing Date has the meaning given in paragraph F. 39 of Schedule 8;

Further Respondent has the meaning given in paragraph F.37 of Schedule 8;

Gas Transportation Agreement means an agreement between a person and the Company for the transportation by the Company on behalf of that person of natural gas through the Pipeline System;

Ghana means either the Republic of Ghana or the territory of the Republic of Ghana, as the context may require;

Good Engineering Practice means the exercise of that degree of skill, diligence, prudence, foresight and operating practice which would reasonably and ordinarily be expected from a skilled and experienced operator in accordance with internationally

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acceptable industry standards and recognised good practice applicable to high pressure natural gas pipelines;

Hearing has the meaning given in paragraph F.15 of Schedule 8;

Hearing Date has the meaning given in paragraph F.15 of Schedule 8;

ICSID Rules means the Rules of Procedure for Arbitration Proceedings of the International Centre for Settlement of Investment Disputes;

Income has the meaning given in paragraph B.4 of Schedule 8;

Income Tax means amounts payable by a WAGP Company in accordance with Part B of Schedule 8;

Income Tax Holiday Period has the meaning given in paragraph B.18 of Schedule 8;

Industrial Development Shipper has the meaning given in Schedule 7;

Industrial Development Tariff has the meaning given in Schedule 7;

Inflation Index means the United States Consumer Price Index for All Urban Consumers as published by the United States Bureau of Labor Statistics from time to time, with a base year of the year in which the Final Investment Decision occurs;

Initial Development means the extent to which the Pipeline System will initially be constructed by the Company to meet the initial market for natural gas, prior to expansion to meet demand for additional capacity, as agreed in the Approved Pipeline Development Plan;

Initial Term means the period commencing upon the execution of this Agreement and ending on the last day of the Primary Transportation Term or such later date as is agreed in accordance with Clause 29.5;

Insurance Programme means the Company's programme of insurances of the types specified in Clauses 27.1 and 27.2;

interest includes all other forms of return in respect of a debt claim (other than repayment of the debt), including, for the avoidance of doubt, discounts, fees and charges;

Legislative Outlines means:

(a) In respect of Benin, the legislative outline set out in Schedule 22;

(b) In respect of Ghana, the legislative outline set out in Schedule 23;

(c) In respect of Nigeria, the legislative outline set out in Schedule 24; and

(d) In respect of Togo, the legislative outline set out in Schedule 25.

Legislature means;

(a) in respect of Benin, the National Assembly of Benin;

(b) in respect of Ghana, the Parliament of Ghana;

(c) in respect of Nigeria, the National Assembly of Nigeria; and

(d) in respect of Togo, the National Assembly of Togo;

Local Businesses means businesses owned or operated by persons who are incorporated or resident in one of the ECOWAS States;

Local Investment Entity has the meaning given in paragraph (b) of Clause 6.1;

Long Stop Date means 30 September, 2004, as it may be extended under Clause 34.5;

Major Company Event of Default has the meaning given in Clause 37.3;

Major Contract means a construction contract entered into by the Company for the construction of the Initial Development (not including contracts for professional services), which the Company anticipates will have a contract value exceeding US$5 million;

Mid-Market Forecast has the meaning given in Schedule 7;

MMBtu means million Btu;

MMscfd means million standard cubic feet per day;

MMscf means million standard cubic feet;

natural gas means any hydrocarbons (or a mixture of hydrocarbons and other gases) which at a temperature of 60 degrees Fahrenheit and at atmospheric pressure are predominantly in a gaseous state;

Nigeria means either the Federal Republic of Nigeria or the territory of the Federal Republic of Nigeria, as the context may require;

Nigerian Commercial Group Members means Chevron Nigeria Limited, Nigerian National Petroleum Corporation and The Shell Petroleum Development Company of Nigeria Limited, or any of them, or their respective successors or assignees in respect of their interests in the Nigerian joint ventures between them for the production of oil and natural gas;

Non-Allowable Expense has the meaning given in paragraph B.8 of Schedule 8;

Non-WAGP Regime means the legislation, regulations, principles of interpretation and application and any other features of the system of taxation applicable either generally or specifically in any one or more of the States, as amended, modified or

enacted from time to time, which is not legislation introducing, amending, modifying, re-enacting or consolidating the Agreed Fiscal Regime;

Notice of Appeal has the meaning given in paragraph F.13 of Schedule 8;

Notice of Default has the meaning given in Clause 37.4;

Notice of Further Appeal has the meaning given in paragraph F.37 of Schedule 8;

Open Access Commencement Date means the first day of the calendar year:

(a) following the year in which the committed firm transportation capacity reservations for transportation of natural gas in the Pipeline System under Gas Transportation Agreements remaining in force and being performed according to their terms, in respect of natural gas sourced from the Nigerian Commercial Group Members or their Affiliates, first reaches 200 MMscfd; or

(b) which is 10 full calendar years after the Commercial Operation Date,

whichever occurs first;

Operating Period means the period beginning on the Commercial Operation Date and continuing for as long as Gas Transportation Agreements are in force;

Operator means an operator engaged by the Company in connection with the operation of the Pipeline System in accordance with the provisions of Clause 23.2;

Parties means Benin, Ghana, Nigeria, Togo and the Company (and ***Party*** means any of them);

Pipeline Development Plan means the development plan for the Pipeline System to be prepared in accordance with Clause 15 and Schedule 17;

Pipeline Licences has the meaning given in Clause 16.1;

Pipeline System means a natural gas pipeline running from the Escravos-Lagos Pipeline System near Lagos Nigeria, through Benin and Togo, to a terminus initially near Takoradi, Ghana, to be developed, built, operated and maintained by the Company under the terms of this Agreement together with ancillary permanent facilities which are needed for the construction and operation thereof (including compression stations, metering stations, valve stations, pig launching and receiving stations and SCADA systems), and includes any extension or expansion;

Pipeline System Enlargement has the meaning given in Clause 25.1;

Post-Consolidation Loss has the meaning given in paragraph B.34(f) of Schedule 8;

Pre-Consolidation Loss has the meaning given in paragraph B.34(e) of Schedule 8;

Pre-Development Costs has the meaning given in Schedule 16;

Primary Transportation Term means the period commencing upon the Completion Date and ending on the date on which the later of the following events shall occur:

(a) the 20th anniversary of the Commercial Operation Date; and

(b) the last date on which a Foundation Gas Transportation Agreement terminates (including any extensions thereto in accordance with options to extend contained in such Foundation Gas Transportation Agreements as originally executed but excluding any extension agreed subsequently);

Project means the development of specifications, feasibility and market studies, design, financing, construction, ownership, operation and maintenance of the Pipeline System;

Project Activities means activities undertaken within one or more of the States by a WAGP Company, the Shareholders or the Project Contractors in connection with the implementation of the Project;

Project Authorisations means all rights, permits, licences, consents, permissions, exemptions and approvals (including those identified in detail in the Approved Pipeline Development Plan) which are needed by a WAGP Company or a Project Contractor for the successful implementation of the Project, or to fulfil commitments made under the Commercial Agreements or for the exercise of any of the rights of the Company under this Agreement, and includes the Pipeline Licences;

Project Contractors means any contractors, sub-contractors, advisers or agents of the Company engaged in connection with the implementation of the Project;

Project Period means a period commencing on the Construction Commitment Date and continuing for as long as Gas Transportation Agreements are in force;

Project Rights means all of the rights, entitlements and benefits conferred on the Company by this Agreement, including the right of the Company to be issued the Project Authorisations and to implement the Project in accordance with the terms of this Agreement;

Regime Failure has the meaning given in Clause 36.1;

Relevant Minister means the Minister of each State from time to time having power to make regulations under the Enabling Legislation;

Respondent has the meaning given in paragraph F.13 of Schedule 8;

Restoration Economic Criteria means the criteria set out in Part C of Schedule 13;

Returns has the meaning given in paragraph B.25 of Schedule 8;

Securities means shares or Debt instruments;

Sellers means the sellers of natural gas which has been or is to be transported through all or part of the Pipeline System;

Shareholders means:

(a) the Affiliate of Chevron Nigeria Limited that holds shares in the Company;

(b) the Affiliate of The Shell Petroleum Development Company of Nigeria Limited that holds shares in the Company;

(c) [the Affiliate of] Nigerian National Petroleum Corporation [that holds shares in the Company];

(d) The Volta River Authority;

(e) Societé Béninoise de Gaz S.A. and

(f) Societé Togolaise de Gaz S.A.,

and their successors and assigns, each a ***Shareholder***;

Shipper means a person who enters into a Gas Transportation Agreement with the Company;

Standard Reference Tariff has the meaning given in Schedule 7;

Standard Shipper has the meaning given in Schedule 7;

Standard Tariff has the meaning given in Schedule 7;

State Authorities means, in relation to a State, the Government and each aspect thereof at every level, including central, regional and local authorities or bodies, and all instrumentalities, statutory bodies, taxing authorities, branches and subdivisions of any of the foregoing, and any entity which is directly or indirectly controlled by a State or one or more State Authorities; and includes the State Environmental Protection Authorities, the Tax Authority and the Technical Authorities of that State;

State Environmental Protection Authority means:

(a) in respect of Benin, the Ministère de L'Environment de L'Habitat et De L'Urbanisme;

(b) in respect of Ghana, the Environmental Protection Agency;

(c) in respect of Nigeria:

  (i) the Federal Ministry of the Environment;

  (ii) the environmental section of the Department of Petroleum Resources;

  (iii) the Environmental Protection Agency for Lagos State;

  (iv) the [Ministry of Environment] for Lagos State;

  (v) the Environmental Protection Agency for Ogun State;

(vi) the [Ministry of Environment] for Ogun State; and

(vii) the environmental section of the National Inland Waterways Authority; and

(d) in respect of Togo,

(i) the Ministère De L'Environment et de la Protection Forestiere; and

(ii) Programme Nationale d'Action Environnementale.

State Force Majeure Event means any event or circumstance which is unforeseen and beyond the reasonable control of all States and which materially affects the ability of a State to perform its obligations under this Agreement, but limited to:

(a) acts of war or the public enemy and civil war whether war is declared or not;

(b) public disorder, insurrection, rebellion, sabotage, riots, demonstrations or protestor activities; and

(c) explosions, fires, earthquakes or other natural calamities and acts of God;

PROVIDED THAT State Force Majeure Event does not include:

(i) a lack of funds or the inability to use funds for any reason, or events or circumstances resulting therefrom;

(ii) any wilful misconduct or negligence by a State, by any State Authority or by the WAGP Authority (or any officer, servant or agent of such State, State Authority or WAGP Authority) or which has been provoked, instigated or encouraged by a State, or events or circumstances resulting therefrom; or

(iii) a Regime Failure or events or circumstances resulting therefrom;

State Liability has the meaning given in paragraph B.2 of Schedule 8;

States means Benin, Ghana, Nigeria and Togo, each a ***State***;

Supplemental Authorisations means all rights, permits, licences, consents, permissions, exemptions and approvals which under the laws of a State are required by a Buyer, a Seller or a Shipper or any other person in connection with the sale or purchase or transportation of natural gas which has been or is to be transported in the Pipeline System or the transportation of natural gas in the Pipeline System;

Steering Committee means the Steering Committee referred to in Recital (C) above;

Tax or ***Taxes*** means any existing or future taxes, levies, duties, customs, imposts, contributions (such as social fund and compulsory medical insurance contributions), fees, assessments or other similar charges payable to or imposed by a State or a State Authority, does not include reasonable Administrative Fees, but does include

Administrative Fees to the extent that they exceed a reasonable amount for the services, materials or rights provided or granted;

Tax Authority means, in respect of Benin, [ ]; in respect of Ghana, [ ]; in respect of Nigeria, the Federal Internal Revenue Service; and in respect of Togo, [ ];

Tax Year means a period of one year beginning on 1 January and ending on 31 December;

Taxable Income has the meaning given in paragraph B.3 of Schedule 8;

Technical Authority means:

(a) in respect of Benin, the Ministère d'Energy and the Office Beninois De Recherches Geologiques et Minieres;

(b) in respect of Ghana, the Ministry of Energy and the Energy Commission;

(c) in respect of Nigeria, the Federal Ministry of Petroleum Resources; and

(d) in respect of Togo, the Direction Generale des Mines et de la Geologie;

Technical Dispute means any dispute or difference arising out of or in connection with the Pipeline Development Plan, the Approved Pipeline Development Plan, the Environmental Impact Assessment or the Environmental Management Plan, together with any other disputes which the Parties to the dispute agree are of a technical nature, but does not include:

(a) any dispute as to whether a Company Event of Default is a Major Company Event of Default; or

(b) any dispute concerning the interpretation of this Agreement.

Togo means either the Republic of Togo or the territory of the Republic of Togo, as the context may require;

UNCITRAL Arbitration Rules means the Rules of Arbitration of the United Nations Commission on International Trade Law;

US dollars or US$ means the lawful currency of the United States of America;

VAT has the meaning given in paragraph C.1 of Schedule 8;

VAT Group has the meaning given in paragraph C.11 of Schedule 8;

WAGP Activities means any activities of the Company or any subsidiary of the Company which:

(a) are engaged in by the Company or its subsidiary in relation to the Pipeline System business or for the purpose of furthering the West African Gas Pipeline System business; or

(b) are agreed by the Company and the WAGP Authority to be a WAGP Activity,

but shall not include:

(i) the operation of local distribution companies; or

(ii) any other activity agreed by the Company and the WAGP Authority not to be a WAGP Activity.

WAGP Authority Charge has the meaning given in Clause 9.4;

WAGP Company means the Company or any subsidiary of the Company;

WAGP Regulations means regulations governing the construction and operation of the Pipeline System, to be adopted by the Relevant Minister of each State under the Enabling Legislation;

WAGP Treaty has the meaning given in Recital (F) above;

WAGP/ELPS Interconnection Point means the point at which the Pipeline System joins ELPS;

West African Gas Pipeline Authority or ***WAGP Authority*** means the body established under the WAGP Treaty;

Works means the works relating to the design, construction, installation, completion, testing and commissioning of the Pipeline System (including any expansion thereof); and

Written Down Value has the meaning given in paragraph B.15 of Schedule 8.

Interpretation

1.2 The following rules shall apply to the interpretation of this Agreement:

(a) references to "***Clauses***" or "***Schedules***" are to the Clauses of, and to the Schedules to, this Agreement unless otherwise stated. Headings to clauses, paragraphs, chapters, schedules and other provisions of this Agreement are inserted for ease of reference only and shall not affect the interpretation of this Agreement. The Schedules to this Agreement are an integral part hereof;

(b) any reference to a person or persons includes reference to any individual, corporation, partnership, joint venture, association, public body, governmental authority or other entity. Where the context requires, words in the singular shall also include the plural and vice versa;

(c) any reference to this Agreement or to any other agreement or document includes a reference to this Agreement, or, as the case may be, such other agreement or document as amended from time to time;

(d) references to "*days*" shall be references to calendar days; provided that if an obligation falls due on a day which is a national holiday in the State where the obligation is to be performed then the obligation shall fall due on the next day on which government offices are open for business in that State;

(e) no amendment of this Agreement shall be valid unless it is in writing and signed by or on behalf of all Parties hereto;

(f) if and to the extent that any provision of this Agreement is held to be illegal, void or unenforceable, such provision shall be given no effect and shall be deemed not to be included in this Agreement, as the case may be, but without invalidating any of the remaining provisions of this Agreement;

(g) no failure or delay by any Party in exercising any right or remedy provided by law under or pursuant to this Agreement shall impair such right or remedy or operate or be construed as a waiver or variation of it or preclude its exercise at any subsequent time and no single or partial exercise of any such right or remedy shall preclude any other or further exercise of it or the exercise of any other right or remedy; and

(h) this Agreement, including the Schedules, constitutes the entire agreement and understanding between the Parties in respect of the subject matter hereof, and supersedes:

(i) any and all previous agreements and arrangements between the Parties in respect thereof, and

(ii) the Memorandum of Understanding referred to in Recital (C).

Consequence of unenforceability

1.3 If any provision of this Agreement is held to be illegal, void or unenforceable, such provision shall be given no effect and shall be deemed not to be included in this Agreement but without invalidating any other provisions. The Parties shall thereafter meet to negotiate in good faith to agree a valid, binding and enforceable substitute provision or provisions, (if necessary with reconsideration of other terms of this Agreement not so affected) so as to maintain the commercial interests of the Parties set out in this Agreement as executed.

2. TERM AND EFFECTIVENESS

Term

2.1 Unless terminated earlier in accordance with Clauses 38 or 39, this Agreement shall remain in full force and effect for as long as a Gas Transportation Agreement remains in effect.

Effectiveness

2.2 Subject to Clauses 2.3 and Clause 2.4, the provisions of this Agreement shall come in to force and be binding upon the Parties upon the date on which this Agreement is executed by all of the Parties and the WAGP Treaty is executed by the States.

2.3 The provisions of Clauses 6, 22, 23, 24, 25, 27 and 28.5 of this Agreement shall only come in to force and be binding upon the Company following the occurrence of the Construction Commitment Date.

2.4 The provisions of Clauses 36 and 40.3 of this Agreement shall only come in to force and be binding upon the States following the Company:

(a) providing the WAGP Authority with a summary of the key terms and conditions of all Foundation Gas Transportation Agreements, including the key terms listed in Schedule 14; and

(b) taking all necessary steps for it to establish in each State the legal presence described in paragraphs (a), (b), (c) and (d) of Clause 5.1.

3. EXCLUSIVITY

No State shall, prior to 2 December 2003, enter into negotiations with, or issue any consents, permits, licences, approvals or similar authorisations to, any other person in relation to the establishment of a cross-border pipeline or pipelines for the transmission of natural gas where the delivery of natural gas from such a pipeline would be capable of competing with the delivery of natural gas shipped through the Pipeline System.

4. REPRESENTATIONS AND WARRANTIES

The Company

4.1 The Company hereby represents and warrants as follows:

(a) That it is a company duly incorporated and validly existing under the laws of Bermuda;

(b) That it has the requisite power and authority to enter into and perform this Agreement and all such actions have been duly authorised by all necessary procedures on its part;

(c) That this Agreement will constitute its valid and binding obligations in accordance with its terms;

(d) That the execution, delivery and performance of this Agreement will not:

(i) result in a breach of any provision of its bye-laws;

(ii) result in a breach of, or constitute a default under, any instrument to which it is a party or by which it is bound; or

(iii) result in a breach of any order, judgement or regulation by which it is bound.

The States

4.2 Each of the States hereby represents and warrants as follows:

(a) That it is duly authorised and empowered under its Constitution to enter into this Agreement and the WAGP Treaty;

(b) That the obligations imposed in this Agreement will constitute its legal valid and binding obligations, enforceable in accordance with their terms;

(c) That it is not a party to or lawfully bound to observe or enforce any international agreement or similar or other commitment, that conflicts with, impairs or interferes with, or adversely affects such State's performance of its obligations under, the WAGP Treaty or this Agreement or the implementation of the Project; and

(d) That the Project Rights are valid in accordance with the its applicable laws and neither it nor its State Authorities have issued (nor are any of them obliged to issue) to any person any rights or privileges that are inconsistent with or conflict with or would limit or interfere with the exercise and enjoyment of the Project Rights.

5. THE WEST AFRICAN GAS PIPELINE COMPANY

Registration as a foreign company

5.1 Before or as soon as practicable after the occurrence of the Construction Commitment Date, the Company shall establish in each State the following legal presence and each State shall fulfil the following requirements for the establishment of such legal presence:

(a) In respect of Benin, the Company shall register as an unincorporated branch of a foreign corporation. Benin shall cause its Ministry of Commerce to deliver to the Company by not later than the Construction Commitment Date an unconditional exemption from the requirements of Art. 120 of the Uniform Act on Company Law by way of an "arrêté". Such exemption shall be in force for as long as the Company holds a Pipeline Licence.

(b) In respect of Ghana, the Company shall register as an external company pursuant to Section 303 of the Companies Code, and shall comply with such provisions of the Companies Code as are applicable to external companies (including, without limitation, Sections 302-316 relating to service of process, the filing of accounts and related information, the registration of charges over an external company's local assets and other corporate informational

requirements). The Company shall be entitled to so register for as long as the Company holds a Pipeline Licence.

(c) In respect of Nigeria, the Company shall apply to Nigeria for, and Nigeria shall procure the grant of, an exemption under Section 56 of the Companies and Allied Matters Act (***CAMA***) from the requirement to incorporate a local subsidiary, thereby giving the Company the status of an unregistered company in Nigeria. Such exemption shall remain in force for as long as the Company holds a Pipeline Licence.

(d) In respect of Togo, the Company shall register as an unincorporated branch of a foreign corporation. Togo shall cause its Ministry of Commerce to deliver to the Company by not later than the Construction Commitment Date an unconditional exemption from the requirements of Art. 120 of the Uniform Act on Company Law by way of an "arrêté". Such exemption shall remain in force for as long as the Company holds a Pipeline Licence.

Corporate reorganisation consent

5.2 The Company shall not reorganise its legal corporate structure without the prior written consent of the WAGP Authority, which consent shall not be unreasonably withheld, delayed or conditioned.

Accounting Principles

5.3 The accounts of the Company shall be prepared in accordance with international accounting standards, on an accrual (as opposed to cash) basis unless otherwise specifically provided in this Agreement, with revenues attributed to the accounting period in which they are earned, and costs and expenses to the accounting period in which they are incurred without the need to consider when the amount is received or disbursed in connection with a particular transaction, and costs and expenses deemed to have been incurred, in the case of physical items, in the accounting period when title passes, and in the case of services, in the accounting period when such services are performed.

Denomination of accounts

5.4 The Company and any of its branches, places of business, subsidiaries or unregistered foreign offices within any of the States shall be entitled to maintain their statutory accounts denominated in US dollars and shall not be required to prepare branch accounts in the States. All financial reports to be prepared and submitted by the Company or any of its branches, places of business, subsidiaries or unregistered foreign companies shall be prepared in US dollars in accordance with the Accounting Principles.

Restriction on share transfers

5.5 The Company shall procure that Shareholders do not, without the prior written consent of the WAGP Authority, which consent shall not be unreasonably withheld, delayed or conditioned:

(a) transfer shares in the Company; or

(b) enter into agreements which allow other parties to exercise control over the Company.

5.6 Clause 5.5 shall not apply to any transfer or assignment:

(a) by a Shareholder to an Affiliate of such Shareholder; or

(b) between Shareholders or their Affiliates; or

(c) occurring 10 years or more after the Completion Date; or

(d) entered into for the benefit of the financiers or other creditors of the Company or the Shareholders; or

(e) made pursuant to the exercise of rights under any security provided for a Commercial Agreement; or

(f) occurring after the date on which the Company becomes a public company; or

(g) occurring after the rights set out in Clause 6 have been exercised.

6. LOCAL EQUITY PARTICIPATION IN THE COMPANY

Local Investment Entity

6.1 In this Agreement:

(a) ***Eligible Investment Entity*** means an entity:

(i) which is duly established and validly existing under the laws of its country of incorporation with the capacity to enter into and perform the transactions provided for hereunder;

(ii) which is structured so as to hold an equity investment in the Company solely for the benefit of citizens of the States or a category of citizens of the States in which all citizens of the States have the right to participate;

(iii) which is or will be adequately funded to enable it to assume the responsibilities and liabilities referred to below; and

(iv) the structuring or ownership of which will not cause or be likely to cause the Company or any of its Shareholders or their Affiliates to be in breach of, or subject to any penalty or sanction under, the Foreign Corrupt Practices Act of the United States of America or the Prevention of Corruption Act 1906 or the Anti-terrorism, Crime and Security Act 2001 of the United Kingdom (or similar legislation in any applicable jurisdiction) or the Iran-Libya Sanctions Act; and

(b) ***Local Investment Entity*** means an Eligible Investment Entity nominated in accordance with Clause 6.2.

6.2 On a single occasion during the period beginning on the date falling 24 months and ending on the date falling 60 months after the Commercial Operation Date, the States may, by a notice signed by the Relevant Minister of each of the States and delivered to the Company, nominate a single Eligible Investment Entity to be the Local Investment Entity and request that the Company prepare a Company Valuation in accordance with this Clause 6.

6.3 A notice given under Clause 6.2 shall be accompanied by:

(a) a statement advising the full corporate details of the Local Investment Entity, including its corporate nature and place of location, and its equity owners, directors and management;

(b) a copy of its memorandum of association and by-laws, or equivalent;

(c) details of the category or categories of local citizens who will benefit from the interest in the Company through the Local Investment Entity and the nature of that benefit, including a copy of any instruments which establish or will establish the benefit; and

(d) details of the proposed funding of the Local Investment Entity for the acquisition of an interest in the Company as provided in this Clause 6, including the source of that funding, the terms of the funding and evidence of the adequacy and availability of such funding.

Company Valuation

6.4 Upon receipt of a notice given under Clause6.2, the Company shall procure a Company Valuation.

Information

6.5 The Company shall, at the same time that it notifies the Relevant Ministers of the Company Valuation, also:

(a) notify them whether, if the Local Investment Entity is to acquire an interest in the Company under Clause 6.6, the interest to be acquired will be a transfer of Securities from existing Shareholders or their Affiliates, or the allotment of new Securities by the Company; and

(b) provide to the Relevant Ministers a copy of all agreements (including the shareholders' agreement of the Company) then in force to which the Local Investment Entity would, upon taking an interest in the Company under this Clause, be required to become a party.

Election to acquire

6.6 Within 28 days of the Relevant Ministers being advised of the Company Valuation and provided with the other information to be provided by the Company under Clause 6.5, the Local Investment Entity may elect by notice in writing to the Company to acquire up to a 25% interest in the share capital of the Company, and the same proportion of any Debt owed by the Company to Shareholders or their Affiliates, as specified in this Clause. An election made under this Clause shall stipulate the percentage interest to be acquired, and shall constitute a binding commitment by the Local Investment Entity to:

(a) acquire in the same form and on the same terms as then held by the Shareholders or their Affiliates the interests to be acquired;

(b) accept from the Shareholders or their Affiliates, or from the Company, an assignment and transfer or allotment of the Securities to be acquired;

(c) enter into an accession agreement to the shareholders' agreement of the Company as then in force;

(d) in accordance with such shareholders' agreement, enter into a deed of adherence in respect of any other agreements then in force between the Shareholders or their Affiliates which have been notified under Clause 6.5 as agreements to which the Local Investment Entity is required to become a party; and

(e) accept liability for a proportionate share of the obligations then borne by the Shareholders or their Affiliates in relation to the Company or its finances.

If the Local Investment Entity fails to make such an election within the period specified above, the option under this Clause shall lapse.

Price payable for interest

6.7 The price to be payable for the interest to be acquired by the Local Investment Entity shall be payable immediately upon execution of the instruments referred to in Clause 6.6 in immediately available money at the direction of the assignors or the Company, as the case may be, and shall be:

(a) if the Company advised under paragraph (a) of Clause 6.5 that the interest to be acquired would be a transfer from existing Shareholders or their Affiliates, one hundredth of the Company Valuation advised by the Company under Clause 6.5 per percentage point of the interest which the Local Investment Entity elects under Clause 6.6 to acquire; or

(b) if the Company advised under paragraph (a) of Clause 6.5 that the interest to be acquired would be the allotment of new Securities by the Company, an amount derived from the following formula:

$$P = V(I / (100 - I))$$

where: **P** is the price to be paid;

V is the Company Valuation notified by the Company in accordance with Clause 6.5; and

I is the number of percentage points notified by the Local Investment Entity under Clause 6.6 as the percentage interest in the Company it would acquire.

The States shall procure payment by the Local Investment Entity of the price payable pursuant to this Clause.

Securities to be acquired

6.8 If pursuant to paragraph (a) of Clause 6.5 the Company notified the Relevant Ministers that the interest to be acquired by the Local Investment Entity will be a transfer of Securities from existing Shareholders or their Affiliates, then:

(a) the Company shall procure the transfer from the Shareholders or their Affiliates, as the case may be, to the Local Investment Entity, upon receipt of payment by the Local Investment Entity; and

(b) the States shall procure the acceptance by the Local Investment Entity of that transfer,

of the percentage elected and notified by the Local Investment Entity under Clause 6.6 of the interest then held by each Shareholder or its Affiliate in the Securities comprising the share capital of the Company and the Debt owed to each Shareholder or its Affiliates by the Company.

6.9 If pursuant to paragraph (a) of Clause 6.5 the Company notified the Relevant Ministers that the interest to be acquired by the Local Investment Entity would be by way of the allotment of new Securities by the Company, then:

(a) the Company shall allot to the Local Investment Entity, upon receipt of payment by the Local Investment Entity; and

(b) the States shall procure the acceptance by the Local Investment Entity of that allotment,

of Securities equivalent to those then held by the Shareholders or their Affiliates in the share capital of the Company and in the Debt of the Company, which after allotment would be equal to the percentage of such Securities elected and notified by the Local Investment Entity under Clause 6.6.

Restrictions on transfer

6.10 The Local Investment Entity shall not, without the prior written consent of the Company, which consent shall not be unreasonably withheld, delayed or conditioned, be permitted to transfer all or any of the Securities acquired pursuant to this Clause. No transfers of any such Securities shall be permitted other than to a single entity.

Costs and expenses

6.11 All costs and expenses of the Local Investment Entity will be borne by the States.

Change to Local Investment Entity

6.12 The States shall procure that, following the acquisition by the Local Investment Entity of an interest in the Company pursuant to this Clause 6, the Local Investment Entity continues, for as long as it holds that interest in the Company, to be structured solely for the benefit of citizens of the States generally.

7. AGREED REGIME

Definition of Agreed Regime

7.1 In this Agreement, the expression Agreed Regime means the regime comprising each of the following elements:

(a) The WAGP Treaty as originally executed between the States;

(b) Laws enacted and in force in each State giving legislative effect to the principles set out in the Legislative Outline for each such State (except to the extent that Clause 29 provides that the Agreed Fiscal Regime is not required to be maintained;

(c) The Company being permitted to register in accordance with Clause 5.1, and being granted the exemptions provided for in Clause 5.1, and all such exemptions being maintained in force in accordance with Clause 5.1;

(d) Laws enacted and in force giving legislative effect to, or administrative actions implementing, the Anti-trust Regime and the Exchange Control Regime in each State, and the Anti-trust Regime and the Exchange Control Regime being maintained in force in each State;

(e) The WAGP Regulations adopted and in force in each State; and

(f) All of the rights and entitlements provided for in this Agreement, including the Project Authorisations, and in the WAGP Treaty, having been validly granted and continuing to be valid; and

(g) Performance by the States of their material commitments under this Agreement.

Implementation of Agreed Regime

7.2 Each State shall, to the extent applicable in that State, use its best endeavours to implement and maintain in existence the Agreed Regime.

8. LEGISLATIVE PROCESS

Requirement for legislation

8.1 As part of the establishment of the Agreed Regime, each State shall use its best endeavours to procure that laws are passed by its Legislature and brought in to force in that State giving legislative effect to the principles set out in the Legislative Outline applicable to the State (***Enabling Legislation***).

Parliamentary process

8.2 Each State shall, as soon as practicable following the execution of this Agreement:

(a) if and to the extent required by the laws of such State, take such steps and complete all such formalities as are necessary to present, and present, the WAGP Treaty to its Legislature for ratification;

(b) take such steps and complete all such formalities as are necessary to present, and present, the Draft Legislation applicable to that State to its Legislature for enactment as a law of that State, and

(c) use its best endeavours to facilitate the prompt passage of the Draft Legislation through its Legislature.

Harmonisation of laws

8.3 Each State shall use its best endeavours to ensure that the provisions of the Enabling Legislation in force within its jurisdiction are at all times in all material respects consistent with the equivalent provisions in the Enabling Legislation in force in the other States, and that its Enabling Legislation is not amended unless:

(a) all of the States make the same changes having effect at the same time; and

(b) the provisions in the Enabling Legislation concerning the authority and power of the WAGP Authority and the WAGP Regulations are not amended without the prior written consent of the Company.

Amendment to Enabling Legislation

8.4 If any State or the WAGP Authority considers it necessary or appropriate to amend or supplement the Enabling Legislation, it shall notify each of the Parties (and, in the case of a State, the WAGP Authority) of the change it proposes be made. The States shall consult with the Company on the proposed changes and afford the Company the opportunity to comment thereon and/or submit alternative amendments or supplements to the Enabling Legislation. The States shall not agree to or propose changes to the Enabling Legislation which would have the effect of creating a different set of laws on the same topic applying in one or more States or which are materially inconsistent with the provisions of this Agreement, without the prior written approval of the Company.

9. WAGP AUTHORITY

Functions of the WAGP Authority

9.1 The functions of the WAGP Authority shall be as set out in the WAGP Treaty as originally signed. The States shall not alter the functions of the WAGP Authority without the prior written consent of the Company, which consent shall not be unreasonably withheld, delayed or conditioned.

Empowering the WAGP Authority

9.2 Each State shall take all necessary steps to ensure that the WAGP Authority is granted or delegated full authority to perform its functions under this Agreement.

Composition of the WAGP Authority

9.3 The States shall ensure that the staffing levels and other costs incurred by the WAGP Authority, and the funding requirements notified by the WAGP Authority hereunder, are reasonable having regard to the functions of the WAGP Authority as described in this Agreement and in the WAGP Treaty, and that the WAGP Authority at all times has sufficient funding to perform its functions.

Funding of the WAGP Authority

9.4 The Company will contribute to the funding of the WAGP Authority in the following manner:

(a) During the period from the formation of the WAGP Authority (or such earlier date as may be agreed by the Parties) until the Construction Commitment Date, the Company shall pay to the WAGP Authority, in quarterly payments in advance, a funding contribution for that period at a rate of US$[ ] per year.

(b) The WAGP Authority will advise the Company in writing of its funding requirement (in US dollars) for its activities as described in this Agreement and the WAGP Treaty for each calendar year or part thereof from the Construction Commitment Date up until the Commercial Operation Date. This funding requirement may include the cost of hiring of consultants or other services reasonably required for the WAGP Authority for the activities described in this Agreement or the WAGP Treaty which are to be performed during that period. The funding requirement notified by the WAGP Authority in accordance with this paragraph shall be a reasonable amount for the carrying out of the activities to which the funding relates, and shall include a detailed breakdown of the anticipated expenditure of the WAGP Authority. The Company shall provide a copy of that detailed breakdown to all Shippers. The Company will pay to the WAGP Authority the amount of the reasonable funding requirement, in quarterly instalments in advance, commencing on the first day of the first quarter which begins after the Construction Commitment Date.

(c) For each calendar year or part thereof after the Commercial Operation Date, the WAGP Authority shall notify the Company in advance of its funding requirement (in US dollars) for its activities as described in this Agreement and the WAGP Treaty for that year in excess of retained funds, including for the hiring of consultants or other services reasonably required for the WAGP Authority for those activities, but excluding any costs of auditing the Company which in accordance with Clause 10 are not to be included in the calculation of the funding requirement (which costs shall be payable by the States in accordance with Clause 9.5). The funding requirement notified by the WAGP Authority in accordance with this paragraph shall be a reasonable amount for the carrying out of the activities to which the funding relates, and shall include a detailed breakdown of the anticipated expenditure of the WAGP Authority. The Company shall provide a copy of that detailed breakdown to all Shippers.

(d) With effect from the Commercial Operation Date, the Company shall (subject to paragraphs (e) and (g) below) charge Shippers a monthly ***WAGP Authority Charge***, which will be a separate, identifiable charge to support the operation of the WAGP Authority. The WAGP Authority Charge will comprise each month:

(i) a levelised amount necessary to recover over a 10-year period the amounts paid by the Company pursuant to paragraphs (a) and (b) above together with interest thereon of 12% per annum; plus

(ii) an amount equal to the funding requirement notified by the WAGP Authority under paragraph (c) above for that year divided by 365 (or 366 in a leap year) and multiplied by the number of days in that month.

(e) Subject to paragraph (g) below the Company shall charge Shippers the monthly amount provided for in paragraph (d) above in all months after the Commercial Operation Date, allocated to all Shippers in proportion to their capacity reservations in the Pipeline System, provided however that the amount charged to and payable by such Shippers shall be reduced proportionately to the extent that their obligation to pay for transportation of natural gas in the Pipeline System is reduced in that month due to events of force majeure or default by the Company. If the Company is in default under a Gas Transportation Agreement and as a consequence a Shipper is relieved from paying an amount which it would otherwise have been liable to pay in accordance with this paragraph, the Company shall nevertheless be liable to pay that amount to the WAGP Authority.

(f) The Company shall, as soon as practicable following receipt thereof, pay to the WAGP Authority all amounts received by the Company under paragraph (e) above in respect of a month less the amount in respect of that month calculated under sub-paragraph (d)(i) above.

(g) Notwithstanding paragraphs (a), (b), (c) and (d) above, the WAGP Authority Charge shall not exceed in any month an amount equal to 1 cent (US$0.01) per MMBtu (or its volumetric equivalent) of daily capacity reserved by

Shippers in the Pipeline System per day, and the amount to be charged by the Company in respect of the funding requirement notified by the WAGP Authority, and paid over to the WAGP Authority in accordance with paragraph (f) above following receipt, shall not exceed that amount minus the amount calculated under sub-paragraph (d)(i) above.

Costs in excess of receipts pursuant to Clause 9.4

9.5 Any costs incurred by the WAGP Authority in excess of those amounts paid to it by the Company in accordance with Clause 9.4 will be funded by the States, irrespective of the reason for any shortfall in funding suffered by the WAGP Authority.

States to procure WAGP Authority carries out functions

9.6 The States shall procure that the WAGP Authority carries out and performs its functions and obligations as set out for it in, and complies with, this Agreement. The Relevant Ministers will be responsible for overseeing performance of this obligation.

WAGP Authority to facilitate Project and participants

9.7 The WAGP Authority shall, if requested by the Company, where it appears that a State or State Authority is failing to comply with the provisions of this Agreement or the Enabling Legislation to the detriment of a WAGP Company, a Project Contractor, a Buyer, a Seller or a Shipper, intervene and use its best endeavours to procure the compliance by that State or State Authority with this Agreement or the Enabling Legislation.

10. AUDITS BY WAGP AUTHORITY

Audit of costs and tariff calculations

10.1 The WAGP Authority shall be entitled to audit the costs of the Company which are to be included in the calculation of the Foundation Reference Tariff and the Standard Reference Tariff, and the calculation of the Foundation Reference Tariff and the Standard Reference Tariff, as follows:

(a) The Company shall provide to the WAGP Authority, as part of the Pipeline Development Plan, an audited statement of:

(i) all costs which it asserts should be included in the calculation of the Foundation Reference Tariff and the Standard Reference Tariff, including estimates of costs from the time of providing that statement until the Construction Commitment Date, all costs determined in accordance with the Bidding Procedure, and estimates of all other costs to be incurred in the construction or operation of the Pipeline System; and

(ii) its calculation of the Foundation Reference Tariff and the Standard Reference Tariff derived from those costs.

(b) The WAGP Authority may conduct a further audit of those costs and that calculation, including the reasonableness of estimates. The WAGP Authority may engage a consulting firm to conduct the further audit. Subject to the consulting firm agreeing to reasonable terms of confidentiality, the Company shall provide to the consulting firm all information and materials reasonably required by it in the conduct of the audit.

(c) The WAGP Authority shall procure that any audit it wishes to conduct is completed, and it shall notify the Company in writing of its acceptance or otherwise of the Company's statement and calculation, within 90 days of receipt by the WAGP Authority of the original statement of costs and calculation of the Foundation Reference Tariff and the Standard Reference Tariff.

(d) The Company may at any time prior to the Construction Commitment Date provide to the WAGP Authority an updated audited statement of costs and calculation of the Foundation Reference Tariff and the Standard Reference Tariff. In that event the WAGP Authority may conduct a further audit of changes to the statement, and notify the Company in writing of its acceptance or otherwise of those changes. If the further audit is not conducted and the Company notified within 45 days of receipt by the WAGP Authority of the updated statement, the updated statement of costs and the calculation of the Foundation Reference Tariff and the Standard Reference Tariff provided by the Company shall be deemed to be correct and to have been accepted by the States, and shall become part of the Approved Pipeline Development Plan.

Audit of application of Economic Criteria

10.2 If at any time the Company asserts that it is relieved of an obligation hereunder because of the application of the Construction Economic Criteria, the Expansion Economic Criteria or the Restoration Economic Criteria, the WAGP Authority shall be entitled to audit the application of those criteria, as follows:

(a) Upon asserting the application of such criteria, the Company shall provide to the WAGP Authority an audited statement of the reasons for its conclusions, setting out all of the facts and matters which give rise to those conclusions and including the calculations which demonstrate those conclusions.

(b) The WAGP Authority may, within 90 days of receipt of that statement, conduct its own audit of the application of those criteria. The WAGP Authority may engage a consulting firm to conduct the audit. Subject to the consulting firm agreeing to reasonable terms of confidentiality, the Company shall provide to the consulting firm all information and materials reasonably required by it in the conduct of the audit.

(c) If the consulting firm has not conducted the audit and provided its report to the WAGP Authority and the Company within the 90 day period mentioned above, the conclusions of the Company in the statement provided by it shall be deemed accepted by the WAGP Authority.

Audit of Returns

10.3 Subject to Schedule 8 the WAGP Authority shall be entitled to audit the Returns of the Company, as follows:

(a) The WAGP Authority may, at any time within the limits specified in Schedule 8, procure that an independent internationally-recognised accounting firm conduct an audit of the Returns of the Company. Subject to the accounting firm agreeing to reasonable terms of confidentiality, the Company shall provide to the accounting firm all information and materials reasonably required by it in the conduct of the audit.

(b) The reasonable costs of the accounting firm in conducting the audit not more than once every three years shall be included in the calculation of the funding requirement notified under paragraph (c) of Clause 9.4. Any more frequent audits in accordance with Schedule 8 shall be conducted at the sole cost of the States.

(c) If any dispute arises as to the outcome of an audit under this Clause 10.3, such dispute shall be resolved in accordance with Schedule 8.

Audit of force majeure

10.4 If the Company asserts that a Company Force Majeure Event has occurred during the Construction Period and as a consequence the Company is relieved for a period of time from its obligation to construct the Pipeline System, it shall provide the WAGP Authority with a statement of all relevant information establishing the existence and effect of such Company Force Majeure Event. The WAGP Authority shall be entitled within 90 days of receipt of such a statement to inspect any relevant records of the Company which establish the existence and effect of such Company Force Majeure Event.

10.5 If during the operating Period the Company asserts that a force majeure event has resulted in a reduction of the amount collected in respect of the WAGP Authority Charge in accordance with paragraph (e) of Clause 9.4, the Company shall provide to the WAGP Authority copies of all force majeure notices given to it under its Gas Transportation Agreements.

Audit of application of Access Code

10.6 The WAGP Authority shall be entitled to audit the application of the Access Code to the Gas Transportation Agreements of the Company, as follows:

(a) The WAGP Authority may at any time procure that an independent internationally-recognised firm conduct an audit of the books and records of the Company establishing the volumes of natural gas transported by the Company and the charges made by the Company for that transportation, to determine whether the charges made by the Company have been made in accordance with the Access Code. Subject to the accounting firm agreeing to reasonable terms of confidentiality, the Company shall provide to the

accounting firm all information and materials reasonably required by it in the conduct of the audit.

(b) The accounting firm may retain technical or other specialists to assist it in the audit.

(c) The reasonable costs of the accounting firm in conducting the audit under this Clause 10.6 not more than once every two years shall be included in the calculation of the funding requirement notified under paragraph (c) of Clause 9.4. Any more frequent audits under this Clause 10.6 shall be conducted at the sole cost of the States.

11. TRANSITIONAL ARRANGEMENTS

11.1 Pending the establishment of the WAGP Authority and it having acquired the necessary authority and power in respect of a function in accordance with Clause 9.2, the Steering Committee shall be responsible to exercise and carry out that function. Until such time as the WAGP Authority has the necessary authority and power in respect of that function all references to the WAGP Authority in this Agreement in respect of that function shall, unless the contrary intent appears, be construed as references to the Steering Committee.

11.2 The Steering Committee may delegate its responsibilities under Clause 11.1. The actions of a person acting pursuant to a delegation from the Steering Committee under this Clause 11.2 shall for the purposes of this Agreement be the actions of the Steering Committee.

12. WAGP REGULATIONS

Development and adoption of WAGP Regulations

12.1 Following execution of this Agreement, the draft WAGP Regulations shall be prepared by the WAGP Authority in consultation with WAPCo, for adoption by the Relevant Ministers. Following the coming in to force of the Enabling Legislation in each State, each State shall procure that its Relevant Minister adopts, in accordance with the Enabling Legislation, the WAGP Regulations.

Content of WAGP Regulations

12.2 The WAGP Regulations shall provide for all matters normally included in regulations governing pipeline construction and operation (other than environmental standards and procedures for obtaining environmental approvals), including those matters identified in Schedule 6, and shall be consistent with this Agreement and accord with Schedule 6.

Amendments to the WAGP Regulations

12.3 If any State or the WAGP Authority considers it necessary or appropriate to amend or supplement the WAGP Regulations, it shall notify each of the Parties (and, in the case of a State, the WAGP Authority) of the change it proposes be made. The

States shall consult with the Company on the proposed changes and afford the Company the opportunity to comment thereon and/or submit alternative amendments or supplements to the WAGP Regulations. The States shall not agree to or implement changes to the WAGP Regulations, and each State shall procure that its Relevant Minister does not make changes to the WAGP Regulations, which would have the effect of creating a different set of regulations applying in one or more States or which are inconsistent with the provisions of this Agreement, without the prior written approval of the Company.

13. INITIAL UNDERTAKINGS OF THE COMPANY

Information undertaking

13.1 The Company shall, following the execution of this Agreement by each of the Parties hereto, use reasonable endeavours to keep the WAGP Authority advised of progress being made by the Company in the performance of its obligations under this Agreement in the period prior to the occurrence of the Construction Commitment Date. In particular, the Company shall provide a report to the WAGP Authority each month outlining such progress and highlighting any major events that have occurred, including all events which the Company considers are likely to be of interest to the States and the WAGP Authority.

Project development milestones

13.2 The Parties anticipate that following the execution of this Agreement by each of the Parties hereto, the milestones identified in Schedule 1 will be achieved by the relevant date for each such milestone identified in such Schedule. Failure to achieve a project milestone by the date by which it is expected to be achieved shall not constitute either:

(a) a breach by the Company of this Agreement; or

(b) a Company Event of Default.

14. COMMERCIAL AGREEMENTS

Commercial Agreements

14.1 The Company shall, following the execution of this Agreement by each of the Parties hereto, use its reasonable endeavours to:

(a) conclude the negotiation of, and enter into, such of the Commercial Agreements to which the Company is a party on terms acceptable to the Company; and

(b) satisfy those conditions precedent to such agreements that are to be satisfied by the Company (excluding for these purposes any condition precedent as to the Pipeline System being constructed and commissioned),

provided that the Company shall act in its sole discretion in determining whether to, and on the conditions on which it will, enter into a Commercial Agreement. Neither the WAGP Authority nor any State shall have any approval right over or in respect of any Commercial Agreement or any amendment thereto other than as set out in Clause 14.2.

Foundation Gas Transportation Agreements

14.2 The Foundation Gas Transportation Agreements shall be consistent with the Approved Tariff Methodology. The Company shall, not later than 30 days after the Construction Commitment Date, provide the WAGP Authority with a summary of the key terms and conditions of all Foundation Gas Transportation Agreements, including the key terms listed in Schedule 14. The summary so provided shall not be disclosed publicly and shall be kept confidential in accordance with Clause 45.

Non-foundation Gas Transportation Agreements

14.3 The Company shall be entitled to negotiate additional Gas Transportation Agreements (in addition to the Foundation Gas Transportation Agreements) on commercial terms established pursuant to the Access Code. The Company shall not, without the prior written consent of the WAGP Authority, enter into Gas Transportation Agreements (except Foundation Gas Transportation Agreements) other than in accordance with the provisions of the Access Code.

15. TARIFF METHODOLOGY IN GAS TRANSPORTATION AGREEMENTS

Approved Tariff Methodology

15.1 The Approved Tariff Methodology is designed to enable the Company to achieve over the Primary Transportation Term a real, after Income Tax, rate of return:

(a) from net cash flows (after payment of all operating and other expenses) derived from Foundation Gas Transportation Agreements, of 12% on total capital employed in the Initial Development (including Pre-Development Costs); and

(b) from net cash flows (after payment of all operating and other expenses) derived from all Gas Transportation Agreements:

(i) of exactly 15% on total capital employed in the Pipeline System (including Pre-Development Costs) from all Gas Transportation Agreements, assuming that actual volumetric growth in the market for natural gas transported in the Pipeline System exactly equals the Mid-market Forecast;

(ii) of less than the 15% rate of return provided for under sub-paragraph (i) above if the actual volumetric growth in the market for natural gas transported in the Pipeline System is less than the Mid-market Forecast; and

(iii) of more than the 15% rate of return provided for under sub-paragraph (i) above if the actual volumetric growth in the market for natural gas transported in the Pipeline System is greater than the Mid-market Forecast.

The above results are dependent on the performance of the Buyers and the market for natural gas and the States have not warranted that those rates of return will be achieved.

Amendments

15.2 The Company and the WAGP Authority may agree from time to time to amend the Approved Tariff Methodology.

Approved Tariff Methodology after Primary Transportation Term

15.3 The Parties shall negotiate in good faith on the terms of the Approved Tariff Methodology to apply after the Primary Transportation Term, to enable the Company to achieve:

(a) a real, after Income Tax, rate of return of 15% on additional capital employed in the course of a Pipeline System Enlargement under Clause 25, by means of an extension to the Initial Term in accordance with Clause 29.5 or otherwise, plus the recovery of reasonable operating costs of the Pipeline System and a reasonable profit thereon; and

(b) in the absence of a Pipeline System Enlargement, a recovery of reasonable operating costs of the Pipeline System and a reasonable profit thereon.

Access Code to include Approved Tariff Methodology

15.4 The Access Code shall include, and require the application by the Company of, the Approved Tariff Methodology.

Establishment of tariffs each year.

15.5 Not less than 30 days prior to the start of each year, the Company shall provide to the WAGP Authority its calculation of the Foundation Tariff and the Standard Tariff to apply for the following year, and a statement of the application of the Inflation Index and the volumes on which the calculation is based. The WAGP Authority shall promptly confirm in writing to the Company the accuracy of the calculation, or advise the Company of any error it considers exist in the calculation. The WAGP Authority may consult with Buyers or Shippers prior to giving its advice.

16. LICENCES TO CONSTRUCT AND OPERATE PIPELINE SYSTEM

Operation under local law in each State

16.1 The Pipeline System will be constructed and operated under the prevailing laws in the States, as amended or supplemented by the Enabling Legislation and the

WAGP Regulations. Accordingly, the principal authorisation for the Company to construct and operate the Pipeline System shall be as follows:

(a) In respect of Benin, a licence to be issued by its Relevant Minister under pipeline licensing provisions to be included in the Enabling Legislation;

(b) In respect of Ghana, a licence to be issued by its Relevant Minister under pipeline licensing provisions to be included in the Enabling Legislation;

(c) In respect of Nigeria, a licence to be issued by the Minister for Petroleum Resources under section 7 of the Oil Pipelines Act, Cap. 338; and

(d) In respect of Togo, a licence to be issued by its Relevant Minister under pipeline licensing provisions to be included in the Enabling Legislation,

(each a ***Pipeline Licence*** and collectively the ***Pipeline Licences***).

Process for obtaining Pipeline Licences

16.2 The Company shall, following the execution of this Agreement, in accordance with Schedule 17 submit to the WAGP Authority:

(a) a Conceptual Design Package for the Initial Development;

(b) a Front End Engineering Design Package for the Initial Development; and

(c) a draft Pipeline Development Plan.

The Company, the States, the WAGP Authority and the Technical Authorities shall follow the processes set out in Schedule 17 for public review and consultation and for reviewing, agreeing and approving the Pipeline Development Plan, and recommending the issue of the Pipeline Licences.

Co-ordination with environmental process

16.3 The WAGP Authority shall work with all of the State Environmental Protection Authorities, and each Technical Authority shall work as appropriate with the State Environmental Protection Authorities in its State, to ensure consistency between the permitting process set out in Schedule 17 and the environmental approval process set out in Part C of Schedule 2, and to suitably address impacts relevant to each organisation. In its submissions under Schedule 17, the Company may reference documents submitted in accordance with Schedule 2. If conflicts should arise between the requirements of a Technical Authority and the requirements of a State Environmental Protection Authority, the State Authorities concerned shall rectify these conflicts within 28 days of them being pointed out in writing by the Company. The Technical Authorities will participate in activities conducted by the Company in conjunction with the State Environmental Authorities to address common issues and to efficiently advance the approval processes.

Issue of Pipeline Licences

16.4 The States shall ensure that applications for Pipeline Licences are processed and the Pipeline Licences are issued in accordance with Schedule 17.

Approval to Operate

16.5 The Company shall not commence the commissioning or operation of the Pipeline System, or any newly installed part thereof, without an Approval to Operate being given by the WAGP Authority in accordance with this Clause and the Enabling Legislation. The Company shall, following physical completion of the Initial Development or completion of the installation of additional facilities as part of the Pipeline System, provide to the WAGP Authority the materials set out in Schedule 18 and request in writing that the WAGP Authority issue an Approval to Operate. The WAGP Authority shall be entitled in accordance with the WAGP Regulations to inspect the records of the Company relating to the construction and testing of the Pipeline System or such additional facilities. The WAGP Authority shall respond in writing within 21 days of receipt of a request from the Company under this Clause, either advising of its approval to operate the Pipeline System (which approval shall constitute an Approval to Operate under this Clause) or the additional facilities or else advising what matters it requires to be satisfied before giving its approval. If the WAGP Authority does not respond in writing within 21 days then the Approval to Operate shall be deemed given on the 22nd day following the request.

17. PROJECT AUTHORISATIONS AND SUPPLEMENTAL AUTHORISATIONS

Application for other Project Authorisations

17.1 In addition to the Pipeline Licences, the Company will apply for and be issued all other normal licences and permits which under the laws of a State are required to construct or operate the Pipeline System.

Issue of other Project Authorisations

17.2 The States shall, as soon as practicable following approval of the Pipeline Development Plan in accordance with Clause 18.3 and Schedule 17 and completion by the Company of the legal procedures required under the prevailing laws in each State, including payment of any fees, issue to the Company the other Project Authorisations specified in the Approved Pipeline Development Plan, subject only to the conditions agreed by the WAGP Authority and the Company in the Approved Pipeline Development Plan. Fees charged for such Project Authorisations shall be fair, reasonable and non-discriminatory.

No other authorisations required

17.3 Without prejudice to the provisions of Clause 32, neither the Company nor any of its Shareholders or Project Contractors shall be required to obtain any licences or any other permit or right to construct or operate the Pipeline System other than the Project Authorisations.

Preliminary list of Project Authorisations

17.4 The Pipeline Development Plan shall set out a preliminary list of all Project Authorisations required by the Company (including the Pipeline Licences) and shall specify the fees, if any, to be charged to the Company in respect of each such authorisation. The Company shall from time to time notify the WAGP Authority of any further Project Authorisations which it identifies as being required for that purpose.

Extension of Project Authorisations

17.5 Prior to the date on which any Project Authorisation is due to expire, the Company may, by written notice to the relevant State, request an extension of that Project Authorisation for such period as is permitted by law, and such State shall renew, extend or reissue as appropriate such Project Authorisation for such period provided that at that time the Company has made proper application and is not in material breach of any obligation under this Agreement which would have a material adverse effect on its ability to perform its obligations to the relevant State hereunder. Any renewal, extension or reissue of a Project Authorisation pursuant to the terms of this Clause 17.5 shall, unless otherwise agreed by the Company and the WAGP Authority, be on the same terms and conditions as the Project Authorisation to which it relates and such authorisation shall continue in full force and effect for the duration of such extension.

Changes to Project Authorisations

17.6 To the extent that the Company requests changes or additions to the Project Authorisations, each State undertakes to promptly enter into discussions with the Company about such new Project Authorisations or changes, and shall implement such changes or additions as are reasonable in the circumstances.

Issue and renewal of Supplemental Authorisations

17.7 The States shall, as soon as practicable following an application from a Buyer, a Seller, a Shipper or another relevant person and completion by the applicant of the legal procedures required under the prevailing laws in each State, issue to such Buyer, Seller, Shipper or other relevant person all Supplemental Authorisations requested by them. Applicants for Supplemental Authorisations shall only be charged reasonable and non-discriminatory fees for the issue of Supplemental Authorisations. Each State shall upon request, and subject to the completion of formalities and payment of reasonable fees, extend or renew Supplemental Authorisations as required.

Recommendations by the WAGP Authority

17.8 The Company shall notify the WAGP Authority of any refusal or failure to issue a Supplemental Authority upon application. Upon receipt of a recommendation from the WAGP Authority, as to the necessity for a particular Project Authorisation or Supplemental Authorisation to be issued or extended or renewed or varied the State in question shall promptly take such action as may be required to give effect to such recommendation.

Right to extend benefit of Project Authorisations

17.9 All Project Authorisations and Project Rights issued or granted to the Company shall be capable of being extended to Project Contractors, to the extent necessary to implement the Project in accordance with the contracts entered into by the Company.

18. PIPELINE DEVELOPMENT PLAN

Requirements for the Pipeline Development Plan

18.1 All drafts of the Pipeline Development Plan to be submitted by the Company pursuant to Clause 15 and Schedule 17 shall:

(a) be consistent with the Agreed Design Standards;

(b) be consistent with internationally acceptable industry standards and recognised good practice applicable to high pressure natural gas pipelines in similar conditions;

(c) be consistent with the highest standards of contemporary practice used in similar conditions for the construction of high pressure natural gas pipelines by the Shareholders or their Affiliates in order to protect the environment; and

(d) include the information referred to in Schedule 3.

Negotiation in good faith

18.2 The Company and the WAGP Authority shall negotiate in good faith on the detail of the content of the Pipeline Development Plan.

Approval by WAGP Authority

18.3 If the Company and the WAGP Authority reach agreement on the content of the Pipeline Development Plan in accordance with Schedule 17, the WAGP Authority shall approve the final Pipeline Development Plan in writing.

Amendments to Approved Pipeline Development Plan

18.4 The Approved Pipeline Development Plan may be amended from time to time by written agreement between the Company and the WAGP Authority (acting in conjunction with the relevant Technical Authority in each State). Upon amendments being made to the Approved Pipeline Development Plan in accordance with this Clause, the States shall ensure that any Project Authorisation which is or has been issued in respect of the Pipeline System as described in the amended Approved Pipeline Development Plan shall be amended as provided for in the amended Approved Pipeline Development Plan, and that any new Project Authorisations provided for therein are issued.

19. ENVIRONMENT

Environmental Impact Assessment

19.1 The Company shall prepare and submit to the WAGP Authority a preliminary version of the environmental impact assessment (the ***Environmental Impact Assessment***) in the format identified, and providing the information required, in Part A of Schedule 2 and which shall include without limitation:

(a) the identification of environmental values potentially at risk;

(b) the potential impact of the Project on such values;

(c) a baseline study (including the identification of pre-existing environmental liabilities and risks, both actual and contingent);

(d) potential mitigation measures;

(e) an alternatives discussion; and

(f) the assessment necessary to develop the Environmental Management Plan.

The Environmental Impact Assessment shall address each State individually, and shall also consider the overall impact of the Project, focussing on cross-border aspects and issues of common interest.

Environmental Management Plan

19.2 At the same time as the Company delivers the preliminary Environmental Impact Assessment to the WAGP Authority pursuant to Clause 19.1, the Company shall prepare and submit a preliminary environmental management plan (the ***Environmental Management Plan***) to be developed as set out in, and providing the information required under, in Part B of Schedule 2, and which shall include without limitation:

(a) a description as to how the impact mitigation measures proposed in the draft Environmental Impact Assessment will be managed in practice;

(b) a description as to how the Project will be managed and operated to maintain compliance with applicable legal requirements, to avoid or minimise adverse environmental, safety and socio-economic effects, and to enhance the environmental, safety and socio-economic aspects of the Project;

(c) a plan to monitor relevant aspects and impacts of the Project, as well as to evaluate the effectiveness of mitigation measures and to adjust them as needed throughout the construction and operation of the Pipeline System;

(d) a description of the procedures to periodically revise and update the Environmental Management Plan; and

(e) an assessment of the impacts of the Project in each State, and also the overall impact of the Project.

Review and approval process

19.3 The draft Environmental Impact Assessment and the draft Environmental Management Plan prepared and submitted by the Company pursuant to Clauses 19.1 and 19.2 shall be reviewed and approved in accordance with the processes set out in Part C of Schedule 2.

Co-ordination with permitting process

19.4 The WAGP Authority shall work with all of the Technical Authorities, and each State Environmental Protection Authority shall work as appropriate with each Technical Authority in its State, to ensure consistency between the permitting process set out in Schedule 17 and the environmental approval process set out in Part C of Schedule 2, and to suitably address impacts relevant to each organisation. In its submissions under Schedule 2, the Company may reference documents submitted in accordance with Schedule 17. If conflicts should arise between the requirements of a State Environmental Protection Authority and the requirements of a Technical Authority, the State Authorities concerned shall rectify these conflicts within 20 days of them being pointed out in writing by the Company. The State Environmental Protection Authorities will participate in activities conducted by the Company in conjunction with the Technical Authorities to address common issues and to efficiently advance the approval processes.

Implementation of the Environmental Management Plan

19.5 Each State shall, following its approval of the final draft of the Environmental Impact Assessment and the final draft of the Environmental Management Plan in accordance with the procedures set out in Part C of Schedule 2, consent to relevant actions taken by or on behalf of the Company in connection with the implementation of the final Environmental Impact Assessment and the final Environmental Management Plan. The State Environmental Protection Authorities shall monitor actions taken during implementation of the Environmental Management Plan, and shall advise the Company and the WAGP Authority of any proposed adjustments which they consider would enhance the Environmental Management Plan. Any such proposed adjustments shall be considered in accordance with Clause 19.7.

Authorised Expansions

19.6 If the Company proposes to construct an Authorised Expansion and submits an Authorised Expansion Approval Package in accordance with Schedule 19, the State Environmental Protection Authorities within whose area of jurisdiction the new facilities would lie shall review and deal with the proposal as set out in Schedule 19.

Periodic review

19.7 The Environmental Management Plan shall be reviewed from time to time, and in any event on any occasion when a State Environmental Protection Authority

advises of a proposed change on accordance with Clause 19.5. The WAGP Authority (acting in consultation with the relevant State Environmental Protection Authorities) shall have the power to agree on amendments to the Environmental Management Plan with the Company. The Company and the WAGP Authority shall co-operatively agree to amend the Environmental Management Plan as appropriate in the light of new circumstances or facts. Any new environmental requirements on the Project shall only be proposed and adopted in accordance with this Clause 19.7.

Consistent environmental standards

19.8 The Environmental Impact Assessment and the Environmental Management Plan prepared and submitted by the Company pursuant to Clauses 19.1 and 19.2 shall be consistent with:

(a) the highest standard of contemporary practice used in similar conditions for the construction and operation of high pressure natural gas pipelines by the Shareholders or their Affiliates in order to protect the environment;

(b) internationally acceptable industry standards and recognised good practice applicable to high pressure natural gas pipelines; and

(c) the standards used by export credit agencies and international financial institutions in similar conditions for the construction and operation of high pressure natural gas pipelines in order to protect the environment, to the extent the Company would need to comply with such standards.

Assistance and support

19.9 Each of the States shall provide the Company and any advisers engaged by or on behalf of the Company (including any environmental consulting firm) with such support and assistance as the Company or, as the case may be, such advisers may reasonably request for the purposes of facilitating compliance by the Company with its obligations as set forth in this Clause, including the facilitation of the consultations referred to in Part C of Schedule 2. In particular, and to enable the Company to comply with its obligations hereunder, the States shall, promptly upon request of the Company, and without attaching any unreasonable conditions thereto, procure the registration in the relevant State of any experienced and reputable international consulting firm which the Company desires to have registered, and issue such firm all such authorisations as would be required to enable such firm to assist the Company perform its obligations hereunder.

20. PRE-DEVELOPMENT RIGHTS

Notification of requirements

20.1 The Company shall notify the WAGP Authority of the surveyed locations of land (together with their legal descriptions, if any) and territorial waters to which the Company and the Project Contractors require temporary access for the purposes of surveying the proposed route of the Pipeline System and the proposed sites of related and other ancillary support facilities, determining the suitability of proposed sites,

carrying out environmental studies, or otherwise performing its obligations under this Agreement. The WAGP Authority shall forward all such notifications to the relevant State Authority in each State.

Grant of access

20.2 Each State shall, in respect of land and sea within its jurisdiction, procure that the Company and the Project Contractors are granted in a timely manner (having regard to the timeframe within which the Project is to be implemented) all temporary access to land and/or sea notified under Clause 20.1.

Compensation

20.3 The Company shall pay to any affected legitimate land owners or lawful occupiers of land entered in accordance with this Clause fair compensation for disturbance or damage caused by the activities of the Company or the Project Contractors on such land. The principles and procedures for quantifying the amount of such compensation (together with procedures for resolving any disputes in respect of such compensation) shall be those applying under the prevailing laws of the relevant State.

21. LAND RIGHTS

Identification of rights required

21.1 The Company shall in the Pipeline Development Plan identify all surveyed locations of land in respect of which it requires:

(a) a right of exclusive possession for the siting of its facilities, operations and supporting operations; or

(b) a temporary or permanent right of way or temporary or permanent right of access for the implementation of the Project.

Non-exclusive rights

21.2 The permanent land rights which the Company requires which do not involve exclusive possession of land by the Company shall be granted by the States as rights attaching to the Pipeline Licences.

Company to seek exclusive rights

21.3 The Company shall endeavour to obtain the exclusive possession land rights which it needs over land which is not owned by a State or a State Authority by way of negotiation with the owner and occupier of the land.

States to procure land rights

21.4 The Company shall notify the WAGP Authority when it has taken its Final Investment Decision, and at the same time notify the WAGP Authority of all land in respect of which it has not obtained the exclusive possession land rights which it

needs. Upon receipt of such notice by the WAGP Authority, each State shall procure, in respect of land within its territory and jurisdiction (including the seabed), that the Company is granted exclusive possession rights to all such land. Such exclusive possession rights shall be by way of transfer or issue to the Company of the longest form of exclusive title or right of use available under the laws of the relevant State. Following the provision by a State of such title to the Company, that State shall indemnify the Company in respect of any claim by any other person which is adverse to the Company's rights as set out above.

Joint occupation of rights of way

21.5 The Company shall grant to public utilities or public infrastructure projects which request the same the right to jointly occupy its permanent rights of way, subject to non-interference with the implementation of the Project or operation of the Pipeline System and provided always that the Company has received an indemnity from such utility or project in form and substance acceptable to it.

Compensation for land not owned by the State

21.6 Upon the grant to it of the permanent rights referred to in Clause 21.4 the Company shall, where the land over which the rights referred to in Clause 21.4 are granted is not owned by a State or a State Authority (including land which is compulsorily acquired by a State for the purposes of the Project), have an obligation to pay to the States on behalf of such owners or occupiers, fair and reasonable compensation for the acquisition of exclusive possession interests in land or permanent rights of way or permanent access rights acquired from them, without taking into account the use to which the land will be put, or as otherwise provided by the laws of that State, but otherwise the Company shall have no obligation to make any initial or ongoing payments for such land rights. The principles and procedures for quantifying the amount of such compensation (together with procedures for resolving any disputes) shall be those applying under the prevailing laws of the relevant State.

No compensation for State-owned land

21.7 Where the land over which the rights in Clause 21.4 are granted is owned by a State or State Authority, the rights referred to in Clause 21.4 shall be granted to the Company without charge.

Granting of temporary rights

21.8 Each State shall also, in respect of land within its jurisdiction, procure for the Company and the Project Contractors in a timely manner all temporary land access required for the purpose of construction of the Pipeline System, including related facilities.

Compensation for temporary rights

21.9 The Company shall pay to any affected legitimate land owners or lawful occupiers of land entered in accordance with Clause 21.8 fair compensation for

disturbance or damage caused by the activities of the Company or the Project Contractors on such land. The principles and procedures for quantifying the amount of such compensation (together with procedures for resolving any disputes in respect of such compensation) shall be these applying under the prevailing laws of the relevant State.

Delay and disputes

21.10 Each State shall procure that the land use grants referred to in Clauses 20 and 21 are not delayed. If any dispute arises as to valuation, the land rights in question shall, to the extent permitted by applicable local law, be granted and land acquired and transferred promptly, subject to the payment or provision by the Company of security for any amount in dispute. The Parties shall thereafter consult with each other in an effort to resolve the dispute.

22. CONSTRUCTION

Obligation to construct Pipeline System

22.1 The Company shall, following the Construction Commitment Date:

(a) Diligently construct or procure the construction of the Pipeline System in accordance with and subject to this Clause 22; and

(b) Expand or procure the expansion of the capacity of the Pipeline System in accordance with and subject to Clause 24.

The Company shall construct the Pipeline System and undertake the Project at its own risk and cost on the terms set out, and subject to the conditions set out, in this Agreement.

Initial Construction

22.2 The obligation of the Company under paragraph (a) of Clause 22.1 shall be to construct the Pipeline System to the extent of the Initial Development. The construction of the Pipeline System shall thereafter be expanded in accordance with, but subject to the provisions of, Clause 24.

Construction Process

22.3 The Company shall carry out or procure the design, planning, fabrication, construction, installation, testing and commissioning of the Pipeline System in accordance with the Approved Pipeline Development Plan, the WAGP Regulations and the provisions of this Agreement. Subject to the provisions of this Agreement, the Company shall be free to establish any contractual structure for the construction activities conducted in connection with the Project it wishes, and may engage Project Contractors to undertake such activities.

Competitive bidding required

22.4 Major Contracts for Works shall be granted by means of competitive bidding, conducted in accordance with the Bidding Procedures.

Standard of construction

22.5 The Pipeline System shall be constructed in accordance with internationally acceptable industry standards and recognised good practice applicable to high pressure natural gas pipelines, the WAGP Regulations, the Environmental Management Plan and the Approved Pipeline Development Plan. The Company shall procure that all contracts for the construction of the Pipeline System are written so as to:

(a) adhere to such standards, practices, regulations and plans;

(b) require that the Pipeline System be constructed accordingly; and

(c) require conformance with the Environmental Management Plan and other health, environmental or safety standards identified by Company.

Status reports

22.6 The Company shall submit to the WAGP Authority status reports on the implementation of the Project every month from the Construction Commitment Date until the Completion Date. The Company shall also comply with all other reporting requirements set out in the WAGP Regulations, including the prompt reporting of any Emergency Condition. In addition, during the period from the Construction Commitment Date until the Completion Date, the Company shall promptly furnish to the WAGP Authority such information with respect to the construction of the Pipeline System as the WAGP Authority may from time to time reasonably request.

Inspection by WAGP Authority

22.7 During the Construction Period, the Company shall permit authorised representatives of the WAGP Authority to visit and inspect the Project sites as permitted under the WAGP Regulations.

Construction Economic Criteria

22.8 Notwithstanding the foregoing, the Company shall not be obliged to construct the Pipeline System or to continue with its construction in circumstances where the Construction Economic Criteria are not satisfied. Any dispute as to whether the Construction Economic Criteria are met shall be resolved in accordance with the Dispute Resolution Procedure.

Completion of construction

22.9 Upon completion of construction of the Initial Development, the Company shall provide to the WAGP Authority:

(a) As built drawings of the Pipeline System;

(b) Alignment sheets showing the depth of cover and locations of waterway and public roadway crossings; and

(c) The names and locations of population centres inhabited by 20 people or more that lie within 100 metres of the Pipeline System.

23. Operation, Maintenance and Repair

Company's obligation

23.1 The Company shall arrange for the safe and reliable operation and maintenance of the Pipeline System in accordance with the terms of this Agreement and the WAGP Regulations. Subject to such terms, the Company shall be free to contract for the operation and maintenance activities conducted in connection with the Project and shall be entitled to engage Project Contractors to undertake such activities.

Alternate operator

23.2 The Company may engage another entity to accept primary responsibility for the operation of the Pipeline System with the consent of the WAGP Authority. Such consent shall not be unreasonably withheld and may only be withheld on the grounds of lack of technical competence or lack of financial strength.

Repair

23.3 If the Pipeline System is damaged or destroyed, the Company shall, subject to Clause 23.4, repair or procure the repair of such damage and restore or procure the restoration of the Pipeline System to its state prior to the event which caused the damage or destruction.

Restoration Economic Criteria

23.4 The Company shall have no obligation under Clause 23.3 if the expenditure for the Works required to carry out such repairs or restoration does not meet the Restoration Economic Criteria.

Standards and practices

23.5 The Pipeline System shall be operated, maintained and repaired in accordance with internationally acceptable industry standards and recognised good practice applicable to high pressure natural gas pipelines in similar situations, the WAGP Regulations, the Environmental Management Plan and the Approved Pipeline Development Plan. The Company shall procure that all contracts for the operation, maintenance or repair of the Pipeline System are written so as to:

(a) adhere to such standards, practices, regulations and plans;

(b) require that the Pipeline System be operated, maintained or repaired accordingly; and

(c) require conformance with the Environmental Management Plan and other health, environmental or safety standards identified by Company.

24. EXPANSION OF CAPACITY OF THE PIPELINE SYSTEM

Commitment to expand capacity

24.1 Subject to Clause 24.2, the Company shall expand the capacity of the Pipeline System from time to time as required to meet total firm contracted capacity entitlements of Shippers, up to the maximum design capacity described in the Approved Pipeline Development Plan, provided:

(a) the incremental return to the Company from the cost of the expansion satisfies the Expansion Economic Criteria; or

(b) where the Expansion Economic Criteria are not satisfied, if the expansion is paid for by a Shipper or a Buyer or one or more States.

Approvals and agreement required

24.2 The obligation of the Company under Clause 24.1 is subject to the Company receiving all necessary approvals (including environmental and technical approvals as provided in Schedule 19) and to the appropriate amendment to the Approved Pipeline Development Plan being made. Where the conditions set out in paragraphs (a) or (b) of Clause 24.1 are satisfied, the Company shall use all reasonable endeavours to obtain all such approvals and agree on the appropriate amendment to the Approved Pipeline Development Plan.

Ownership of additional facilities

24.3 Subject to any agreement at the time, where paragraph (b) of Clause 24.1 applies and the expansion of the Pipeline System is paid for by another person, the additional facilities will nevertheless be owned by the Company. The basis for such payment by another person and the economic consequences for the payer shall be determined in the agreement reached at the time.

Authorised Expansions

24.4 Where the Company proposes to make an Authorised Expansion, it shall notify the WAGP Authority accordingly in writing. The Company, the WAGP Authority, the States and the relevant Technical Authorities and State Environmental Protection Authorities shall follow the process set out in Schedule 19 to achieve all necessary approvals for the Authorised Expansion, and amendment to the Approved Pipeline Development Plan and the conditions of the relevant Pipeline Licence. The amendment to the Pipeline Licence for the purposes of the Authorised Expansion shall constitute approval for the Company to construct the Authorised Expansion.

25. PIPELINE SYSTEM ENLARGEMENT

Pipeline System Enlargement

25.1 The Company may submit an application to the States to extend the length of the Pipeline System, or to expand its capacity in a manner which is not an Authorised Expansion (***Pipeline System Enlargement***). The Parties will then negotiate in good faith the terms and conditions on which the Pipeline System Enlargement would be implemented.

Agreement between the Company and the States

25.2 Any Pipeline System Enlargement shall be subject to agreement between the Company and the States on amendments to the Approved Pipeline Development Plan (including the terms of amendments to existing or issue of new Project Authorisations), preparation and agreement as appropriate of an environmental impact assessment and environmental management plan, and agreement as appropriate on variations to the WAGP Regulations and the Access Code. If the States and the Company agree upon a Pipeline System Enlargement, the States and/or the relevant State Authority shall issue or amend as necessary all applicable Project Authorisations. The provisions of this Agreement shall apply to the Pipeline System Enlargement.

Pipeline System Enlargement involving additional country

25.3 To the extent a Pipeline System Enlargement would require the involvement of a country which is not a party to this Agreement, any commitment of the Parties concerning such Pipeline System Enlargement shall be subject to such country:

(a) enacting legislation in respect of the Pipeline System Enlargement having equivalent effect to the Enabling Legislation;

(b) signing and (if required by its Constitution) ratifying the WAGP Treaty;

(c) adopting the WAGP Regulations; and

(d) becoming a party to this Agreement,

subject to any modifications to the above that may be required as a consequence of the envisaged Pipeline System Enlargement.

26. ACCESS CODE

Requirement for Access Code

26.1 The Company and the WAGP Authority shall negotiate in good faith in accordance with Clause 26.2 on the terms of an access code to apply to all Gas Transportation Agreements for transportation of natural gas in the Pipeline System other than Foundation Gas Transportation Agreements (***Access Code***). The States will not oblige the Company to transport natural gas through the Pipeline System other than in accordance with the provisions of this Agreement and the Access Code.

Content of the Access Code

26.2 The Access Code will be consistent with the Access Code Principles set out in Schedule 10 and will contain the terms and conditions (including the tariffs to be derived from the Approved Tariff Methodology) for Gas Transportation Agreements which are entered into after the Construction Commitment Date.

Open access

26.3 Subject to Clause 26.4, after the Construction Commitment Date the Company shall, unless otherwise agreed in writing with the WAGP Authority, to the extent and in the circumstances set out in the Access Code enter into Gas Transportation Agreements with any prospective Shipper on the terms set out in and subject to the Access Code.

Limited access prior to Open Access Commencement Date

26.4 Subject to Clause 26.5, prior to the Open Access Commencement Date the obligation under Clause 26.3 shall only apply in respect of prospective Shippers of and Gas Transportation Agreements for the transportation of:

(a) natural gas which is produced in Nigeria by Chevron Nigeria Limited, Nigerian National Petroleum Corporation or The Shell Petroleum Development Company of Nigeria Limited or their Affiliates; or

(b) natural gas produced in Benin, Togo or Ghana.

Restricted access

26.5 Prior to the Open Access Commencement Date, if:

(a) a potential Buyer is willing to pay the Access Reference Price to buy natural gas delivered at a delivery point into ELPS; and

(b) the Nigerian Commercial Group Members, or their Affiliates or representatives, are not willing at that time to sell natural gas at the Access Reference Price delivered at a delivery point into ELPS; and

(c) another potential seller of natural gas produced in Nigeria is willing to sell natural gas delivered at a delivery point into ELPS at the Access Reference Price,

and that potential buyer and potential seller enter into a bona fide gas sales contract on those terms, then the Company shall grant access to the Pipeline System on the terms set out in and subject to the Access Code for natural gas sold under that gas sales contract.

Disputes over access

26.6 Any dispute arising out of any refusal by the Company to enter into a Gas Transportation Agreement with a prospective Shipper shall be resolved in accordance

with the dispute resolution procedure set out in the Access Code for that purpose. Provided the Company complies with that dispute resolution procedure, the Company shall not be considered to be in breach of its obligations under this Agreement or under the Access Code.

Default by Company

26.7 The Company shall be responsible for administering the Access Code. If the Company fails to comply with the provisions described in Clause 26.3 in any material respect, the States shall be entitled to impose the Access Code by adopting regulations which have the force of law. The States shall not adopt any such regulations unless the Company's failure to comply with Clause 26.3 or the Access Code has continued for a period of at least 60 days following the date on which the WAGP Authority, with the prior written consent of each Relevant Minister, gave the Company notice of such failure, and the dispute resolution procedure under the Access Code in relation to the issue in question, or the Dispute Resolution Procedure for a dispute as to the alleged failure to comply with the Access Code, has been finally determined.

Amendment of the Access Code

26.8 The Access Code may be amended by written agreement between the WAGP Authority and the Company.

Publication of the Access Code

26.9 The Access Code shall be a public document. The Company shall, upon payment of reasonable expenses, make a copy of the Access Code available to any person who desires a copy. The WAGP Authority shall be at liberty to distribute copies of the Access Code as it sees fit.

27. INSURANCE

Construction Period insurance

27.1 During the Construction Period, the Company shall effect and maintain, or shall cause any Project Contractor engaged in connection with construction of all or part of the Works to effect and maintain, such construction-related insurance with respect to that part of the Works then in progress as the Company acting in accordance with good industry practice considers appropriate, including the following insurances with the following minimum single event coverage and maximum deductibles:

Insurance Type	Minimum Coverage ($)	Maximum Deductible ($)
Contractor's all risks insurance:		
General liability insurance:		

Worker's liability and/or employer's liability insurance:		

Operating Period insurance

27.2 During the Operating Period, the Company shall effect and maintain, or shall cause the Operator (or other Project Contractor engaged in connection with all or a part of the operation of the Pipeline System) to effect and maintain, such operating-related insurance with respect to the operation and maintenance of the Pipeline System as the Company acting in accordance with good industry practice considers appropriate, including:

Insurance Type	Minimum Coverage ($)	Maximum Deductible ($)
Physical damage (excluding business interruption) insurance:		
Marine cargo insurance:		
General liability insurance:		
Worker's liability and/or employer's liability insurance:		
Pollution liability insurance:		

Adverse market conditions

27.3 The Company shall be relieved of its obligations under Clauses 27.1 and 27.2, if conditions in the insurance market are such that it is not possible to satisfy such requirements on commercially reasonable terms and at a cost that does not or will not be reasonably likely to have an adverse impact on the economics of the Project. In that event the Company shall be considered to be self insured.

Information and review

27.4 The Company shall provide the WAGP Authority with an annual report detailing the insurances in effect of the types required under Clauses 27.1 and 27.2, and shall provide to the WAGP Authority copies of all certificates of insurance establishing compliance with those Clauses, or a certification that the Company is self insured in accordance with Clause 27.3. The Company shall notify the WAGP Authority in the period between delivery of such annual reports should any material change occur to any of the terms listed therein. The Company shall review the Insurance Programme periodically to ensure that the coverage provided by the various

insurance arrangements continues to be adequate in the context of the then prevailing conditions in the market generally and the States specifically.

Insurance market

27.5 The Company shall effect and maintain the above insurances on such commercially reasonable terms as are available with reliable insurers of adequate financial strength and experience. The Company shall endeavour to obtain insurance coverage for general liability, automobile liability and worker's compensation/employer's liability for the Project from within the States or the ECOWAS States to the extent that such insurances can be obtained from insurers which are sufficiently reliable and have adequate experience and financial strength, and at a cost equivalent to that available on international markets. In all other circumstances the Company may obtain insurance in the international insurance markets.

Extent of cover

27.6 The Company shall be entitled to arrange one or more insurance policies to cover the entire Project, and Shippers shall be entitled to arrange one or more insurance policies to cover their enterprise as Shippers, without regard to the State where the risk exists or an insured event might arise. The Company and Shippers shall not be required by the laws of a State to arrange any insurance coverage within that State or through a resident or citizen of that State.

Assistance and support

27.7 If so requested by the Company, each State shall assist the Company in arranging any insurance that it requires (whether or not part of the Insurance Programme) that would apply to all or any part of the Project.

Insurance proceeds

27.8 The Company shall, subject to the terms of its financing arrangements with lenders other than Shareholders or their Affiliates, apply any proceeds received in respect of insurance against property damage risks to repair such property damage, unless the damage has resulted in either a constructive total loss or a total loss or unless such repair fails to meet the Restoration Economic Criteria. The Company shall be entitled to create security in respect of insurance in favour of any bank, financial institution or other provider of finance or credit or any person taking security from the Company as a creditor. To the extent that such provider of finance would have the right not to apply the proceeds received in respect of any insurance to repair the damage, the Company shall apply an equivalent amount to repairs of the damage unless the damage has resulted in a constructive total loss or a total loss or unless such repair fails to meet the Restoration Economic Criteria.

28. LOCAL PROCUREMENT AND EMPLOYMENT

Opportunities for Local Businesses

28.1 The Company shall identify, in the Pipeline Development Plan, opportunities for Local Businesses to supply goods and services to the Company in the course of construction or operation of the Pipeline System. Any opportunities so identified in the Approved Pipeline Development Plan shall, to the extent permitted by applicable law in the relevant jurisdiction, be reserved for Local Businesses provided however that the granting of such opportunities to Local Businesses does not or would not lead to a breach by the Company of Clause 46.

Participation in international tenders

28.2 Local Businesses will be invited to qualify for all international tenders called by the Company in accordance with the Company's procedures including, in relation to Major Contracts, pursuant to the Bidding Procedures.

Source of goods and services

28.3 Not less than 15% (by value) of the goods and services used in the construction of the Pipeline System will be sourced from Local Businesses. The Company shall keep the WAGP Authority informed, in the reports provided by it under Clause 22.6, of the amount of procurement from Local Businesses, as a percentage of overall procurement.

Giving preference

28.4 Subject at all times to the provisions of Clause 46, the Company shall give preference to the extent reasonably practicable:

(a) in its procurement activities, to technically and commercially qualified Local Businesses, provided that:

  (i) their retention is consistent with internationally acceptable industry standards and recognised good practice applicable to high pressure natural gas pipelines; and

  (ii) subject always to the provision of goods and services by such Local Businesses being equivalent in terms of cost, quality and availability to prospective contractors and suppliers from outside the ECOWAS States; and

(b) in its recruitment of employees, to individuals who are citizens of one of the States and subsequently to individuals who are citizens of other ECOWAS States provided in each case that such preference shall be dependent upon such individuals having appropriate qualifications and experience.

Training programme

28.5 To the extent reasonably practicable, the Company shall develop and implement a technical and managerial training programme for its employees from the ECOWAS States, provided that the Company shall not be required to implement such a programme in a manner which may potentially limit or restrict the Company's ability to achieve the Completion Date on a timely basis.

Manpower and succession plan

28.6 The Company will include in the Pipeline Development Plan a manpower and succession plan. The manpower and succession plan will provide that within 10 years of the Commercial Operation Date, specific positions, representing a majority of senior management and supervisory personnel of the Company or an alternate Operator, shall be held by citizens of ECOWAS States. The Company shall use reasonable endeavours to implement that plan, subject to availability of suitably qualified and experienced personnel. The Company shall keep the WAGP Authority informed in annual reports of the status of implementation of the manpower and succession plan.

Work permits and visas

28.7 The States shall, promptly upon the request of the relevant entity and without attaching unreasonable conditions, grant to the Company, the Project Contractors, the Shareholders and the Shippers and their respective employees and advisers such visas, residence permits, work permits and other permits and authorisations as may be necessary or desirable for such persons to carry out their duties and functions.

Project Contractors

28.8 Each of the States shall promptly upon request of the Company, and without attaching any unreasonable conditions thereto, subject to and to the extent (if any) required by the law of that State, procure the registration in the relevant State of any Project Contractors which the Company desires to have registered, and grant such firm all such authorisations as would be required to enable such firm to assist the Company perform its obligations under this Agreement.

28.9 Project Contractors or their personnel who are citizens of one of the States shall be entitled to work on the Project in any of the States without restriction.

29. AGREED FISCAL REGIME

Requirement for legislation

29.1 The States shall use their best endeavours to implement the Agreed Fiscal Regime as law in each State, and thereby to bring about Fiscal Laws which give the benefits and consequences identified in Schedule 8 to WAGP Companies, Buyers, Sellers, Shippers, Shareholders and Project Contractors.

Acknowledgement of status

29.2 The Parties acknowledge that the terms of the Agreed Fiscal Regime, and in particular the corporate income tax rate, are agreed in recognition of the unique circumstance of the Agreed Fiscal Regime applying uniformly across four States, and as such do not set any precedent for tax rates or other fiscal terms in any one of the individual States.

Liability to Taxes

29.3 The Company shall be liable to pay Taxes, including Income Tax, in accordance with the Fiscal Laws.

Expiry of Initial Term

29.4 With effect from the expiry of the Initial Term, there shall be no consequence under this Agreement if the Legislatures of the States change the provisions of the Fiscal Laws applying to the Project, provided that:

(a) all of the States make the same changes having effect at the same time, so as to maintain the harmonised application of the Fiscal Laws applying to the Project; and

(b) the provisions of the Agreed Fiscal Regime concerning assessment and administration (including the handling of tax returns, the consolidation of tax returns, audit, assessments, amendment of assessments and tax payments) and appeals (including the Fiscal Review Board and the Fiscal Appeal Tribunal) are not changed without the prior written consent of the Company.

Extension of Initial Term

29.5 The Initial Term may be extended from time to time by an instrument in writing signed by each Relevant Minister and by or on behalf of the Company.

Fiscal Review Board and Fiscal Appeal Tribunal

29.6 The States shall from time to time, when requested by an Applicable Person, procure, for the purposes of a fiscal appeal, the establishment of the Fiscal Review Board or the Fiscal Appeal Tribunal as provided for in Schedule 8 and in the WAGP Treaty. The Fiscal Review Board and the Fiscal Appeal Tribunal shall have jurisdiction to review and hear appeals on fiscal matters as set out in Schedule 8. Each State undertakes that the Fiscal Review Board and the Fiscal Appeal Tribunal will be established with all necessary powers to perform their functions as described in Schedule 8.

Appeals from Fiscal Appeal Tribunal

29.7 Each State undertakes that it will not, and to procure that the Tax Authority in that State does not, and the Company undertakes that it will not, exercise any right of appeal it may have to a court of that State against a decision of the Fiscal Review

Board or the Fiscal Appeal Tribunal, or make any appeal on a matter covered by Schedule 8 other than in accordance with that Schedule.

Non-compliance with Clause 29.7

29.8 If any State or the Tax Authority in a State makes an appeal to a court of that State contrary to the undertaking in Clause 29.7 and as a consequence an Applicable Person becomes liable to pay a greater amount of Tax than it would otherwise have been required to pay according to the decision of the Fiscal Review Board or the Fiscal Appeal Tribunal, the State in question shall be liable promptly to pay the additional amount to that Applicable Person. If the Company makes an appeal to a court of a State contrary to the undertaking in Clause 29.7 and as a consequence it becomes liable to pay a lesser amount of Tax than it would otherwise have been required to pay according to the decision of the Fiscal Review Board or the Fiscal Appeal Tribunal, the Company shall be liable promptly to pay the amount thereby saved by it to that State.

Exempt Goods List

29.9 The Company and the WAGP Authority shall agree upon a list of items upon which the Company will incur Capital Expenditure or expenditure which would, but for its price being less than $10,000, be Capital Expenditure (the ***Exempt Goods List***). The Company and the WAGP Authority shall agree in good faith the inclusion of all such items in the Exempt Goods List, and shall from time to time agree upon additions to the Exempt Goods List of any further items expenditure upon which is or would be Capital Expenditure as above but which have not previously been included in the Exempt Goods List.

Certification System

29.10 The Company and the WAGP Authority shall also agree upon and establish a certification system for the import or acquisition of goods which are to be subject to VAT and customs duty exemptions in accordance with this Clause 29 and Schedule 8, and whereby the Company, a Project Contractor or their servants or agents can certify that particular goods and services to be imported into or acquired in a State are goods listed on the Exempt Goods List and that they are imported or acquired for the purpose specified in the Exempt Goods List (***Certification System***). A certificate given by the Company, a Project Contractor, their servants or agents shall, in the absence of fraud or manifest error, be deemed conclusive evidence that goods in the Exempt Goods List which are the subject of the certificate are such goods and are imported or acquired for the certified purpose.

30. Foreign Currency and Exchange Control Arrangements

Each State will use its best endeavours to ensure that the Exchange Control Regime applies as a matter of law. To the extent that the establishment of the Exchange Control Regime by means of the Enabling Legislation would be contrary to the Constitution of a State or its obligations under any treaties to which it is a signatory, each such State shall procure and maintain all such exemptions or permissions as are

necessary under its Constitution or applicable treaties for the establishment of the Exchange Control Regime.

31. NO APPLICATION OF ANTI-TRUST LAWS

General

31.1 Each State, to the extent applicable in that State, will use its best endeavours to ensure that the Anti-trust Regime applies as a matter of law. To the extent that the establishment of the Anti-trust Regime by means of the Enabling Legislation would be contrary to the Constitution of a State or its obligations under any treaties to which it is a signatory, each such State shall procure and maintain all such exemptions or permissions as are necessary under its Constitution or applicable treaties for the establishment of the Anti-trust Regime.

UEMOA Competition Regulations

31.2 Each of Benin and Togo shall use its best endeavours to procure the issuance by the Commission of the Union Economique et Monétaire Ouest Africaine (UEMOA) of a certificate of exclusion (attestation negative) under Article 3 of the UEMOA Regulations N. 3/2002/CM/UEMOA on Procedures Applicable to Restrictive Practices and Abuse of Domination within the UEMOA dated 23 May 2002:

(a) to the Company, in respect of Project Activities or anything done by it the Company pursuant to the terms of this Agreement; or

(b) to any Buyer, Seller or Shipper who requests it, in respect of the sale or purchase or transportation of natural gas which has been or is to be transported in the Pipeline System or the transportation of natural gas in the Pipeline System.

31.3 If a certificate of exclusion cannot be procured in accordance with Clause 31.2, each of Benin and Togo shall use its best endeavours to procure the issuance by that Commission to the Company, or any such Buyer, Seller or Shipper, of a certificate of exemption (décision d'exemption individuelle) under Article 7.1(a) and/or (as the case may be) Article 7.1(b) of those regulations in respect of those activities.

32. STATE SUPPORT

Project undertakings

32.1 Each State shall:

(a) issue such approvals and adopt such procedures as may be necessary to implement or give effect to the Project Authorisations, and upon the issuance thereof make available to the WAGP Authority a copy of the documentation evidencing that Project Authorisation;

(b) issue such approvals and adopt such procedures as may be necessary to implement or give effect to the Supplemental Authorisations;

(c) procure that any of its State Authorities which this Agreement provides should perform functions, do perform those functions as set out in this Agreement;

(d) co-operate with the other States and with the Company and Project Contractors for the purposes of implementing the Project, and take prompt action and provide the resources required to implement the Project on a timely basis;

(e) other than by lawful regulation in the event and as a consequence of a national emergency declared by the State Legislature in accordance with its Constitution, not regulate or prevent the performance of the commercial arrangements between the Company, the Sellers, the Buyers and the Shippers, or any of them (other than in the lawful exercise of powers of inspection and other rights granted to the WAGP Authority under the WAGP Regulations or the Fiscal Laws), or prescribe any conditions on which they or any of them may contract for the transportation of natural gas (other than as set out in the Access Code) or the sale or purchase of natural gas;

Interventions

32.2 In the event that any person make submissions or commence proceedings disputing the validity of the issuance or exercise of Project Authorisations, the States and the WAGP Authority shall:

(a) make submissions and appear before any State Authority, tribunal or commission in support of the Project Authorisation,

(b) actively defend any litigation seeking a judicial review of the action of a Minister or State Authority that has issued Project Authorisations, including applications for rehearing, and

(c) appeal to the highest appellate court any decision of an inferior court or tribunal which invalidates the issuance or exercise of a Project Authorisation.

Guarantees and funding support

32.3 In the event that a Buyer or Shipper is a wholly owned enterprise of a State or several States, that State or those States shall:

(a) to the extent permitted by its agreements with international financial institutions, guarantee the performance obligations of that Buyer or Shipper (including, without limitation, payment obligations in Foreign Currency) to the Seller and/or a Shipper and/or the Company, as the case may be; and/or

(b) procure the provision of credit support for the obligations of that enterprise that is acceptable to the Seller, the Shipper or the Company, as the case may be,

and to the extent that a State's international obligations prevent compliance with the foregoing provision, that State shall seek the consent of those international financial institutions that are counter-parties to those agreements which prevent or limit the giving of such guarantees. The terms and conditions (including fees) of any guarantee to be given by a State pursuant to this Clause shall be separately negotiated between the relevant State and the Company and/or the Seller and/or the Shipper but shall reflect customary international loan market practice for financial support being given in respect of limited recourse project financing.

32.4 Upon request by the Company, the States shall assist the Company in any attempt to raise finance for all or any part of the Project, by:

(a) entering into direct agreements (which may include step-in and cure rights) in respect of this Agreement with any bank, financial institution or other provider of finance in such form; and

(b) providing to any bank, financial institution or other provider of finance such of the undertakings, warranties, representations and assurances as have been given to the Company hereunder,

as may reasonably be requested by such bank, financial institution or other provider of finance for the purposes of financing all or any part of the Project.

Non-impairment

32.5 Each State agrees that it shall not take any action or fail to take any action, and will procure that its State Authorities do not take any action or fail to take any action, which would cause the rights, benefits and entitlements of the Company under this Agreement to be impaired or otherwise adversely affected, or the Company's obligations under this Agreement to be increased. Each State acknowledges that a failure to implement or maintain the regime contemplated in this Agreement as being established for the benefit of Project Contractors, Buyers, Sellers and Shippers would constitute an impairment of the rights, benefits and entitlements of the Company under this Agreement.

Breach of undertaking

32.6 Where a State breaches its obligations under this Agreement, each other State shall, if requested by the Company, without being liable for the breach, take all steps as are practicable in the circumstances to cause the breach to be remedied and to restore the performance of this Agreement including, without limitation, all rights available to them under international law including the WAGP Treaty.

33. EMERGENCIES

Emergency Response Plan

33.1 The Company shall prepare and develop a plan which shall describe the procedures and practices to be implemented by the Company should an Emergency Condition occur during the Project Period (***Emergency Response Plan***). Such

procedures and practices shall comply with all relevant provisions of the WAGP Regulations. The Company shall deliver the Emergency Response Plan to the WAGP Authority by not later than 90 days following the Construction Commitment Date. The WAGP Authority shall distribute the Emergency Response Plan to all relevant emergency response agencies and organizations at the national, state and local levels in each State.

Periodic review

33.2 Following delivery of the initial Emergency Response Plan pursuant to Clause 33.1, the Company shall from time to time review and amend such plan in accordance with Good Engineering Practice. The Company shall deliver such amended Emergency Response Plan to the WAGP Authority, which shall distribute it in accordance with the preceding Clause 33.1.

Reasonable precautions

33.3 The Company shall endeavour to have available to it, in conjunction with other organisations if appropriate, such response equipment and spare parts as it considers appropriate to handle Emergency Conditions which are reasonably foreseeable. All such equipment and spares shall be identified in the Emergency Response Plan.

Emergency Conditions

33.4 If at any time during the term of this Agreement the Company believes that an Emergency Condition has occurred then the Company shall immediately notify the WAGP Authority of the occurrence of such Emergency Condition and shall immediately implement any relevant procedures set out in the Emergency Response Plan. The WAGP Authority shall in turn immediately notify all other agencies and organisations to whom notification should be given. If the Company believes that the Emergency Response Plan is insufficient to deal with the particular circumstances of the Emergency Condition it shall act in accordance with Good Engineering Practice in responding to the Emergency Condition and, to the extent practicable, notify the WAGP Authority immediately of the occurrence of such condition.

State co-operation

33.5 If an Emergency Condition occurs, the States shall (in addition to any obligation they may have under this Agreement) use their reasonable endeavours to make available to the Company promptly and in reasonable quantities such labour, materials and equipment not otherwise readily available to the Company as the Company may reasonably request to assist in its preventative or remedial effort, and each State shall issue such permits, approvals, consents, licences, and other authorities as may be necessary or appropriate in view of the relevant Emergency Condition. The Company shall be liable to pay reasonable costs for the use of such labour, materials and equipment.

34. FORCE MAJEURE

Consequence of a Force Majeure Event

34.1 No Party (the ***Affected Party***) shall be liable to any other Party (the ***Non-affected Party***) for any failures in performance of their obligations under this Agreement to such Non-affected Party to the extent that the Affected Party's failure is caused by or attributable to the occurrence of a Force Majeure Event, and any delay by the Affected Party in performance of its obligations under this Agreement which is caused by such Force Majeure Event shall not constitute a default under this Agreement, provided that the Affected Party gives notice of the Force Majeure Event to the Non-affected Parties in accordance with the provisions of Clause 34.2.

Notification of a Force Majeure Event

34.2 Any Affected Party intending to seek relief from its obligations under this Agreement pursuant to the provisions of Clause 34.1, shall give notice to the Non-affected Parties of the occurrence of the relevant Force Majeure Event (the ***Force Majeure Notice***) as soon as reasonably practicable but in any case no later than 72 hours after becoming aware of the occurrence or commencement of such Force Majeure Event.

Contents of notice

34.3 All Force Majeure Notices given by an Affected Party pursuant to the provisions of Clause 34.2 shall contain the following information in relation to the relevant Force Majeure Event:

(a) a description in reasonable detail of the nature and likely effects of the Force Majeure Event (including the date of commencement);

(b) a bona fide estimate of the likely duration of the Force Majeure Event;

(c) to the extent known or reasonably ascertainable, the reasons for the occurrence of the Force Majeure Event; and

(d) an outline of the actions being taken to remedy the Force Majeure Event,

and from time to time thereafter the Affected Party shall give further notice of the manner in which and the extent to which the performance of the obligations under this Agreement is affected by the Force Majeure Event.

Mitigation

34.4 The Affected Party shall, in consultation with the Non-affected Parties, use reasonable efforts to mitigate the effects of any Force Majeure Events.

Extension of time

34.5 Where this Agreement stipulates a time or a deadline for performance of any obligation by an Affected Party and the performance of that obligation is prevented or

delayed by a Force Majeure Event, the period or deadline for the performance of that obligation shall be extended by the length of the period during which the obligations of the Affected Party have been suspended in whole or in part due to the Force Majeure Event, and the dates referred to in Clause 38 will be deemed extended accordingly.

Fundamental Force Majeure Event

34.6 If a Force Majeure Event prevents the performance by any Party of any material obligation for a period of more than [12] months (a ***Fundamental Force Majeure Event***) then:

(a) any Party may require the other Parties to negotiate in good faith on modifications to this Agreement which shall be fair and equitable having regard to the nature and effects of the Force Majeure Event; and

(b) if the Parties fail to reach agreement within 90 days of a request for negotiations under paragraph (a), the Company shall be entitled to terminate this Agreement in accordance with the procedures set out in Clause 39.

35. EXPROPRIATION

Expropriation Event

35.1 Each State undertakes that the assets or shares of the Company or any Affiliate of the Company within its territory or jurisdiction shall not be nationalised, confiscated, expropriated or subjected to a measure or measures having effect equivalent to nationalisation, confiscation or expropriation (each an ***Expropriation Event***).

Compensation for Expropriation Events

35.2 If an Expropriation Event occurs, the State or States that has or have caused the Expropriation Event shall make to the affected person prompt, adequate and effective payment of compensation for such Expropriation Event, as determined under public international law, in accordance with Clause 44.

Rights under investment treaties

35.3 Nothing contained in this Clause shall be construed as a waiver by the Company or any Affiliate of the Company of any rights under:

(a) a foreign investment treaty entered into by any State; or

(b) any other law of a State, provided however that nothing in this Agreement shall permit the Company or an Affiliate of the Company to recover more compensation in respect of the Expropriation Event than is properly determined in accordance with the provisions of this Agreement.

36. FAILURE OF AGREED REGIME

Definition of Regime Failure

36.1 In this Agreement, the expression ***Regime Failure*** means the occurrence after the Construction Commitment Date of any of the following:

(a) A decision of a court or tribunal having jurisdiction, in which it is determined that the Agreed Regime or part of it is not in force or valid;

(b) Any action or omission of a State or a State Authority as a consequence of which the Agreed Regime or part of it ceases to be or is determined not to be in force or maintained, including the obtaining by a State or a State Authority or the WAGP Authority of a decision of a court or tribunal in which it is determined that the Agreed Regime or part of it is not in force or valid;

(c) The coming in to force in a State of a law, as a consequence of which the Agreed Regime or part of it ceases to be in force or maintained;

(d) The entering by a State into any agreement or similar or other commitment that conflicts with, impairs or interferes with, or adversely affects such State's performance of or ability to perform its obligations under, the WAGP Treaty or this Agreement or the implementation of the Project;

(e) The levying of any Tax in a State during the Initial Term other than as provided in the Agreed Fiscal Regime;

(f) The levying of any Tax in that State as a result of the decision of a court or tribunal in that State which is inconsistent with a decision of the Fiscal Review Board or the Fiscal Appeal Tribunal;

(g) Any act or omission or series of acts or omissions by a State or any of its State Authorities or by the WAGP Authority of any nature whatsoever (including the coming in to force or application of any law, decree or regulation, or a failure to perform its obligations under this Agreement) which prevents or hinders completion of the Pipeline System according to schedule or the operation of the Pipeline System or which has a material adverse effect on the Company, or which causes the benefits derived by the Company from the Project or the value of the Company to the Shareholders to have materially decreased; or

(h) A failure by a State or a State Authority or the WAGP Authority to carry out its obligations as prescribed by law.

Consequences of Regime Failure

36.2 If without the prior written consent of the Company there occurs a Regime Failure which has a material adverse effect on the Company, or which causes the benefits derived by the Company from the Project (as described in Clause 15.1) or the value of the Company to the Shareholders to materially decrease, then:

(a) At the request of the Company, the States (represented by the Relevant Ministers) shall meet with the Company and endeavour in good faith to negotiate a solution which restores the Company and/or the Shareholders to the same or an economically equivalent position it was or they were in prior to such change, and the State or States in respect of which the Regime Failure has occurred shall use its or their best endeavours to procure that the solution is implemented.

(b) If the Regime Failure is attributable to a decision of a court or tribunal, then the State or States concerned shall use their best endeavours to appeal the decision of that court or tribunal to achieve the reinstatement of the Agreed Regime.

(c) If the Regime Failure is caused by coming in to force in a State of a law, or the repeal of change of an existing law, the State concerned shall use its best endeavours to procure the passage of amendments or further legislation to reinstate the Agreed Regime.

(d) If the Regime Failure is caused by an action or omission of a State or a State Authority, the State in question shall use its best endeavours to remedy that action or omission, including making appropriate submissions, taking judicial review proceedings or referring the matter to the relevant minister of state.

Compensation

36.3 If:

(a) the States or the State in question fails to comply with Clause 36.2; or

(b) the Regime Failure is not of the type referred to in paragraph (a) of Clause 36.1, and notwithstanding compliance by the States with Clause 36.2 the Regime Failure continues,

then the Company shall be entitled to compensation in accordance with Clause 36.4.

36.4 Where the Company is entitled to compensation under Clause 36.3, the State or States in respect of which the Regime Failure occurred shall pay to the Company prompt, adequate and effective compensation for the Regime Failure, as determined under public international law, in accordance with Clause 44. The obligation in this Clause to pay compensation is a continuing obligation and the State or States in question shall be liable to pay any cost, expense, loss, damage or liability (including liability to Tax), or any increase therein, as it may arise from time to time.

37. COMPANY EVENT OF DEFAULT

Exclusive remedy

37.1 The Company shall be liable for failure to perform an obligation under this Agreement only in accordance with this Clause 36.

Definitions

37.2 For the purposes of this Clause, the following circumstances shall constitute a ***Company Event of Default***:

(a) After the Construction Commitment Date the Company fails to perform its obligations under, or commits a breach of, this Agreement, and such failure or breach is not remedied within a period of 90 days after receipt by the Company from the WAGP Authority of a notice setting out full particulars of the obligation not complied with or the alleged breach and demanding remedy thereof;

(b) the Company takes any external action or starts any legal proceedings under any law or regulation or takes any other steps for:

(i) it to be adjudicated bankrupt or insolvent; or

(ii) its winding up, administration or dissolution, on grounds of insolvency; or

(iii) the appointment of a liquidator, trustee (in the context of insolvency), receiver, administrator or similar officer of the Company or of the whole or any material part of its undertaking, assets, rights or revenues;

(c) the Company is adjudicated bankrupt or insolvent, or is wound up, placed in administration or dissolved (on grounds of insolvency), or a liquidator, trustee (in the context of an insolvency), receiver, administrator or similar officer is appointed in respect of the Company or of the whole or a material part of its undertaking, assets, rights or revenues;

(d) the Company fails to comply with an award made against it under the Dispute Resolution Procedure or implement the resolution of a Technical Dispute; or

(e) the Company fails to make a payment which it is obliged to make under Clauses 9.4 or 29.3.

37.3 In this Agreement, ***Major Company Event of Default*** means a Company Event of Default which has a material adverse effect on the implementation of the Project.

Notification of default

37.4 If the States assert that a Company Event of Default has occurred and (in the case of an event which is capable of remedy) is continuing, the WAGP Authority may give written notice thereof to the Company setting out full particulars of the circumstances and facts which the States assert give rise to the Company Event of Default (***Notice of Default***).

Company to take action

37.5 Upon receipt of a Notice of Default, the Company shall:

(a) Take such action as it considers appropriate to remedy the Company Event of Default, and notify the WAGP Authority of the actions taken by it; or

(b) if the Company disputes that a Company Event of Default has occurred, give a notice of dispute in accordance with Clause 37.6.

If the Company fails to so notify the WAGP Authority within 28 days of receipt of the Notice of Default (or such longer period as may be agreed between the WAGP Authority and the Company), or fails within 60 days of receipt of the Notice of Default (or such longer period as may be agreed between the WAGP Authority and the Company) to rectify the Company Event of Default, the Company shall be liable for the payment of such penalties, if any, as are prescribed in the WAGP Regulations for the actions or omissions in question.

Notice of dispute

37.6 The Company may within a period of 28 days after receipt of a Notice of Default, notify the WAGP Authority that it disputes that a Company Event of Default has occurred and (in the case of an event which is capable of remedy) is continuing and refer the matter for resolution under the Dispute Resolution Procedure. If the Company does not so notify the WAGP Authority and refer the matter for resolution under the Dispute Resolution Procedure, a Company Event of Default shall be deemed to have occurred as described in the Notice of Default.

Notification of Major Company Event of Default

37.7 If the States assert that a Major Company Event of Default has occurred and (in the case of a default which is capable of remedy) is continuing, the Relevant Ministers may instruct the WAGP Authority in writing accordingly. Upon receipt of such a notice signed by each Relevant Minister the WAGP Authority shall give a Notice of Default to the Company and shall include in the Notice of Default a statement that the States consider the occurrence to be a Major Company Event of Default, setting out full particulars of the circumstances and facts which the States assert give rise to the Major Company Event of Default, and the reasons why they believe the Company Event of Default constitutes a Major Company Event of Default including full particulars of the facts and circumstances involved and of the alleged material adverse effect on the implementation of the Project, and enclosing a copy of the instruction from the Relevant Ministers.

Dispute by Company

37.8 If the Company disputes that a Major Company Event of Default has occurred, it shall give a notice of dispute in accordance with Clause 37.6, notifying the WAGP Authority that the Company disputes that the event was a Major Company Event of Default. If the Company does not within the foregoing period notify the WAGP Authority that the Company disputes that the event was a Major Company Event of

Default, a Major Company Event of Default shall be deemed to have occurred as described in the Notice of Default.

Resolution of dispute as to Major Company Event of Default

37.9 If the Company serves a notice under Clause 37.8, the Company Event of Default described in the Notice of Default given by the WAGP Authority shall be deemed not to be a Major Company Event of Default unless the States refer the matter for resolution in accordance with the Dispute Resolution Procedure and a contrary determination is made. If the States wish to refer such an issue for resolution under the Dispute Resolution Procedure they shall commence proceedings under the Dispute Resolution Procedure within 28 days of receipt by the WAGP Authority of the Company's notice of dispute, failing which the Company Event of Default shall be deemed conclusively not to have been a Major Company Event of Default.

Consequences of Major Company Event of Default

37.10 Following the occurrence of a Major Company Event of Default (provided such occurrence is deemed to have occurred under Clause 37.6 or determined to have occurred under the Dispute Resolution Procedure), the States shall be entitled to exercise the following remedies:

(a) if such default occurred prior to the occurrence of the Construction Commitment Date the States may, by written notice signed by each Relevant Minister, suspend performance of their obligations under this Agreement, other than to the extent the performance by the States of those obligations (i) is necessary to enable the Company to remedy the relevant Major Company Event of Default, or (ii) affects the Company's ability to perform its obligations to other persons under the Commercial Agreements; or

(b) if such default occurred after the occurrence of the Construction Commitment Date the States may:

    (i) suspend performance of their obligations under this Agreement, other than to the extent the performance by the States of those obligations (a) is necessary to enable the Company to remedy the relevant Major Company Event of Default, or (b) affects the Company's ability to perform its obligations to other persons under the Commercial Agreements; and/or

    (ii) request that the WAGP Authority impose such penalties, if any, as are prescribed in the WAGP Regulations for the actions or omissions,

provided that for the duration of any such suspension or prior to the date on which a termination pursuant to the foregoing takes effect, the Company shall be entitled to take all steps and actions necessary to remedy the relevant Company Event of Default, which default shall be deemed to be cured and never to have occurred if remedied within such period.

Delays in determination

37.11 For the purpose of determining the period for which any penalties payable by the Company pursuant to Clause 37.10(b)(ii) are to apply, should either the States or the Company hereunder institute the Dispute Resolution Procedure, if a Major Company Event of Default is determined to have occurred then any delay in the determination of the Dispute Resolution Procedure shall not affect the period for which the default is taken to have continued.

Extension of time

37.12 If pursuant to paragraphs (a) or (b) of Clause 37.10 the performance by the States of their obligations is suspended for any period, then any deadline with which the Company must comply which depends on the fulfilment by the States (or any of them) of those obligations shall be extended for an equivalent period.

Termination

37.13 In addition to the above remedies for a Company Event of Default, the States shall be entitled to terminate this Agreement if the circumstances set out in Clause 38 arise.

Remedies exhaustive

37.14 The remedies of the States set out in this Agreement in respect of the performance or non-performance of this Agreement by the Company shall be exhaustive and all other rights or remedies that any of the States may have against the Company at law or in equity in respect thereof are hereby excluded.

38. FAILURE TO ACHIEVE CRITICAL MILESTONES

At Long Stop Date

38.1 If the Construction Commitment Date does not occur by the Long Stop Date, then the Company shall notify the WAGP Authority in writing of the reasons, and of the steps and anticipated timetable for the Construction Commitment Date to be achieved.

State buyout right

38.2 If:

(a) the Company either fails to provide reasonable assurances under Clause 38.1 that Construction Commitment Date will be achieved, or to achieve Construction Commitment Date in accordance with such assurances; or

(b) the Completion Date has not occurred by the date which is [30 months] after the Construction Commitment Date (as it may be extended under Clause 34.5);

then subject to Clause 38.3 the States may exercise the rights set out below in this Clause 38.

38.3 The right under Clause 38.2 may only be exercised if:

(a) all Gas Transportation Agreements have been terminated by the Shippers thereunder for default by the Company or for failure by the Company to achieve the Construction Commitment Date or the Completion Date; or

(b) the States successfully negotiate with Shippers a transfer of the rights under those Gas Transportation Agreements to a successor to the Company as owner of the Pipeline System.

38.4 Where Clause 38.2 applies, the States may, by written notice to the Company signed by each Relevant Minister, require the Company to obtain a Company Valuation. Upon receipt of a notice under this Clause, the Company shall obtain a Company Valuation in accordance with Schedule 15.

38.5 The States shall have the right, for a period of 28 days from the date on which the States receive notification from the Company of the Company Valuation in accordance with Schedule 15, to elect to acquire from the Company the assets of the Company held for the purposes of the Project, as set out below. The States may exercise this right by written notice to the Company signed by each Relevant Minister. Such notice shall specify a person or persons to whom the Company shall assign the assets.

38.6 Within 28 days of the giving of a notice under Clause 38.5, the States shall pay to the Company, in accordance with Clause 44, the amount of the Company Valuation notified in accordance with Clause 38.4, and the Company shall assign and transfer to the nominated assignee or assignees, to the extent then in existence and to the fullest extent possible or permitted under the terms of its relevant contractual arrangements:

(a) all design drawings and other technical design documents prepared by the Company for the Pipeline System;

(b) all contractual rights held by it in relation to the Pipeline System;

(c) all Project Authorisations; and

(d) the Pipeline System.

38.7 Upon completion of the payment and assignment in accordance with Clause 38.6, this Agreement shall terminate.

39. TERMINATION

Termination by the States

39.1 Subject to the final determination of any dispute in accordance with the Dispute Resolution Procedure, the States may, by not less than 30 days' prior written

notice to the Company signed by the Relevant Minister of each State, terminate this Agreement in the following circumstances:

(a) if, prior to the Long Stop Date, the Company fails for a material period to diligently endeavour to achieve the Construction Commitment Date;

(b) subject to Clause 34, the Construction Commitment Date has not occurred by the Long Stop Date (provided that each of the States have satisfied each of the conditions precedent referred to in paragraphs (a) to (o) inclusive of Schedule 4 by the date falling 3 months prior to the Long Stop Date or have used reasonable endeavours to do so but have been prevented from doing so by the Company's failure to make timely, complete and accurate applications for such Project Authorisations as it requires to commence the Works or otherwise to co-operate with the States in ensuring the satisfaction of the conditions set out in paragraphs (a) to (o) inclusive of Schedule 4; and further provided that if the Construction Commitment Date subsequently occurs and the States have not at that point of time terminated this Agreement under this paragraph (b), the right to terminate under this paragraph (b) shall lapse);

(c) prior to the Construction Commitment Date if a Major Company Event of Default is deemed to have occurred under Clause 37.6 or determined to have occurred under the Dispute Resolution Procedure (provided that the States have satisfied each of the conditions precedent referred to in paragraphs (a) to (o) inclusive of Schedule 4 or have used reasonable endeavours to do so but have been prevented from doing so by the Company's failure to make timely, complete and accurate applications for such Project Authorisations as it requires to commence the Works or otherwise to co-operate with the States in ensuring the satisfaction of the conditions set out in paragraphs (a) to (o) inclusive of Schedule 4);

(d) after the occurrence of the Construction Commitment Date but prior to the occurrence of the Completion Date, if:

(i) the Company advises the WAGP Authority in writing that it is relinquishing its rights under this Agreement; or

(ii) for a continuous period of not less than 6 months the Company has taken no action to implement the Project (unless such failure is as a direct or indirect result of a Force Majeure Event or a breach of this Agreement by the States or a breach by a Project Contractor of its agreement with the Company) and such failure is continuing and has not been remedied or waived;

(iii) the Company has exercised it rights under Clause 22.8, and construction has ceased for a continuous period of not less than 12 months; or

(iv) a Major Company Event of Default is deemed to have occurred under Clause 37.8 or determined to have occurred under the Dispute Resolution Procedure.

(e) after the occurrence of the Completion Date, if

(i) the Company advises the WAGP Authority in writing that it is relinquishing its rights under this Agreement;

(ii) the Company exercises its rights under Clause 23.4 and as a consequence the Pipeline System is incapable of transporting any natural gas for a continuous period of not less than 12 months; or

(iii) a Major Company Event of Default is deemed to have occurred under Clause 37.8 or determined to have occurred under the Dispute Resolution Procedure.

Termination by the Company

39.2 Subject to the final determination of any dispute in accordance with the Dispute Resolution Procedure, the Company may, by giving not less than 30 days' prior written notice to each of the States, terminate this Agreement in the following circumstances:

(a) if, by the Long Stop Date, any of the conditions precedent referred to in paragraphs (a) to (o) inclusive of Schedule 4 have not been met, provided that such States have not been prevented from meeting such conditions precedent by a State Force Majeure Event or by the Company's failure to make timely, complete and accurate applications for such Project Authorisations as it requires to commence the Works or otherwise to co-operate with the States in ensuring the satisfaction of the conditions set out in paragraphs (a) to (o) inclusive of Schedule 4;

(b) upon the occurrence of a material breach by any of the States of any of their obligations under this Agreement (other than a breach caused by the breach of this Agreement by the Company) which is not remedied to the satisfaction of the Company within 14 days after the Company has given notice thereof to the States stating that such a breach has occurred, identifying the breach in question in reasonable detail and demanding remedy thereof;

(c) upon the occurrence of a Fundamental Force Majeure Event which is continuing beyond the 90 day period referred to in Clause 34.6 and continuing at the time of termination.

Date of termination

39.3 Any termination pursuant to the provisions of this Clause shall (subject to the required notice period being given) be deemed to take effect on the date specified in such notice.

Ownership of Pipeline System and related facilities

39.4 Subject to the exercise by the Company of its rights under Clause 40.3, termination of this Agreement at any time shall not affect ownership of the Pipeline

System or any other property then held by the Company. The Company shall at all times have full entitlement to own the Pipeline System and all related facilities and other property used in the course of the Pipeline System's construction or operation. All such property shall continue to be the property of the Company, to use or dispose of in accordance with its legal rights and entitlements.

Survival

39.5 All accrued rights at the time of termination, and the provisions of Clauses [ ], shall remain in full force and effect notwithstanding the termination or expiry of this Agreement.

Design drawings and technical data

39.6 If the States terminate this Agreement pursuant to paragraphs (a) or (b) of Clause 39.1, the Company shall, to the fullest extent possible or permitted under the terms of its relevant contractual arrangements, promptly provide to the States copies of all design drawings and other technical design documents prepared by it for the Pipeline System.

40. COMPENSATION ON TERMINATION

Termination prior to Construction Commitment Date

40.1 If after the Long Stop Date but prior to the Construction Commitment Date this Agreement is terminated by the Company pursuant to paragraph (b) of Clause 39.2 due to the failure of one or more States or the WAGP Authority to comply with Clauses 16, 18 or 19, and a reasonable and prudent investor would have terminated the agreement in the same circumstances, the State or States whose actions and/or omissions gave rise to the Company's right to terminate (and if more than one, then in equal proportions unless another proportion shall be determined under the Dispute Resolution Procedure), or in the case of a failure of the WAGP Authority all of them, shall pay to the Company an amount determined in accordance with Clause 40.2.

40.2 The amount payable upon termination of this Agreement in accordance with Clause 40.1 shall be the amount determined by the auditors of the Company as at the date of termination in accordance with paragraph 3(b) of Schedule 15, except that no expenditure prior to 8 August 2002 shall be brought to account.

Termination after Construction Commitment Date

40.3 If after the Construction Commitment Date this Agreement is terminated by the Company pursuant to paragraphs (a) or (b) of Clause 39.2, the State or States whose actions and/or omissions gave rise to the Company's right to terminate (and if more than one, then in equal proportions unless another proportion shall be determined under the Dispute Resolution Procedure) shall pay to the Company an amount equal to the aggregate of:

(a) the Company Valuation as at the date of termination;

(b) all amounts which the Company would be liable under Gas Transportation Agreements to pay to Shippers as if the termination of this Agreement constituted a breach of those Gas Transportation Agreements and those Gas Transportation Agreements were terminated at that time for breach by the Company of its obligations thereunder; and

(c) should the Company decide or be obliged to abandon the Pipeline System as a result of such termination, the costs incurred by the Company in making the Pipeline System safe pursuant to Clause 41.

Transfer of ownership

40.4 The Company shall, following termination of this Agreement pursuant to the provisions of paragraphs (a) or (b) of Clause 39.2 and following payment in full of all amounts payable to the Company under Clause 40.3, transfer its legal and beneficial ownership interests in the Pipeline System to the State or States which have made payment to it under Clause 40.3, or to such other entity as such State or States may direct the Company in writing. Upon completion of such transfer the Company shall be relieved of any obligation in respect of the Pipeline System under Clause 41, and the State or States to which or at whose direction the Pipeline System may be transferred as provided above (and if more than one in the proportions in which the Pipeline System was transferred to them) shall indemnify the Company against any liability which it may thereafter have or amount which it might be thereafter obliged to pay to any person in respect of the Pipeline System.

41. ABANDONMENT

Abandoning the Pipeline System

41.1 In the event that the Company should decide to permanently cease the operation of the Pipeline System, the Company shall give to the WAGP Authority not less than 6 months written notice thereof, stating the date upon which the Company intends to cease operation. Subject to Clause 41.4, upon the Company permanently ceasing operation of the Pipeline System the Company shall ensure that the Pipeline System is made safe, and (except as otherwise agreed with the WAGP Authority) that the pipeline is filled with seawater or a non-flammable inert substance and sealed in accordance with internationally acceptable industry standards and recognised good practice applicable to the abandonment of high pressure natural gas pipelines.

Abandonment costs

41.2 The cost of the work involved in implementing the provisions of Clause 41.1 shall be borne by the Company.

No further liability

41.3 On abandonment of the Pipeline System in accordance with the provisions of this Agreement, all title to and risks associated with the Pipeline System shall in several proportions pass to and vest in the States (with each State separately accepting the title and risk in respect of the portion of the Pipeline System which is located

within that State), and the Company shall cease to have any liability under this Agreement except as to environmental pollution caused prior to or during the abandonment.

Election of States to take Pipeline System

41.4 Following receipt by the WAGP Authority of a notice given by the Company in accordance with Clause 41.1, the States shall have the option, in lieu of the Pipeline System being abandoned, to accept a transfer of the Pipeline System from the Company to them (or to a nominee), as follows:

(a) If the States desire to exercise the option under this Clause 41.4 then the WAGP Authority shall give written notice thereof to the Company not less than 90 days prior to the cessation date notified by the Company under Clause 40.1, nominating one or more transferees to take a transfer of the Pipeline System from the Company.

(b) The Company and the nominee or nominees of the States shall negotiate in good faith and sign a transfer from the Company to the States of the Pipeline System and of all current Project Authorisations pertaining thereto, with effect from the cessation date notified by the Company under Clause 41.1.

(c) No consideration shall be payable to the Company for the transfer, and no money or assets of the Company other than those assets comprised in the Pipeline System shall be payable or transferable by the Company.

(d) Upon completion of the transfer, all title to and risks associated with the Pipeline System shall pass to and vest in the transferee(s), and the Company shall have no further liability in respect thereof.

Evidence of financial ability to abandon the Pipeline System

41.5 The Company shall, within 6 months of receipt of a written request of the WAGP Authority, which may be made not less than 6 months' prior to the conclusion of the Initial Term and at intervals of 5 years thereafter until the Pipeline System is abandoned or transferred under this Agreement, provide to the WAGP Authority:

(a) a costed plan for abandonment of the Pipeline System at the time the Company then contemplates the Pipeline System will be abandoned; and

(b) evidence of its financial ability to carry out the abandonment in accordance with that costed plan.

42. DISPUTE RESOLUTION

Good faith discussions

42.1 If any dispute between the Parties or any of them arises out of or in connection with this Agreement or the Project, the parties to the dispute shall first meet and

attempt in good faith to resolve the dispute in negotiation within 15 days of the dispute arising, before pursuing any other remedies available to them.

Technical Disputes

42.2 If the parties to the dispute are unable to resolve Technical Disputes in accordance with Clause 42.1, any such dispute shall be resolved in accordance with the following procedure:

(a) the parties to the dispute shall submit the Technical Dispute to an Expert to assist them in resolving the Technical Dispute. Any arty to the dispute may give written notice to the other describing the nature of the dispute, requiring the dispute to be submitted to an Expert and proposing the name of a suitable Expert to be appointed.

(b) the parties to the dispute shall meet and endeavour to agree upon a single Expert to whom the relevant matter in dispute may be referred for resolution.

(c) if within 14 days of the initial request, the parties to the dispute shall have failed to meet or failed to agree upon an Expert, then any party to the dispute may refer the matter to the ICC Centre for Technical Expertise which shall be requested to select an Expert within 14 days of the Parties request and to notify the parties to the dispute of the selection.

(d) upon the Expert being agreed or selected pursuant to the foregoing, either party to the dispute (or both) shall notify the Expert of his selection and shall request him within 14 days to confirm whether or not he is willing/able to accept the appointment.

(e) if the Expert is unable or unwilling to act, the parties to the dispute shall repeat step (c) above.

(f) if the Expert accepts the appointment, it shall enter into a contract of appointment with the parties to the dispute and the parties to the dispute shall promptly provide all relevant information to the Expert. Any disputes over the Expert's remuneration will be determined by the ICC Centre for Technical Expertise.

(g) no person shall be appointed an Expert if such person is or has at any time been a director, office holder or an employee of or a contractor, advisor or consultant to one of the parties to the dispute.

(h) the Expert shall:

    (i) promptly fix a time and place for receiving information from the parties to the dispute in connection with the Technical Dispute;

    (ii) make his decision only in relation to matters expressly referred to him for resolution; and

(iii) issue a draft decision, with all necessary supporting information and documentation, to each party to the dispute within 21 days after the signing of the agreement appointing the Expert and the provision of information, or such shorter period as the parties to the dispute may have mutually agreed at the time the dispute was referred to the Expert. Each party to the dispute will have 7 days to submit comments on the draft decision to the Expert and the Expert shall issue his final determination in writing within 7 days after the submission of such comments, or such shorter period as the parties to the dispute may have mutually agreed at the time the dispute was referred to the Expert.

(i) except in case of manifest error, any decision of the Expert with up to US$ 1 million impact on a party to the dispute shall be final and binding on that party to the dispute provided that any decision of the Expert of greater than US$ 1 million impact on a party to the dispute may be referred to arbitration in accordance with the UNCITRAL Arbitration Rules as then in force and:

(i) the appointing authority shall be the London Court of International Arbitration;

(ii) the number of arbitrators shall be those appointed in accordance with the UNCITRAL Arbitration Rules;

(iii) the seat of arbitration shall be London; and

(iv) the arbitration shall also be governed by paragraphs (b) to (i) inclusive of Clause 42.4.

(j) the Expert dispute resolution proceedings shall be held at a site mutually agreed by the parties to the dispute. The Expert shall be required to keep confidential:

(i) all confidential information that is disclosed to the Expert or otherwise comes to his knowledge during the course of his appointment; and

(ii) all matters concerning the existence and resolution of the dispute before the Expert.

(k) costs and fees associated with the resolution of Technical Disputes shall be borne equally by the parties to the dispute.

(l) the language to be used in the Expert determination proceedings shall be English.

Other disputes

42.3 If the parties to the dispute are unable to resolve disputes, other than Technical Disputes, in accordance with Clause 42.1, any such dispute shall be resolved in accordance with the following procedure:

(a) the parties to the dispute shall submit the dispute to the Disputes Panel who shall meet and attempt to resolve the dispute. Any party to the dispute may give written notice to the other or others involved in the dispute, requiring the dispute to be submitted to the Disputes Panel;

(b) the Disputes Panel shall promptly meet at a time and place fixed by agreement between the parties to the dispute and seek to resolve the dispute within 30 days of the submission by the parties to the dispute referred to in paragraph (a) above; and

(c) costs and fees associated with the resolution of disputes by the Disputes Panel shall be borne equally by the parties to the dispute.

Reference to arbitration

42.4 If any dispute (other than a Technical Dispute) remains unresolved for a period of 45 days following reference of that dispute to the Disputes Panel or (as the case may be) if any party to a dispute wishes to appeal a decision of the Expert in accordance with Clause 42.2, any party to the dispute may submit the dispute for settlement by arbitration by using the following procedure:

(a) The dispute shall, at the request of any party to the dispute upon notice to that effect to the other parties to the dispute (a ***Notice of Reference***) be exclusively settled by final and binding arbitration pursuant to the Convention on the Settlement of Investment Disputes between States and Nationals of other States (the ***ICSID Convention***), for which purpose each of the States expressly and irrevocably acknowledges that the Company shall at all times be treated as a national of another Contracting State within the meaning of the ICSID Convention and that the Project constitutes an investment within the meaning of the ICSID Convention.

(b) The arbitral tribunal shall be constituted as follows:

(i) The claimant and the respondent(s) shall, within 30 days from the day on which a request for arbitration has been submitted, appoint an arbitrator each (and if there is more than one respondent, then the respondents collectively shall appoint a single arbitrator), by giving notice in writing of such appointment to the Secretary-General of ICSID and the other party.

(ii) If either the claimant or the respondent(s) fail(s) to comply with the time limit in the preceding paragraph, the Chairman of ICSID shall appoint the arbitrator or arbitrators not yet appointed, at the request of either the claimant or the respondent(s) and after consulting all parties to the dispute as far as possible. The Chairman of ICSID shall give notice in writing of such appointment or appointments to the Secretary-General of ICSID and the parties to the dispute.

(iii) The two arbitrators so appointed shall, within 30 days of their appointment agree upon the person to be appointed as the Chairman of

the tribunal, and give notice of such appointment to the Secretary-General of ICSID and the parties to the arbitral proceedings.

(iv) If the two arbitrators fail to agree upon the person of the Chairman of the tribunal, the Chairman of ICSID shall appoint the Chairman, at the request of either the claimant or the respondent(s). The Chairman of ICSID shall give notice in writing of such appointment or to the Secretary-General of ICSID and the parties to the dispute.

(v) No person shall be appointed an arbitrator if such person is or has at any time been a director, office holder or an employee of or a contractor, advisor or consultant to one of the Parties.

(c) Although the Parties do not anticipate that any arbitral tribunal constituted under paragraphs a and b of this Clause 42.4 would rule that it does not have jurisdiction to determine a dispute referred to it by the parties to the dispute hereunder, if that arbitral tribunal declines jurisdiction the dispute shall be referred to arbitration in accordance with the UNCITRAL Arbitration Rules as then in force, and:

(i) the appointing authority shall be the President of the London Court of International Arbitration;

(ii) the number of arbitrators shall be those appointed in accordance with the said UNCITRAL Arbitration Rules;

(iii) the seat of arbitration shall be London.

(d) All documents shall be set forth in English and French, and all oral proceedings shall be conducted in English.

(e) The parties to the dispute shall give effect to every decision of such arbitration, whether according to the ICSID Convention or under the UNCITRAL Arbitration Rules, and shall comply with the award.

(f) Performance of this Agreement shall continue during any reference to arbitration under this Clause.

(g) The Parties acknowledge that they shall be bound by any remedy, relief or award proposed by the arbitrator, such remedy, relief or award shall not be subject to appeal to any court, and to the enforcement of the remedy, relief or reward against them. The arbitrator shall be entitled to impose remedies which include monetary compensation (including for consequential loss, but not by way of punitive or exemplary damages), and extensions to any deadlines applicable under this Agreement. Where an arbitrator determines that a deadline applicable under this Agreement should be extended, the deadline is extended accordingly.

(h) An arbitral tribunal constituted under Clause 42.4 shall have the power to allow one or more other persons, upon the application of any party to the

arbitral proceedings or such other person, to be joined as a party to such arbitral proceedings, provided that:

(i) Any such other person and the applicant party have consented thereto in writing; and

(ii) Any such other person is involved in the implementation of the Project and has contracted with a Party under an agreement; and

(iii) Such joinder is based on such other person's involvement in the relevant dispute or a dispute having substantially the same subject matter as the relevant dispute.

(i) Where such joinder is made pursuant to the provisions of paragraph (h) of Clause 42.4, the arbitral proceedings shall continue to be conducted by the arbitral tribunal which shall have the power to establish at its discretion a procedure for dealing with multi-party proceedings and to make a single final award, or separate awards, in respect of all parties to the arbitral proceedings.

Language

42.5 In a dispute involving a question of interpretation of this Agreement, the Access Code or the WAGP Regulations, the language of the law applying under Clause 50 shall be used in the determination of the question.

43. WAIVER OF SOVEREIGN IMMUNITY

Commercial acts

43.1 Each of the States hereby confirms that the execution by it of this Agreement and the performance by it of all payment obligations it may have under this Agreement constitute private and commercial acts.

Waiver of immunity

43.2 Each State hereby unconditionally and irrevocably waives and agrees not to claim for itself, its assets and/or its revenues any and all immunity (to which it is now or may hereafter become entitled under the laws of any jurisdiction) from suit execution or other legal process in connection with any actions or proceedings to obtain or enforce an arbitral award relating to the Project with the exception of (a) any property that is (i) used by a diplomatic or consular mission, (ii) military in character or under the control of a military authority or defence agency, or (iii) located within a State and dedicated to a public or governmental use, or (b) bona fide accounts with domestic or foreign financial institutions that are established pursuant to binding agreements between any State and its lenders that are administered by paying agents and committed solely to service the State's Debt to such lenders. Each State hereby declares that such waiver shall be effective to the fullest extent permitted by such laws. Without limiting any of the foregoing, each State agrees that an award obtained against it pursuant to Clause 42 shall constitute conclusive written evidence of the existence and amount of the claim against it.

43.3 The Company shall be entitled to register the award of the arbitrator(s) given under Clause 42.4 as a judgement in any of the States as though it was a judgement of the highest court having jurisdiction over monetary claims in the State in which it is registered, and to enforce such judgement in accordance with the rules and procedures applying in such court.

No waiver prior to judgement

43.4 Nothing in this provision is intended to waive immunity from attachment prior to entry of a judgement in aid of the execution of an arbitral award.

Subsequent agreements

43.5 Each Party agrees that this waiver of immunity shall be, or shall be deemed to be, included in any subsequent agreements made between the individual States or a State Authority and the Company or any other person in a direct contractual relationship with a State or State Authority in relation to the Project.

44. General Payment Provisions

Currency of payments

44.1 Any monies payable under this Agreement shall, except as otherwise specified in this Agreement, be paid in US dollars or any other Foreign Currency which is agreed between the States and the Company.

No deduction or withholding

44.2 Any monies payable under this Agreement shall be paid without deduction or withholding.

Interest

44.3 Interest at the Applicable Rate shall accrue daily on any amount outstanding under this Agreement from the date on which such amounts shall become due until the date on which the outstanding amount is paid. If the Company makes an election to treat a State Liability as a payment on account of Income Tax in accordance with paragraph B.2 of Schedule 8, and the State Liability comprises or includes a liability under this Agreement, then for the purposes of this Clause the amount of the liability under this Agreement which is comprised of or included in that State Liability shall be deemed to be paid on the date when the notice of election is given to that State in accordance with that paragraph.

45. Confidentiality

Confidentiality

45.1 All proprietary records, reports, accounts and other documents and information ("***Confidential Information***") forwarded or made available to any Party in connection with the Project shall be treated by the receiving Party as confidential and shall not be used for any purpose other than relating to the Project, and each

receiving Party shall take or cause to be taken such reasonable precautions as may be necessary to prevent the disclosure thereof, or of any extract thereof.

Permitted disclosures

45.2 For the purposes of this Agreement, a Party may forward or make available Confidential Information to:

(a) any then current employee of the Company or any of its branches or subsidiaries to the extent necessary for the implementation of the Project;

(b) any civil servant of the States to the extent necessary for the implementation of the Project;

(c) with respect to any matters reasonably related to their profession, any independent accountants, legal counsel or other consultants employed by any Party in connection with the Project;

(d) any bank, financial institution or other provider of finance appointed or selected with respect to the financing of the Project, as well as the professional advisers employed by any such bank, financial institution or other provider of finance;

(e) The World Bank and any other international institution as needed for the purpose of the Project;

(f) any Project Contractor to the extent necessary for the implementation of this Project;

(g) the Shareholders, any Nigerian Commercial Group Member or any of their respective Affiliates; or

(h) the WAGP Authority,

provided further that disclosure to the persons referred to in paragraphs (a) to (f) above inclusive shall be subject to the condition that such persons undertake or are required to keep such information confidential in accordance with the confidentiality provisions contained herein. The WAGP Authority shall comply with the confidentiality obligations contained herein.

Exceptions

45.3 The above provisions of this Clause 45 do not apply to information:

(a) which shall after the date of this Agreement become published or otherwise generally available to the public, except in consequence of a wilful or negligent act or omission by a Party to this Agreement in contravention of the obligations in this Clause 45;

(b) to the extent made available to the recipient Party by a third party who is entitled to divulge such information and who is not under any obligation of

confidentiality in respect of such information to the other Party or which has been disclosed under an express statement that it is not confidential;

(c) to the extent required or permitted to be disclosed by law or pursuant to an order duly issued by a competent court or regulatory agency having jurisdiction over the Party disclosing the information, provided that the Party disclosing the information makes every reasonable effort to obtain confidential treatment by the person to whom the information is disclosed;

(d) which has been independently developed by the recipient Party otherwise than in the course of the exercise of that Party's rights under this Agreement or the implementation thereof;

(e) which the recipient Party can prove was already known to it before its receipt from the disclosing Party; or

(f) contained in the Access Code or in this Agreement.

Survival

45.4 The provisions of this Clause 45 shall apply from the date of signature hereof and, in addition to the provisions of Clause 39.5, shall survive the expiry of this Agreement by 5 years.

46. BUSINESS ETHICS

Foreign Corrupt Practices Act and OECD Convention

46.1 Each Party warrants that neither it nor any of its Affiliates, agents or employees has made or will make, with respect to the conduct of the Project or any other matters provided for in this Agreement, any offer, payment, gift, promise to pay or give or authorise the payment or gift of any money or the transfer of anything of value (in this Clause 46.1, to ***Confer an advantage***), directly or indirectly, to or for the use or benefit of any official or employee of any State Authority or any public international organisation or to or for the use or benefit of any political party, official or candidate which would or might violate the United States of America Foreign Corrupt Practices Act or the OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions (whether or not these instruments apply to the Parties or their Affiliates, as the case may be) (a ***Prohibited Act***). Each of the Parties further warrants that neither they nor their Affiliates has done or will do anything which would Confer an advantage on any person, with the knowledge, the firm belief, or the awareness that there is a high probability that the recipient would use or had used such advantage for the purpose of performing a Prohibited Act.

Commissions and gifts

46.2 No director, employee or agent of a Party (the ***first Party***) or of any subcontractor or vendor of a Party or its Affiliates shall give to or receive from any director, employee or agent of the other Party or its Affiliates any commission, fee,

rebate, or any gift or entertainment of significant cost or value in connection with this Agreement, or enter into any business arrangement with any director, employee or agent of the other Party or its Affiliates other than as a representative of such other Party or its Affiliates, without prior written notification thereof to such other Party. The first Party shall promptly notify the other Party of any violation of this Clause 46.2 and any consideration received as a result of such violation shall be paid over or credited to such other Party.

47. ASSIGNMENT

No assignment without consent

47.1 Subject to the provisions of Clauses 47.2 and 47.3 and the other provisions of this Agreement, no Party shall assign, transfer, charge or otherwise deal with all or any of its rights and/or obligations under this Agreement without the prior written consent of the other Parties hereto, which consent shall not be unreasonably withheld, delayed or conditioned.

Assignment by way of security

47.2 The Company shall be entitled at any time to assign, transfer or charge by way of security or create a security interest over its rights and/or obligations under this Agreement to any bank, financial institution or other provider of finance or other person who is a creditor or potential creditor of the Company (or any trustee, agent or other person acting on their behalf) as security for any financing or other credit provided to the Company or obligations owed by the Company in respect of the Project.

Exercise of security rights

47.3 The States hereby agree that, if required by any provider of finance to the Company or other creditor of the Company who holds security over the Company's rights and/or obligations under this Agreement granted in accordance with Clause 47.2, they will accept (following the occurrence of an event of a default under any agreement entered into by the Company), as a substitute for the Company under this Agreement, any agent of such financiers or other creditor, or any designee or transferee of such agent or the financier or other creditor, or any purchaser of the Company's interest in the Project pursuant to the exercise of rights granted by such security, and to afford to such financiers or other creditors an opportunity to remedy any event giving rise to any notice of termination served by a State pursuant to Clause 39.1 prior to giving effect to any termination of this Agreement.

48. NOTICES

Delivery

48.1 Any notice to be given by one Party to another or the others or by or to the WAGP Authority under, or in connection with, this Agreement shall be in writing and signed by or on behalf of the party giving it. It shall be served by sending it by fax to the number set out in Clause 48.2, or delivering it by hand, or sending it by pre-paid

recorded delivery (return receipt requested), to the address set out in Clause 48.2 (or such other address as may have been notified hereunder by a Party to all other Parties and the WAGP Authority) and in each case marked for the attention of the relevant party (or as otherwise notified from time to time in accordance with the provisions of this Clause 48.1). Any notice so served by hand, fax or post shall be deemed to have been duly given:

(a) in the case of delivery by hand, when delivered;

(b) in the case of fax, at the time of transmission; and

(c) in the case of prepaid recorded delivery, at the time and date of delivery (as recorded);

provided that in each case where delivery by hand or by fax occurs after 5pm on a working day or on a day which is not a working day, service shall be deemed to occur at 9am on the next following working day.

Addresses

48.2 The addresses and fax numbers of the Parties and the WAGP Authority for the purpose of Clause 48.1 are as follows:

(a) to the Company:

West African Gas Pipeline Company

[Address]

Fax: [ ]

For the attention of: [ ]

(b) to the States:

The Republic of Benin

[Address]

Fax: [ ]

For the attention of: [ ]

The Republic of Ghana

[Address]

Fax: [ ]

For the attention of: [ ]

The Federal Republic of Nigeria

[Address]

Fax: [ ]

For the attention of: [ ]

The Republic of Togo

[Address]

Fax: [ ]

For the attention of: [ ]

[WAGP Authority]

[Address]

Fax: [ ]

For the attention of: [ ]

Change of Address

48.3 Any Party may notify the other of a change to its name, relevant addressee, address or fax number for the purposes of this Clause 48, provided that, such notice shall only be effective on:

(a) the date specified in the notice as the date on which the change is to take place; or

(b) if no date is specified or the date specified is less than 5 working days after the date on which notice is given, the date following 5 working days after notice of any change has been given.

Ancillary provisions

48.4 All notices under or in connection with this Agreement shall be in the English language or, if in French, accompanied by a translation into English. In the event of any conflict between the English text and the French text, the English text shall prevail.

49. LANGUAGE

Six copies of this Agreement shall be executed in both English and French and both versions will be authentic.

50. APPLICABLE LAW

This Agreement shall be governed by, and interpreted in accordance with, the laws of England.

51. CONTRACTS (RIGHTS OF THIRD PARTIES) ACT 1999

A person who is not a party to this Agreement shall have no right under the Contract (Rights of Third Parties) Act 1999 to enforce any of its terms.

52. REVIEW OF AGREEMENT

[Include clause for review of Agreement.]

53. COSTS AND EXPENSES

Unless otherwise agreed, each Party shall bear all its own costs incurred in connection with the negotiation, completion and performance of this Agreement.

54. COUNTERPARTS

This Agreement may be signed in separate counterparts, each of which shall be an original, and all such counterparts shall together constitute the same instrument, unless otherwise stated in this Agreement.

IN WITNESS WHEREOF the Parties have executed this Agreement and the Secretary-General of ECOWAS has added his witness, on the date stated above.

SIGNED by)
[ ])
on behalf of the **Republic of Benin**)

SIGNED by)
[ ])
on behalf of the **Republic of Ghana**)

SIGNED by)
[ ])
on behalf of the **Federal Republic of**)
Nigeria)

SIGNED by)
[ ])
on behalf of the **Republic of Togo**)

SIGNED by)
[ ])
West African Gas Pipeline Company)

WITNESSED by the Secretary-General)
of **ECOWAS**)

SCHEDULE 1

PROJECT DEVELOPMENT MILESTONES

The Parties anticipate that the following milestones will be achieved within the following time periods after execution of this Agreement:

1.	**Initial Milestones**	**Estimated Date**
1.1	Conceptual Design Package submitted:	22 April, 2003
1.2	Gas Sales Agreement for Takoradi and related Gas Transportation Agreements signed:	15 July, 2003
1.3	Priority and Security Deed signed:	15 July, 2003
1.4	First Draft of Pipeline Development Plan (paragraph 16 of Schedule 17)	19 July, 2003
1.5	Front End Engineering Design Package submitted:	9 September, 2003
1.6	Selection of contractors:	11 October, 2003
1.7	Legally required EIA public notice, review and hearings completed:	14 November, 2003
1.8	Final Investment Decision:	2 December, 2003

2.	**Subsequent Milestones**	**Period from Construction Commitment Date**
2.1	Contractor mobilisation notices dispatched:	1 week
2.2	Pipeline System construction commences:	1 month
2.3	Pipeline System construction complete:	17 months
2.4	Commissioning commences:	17 months
2.5	Commercial Operation Date:	19 months

SCHEDULE 2

ENVIRONMENTAL SCHEDULE

Part A : Environmental Impact Assessment

Outline for Presentation of the Environmental Impact Assessment Report

Format de Présentation du Rapport sur l'Etude d'Impact Environnementale

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EIA Report

Recommended Format

Rapport sur l'EIE

Format Recommandé

Title Page

Page de garde

- Project title
  Titre du projet

- Promoter's name
  Nom du promoteur

- Author of study
  Auteur de l'étude

- Competent authority for the project
  Autorité de tutelle du projet

- Authority to which the study is addressed
  Autorité à laquelle l'étude est adressée

- Date
  Date

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Part B : Environmental Management Plan

General

The Environmental Management Plan (EMP) will be developed and used as a tool in the construction and operation of WAGP to minimize and mitigate significant negative impacts from the project. Components of the Environmental Management Plan include monitoring, documentation, evaluation, prediction, warning, prevention, control and reduction of impacts identified in the EIA. The Environmental Management Plan shall also include activities intended to enhance the positive environmental, safety and socio-economic aspects of the Pipeline.

The Environmental Management Plan shall provide a means to ensure that legal air and water standards are complied with and that proper waste minimization and waste management processes are implemented. Ecological mitigation measures shall be included in the Environmental Management Plan addressing impacts to vegetation, wildlife, marine ecosystems and bio-diversity. The Environmental Management Plan will provide a means to assess the effectiveness of these mitigation measures. Socio-economic mitigation measures will be identified in the Environmental Management Plan to reduce negative impacts to communities and to enhance the positive benefits of the project to the communities, the States and the region.

Particularly for surveillance and monitoring, specific measurement parameters will be recommended, including measurement methods, locations, frequency and action thresholds. Appropriate thresholds will include those that forewarn or immediately warn of unfavorable project impacts, but that also trigger project execution controls to eliminate or minimize the level of impact or that lead to governmental reporting/ enforcement.

The following specific components will be included in the EMP.

- Evolution of the erosion phenomena and reestablishment of natural drainage before and after pipeline layout and burial
- Restoration of vegetal cover and productivity of agricultural zones put back in exploitation after the work
- Efficiency of actions taken to preserve sensitive areas
- Follow-up of impact on marine biodiversity and fishing and maritime transportation activities
- ROW Surveilance and other monitoring along the pipeline, particularly for any socio-economic encroachment
- Notices at strategic locations along the pipeline (warnings, safety, etc.)

- Other appropriate mitigation measures as identified in Section 7 and Appendix 5.

Waste Management

The general waste management philosophy adopted by the project to handle wastes can be summarized as;

- Utilize processes that inherently generate less waste streams
- Modify process as required to minimize waste quantities generated from source
- Maximize recycle or re-use of waste streams after appropriate treatment
- Utilize safe storage and handling procedures for hazardous waste streams
- Effective monitoring and control of disposal units, with early warning systems
- Inventory control, audit and post project evaluation of regulatory trend to ensure continued compliance

Air Emissions

During the front end engineering phase of the WAGP project, all air emissions, major & minor, resulting from continuous, intermittent or upset conditions of any of the pipeline equipment will be characterized. Each stream will be evaluated to ensure that there are no components which violate 'Air pollutant emission limits' standards.

Emergency Prevention, Preparedness and Response

The Commercial Group intends to develop an Emergency Preparedness and Response Plan for inclusion in the WAGP EIA and in line with permit requirements for each of the countries. The following steps are anticipated in the development of this plan;

- Assessment of hazards and risks of an unplanned incident to both the communities and WAGP personnel;
- Plan Development for managing those hazards and risks;
- Communication of relevant information to employees, contractors, appropriate agencies and the public;
- Barriers etc. to minimize exposure
- Conducting emergency response exercises independently and in co-ordination with community support organisations;
- Responding immediately and appropriately to incidents, providing the necessary financial, technical and personnel resources to effectively respond.

Energy and Resource Conservation

The Commercial group will, to the extent possible, conserve and protect natural resources. As most of the negative impacts are likely to occur during construction, the Commercial Group will pay particular attention to ecological, water, and other natural resource issues during routing, siting and execution planning. Water resources are the most likely resource that could be affected during pipeline operations. This EIA and the development of a natural resources inventory will identify those natural resources most at risk.

This EIA and subsequent monitoring and analyses during the construction and operational phase will be used to continuously identify potential pathways of exposure and potential or actual receptors affected by releases and emissions. Pathways may include air dispersion and contamination of surface water or groundwater. Receptors can be local communities and sensitive ecological habitats.

The Commercial Group will also a natural resource damage assessment plan in the unlikely event of an unplanned, negative event, so that the response and post-incident mitigation is timely and effective. For unavoidable adverse impacts, the Commercial Group will develop and implement certain mitigation measures e.g., personnel training, activity scheduling, and reclamation.

HSE Management Systems

As discussed above in Mitigation Measures, HSE Management Systems will be established for WAGP construction and operations, including, but not limited to the following aspects:

- Compliance Assurance
- Safe Operations
- Pollution Prevention
- Prevention of gas leaks and subsequent environmental impact
- Emergency Preparedness/Response

In support of these and other components, the Commercial Group will establish policies, objectives, procedures, monitoring/reporting processes and responsibilities, in addition to providing the necessary resources (funding, people) for implementation. Additional details will be provided in the submitted EMP, including a schedule of implementation as the Project scope, associated impacts and proposed mitigation measure are better defined.

Part C : Environmental Review and Approval Process

Oversight and co-ordination

1. The WAGP Authority shall be responsible for overseeing and co-ordinating the review and approval processes set out below with the State Environmental Protection Authorities and shall ensure that those organisations promptly consider all environmental documentation provided by the Company including but not limited to the Environmental Impact Assessment and Environmental Management Plan or drafts thereof.

Stakeholder Consultations

2. The Company shall conduct relevant stakeholder consultations throughout the Environmental Impact Assessment process and prior to giving public notice and conducting formal public hearings as required by the laws of each State in accordance with paragraphs 7 and 8 of Part C of Schedule 2. The Company shall conduct such stakeholder consultations as required by the laws of each State, and in such a manner as to identify opportunities to enhance the benefits to such stakeholders arising from the implementation of the Project, or to reduce potential impacts of concern to such stakeholders. The State Environmental Protection Authorities shall if requested by the Company and in any event may participate in such stakeholder consultations.

Preliminary Environmental Impact Assessment

3. The WAGP Authority shall, immediately following receipt of the same from the Company in accordance with Clause 19.1, distribute copies of the preliminary Environmental Impact Assessment and preliminary Environmental Management Plan together with any accompanying documentation to each State Environmental Protection Authority.

4. Each State Environmental Protection Authority shall within 60 days of the receipt from the WAGP Authority of the preliminary Environmental Impact Assessment and preliminary Environmental Management Plan provide written comments on each of these preliminary documents (the ***Preliminary Environmental Documents***) and meet with the Company to the extent necessary to evaluate and provide feedback on the Preliminary Environmental Documents. Such feedback shall be focussed on information, analysis or other matters necessary to enhance the suitability of the Environmental Impact Assessment documents for submission of the Final Draft Documents in accordance with paragraph 6 below, and for the public notice and formal public hearings as provided in paragraphs 7 and 8 below.

Initial Environmental Impact Assessment

5. By no later than 90 days from the end of the period referred to in paragraph 3 above, the Company shall revise the preliminary Environmental Impact Assessment and preliminary Environmental Management Plan incorporating changes agreed with the State Environmental Protection Authorities and submit to the WAGP Authority

the initial Environmental Impact Assessment together with the initial Environmental Management Plan for further review and comment by the State Environmental Protection Authorities. The State Environmental Protection Authorities shall complete their review of these initial documents and inform the Company of any conditions which they propose be attached to the final drafts of the Environmental Impact Assessment and Environmental Management Plan within a period of 60 days from the date on which the Company delivers the initial Environmental Impact Assessment and initial Environmental Management Plan to the WAGP Authority.

Final Draft Environmental Impact Assessment

6. Based on comments received back from the State Environmental Protection Authorities on completion of the process outlined in paragraph 5 above, the Company shall prepare and submit the final draft Environmental Impact Assessment and the final draft Environmental Management Plan (the ***Final Draft Documents***) to the WAGP Authority and the State Environmental Protection Authorities within a period of 21 days. The State Environmental Protection Authorities shall resolve either to approve the release of the Final Draft Documents for public notice and review, as required by the laws of each State, or to propose that certain changes be made by the Company before such consultations commence. The WAGP Authority shall immediately advise the Company of the State Environmental Protection Authorities' decision and consult with the Company on any changes to the Final Draft Documents which the State Environmental Protection Authorities consider should be adopted.

7. By no later than 21 days following approval of the release of the final draft Environmental Impact Assessment and final draft Environmental Management Plan by the State Environmental Protection Authorities pursuant to paragraph 6 above, the Company shall prepare and publish public notices for each State, as required by the laws of each State, and make copies of the final draft of the Environmental Impact Assessment and Environmental Management Plan available for public review in the areas through which the Pipeline System will pass. The Company will also provide a copy of the final draft of the Environmental Impact Assessment and Environmental Management Plan to all relevant State Authorities (including all local government bodies in whose jurisdiction the Pipeline System will lie).

Legally required public hearings

8. The Company and the relevant State Authorities shall conduct formal public hearings on the final draft of the Environmental Impact Assessment and Environmental Management Plan as required by the laws of each State. Each State shall ensure that each Co-ordinating EPA shall commence and complete public hearings within a period of 21 days following expiration of the posted public notice periods in accordance with the laws of that State. If, following completion of the legally required formal public hearings a State considers that a "panel review" to incorporate input from other State Authorities which may be impacted should be held, such review shall be completed within an additional period of 21 days.

Final Environmental Impact Assessment

9. Following public notice and formal public hearings pursuant to paragraphs 7 and 8 above, the Company shall, in consultation with the WAGP Authority, modify the final draft Environmental Impact Assessment and final draft Environmental Management Plan taking into consideration comments received during the public notice and formal public hearings. The Company shall submit a final Environmental Impact Assessment and final Environmental Management Plan containing such modifications as the Company considers appropriate to accommodate such comments.

10. The WAGP Authority shall, in consultation with the relevant State Authorities, promptly consider the final Environmental Impact Assessment and the final Environmental Management Plan, and shall make recommendations to each of the States within 30 days of receipt from the Company of those documents, such recommendation being either to approve those documents or to propose that certain changes to them be made with a view to obtaining required approvals.

11. The States shall, within 30 days of the date of the recommendation referred to in paragraph 10 above, in writing, either:

(a) approve the final Environmental Impact Assessment and final Environmental Management Plan; or

(b) advise the Company of any changes which they propose the Company should adopt and consult with the Company on such changes in an effort to reach agreement, and provided the Company accepts the changes proposed by the States or the Company and the States reach agreement and the Company amends the Environmental Impact Assessment and Environmental Management Plan accordingly, approve the Environmental Impact Assessment and Environmental Management Plan as so amended.

12. Upon giving approvals in accordance with paragraph 11 above, the States shall promptly issue all other documentation required by their applicable laws, including certificates, environmental impact statements and environmental permits as applicable.

SCHEDULE 3

INFORMATION TO BE CONTAINED IN PIPELINE DEVELOPMENT PLAN

1. The information contained in the Front End Engineering Design Package.

2. Implementation plan and critical path schedule for engineering, procurement, fabrication and construction of the Initial Development, including procurement from local suppliers.

3. An outline of the commissioning and start-up plan for the Initial Development.

4. The estimated spending profile for the Construction Period for the Initial Development.

5. An outline of the operation and maintenance plan for the Pipeline System, incorporating guidelines and procedures for the application of operational safety and security standards.

6. An outline of the Emergency Response Plan.

7. The Company's proposed levels of cover for the Insurance Programme, and its estimate of the costs thereof.

8. The manpower development plan for the Construction Period for the Initial Development, and an outline of the manpower development plan for the Operating Period.

9. Information available to the Company on arrangements and tariffs for obtaining transportation on ELPS, including the regime for allocation of natural gas deliveries in the event of a shortfall.

10. Procedures for scheduling nomination and delivery of natural gas supplies and co-ordination between operators at the facilities of the natural gas producers, ELPS, the Pipeline System and the customers to whom natural gas is delivered out of the Pipeline System.

11. Arrangements for WAGP for allocation of natural gas deliveries in the event of a shortfall.

12. List of those Project Authorisations required by the Company in each State for the construction and commissioning of the Pipeline System.

13. List of those Project Authorisations required by the Company and the Operators for the operation and maintenance of the Pipeline System in each State.

14. A statement of the conditions, if any, pursuant to which the Project Authorisations should be issued.

15. A list of the fees to be charged for each Project Authorisation.

16. A list of the Supplemental Authorisations required by Buyers, Sellers or Shippers.

17. Market forecast, including details of the mid-market forecast required for the Approved Tariff Methodology.

18. Details of the proposed stages of expansion of the Pipeline System from the Initial Development up to the full design capacity of the Pipeline System (without looping the pipeline), including the sites and technical descriptions of additional facilities which might be installed as part of the Pipeline System.

19. A statement of all costs to be included in the calculation of the Foundation Reference Tariff and the Standard Reference Tariff, including the Pre-Development Costs, estimates of costs from the time of providing that statement until the Construction Commitment Date, all costs determined in accordance with the Bidding Procedure, and estimates of all other costs to be incurred in the construction or operation of the Pipeline System.

SCHEDULE 4

CONSTRUCTION COMMITMENT DATE

The conditions precedent to the occurrence of the Construction Commitment Date are as follows:

(a) The WAGP Treaty has been ratified by each of the States and has come in to force on its terms, and an instrument of ratification deposited with the ECOWAS Secretariat.

(b) All steps, formalities and processes necessary to give the Enabling Legislation the force of law in each State (including its enactment into law by the Legislature) have been completed, and such Enabling Legislation has become effective in law; and if the form of Enabling Legislation enacted by the Legislature in a State is different from the Draft Legislation for that State, the Company has confirmed in writing to the WAGP Authority that any such differences are acceptable to it.

(c) All of the Project Authorisations and Supplemental Authorisations identified by the Company in the Approved Pipeline Development Plan, and all other Project Authorisations and Supplemental Authorisations which have been applied for, have been issued in accordance with Clauses 15 and 17 and no Project Authorisations have been issued subject to conditions which have not been agreed to previously by the Company in writing.

(d) The Company has obtained all requisite rights to or over land for the implementation of the Project in accordance with Clauses 20 and 21.

(e) The final Environmental Impact Assessment and the final Environmental Management Plan have been approved by the States in accordance with Clause 19, and the Company has confirmed in writing that as at the date of approval there is no material change to the economics of the Project as a consequence of the terms of such approvals.

(f) The final Pipeline Development Plan has been approved by the WAGP Authority on behalf of the States in accordance with Clause 18.3, and:

   (i) as at that date there is no material change to the economics of the Project as a consequences of the terms of such approval; and

   (ii) the Company has confirmed to the WAGP Authority in writing that there are no conditions attached to that approval which are not acceptable to the Company.

(g) The WAGP Regulations have been adopted by the Relevant Ministers and have come in to force in each State in accordance with Clause 12, and the Company has advised the WAGP Authority in writing that the text of the WAGP Regulations so adopted by the Relevant Ministers is acceptable to the Company.

(h) Any approval of loan facilities sought in accordance with sub-paragraph 8(a)(ii) of Part B of Schedule 8 has been granted.

(i) The WAGP Authority and the Company have agreed upon the Exempt Goods List in accordance with Clause 29.9 and the Certification System in accordance with Clause 29.10.

(j) The actions contemplated in paragraphs (4), (7) and (9) of Article III of the WAGP Treaty have been taken and the WAGP Authority is capable of performing the roles and undertaking the responsibilities assigned to it under this Agreement, the Enabling Legislation and the WAGP Regulations and has been provided by the States with the staffing, funding and facilities needed for that purpose.

(k) The Access Code has been agreed between the WAGP Authority and the Company in accordance with Clause 26.

(l) Each of Benin, Nigeria and Togo has fulfilled the requirements of it under Clause 5.1.

(m) All exemptions as are necessary under its Constitution or applicable treaties to enable a State to grant or issue the rights, benefits, exemptions, permissions, permits, approvals, licences or other rights set out in Clause 30 have been obtained, and all such rights, benefits, exemptions, permissions, permits, approvals, licences or other rights have been granted or issued.

(n) The certificates of exclusion or exemption referred to in Clause 31.2 or 31.3 have been obtained for the Company and for any Buyer, Seller or Shipper which has requested it, and the Company (or the Buyer, Seller or Shipper as the case may be) has advised the WAGP Authority in writing that any such certificate of exclusion or exemption does not contain any conditions or obligations which are not acceptable.

(o) The quantum of all compensation amounts payable by the Company in respect of Clause 21 has been finally determined.

(p) All of the Commercial Agreements have been entered into by each of the parties thereto, and each has become unconditional (other than in respect of conditions as to the Pipeline System being constructed and commissioned or the Construction Commitment Date having occurred).

SCHEDULE 5

COMMERCIAL AGREEMENTS

1. GAS PURCHASE AGREEMENTS

1.1 Gas purchase agreement(s) entered into between N-Gas Limited (***N-Gas***), a corporation owned by the Nigerian Commercial Group Members or their Affiliates, and the Nigerian Commercial Group Members for the purchase of natural gas for supply under the gas sales agreements referred to in item 2 below.

2. GAS SALES AGREEMENTS

2.1 Gas sales agreement to be entered into between N-Gas as seller and the Volta River Authority [and Takoradi International Company] as buyers.

2.2 Gas sales agreement(s) to be entered into between N-Gas as seller and Communaute Electrique du Benin (***CEB***) as buyer.

3. GAS TRANSPORTATION AGREEMENTS

3.1 Foundation Gas Transportation Agreement(s) between the Company and N-Gas for deliveries to the WAGP regulation and metering station at Takoradi.

3.2 Foundation Gas Transportation Agreement(s) between the Company and N-Gas for deliveries to the WAGP regulation and metering stations in Cotonou and Lomé.

3.3 Gas Transportation Agreement between N-Gas and Nigerian Gas Company Limited in respect of the transportation of natural gas through the ELPS.

4. INTERCONNECTION AGREEMENTS

4.1 ELPS/WAGP interconnection agreement between Nigerian Gas Company Limited and the Company in relation to the interconnection between the Pipeline System and ELPS.

5. CREDIT SECURITY AGREEMENTS

5.1 Direct agreement between the Volta River Authority, N-Gas and the Company for Buyer credit support.

5.2 Government of Ghana Consent and Support Agreement (credit support for the Volta River Authority) between the Government of Ghana, N-Gas and the Company.

5.3 Financial guarantee between MIGA and the Company [and other documentation relating to the MIGA guarantee].

5.4 Credit support agreement relating to CEB deliveries between the Governments of Benin and Togo, N-Gas and the Company.

5.5 Further credit support agreement backing the Governments of Benin and Togo in relation to CEB deliveries.

5.6 Priority and Security Deed between the Company, N-Gas, Nigerian Gas Company Limited (as operator of ELPS), the Nigerian Commercial Group Members (as producers and sellers of natural gas) and others providing for the allocation of revenues amongst the participants in the event of default and establishing the necessary security arrangements amongst them.

SCHEDULE 6

WAGP REGULATIONS

1. The WAGP Regulations shall:

(a) be consistent with this Agreement;

(b) adopt the Agreed Design Standards;

(c) accord with internationally acceptable industry standards; and

(d) accord with recognised good practice applicable to high pressure natural gas pipelines.

2. The WAGP Regulations shall not govern the environmental standards which shall be applied to the Pipeline System and implemented in the construction and operation of the Pipeline System, or the procedures for obtaining environmental approvals, which standards and procedures shall remain the subject matter of the prevailing environmental legislation applying in each State.

3. The WAGP Regulations shall include, without limitation, regulations addressing the following matters:

(a) Standards and procedures for the design and construction of the Pipeline System incorporating the Agreed Design Standards set out in Schedule 9;

(b) Standards and procedures for the testing and commissioning of the Pipeline System incorporating the Agreed Design Standards set out in Schedule 9;

(c) Standards and procedures for the operation and maintenance of the Pipeline System including for the repair, testing and checking of the Pipeline System (for internal and external corrosion) incorporating the Agreed Design Standards set out in Schedule 9;

(d) Standards of and procedures for measurement to be used in the Pipeline System;

(e) Health and safety requirements and practices for the Pipeline System;

(f) Environmental operating requirements, including handling of leaks and discharges;

(g) Qualifications and experience required for operating personnel and companies;

(h) Requirements for periodic reporting to the WAGP Authority;

(i) Rights of inspection to be granted to the WAGP Authority;

(j) a regime providing for the imposition of penalties on the Company for certain breaches of the WAGP Regulations in the operation of the Pipeline System and for continuing Company Events of Default of this Agreement;

(k) Procedures to deal with an emergency situations, including the circumstances in which the Company may be required to suspend its operations for reason of risk to health, safety or the environment;

(l) Procedures for the termination and/or resumption of operation of the Pipeline System including procedures for abandonment.

4. The WAGP Regulations shall provide that:

(a) All drawings, plans, designs and other technical documents made or prepared by the Company for the purposes of the Project, and any plans for the fabrication or construction of the Pipeline System, which have been approved by the Steering Committee or its delegates prior to the establishment and empowerment of the WAGP Authority shall be deemed to have been duly approved by the WAGP Authority;

(b) All actions (other than those identified in paragraph (a) above) taken in accordance with this Agreement by the Steering Committee or its delegates prior to the establishment and empowerment of the WAGP Authority which are functions of the WAGP Authority, shall be deemed to have been duly taken by the WAGP Authority;

(c) Any drawings, plans, designs and other technical documents made or prepared by the Company for the purposes of the Project, and any plans for the fabrication or construction of the Pipeline System, which have been approved by the WAGP Authority or its delegates (or deemed to have been so approved by operation of paragraph (a) above) prior to the entry into force of the WAGP Regulations, which are approvals provided for in the WAGP Regulations, shall be deemed to have been approved under the WAGP Regulations upon their entry into force; and

(d) All actions taken by the WAGP Authority (or deemed to have been so taken by operation of paragraph (b) above) prior to the entry into force of the WAGP Regulations, which are actions provided for in the WAGP Regulations, shall be deemed to have been duly taken under the WAGP Regulations upon their entry into force.

SCHEDULE 7

APPROVED TARIFF METHODOLOGY

1. GENERAL TARIFF PRINCIPLES

1.1 The following principles are used to derive tariffs:

(a) rates are set at the time of the Final Investment Decision, to recover the Pre-Development Costs plus the anticipated costs of constructing and operating the Pipeline System, based on estimated construction costs including the results of Bidding Procedures for Major Contracts;

(b) costs are allocated appropriately among various classes of customers;

(c) rates are set to allow the Company to achieve:

(i) from net cash flows (after payment of all operating and other expenses) derived from Foundation Gas Transportation Agreements, a real (in US dollar terms), after-tax, rate of return of 12% on total capital employed in the Initial Development (including Pre-Development Costs);

(ii) from net cash flows (after payment of all operating and other expenses) derived from all Gas Transportation Agreements:

(A) a real (in US dollar terms), after-tax, rate of return of 15% on total capital employed in the Pipeline System (including Pre-Development Costs), and in which calculation the anticipated reduction in corporate income tax from the allowance for tax purposes of anticipated interest in respect of debt shall be brought to account) if the forecast agreed in the Approved Pipeline Development Plan of the volumetric growth in the market for natural gas transported in the Pipeline System as having at least a 50% likelihood of being achieved (the "***Mid-Market Forecast***"), is exactly achieved;

(B) less than the 15% rate of return provided for under sub-paragraph (A) above if the actual volumetric growth in the market for natural gas transported in the Pipeline System is less than the Mid-market Forecast; and

(C) more than the 15% rate of return provided for under sub-paragraph (A) above if the actual volumetric growth in the market for natural gas transported in the Pipeline System is greater than the Mid-market Forecast;

(d) the exact amounts of the costs to be used in the calculation of the tariffs will be those which are agreed by the Company and the WAGP Authority and set out in the Approved Pipeline Development Plan;

(e) a non-distance sensitive rate design having only one single transportation rate for the class of Shipper regardless of distance that natural gas is transported along the pipeline route;

(f) pass through by the Company, as the WAGP Authority Charge, of the costs of the WAGP Authority which are recouped from Shippers in accordance with Clause 9.4;

(g) reduction in tariffs charged as throughput increases, starting when volumes grow beyond the level of Foundation volume commitments; and

(h) tariffs quoted, and payment made, in US dollars.

1.2 The tariffs will be structured in a two-part rate, with one part fixed and the other part varying according to the volume of natural gas actually transported, as follows:

(i) fixed costs (including all operating and other expenses other than fuel gas, and all capital costs) are recovered through a reservation charge assessed on the quantity of pipeline capacity contracted by the Shipper, and the class into which the Shipper falls; and

(ii) the cost of fuel gas for the Company's compressors is recovered through a variable or usage charge, assessed on actual volumes of natural gas transported.

1.3 The exact usage charge will be adjusted annually to account for actual fuel usage and contracted capacity on the pipeline. All Shippers of all classes will pay the same usage charge per unit of natural gas transported.

2. TARIFF CLASSES

2.1 The following principles apply to the establishment of tariffs to recover the fixed costs. The usage charge to recover the variable cost of fuel gas is calculated separately.

2.2 For tariff setting purposes, three potential classes of Shippers are recognised. Shippers in these classes will receive different tariff structures. They are:

(a) Foundation Shippers;

(b) Standard Shippers; and

(c) Industrial Development Shippers.

Foundation Tariff

2.3 To qualify for the Foundation Tariff, a Shipper must be a Foundation Shipper. The Foundation Tariff applies only in respect of Foundation Gas Transportation Agreements. Foundation Shippers under Foundation Gas Transportation Agreements will receive a tariff discount relative to the Standard Tariff.

Standard Tariff

2.4 All Shippers who make contractual commitments for capacity after the Final Investment Decision, and other Shippers who do not meet the qualifications of a Foundation Shipper, will have available the Standard Tariff. Contract terms will be 5 years or more.

Industrial Development Tariff

2.5 The Industrial Development Tariff involves a cross-subsidy to provide a tariff level below the Standard Tariff as a method of encouraging natural gas usage by small industrial customers, as therefore its applicability is restricted to the specifically targeted beneficiaries.

2.6 The Industrial Development Tariff will be available for the transportation of natural gas for consumption by individual users having a total gas demand of not more than 1 MMscfd, and which is not used for electric power generation.

2.7 The Industrial Development Tariff is available only for natural gas which is used by specific customers meeting these criteria. If the actual Shipper is a natural gas distribution utility or other intermediary, the Shipper will need to provide evidence of gas delivery to the actual end use customer to qualify for this tariff class in respect of that quantity of natural gas. Any natural gas transported for a Shipper where the Shipper cannot establish that the ultimate deliveries were to users who do not meet these criteria, or used for a purpose which does not meet these criteria, will be subject to the Standard Tariff.

3. SPECIFIC TARIFF PRINCIPLES

Foundation Tariff

3.1 The following additional principles are used to derive Foundation Tariffs:

(a) A foundation "reference tariff" is calculated (the ***Foundation Reference Tariff***). To derive the Foundation Reference Tariff, all costs of the Initial Development (including Pre-Development Costs) will be allocated to the Foundation Reference Tariff. The Foundation Reference Tariff will be calculated to achieve the rate of return referred to in paragraph 1.1(c)(i) above;

(b) The Foundation Reference Tariff will be fixed for the Primary Transportation Term;

(c) The Foundation Reference Tariff will be averaged or levelised over the Primary Transportation Term. Levelised means that the effects of depreciation and accumulated recovery of capital costs are evened out over the initial 20 year period;

(d) The Foundation Reference Tariff will be adjusted annually by applying the Inflation Index; and

(e) In order to determine from the Foundation Reference Tariff the actual tariffs charged to Foundation Shippers (the ***Foundation Tariff***), there will be an adjustment mechanism applied, so that as the total contracted capacity on the Pipeline System rises and the Company receives payment from Shippers being charged the Standard Tariff, the Foundation Tariff falls.

Standard Tariff

3.2 The following additional principles are used to derive Standard Tariffs:

(a) All capital costs for additional compression or lateral pipelines not installed as part of the Initial Development, but which are contemplated in the Approved Pipeline Development Plan, will be allocated to the Standard Tariff. A standard "reference tariff" will be calculated (the ***Standard Reference Tariff***). This will be set so that, if the Mid-Market Forecast is exactly achieved, and if the Foundation Shippers were to pay the Foundation Reference Tariff for the term of their contracts, and if all Shippers other than Foundation Shippers assumed in the Mid-Market Forecast paid the Standard Reference Tariff, the Company would achieve, after 20 years, the rate of return referred to in paragraph 1.1(c)(ii) above.

(b) There will be an annual adjustment to the Standard Reference Tariff by applying the Inflation Index.

(c) The Standard Reference Tariff is less than the Foundation Reference Tariff. However the actual tariff charged to Standard Shippers (the ***Standard Tariff***) must always be greater than the Foundation Tariff, and therefore there needs to be an equalising mechanism, which lowers the tariff charged to Foundation Shippers and raises the tariff charged to Standard Shippers to a point just above the Foundation Tariff.

Industrial Development Tariff

3.3 The following additional principles are used to derive Industrial Development Tariffs:

(a) Total volume of capacity available for this tariff class will be limited to 10% of the ultimate capacity of the Pipeline System (after installation of the midpoint compressor station), measured at the inlet point.

(b) This tariff will be set below the initial Foundation Tariffs and Standard Tariffs, at a level that the Standard Tariff is expected to be on the date falling 20 years after the Commercial Operation Date, assuming the Mid-Market Forecast is exactly achieved. Using this approach, the Standard Tariff will reduce to the same level as the Industrial Development Tariff after 20 years (if volumes grow according to the Mid-Market Forecast).

3.4 When the Standard Tariff reaches the level of the Industrial Development Tariff, from that time forward there will be only one class of tariff other than the Foundation Tariff offered, the Standard Tariff.

4. CALCULATION OF TARIFFS

4.1 The tariffs are calculated as set out below.

Calculation of initial Foundation Tariff

4.2 Initially, until additional Shippers commence paying the Standard Tariff, the Foundation Tariff equals the Foundation Reference Tariff.

4.3 As additional Shippers contract and commence paying for capacity on the Pipeline System, the Foundation Tariff will drop below the Foundation Reference Tariff, by way of a rebate out of funds received from those additional Shippers. The Foundation Tariff will be as calculated below (subject to receipt by the Company of payment of the Standard Tariff by Standard Shippers). In addition, a discount, or differential, of US$ 0.10 / Mscfd (in nominal, not real, US dollars) will be maintained between the Foundation Tariff and the Standard Tariff.

Calculation of Industrial Development Tariff

4.4 The Industrial Development tariff is calculated as at the Final Investment Decision, based on the two reference tariff parameters, the Foundation Reference Tariff ($T_{F\ (Ref)}$) and the Standard Reference Tariff ($T_{S\ (Ref)}$), and the Mid-Market Forecast volume after 20 years, all of which are known at the Construction Commitment Date.

4.5 The Industrial Development Tariff equals the projected Standard Tariff after 20 years, assuming that the Mid-Market Forecast is exactly achieved and there are no tariffs other than the Foundation Tariff and the Standard Tariff.

4.6 The Industrial Development Tariff is real (in US dollar terms), so it is adjusted annually by applying the Inflation Index.

4.7 When, as market growth materialises, the Standard Tariff falls to equal the Industrial Development Tariff, from that time on both Industrial Development Shippers and Standard Shippers will pay the Standard Tariff.

Foundation Tariff and Standard Tariff as Volumes Grow

4.8 The Foundation Tariffs and Standard Tariffs are re-calculated annually. The following factors are used:

V_F	=	**Foundation volume of contracted capacity**
$T_{F\ (Ref)}$	=	**Foundation Reference Tariff, calculated as described above**
$T_{S\ (Ref)}$	=	**Standard Reference Tariff, calculated as described above, assuming the Mid-Market Forecast is exactly achieved**

T_{IND}	=	**Industrial Development Tariff, calculated as described above using the formula set out below**
		All of the above factors are known at the outset, and remain fixed for the Primary Transportation Term. The following factors vary from year to year.
V_{ACT}	=	**Actual total volume of contracted capacity for a given year, including V_F**
V_{IND}	=	**Volume of contracted capacity in a given year that qualifies for the Industrial Development Tariff**
V_S	=	**Volume of contracted capacity in a given year that is subject to the Standard Tariff (V_{ACT} - V_F - V_{IND})**

From these parameters, the Foundation Tariff (T_F) and Standard Tariff (T_S) (in real US$ terms) in any year is calculated as follows:

$$T_F = \frac{(T_{F(Ref)} x V_F) + (T_{S(Ref)} x V_S) - ((T_{IND} - T_{S(Ref)}) x V_{IND}) - (V_S x 0.10)}{[V_F + V_S]}$$

$$T_S = T_F + 0.10$$

SCHEDULE 8

AGREED FISCAL REGIME

A. INTRODUCTION

WAGP Companies

1. This Schedule sets out the principles and rules relating to the liability for, and the calculation of, and method of assessment of, Tax on each WAGP Company in relation to Assessable Income. This Schedule shall not apply in respect of any liability of a WAGP Company to Tax arising other than in relation to WAGP Activities or Assessable Income.

2. The Non-WAGP Regime shall not apply to any WAGP Company in respect of WAGP Activities or Assessable Income except as set out below. For the avoidance of doubt, the Non-WAGP Regime shall apply to the taxation of any WAGP Company in respect of activities other than WAGP Activities or in respect of Income other than Assessable Income.

3. All Income Tax liabilities of each WAGP Company, and payments made by each WAGP Company in respect of those liabilities, shall be to the respective Tax Authority in each State. The WAGP Authority will participate in the determination of the liability of each WAGP Company to pay Income Tax as set out below.

4. The Income Tax liability of each WAGP Company shall be calculated by reference to Tax Years.

Other persons

5. This Schedule also sets out the principles and rules relating to the liability for, and the calculation of, Tax on Buyers, Sellers, Shippers and Project Contractors, to the extent specified in this Schedule.

6. The Non-WAGP Regime applying to such persons in respect of their activities as contemplated in this Schedule shall be modified in accordance with this Schedule.

7. If any WAGP Company undertakes any action, transaction or agreement (whether or not as a part of an arrangement or series of arrangements) where the principal purpose of the WAGP Company in undertaking that action, transaction or agreement (or arrangement or series of arrangements) is to obtain for itself a relief (or increased relief) from, or repayment or increased repayment of, Tax on Assessable Income imposed by this Schedule, or the avoidance or reduction of a charge to such a Tax or an assessment to such a Tax, the amount of the relief, repayment or charge for that WAGP Company shall be the amount that would have been the case had the action, transaction or agreement (or arrangement or series of arrangements) not been undertaken.

B. INCOME TAX

Liability to and rate of Income Tax

1. Subject to the principles and rules set out in this Schedule, and in particular to paragraph B.19 below, each WAGP Company shall be liable to pay to each State, in respect of each Tax Year, Income Tax at the rate of 35% of its Taxable Income attributable to that State in the Tax Year. The Taxable Income of a WAGP Company attributable to a State shall be calculated as set out below, following the apportionment between the States of the components of Taxable Income as set out below.

2. In calculating the amount due in respect of Income Tax from a WAGP Company to an individual State, credit shall be given for any amounts in respect of which an election is made by that WAGP Company under this paragraph B.2, as follows:

(a) Where any amount is owing by an individual State to that WAGP Company under Clause 36.4 or under the Fiscal Laws (whether laws implementing the provisions of paragraphs C.10 or E.6 below, or otherwise), including interest thereon arising under Clause 44.3 or paragraphs B.48 or B.49 below (a ***State Liability***), that WAGP Company may elect in accordance with this paragraph to treat that amount as a payment made by the WAGP Company concerned to that State on account of Income Tax due to that State under paragraph B.1 above.

(b) That WAGP Company may, at any time on or before the date upon which a payment of Income Tax is due to a State (including interim payments, adjusting payments and further adjusting payments payable under paragraphs B.45, B.46 or B.47 below), by notice in writing given to the Tax Authority of that State, elect that a particular amount of State Liability of that State be treated as a payment made by the WAGP Company concerned on account of that WAGP Company's liability to pay Income Tax to that State. A notice of election given under this paragraph shall state the exact amount in respect of which the election is made, and provide particulars of how the components of that State Liability arose, including a breakdown of the components of that State Liability if more than one.

(c) Upon a notice of election being given by the Company in accordance with sub-paragraph B.2(b) above, an amount of the State Liability equal to the amount referred to in that notice shall be extinguished, and the Company shall be deemed to have made a payment of that specified amount to that State on account of its Income Tax liability to that State, on the date on which the notice is given to the Tax Authority of that State.

Taxable Income

3. ***Taxable Income*** for any period equals the amount of Assessable Income for that period less the aggregate of:

(a) Allowable Expenses for that period; and

(b) Claimed Reliefs in respect of that period.

Assessable Income and Allowable Expenses

Income and Expenses

4. For the purposes of this Schedule 8:

(a) ***Income*** means any receipts or realised gains of a revenue nature, determined in accordance with the Accounting Principles (and for the avoidance of doubt Income includes amounts recovered by way of insurance claims, judicial or arbitral awards, recovered legal costs, rental or refunds, proceeds from sale or exchange of plant or facilities or supplies, or sale or licence of intellectual property, where under the Accounting Principles such amounts would be treated as Income); and

(b) ***Expenses*** means any payment or outflow or depletion of assets or incurrence of liabilities, other than distributions to equity participants.

Assessable Income

5. Subject to paragraph B.6 below, the amount of ***Assessable Income*** for any Tax Year is the aggregate of:

(a) payments received by the WAGP Company concerned during that Tax Year that are derived from natural gas transportation operations which are WAGP Activities; and

(b) Income accrued during that Tax Year in respect of any debt claims in which the Company is the creditor or another WAGP Company is the creditor and the debt claim relates to WAGP Activities or is in respect of monies derived from WAGP Activities; and

(c) any other Income incidental to WAGP Activities received by the WAGP Company concerned during that Tax Year; and

(d) any Balancing Charges in respect of that Tax Year.

6. Assessable Income shall not include:

(a) any amount received in respect of the disposal of any Capital Asset;

(b) any part of the WAGP Authority Charge;

(c) any dividend received from any WAGP Company;

(d) any interest accrued in respect of any debt claims in which any other WAGP Company is the debtor to the extent that paragraph B.8(a) applies to deem the

interest accrued on that debt claim to be a Non-Allowable Expense for that WAGP Company;

(e) any amount paid or accrued to a WAGP Company by a State under this Agreement, except where and to the extent that the amount paid is compensation for or reimbursement of lost Assessable Income;

(f) any interest accruing prior to the Commercial Operation Date; and

(g) any interest received in respect of an overpayment of, or on account of, Tax under paragraphs B.47 to B.49 below.

Allowable Expenses

7. ***Allowable Expenses*** for a period means any Balancing Allowances in respect of that period, and all Expenses (other than Non-Allowable Expenses) which are incurred in that period (including accruals on any debt claims where the WAGP Company concerned is the debtor) wholly and exclusively for the purpose of deriving Assessable Income. For the avoidance of doubt, Expenses shall not cease to be Allowable Expenses solely as a result of being incurred in respect of related party transactions.

8. ***Non-Allowable Expenses*** means:

(a) interest expense to the extent that:

(i) the average ratio of Debt to Equity during the Tax Year exceeds 70:30 (and so that in calculating the amount of Allowable Expenses and Non-Allowable Expenses where this ratio is exceeded the amount of the interest Expense shall be pro-rated between the two in accordance with the amount of Debt that falls within and exceeds this ratio, respectively);

(ii) such interest is incurred in an amount exceeding a reasonable commercial return for the borrowing at that time on the same terms for the same amount and period and in the same currency as the relevant borrowing by the WAGP Company concerned; provided that if the Company and the WAGP Authority agree on a mechanism for determining reasonable interest rates for the purposes of this paragraph, or if the WAGP Authority approves the terms of a finance facility, then any interest accrued under a facility which complies with that mechanism or under any facility the terms of which are so approved, shall not be a Non-Allowable Expense; or

(iii) the Debt in respect of which the interest accrues is incurred for the principal purpose of reducing that WAGP Company's Tax liability.

(b) any Expenses incurred in providing business entertainment or gifts, other than the cost of accommodation, food and drink attributable to any employee or director of any WAGP Company incurred in any of the States;

(c) legal fees or other costs of proceedings incurred in relation to arbitration of any determination under this Agreement;

(d) any Expenses incurred prior to the Commercial Operation Date;

(e) any Expenses already taken into account as a deduction in respect of any Tax liability calculated by reference to net profits or gains of any Shareholder in any State;

(f) any Expenses in relation to any purchase of goods from any Shareholder or an Affiliate of a Shareholder to the extent that the consideration given exceeds the consideration which would be payable in an arm's length transaction of substantially the same nature between unconnected parties;

(g) the cost of any letter of guarantee from Shareholders or Affiliates to the States which is given in relation to this Agreement;

(h) fines and penalties imposed under any law of a State; and the costs of indemnities to employees, contractors or agents of any WAGP Company in respect of such fines and penalties;

(i) any general overhead or general head office costs incurred by Shareholders or Affiliates and re-charged to any WAGP Company (not including any amounts charged in respect of specific services supplied and separately invoiced by such Shareholders or Affiliates) to the extent these exceed 1.5% of that WAGP Company's aggregate Allowable Expenses, excluding the amounts to be re-charged, for the relevant Tax Year;

(j) any depreciation for accounting purposes in the value of any assets;

(k) any Capital Expenditure;

(l) any payment by the Company to the WAGP Authority which is reimbursable through the WAGP Authority Charge; and

(m) any payments of, or on account of, Tax and any interest in respect of an underpayment of, or on account of, Tax.

Reliefs

9. ***Claimed Reliefs*** are the Allowable Losses and Capital Allowances claimed in the Returns in respect of the relevant Tax Year.

Loss Reliefs

10. If in any Tax Year the amount of Allowable Expenses exceeds the amount of Assessable Income, the excess shall be an Allowable Loss of the WAGP Company concerned for that Tax Year. An amount of Allowable Loss shall be carried forward and may be claimed by that WAGP Company in any of the nine subsequent Tax Years. Where an amount of the Allowable Loss is claimed by that WAGP Company in any subsequent Tax Year, the amount of the Taxable Income of that WAGP

Company in respect of that Tax Year shall, as described in paragraph B.3 above, be reduced by the amount of Allowable Loss so claimed and the amount of Allowable Loss that may be carried forward for use in subsequent Tax Years shall be reduced by the amount so used. The WAGP Company concerned shall be deemed to claim amounts of Allowable Loss in chronological order beginning with those that arose in the earliest available Tax Year.

Capital Allowances

11. All Pre-Development Costs and (to the extent not included in the Pre-Development Costs) all Allowable Expenses incurred by a WAGP Company prior to the Commercial Operation Date, less the sum of all Assessable Income derived by a WAGP Company prior to the Commercial Operation Date (including the amount of any interest accruing prior to the Commercial Operation Date), will be the amount of the ***Capital Account*** as at the Commercial Operation Date.

12. At the end of each Tax Year, the amount of the Capital Account of each WAGP Company shall be adjusted by adding the amount of Capital Expenditure incurred by that WAGP Company in that Tax Year (other than Capital Expenditure incurred prior to the Commercial Operation Date).

13. Each WAGP Company may elect to claim an amount of relief (known as ***Capital Allowances***) equal to not more than 25% of the balance of its Capital Account at the end of the relevant Tax Year. The amount of the Capital Allowances shall be taken into account in reducing the Taxable Income of that WAGP Company for the relevant Tax Year as described in paragraph B.3 above, and shall be deducted from the capital account at the commencement of the next succeeding Tax Year. Capital Allowances shall not be claimed, and the balance of the Capital Account shall not be reduced, until the Tax Year or part thereof which follows the Income Tax Holiday Period, and in subsequent Tax Years.

14. ***Capital Expenditure*** shall be (a) the cost of acquiring or improving any asset which is a Capital Asset and (b) the cost of Capital Services but, in each case, shall not include any Expenses that do not exceed US$10,000. An asset is a ***Capital Asset*** if that asset is acquired not with a view to its sale for a profit, but for the enduring benefit of the business of the Project. A service is a ***Capital Service*** if that service is not acquired by the relevant WAGP Company to be utilised by that WAGP Company directly for an onward supply of goods and services with a view to profit, but is supplied for the enduring benefit of the business of the Project.

15. Each WAGP Company will keep a ledger in US dollars recording all Capital Expenditure incurred and the Capital Asset in respect of which that Capital Expenditure has been incurred. This ledger will also show the ***Written Down Value*** of each Capital Asset, which is the Capital Expenditure incurred in acquiring or improving that Capital Asset less the amount of Capital Allowances that have been claimed in respect of that Capital Asset, assuming that the amount of Capital Allowances claimed are pro rated across all of the Capital Assets represented within the Capital Account.

16. Where any Capital Asset is disposed of and the Written Down Value of that Capital Asset exceeds the sale proceeds, a ***Balancing Allowance*** will arise in the Tax Year in which the disposal takes place. The amount of that Balancing Allowance shall be the amount by which the Written Down Value of that Capital Asset exceeds the sale proceeds, and the Balancing Allowance shall be taken into account in reducing Taxable Income as set out in paragraph B.3 above.

17. Where any Capital Asset is disposed of and the sale proceeds exceed the Written Down Value of that Capital Asset, a ***Balancing Charge*** shall arise in the Tax Year in which the disposal takes place. The amount of that Balancing Charge shall be the amount by which the sale proceeds for, or, if lower, the Capital Expenditure on, that Capital Asset exceeds the Written Down Value of that Capital Asset, and the Balancing Charge so arising shall be taken into account as Assessable Income as set out in paragraph B.5 above.

Income Tax Holidays

18. The ***Income Tax Holiday Period*** shall be the period starting on the Commercial Operation Date and lasting for 60 months.

19. No Income Tax shall be payable by a WAGP Company in respect of Assessable Income arising prior to the last day of the Income Tax Holiday Period. If a Tax Year begins before and ends after the last day of the Income Tax Holiday Period, the amount of Assessable Income earned and Allowable Expenses incurred in that Tax Year in the part periods before the last day and after the last day of the Tax Holiday Period shall be calculated on a pro rata basis by apportionment of the total Assessable Income and Allowable Expenses of the Tax Year between the two periods according to the number of days falling before that last day and the number of days falling after. The maximum Capital Allowances claimable in respect of the period after the last day of the Tax Holiday Period shall be pro-rated downwards in the same manner. For the avoidance of doubt, Income Tax payable in respect of Taxable Income arising during the Tax Year in question shall be calculated only by reference to Assessable Income and Allowable Expenses apportioned to the period after the last day of the Income Tax Holiday Period.

Assessment and Administration

Tax Liability

20. All Assessable Income, Allowable Expenses and Claimed Reliefs for a Tax Year shall be apportioned between each State in accordance with that State's apportionment percentage as shown in the table in B.21 below (the ***Apportionment Percentages***), irrespective of where or how such Assessable Income might have been earned or accrued or Expenses incurred.

21. The Apportionment Percentages for the Initial Term shall be as set out in the following table:

State	Apportionment Percentage

Benin	
Ghana	
Nigeria	
Togo	
TOTAL	100.00%

22. The Apportionment Percentages set out above shall only be altered during the course of the Initial Term by the agreement of the Parties, in the form of a written instrument signed (a) by the Relevant Minister of each of the States and (b) by or on behalf of the Company.

23. The Apportionment Percentages may be altered following the expiry of the Initial Term by written notice to the Company, such notice to be signed by the Relevant Minister of each of the States (provided that, for the avoidance of doubt, the sum of the Apportionment Percentages shall not exceed 100%).

24. Any alteration provided for in paragraphs B.22 or B.23 above shall have effect from the commencement of, and in respect of Income Tax for, the next succeeding Tax Year.

Tax Returns

25. Subject to paragraphs B.33 to B.37 below, each WAGP Company will produce five identical returns for each Tax Year beginning with the last Tax Year commencing prior to the Construction Commitment Date (each, a ***Return*** and together the ***Returns***) setting out its Assessable Income, Allowable Expenses and Claimed Reliefs for that Tax Year (apportioned between the States in accordance with paragraph B.21), and its calculation of its liability to Income Tax in each State for that Tax Year. The Returns will comprise the audited company accounts of the WAGP Company concerned (prepared in accordance with the Accounting Principles) together with tax accounts showing the appropriate tax adjustments to the financial statements. The Returns will include the results of each of its branches and of each other WAGP Company that is deemed to be a branch of the first WAGP Company pursuant to paragraphs B.33 to B.37 below.

26. Each WAGP Company shall maintain its accounting records and present its financial statements, Income Tax computations and Returns in US dollars.

27. Each WAGP Company shall submit one Return to the WAGP Authority and one to the Tax Authority in each State. The Returns must be submitted within six months of the end of the Tax Year (the final date of such six month period being the ***Filing Date***). Failure to submit the Returns by the Filing Date will give rise to a penalty to be stipulated in the Enabling Legislation per Return.

28. The Tax Authorities in the States shall jointly review the Returns in conjunction with the WAGP Authority and prepare a single combined assessment (the ***Combined Assessment***) on the basis of the information contained in the Returns. The Combined Assessment shall show the calculation of the Taxable Income of the WAGP Company in each State for the Tax Year in question, which shall bear the proportions to each other of the prevailing Apportionment Percentages, and the liability of the WAGP Company concerned to each State for Income Tax in respect of the Tax Year in question, having credited any amounts to be credited in accordance with paragraph B.2 above, and shall constitute a tax assessment (the ***Assessment***) by each individual State for the amounts so assessed in respect of that State.

29. The WAGP Authority shall, on behalf of the Tax Authority in each State, issue the Combined Assessment to the WAGP Company concerned within 90 days of the Filing Date.

30. If no assessment is issued in accordance with paragraph B.29 within 90 days of the Filing Date, then the WAGP Company concerned shall be deemed to have been assessed by the Tax Authority in each State, exactly in accordance with the Returns filed by the WAGP Company concerned, and such deemed assessment shall constitute a tax assessment (the ***Assessment***) by each individual State accordingly.

31. An Assessment of liability to Income Tax of a WAGP Company shall only be made in accordance with paragraphs B.29 or B.30, and shall not be made by a Tax Authority otherwise than in accordance with those paragraphs.

32. An Assessment made under paragraphs B.29 or B.30 shall be without prejudice to the power for an amended or altered Assessment to be made following an audit, in accordance with paragraphs B.41 or B.42.

Consolidated Tax Returns

33. The Company may, by notice in writing to the WAGP Authority and to each Tax Authority, elect that it shall together with those subsidiaries of it (a) of which it owns, directly or indirectly, 100% of the share capital and (b) which are listed in the election notice (together with the Company, the ***Consolidated Group***) be treated as a consolidated entity for the purposes of calculating the liabilities to Income Tax of the members of the Consolidated Group under this Schedule 8.

34. For all purposes of this Schedule 8, each of the members of the Consolidated Group shall, with respect to each Tax Year commencing on or after the date on which notice is given under paragraph B.33 above, be treated as a branch of the Company in respect of Assessable Income, Allowable Expenses and Claimed Reliefs. In particular:

(a) all Assessable Income shall be treated as if it is or was earned, accrued, received or arising by or to the Company;

(b) all Allowable Expenses shall be treated as if they are or were incurred by the Company;

(c) the nature and purpose of Income as Assessable Income or Expenses as Allowable Expense in the hands of the Company shall be the same as it would have been in the hands of the WAGP Company concerned had no consolidation taken place;

(d) any payments to and/or receipts from another member of the Consolidated Group and all supplies and/or disposals between members of the Consolidated Group shall be disregarded;

(e) any Allowable Loss arising to any WAGP Company who is a member of the Consolidated Group in any Tax Year commencing before the date on which the election notice is given under paragraph B.33 above (a ***Pre-Consolidation Loss***) shall be treated, for so long as that WAGP Company is a member of the Consolidated Group, as if it was an Allowable Loss of the Company that arose to the Company at the time that it actually arose to the WAGP Company concerned;

(f) any Allowable Loss arising to the Consolidated Group (on the basis of the treatment set out in sub-paragraphs (a)-(d) above) in any Tax Year commencing after the date on which the election notice is given under paragraph B.33 above (a ***Post-Consolidation Loss***) shall be treated, for so long as that Consolidated Group is not altered or brought to an end pursuant to paragraph B.36 below, as if it was an Allowable Loss of the Company;

(g) each member of the Consolidated Group shall continue to maintain a ledger in accordance with paragraph B.15 above, but the amount of the Capital Account of each WAGP Company who is a member of the Consolidated Group shall be treated, for so long as that WAGP Company is a member of the Consolidated Group, as if it was added to the amount of the Capital Account of the Company (provided that the amount of Capital Allowances, if any, claimed in any Tax Year by the Consolidated Group shall reduce the amounts of the Capital Accounts of each of the members of the Consolidated Group pro rata to the amount of each of the Capital Accounts before such reduction).

(h) on the disposal of a Capital Asset (which is not disregarded for the purposes of the Consolidated Return by virtue of sub-paragraph (d) above) by any member of the Consolidated Group, the Capital Asset shall be treated for the purpose of assessing any Balancing Charge or Balancing Allowance as if it were an asset of the Company with a Written Down Value of the same amount as that of the WAGP Company concerned, disposed of, and the sale proceeds received, by the Company.

35. The Company shall submit Returns, and Assessments shall be issued to the Company, in respect of the Consolidated Group on the basis of the assumptions set out above.

36. The Company may, by notice in writing to the WAGP Authority, copied to each Tax Authority, elect that the members of a Consolidated Group be altered or that the Consolidated Group cease to exist (provided always that each member, if any, of the Consolidated Group other than the Company must be owned, directly or

indirectly, as to 100% of share capital by the Company throughout the period of consolidation) with effect from the beginning of the next subsequent Tax Year.

37. On any WAGP Company ceasing to be a member of the Consolidated Group pursuant to paragraph B.36 above or on ceasing to be entitled to be a member as a result of the Company ceasing to own, directly or indirectly, 100% of the share capital of the WAGP Company concerned, paragraph B.33 shall cease to apply to that WAGP Company and, in particular, that WAGP Company shall be treated as entitled to utilise the Pre-Consolidation Loss of that WAGP Company, if, any, less the relevant proportion of that Pre-Consolidation Loss, if any, added to the designated amount of the Post-Completion Loss arising to the Consolidated Group during the period in which it was a member of the Consolidated Group, if any, provided that:

(i) the ***relevant proportion*** of the Pre-Consolidation Loss shall be the proportion of the Pre-Consolidation Loss utilised by the Consolidated Group during the period in which that WAGP Company was a member as is attributable to the Pre-Consolidation Loss of that WAGP Company on a pro-rata basis according to the amount of the Pre-Consolidation Loss of each member of the Consolidated Group before such attribution, always subject to the rule as to the order in which amounts of Allowable Loss are deemed to be taken contained in paragraph B.9 above; and

(ii) the ***designated amount*** of the Post-Consolidation Loss shall be the amount, if any, designated in the notice given by the Company pursuant to paragraph B.36 above (but so the aggregate amount of the designated amounts for any Tax Year shall not exceed the total amount of such Post-Consolidation Loss for that Tax Year and any amount of such Post-Consolidation Loss that is not so designated shall be deemed to arise to the remaining Consolidated Group or, if no Consolidated Group remains, the Company).

Audit and amended assessments/returns

38. The WAGP Authority may, on behalf of and as agent of the Tax Authority in each State, request further information and conduct an audit of any Return at any time during the period of six years from the Filing Date.

39. Except as provided in paragraph B.38, no audit of a WAGP Company (other than in respect of activities which are not WAGP Activities) shall be conducted by any Tax Authority.

40. The WAGP Authority shall be empowered to act on behalf of and as agent of the Tax Authority in each State in dealing with a WAGP Company on a dispute as to an Assessment or the outcome of an audit. Any agreement reached between the WAGP Authority so acting and the WAGP Company shall be binding on each Tax Authority.

41. Each WAGP Company may at any time during the six years following the Filing Date submit five identical amended Returns for a Tax Year, one to each of the

WAGP Authority and the Tax Authority in each State, in which case each Tax Authority shall issue an amended Assessment or more than one amended Assessments in accordance with paragraph B.29 above within 90 days of receipt of the amended Return or, if it fails to do so, paragraph B.30 shall apply.

42. The WAGP Authority, acting for and on behalf of each Tax Authority, may issue an altered Assessment to any WAGP Company if they consider that a previous Assessment was incorrect in any manner. However, if there is a dispute as to an Assessment then any agreement reached to resolve that dispute shall, in the absence of fraud, be binding on the WAGP Authority and each Tax Authority, and no Assessment shall be issued which is inconsistent with such agreement.

Currency of Income Tax payments

43. All payments in respect of Income Tax shall be made in US dollars.

Interim payments

44. Within 30 days of the commencement of each Tax Year, the Company will deliver to the WAGP Authority an estimate of its Income Tax liability in respect of Taxable Income (including, where applicable, as a result of paragraphs B.33 to B.34 above) and that of each other WAGP Company for that Tax Year. The Company may vary any such estimate at any time during the year by written notice to the WAGP Authority.

45. Each WAGP Company will make instalment payments on the dates falling 3, 6 and 9 months after the first day of the Tax Year. Each payment shall be of an amount so that that WAGP Company following that payment has paid or is deemed to have paid an amount of Income Tax in respect of Taxable Income in a State equal to the estimated Income Tax in respect of Taxable Income in that State for the year multiplied by the product of 25% and the number of instalment payment dates that have then fallen due. A final instalment payment shall become due on the final date of the Tax Year.

46. An adjusting payment, if any, (the ***Adjusting Payment***) will be due within 60 days from the date on which the Assessment is issued. Any amount of interest due from or to any WAGP Company under paragraph B.48 below shall also be due on that date. In the event that the Adjusting Payment is due from any WAGP Company and interest is due from a State to that WAGP Company (or vice versa), the amounts shall be netted off and only the remainder shall be due.

47. If a Tax liability of any WAGP Company is adjusted following the issue of an amended Assessment or an altered Assessment or following an appeal by that WAGP Company or a State a further adjusting payment, if any, (the ***Further Adjusting Payment***) will be due within 60 days from the date of which the Assessment is issued by that State or, as the case may be, the date on which judgement is given by the relevant appellate body, together with interest at the Applicable Rate from the date on which the amended or altered Assessment or decision on appeal is made.

Interest

48. Subject to the following, interest (payable in US dollars) will also run on under payments of Income Tax in respect of Taxable Income by instalments. This will be calculated in the following way. X and Y shall be calculated as set out below. Where Y exceeds an amount equal to the product of X and 110%, that WAGP Company has underpaid by instalments and is required to pay interest equal to the excess. For these purposes:

X = an amount of interest (in US dollars) that would be due on a series of hypothetical loans of a principal amount equal to the amounts actually paid by that WAGP Company in accordance with paragraph B.45 above or deemed to be paid following an election under paragraph B.2 above in respect of that Tax Year from the date of actual or deemed payment to the date of the Adjusting Payment at the Applicable Rate; and

Y = an amount of interest (in US dollars) that would be due on a series of hypothetical loans of a principal amount equal to the amounts that would have been paid by that WAGP Company in accordance with paragraph B.45 above in respect of that Tax Year if the actual Income Tax liability in respect of Taxable Income of that WAGP Company following the Adjusting Payment were assumed to be payable in equal instalments from the date on which such payments would have been made to the date of the Adjusting Payment at the Applicable Rate.

49. Interest (payable in US dollars) will also be payable at the Applicable Rate on all other amounts owing by the Company to a State or by a State to the Company under the Fiscal Laws.

Withholding Taxes and Information Provision

Withholding

50. No amounts in respect of Taxes will be required to be withheld or deducted from:

(a) dividends declared by any WAGP Company;

(b) payments by or to any WAGP Company in respect of interest, principal or fees, charges or costs in respect of debt;

(c) payments in respect of branch profits or repatriation of branch capital of any WAGP Company;

(d) payments made for sales of natural gas which has been or is to be transported through or consumed in the Pipeline System; or

(e) payments to a Shipper or any WAGP Company for transportation of natural gas through the Pipeline System.

51. Where any WAGP Company receives services from a contractor within any of the States, that WAGP Company shall require a separate invoice in respect of each State in which the services are rendered, or a breakdown by State of the amounts invoiced. The WAGP Company concerned shall then apply a 6% withholding in respect of the invoiced amount and will pay to the contractor the net amount and to the State in which the service is rendered the amount withheld. No withholding will be applied to services that are not rendered in any of the States: nor will there be a withholding in respect of goods supplied to a WAGP Company, whether supplied in conjunction with services or otherwise. For these purposes, a service shall be considered to be rendered and received where the supplier of the services actually performs the services.

52. Where a withholding is applied as above, the treatment of the withholding for the relevant contractor will be as follows:

(a) where the contractor is resident in the State in which the service is rendered, the withholding will be a refundable credit against taxation on Income of that contractor in that State; and

(b) where the contractor is not resident in the State in which the service is rendered, the withholding will be either a final Tax or a refundable credit against taxation on Income in the State in question, at the option of the contractor.

Information provision

53. Each WAGP Company will notify the local Tax Authority whenever to its knowledge it makes a payment of a dividend or an interest payment to a resident of the applicable State.

Other transactions

54. A Buyer or Shipper who acquires natural gas in a State for transmission through the Pipeline System or who otherwise ships natural gas through the Pipeline System or who ships natural gas through other pipeline facilities to the Pipeline System shall not, by reason only of that acquisition or the transmission of that natural gas through the Pipeline System or other facilities, be liable in that State to taxation on Income in respect of that acquisition or transmission.

55. A Shipper or Seller who offers for sale or sells natural gas in a State delivered out of the Pipeline System, or who delivers natural gas into a State through the Pipeline System, shall not, by reason only of that offer or sale or delivery, be liable in that State to taxation on Income in respect of that offer or sale or delivery.

56. For the avoidance of doubt, paragraphs B.54 and B.55 above shall not operate to limit the liability to taxation on Income derived from activities described in those paragraphs if and to the extent that the Buyer, Shipper or Seller concerned is resident in the State concerned.

C. VAT

1. The Non-WAGP Regime in respect of value added tax (*VAT*) in each State shall apply but with the following adaptations. In this Part, references to a State includes references to any State Authority of that State having authority in relation to VAT.

2. All supplies of goods or services which are imported from outside the applicable State shall be exempt for the purposes of VAT, provided in the case of goods that (a) the relevant goods are listed on or are to be parts of items listed on the Exempt Goods List and (b) they have been certified under the Certification System as qualifying for this exemption.

3. VAT in respect of supplies of goods or services rendered in any State shall, to the extent that the relevant expenditure is Capital Expenditure, be zero rated. A supplier of goods or services shall be entitled to rely on a certificate given under the Certification System as evidence that its supply is zero-rated.

4. VAT in respect of supplies of services rendered in any of the States by contractors without a permanent business establishment in any State to a WAGP Company, where such supplies of services are not zero-rated or exempted as above, shall be chargeable in accordance with local applicable law. The WAGP Company concerned shall make payment of that VAT directly to that foreign contractor and may assume that the relevant foreign contractor is bound to account to the State in question.

5. VAT in respect of natural gas imported for transit, or for consumption in the course of the Pipeline System operations, will be exempt from VAT. Natural gas imported for sale will be subject to existing VAT legislation in the State in question, provided that the treatment shall be comparable to the treatment of competing fuels.

6. The sale of natural gas in a State for export through the Pipeline System, and the provision of services in a State to facilitate the delivery of such natural gas into the Pipeline System, shall be zero rated.

7. All natural gas transportation services in respect of the Pipeline System shall be zero rated.

8. For these purposes, supplies of services shall be rendered where the supplier of services actually performs the services and supplies of goods rendered where title to the relevant goods passes.

VAT returns and refunds

9. Each WAGP Company shall be entitled to refunds of all VAT paid in respect of supplies of goods and services to it so long as the WAGP Company concerned only makes supplies which are either zero-rated or value added taxable. To the extent that any WAGP Company makes exempt supplies for the purposes of VAT, the percentage of VAT paid by the WAGP Company concerned in respect of supplies to it which may be recovered shall be equal to the percentage of supplies made by the

WAGP Company concerned in the State concerned which are not exempt for the purposes of VAT.

10. Subject to paragraph C.11 to C.13 below, each WAGP Company shall submit a VAT return to each State on a quarterly basis. Each State will, within 15 days of the submission of the VAT return, reimburse to each WAGP Company, in the currency or currencies in which that WAGP Company made the payments concerned, an amount equal to the VAT refund due in respect of the supplies received during the period to which that return relates. Any amount of VAT refund not reimbursed to the WAGP Company concerned within 15 days of submission of a VAT return by WAGP Company shall bear interest at the Applicable Rate from that date until the date of actual payment. If any State fails to refund an amount due in respect of such a period of account, the WAGP Company concerned may either (a) offset that payment due against any other Tax payable in that State by that WAGP Company or, in the case of a repayment due to the representative member of a VAT Group for the purposes of paragraph C.11 below, any member of that VAT Group or (b) carry forward an Income Tax credit in respect of that State for that amount indefinitely and may use that Tax credit to reduce a Tax liability of that WAGP Company or, in the case of a repayment due to the representative member of a VAT Group for the purposes of paragraph C.11 below, any member of that VAT Group in respect of a subsequent period.

VAT Groups

11. The Company may, by notice in writing to the WAGP Authority, copied to each Tax Authority, elect for it and any subsidiaries of it (a) of which it owns 100% of the share capital and (b) which are listed in the election notice (together with the Company, the ***VAT Group***) to be treated as a group for the purposes of calculating their liabilities to, and rights to a refund in respect of, VAT under this Schedule 8.

12. For all purposes of this Schedule 8, the business carried on by each of the WAGP Companies that are members of the VAT Group shall, with respect to each VAT period of return commencing on or after the date on which notice is given under paragraph C.11 above, be treated as carried on by the Company. In particular:

(a) any supply of goods or services by any member of the VAT Group to another member of the VAT Group shall be disregarded;

(b) any other goods or services by or to a member of the VAT Group shall be treated as a supplied by or, as the case may be, to the Company.

13. The Company shall submit VAT returns, and each Tax Authority shall make payments to the Company, in respect of the VAT Group on the basis of the assumptions set out above.

D. CUSTOMS DUTIES

1. The Non-WAGP Regime in respect of customs duties in each State shall apply but with the following adaptations. For the purposes of this Part D and Part F below, ***customs duties*** includes all customs and excise duties, all import and export duties and all similar charges, fees, Taxes, levies and duties. In this Part, references to a State includes references to any State Authority of that State having authority in relation to customs duties.

2. Goods imported for use on the Pipeline System shall be exempt from custom duties, provided that (a) the relevant goods are listed or are to be parts of items listed on the Exempt Goods List and (b) they have been certified under the Certification system as qualifying for this exemption.

3. If subsequent to the importation of any asset without the payment of duty in accordance with the application of paragraph D.2 above, that asset is utilised within any of the States other than for the purposes of the Pipeline System then the amount of duty will become due from the WAGP Company concerned that would have been due if the exemption had not been available on the initial importation.

4. Each WAGP Company will be obliged to pay reasonable local or national clearance fees, registration fees or any other fees in relation to the importation of Capital Assets.

5. No customs duties will be levied in respect of the import or export of natural gas.

E. OTHER TAXES

Corporate Income Taxes

1. No corporate income taxes other than as described in Part B. above and no taxes on capital gains will be payable by any WAGP Company in respect of Income derived from WAGP Activities or Income falling within paragraph B.5(b) above.

Employment Taxes

2. The Non-WAGP Regime in respect of payroll taxes and national insurance or social security contributions in respect of employees of any WAGP Company shall apply to that WAGP Company.

Administrative Fees

3. Each WAGP Company will be liable to pay Administrative Fees, but to the extent that Administrative Fees exceed a reasonable amount for the services, materials or rights provided or granted they shall be Taxes.

Capital Gains on Company Shares

4. Any gains arising from the sale of Securities as a consequence of the exercise of the rights set out in Clause 6, or the proceeds of such sale, shall not be subject to Taxation.

Any other Taxes

5. The WAGP Companies will, in respect of WAGP Activities, be liable to Taxes on income or gains, VAT and customs duties as set out in Parts B, C, and D of this Schedule 8, but not otherwise.

6. Each WAGP Company will be subject to all other Taxes within the Non-WAGP Regime, but to the extent that the combined liability of all WAGP Companies in respect of these other Taxes to a particular State and to any Tax Authority in that State in a Tax Year in aggregate exceeds (in respect of WAGP Activities) an amount equal to US$50,000 adjusted for inflation up until and including the Tax Year in question by applying the Inflation Index, the amount of that excess shall be a debt owing by that State to the Company, and shall be due and payable with effect from the last day of the Tax Year in question.

F. APPEALS

Right of appeal

General

1. If any Applicable Person is aggrieved or dissatisfied by a decision or action or inaction of a State, a Tax Authority, any other State Authority or the WAGP Authority in relation to the application of the Fiscal Laws, that Applicable Person may apply to the Fiscal Review Board, and beyond it to the Fiscal Appeal Tribunal, for a review of or to appeal that decision or action or inaction or for a direction to such State, Tax Authority, other State Authority or WAGP Authority in respect of such matter, in accordance with this Part F. The right of appeal or review under this Part F extends to all matters covered by the Agreed Fiscal Regime, including Non-WAGP Regime matters which are modified by the implementation of the Agreed Fiscal Regime.

2. A State or State Authority which is aggrieved or dissatisfied by a decision of the Fiscal Review Board may appeal the decision of the Fiscal Review Board in accordance with this Part F, provided that if the matter being appealed is a matter arising under Part B of this Schedule then an appeal lies only if all States or the equivalent State Authority in all States joins in the appeal.

Income Tax

3. If any Applicable Person is dissatisfied with (a) any Assessment or any amended or altered Assessment issued by any State or (b) the failure of any State to issue an amended Assessment following the submission of amended Returns in accordance with paragraph B.41 above, it may appeal to the Fiscal Review Board by written notice to the WAGP Authority, copied to the Tax Authority in each State.

4. Such notice must be given (in the case of paragraph F.3(a) above) within 30 days of the date on which the Assessment, amended Assessment or altered Assessment is issued or (in the case of paragraph F.3(b) above) within 135 days of the submission of the amended Returns as referred to in paragraph B.41 above.

VAT

5. If any Applicable Person is dissatisfied with (a) any refund of VAT by any State or State Authority, or any refusal by any State or State Authority to make a repayment of VAT (in either case including as to the amount of any interest due), or any requirement of a State or State Authority that VAT be paid or charged, or any refusal in whole or in part by any State or State Authority to allow a credit for Tax in respect of VAT paid and not refunded, it may appeal to the Fiscal Review Board by written notice to the WAGP Authority, copied to the Tax Authority of the State concerned and to any other State Authority involved.

6. Such notice must be given within 60 days of the matters giving rise to the dissatisfaction of the Applicable Person coming to its attention.

Customs Duties

7. If any Applicable Person is dissatisfied with any imposition of any customs duties pursuant to Part D of this Schedule by any State, it may appeal to the Fiscal Review Board by written notice to the WAGP Authority, copied to the Tax Authority of the State concerned.

8. Such notice must be given within 60 days of the date on which the matters giving rise to the dissatisfaction of the Applicable Person came to its attention.

Other Taxes/Discrimination/Non-WAGP Regime

9. If any Applicable Person is dissatisfied with any imposition of any Tax by any State or State Authority contrary to the provisions of the Fiscal Laws or by the failure of a State or State Authority or the WAGP Authority to comply with the Fiscal Laws or to correctly apply the Non-WAGP Regime as modified by the implementation of the Agreed Fiscal Regime, it may appeal to the Fiscal Review Board by written notice to the WAGP Authority, copied to the Tax Authority and any other relevant State Authority of the State concerned.

10. Such notice must be given within 90 days of the date on which the State concerned seeks to impose the Tax concerned or the final decision of the State or State Authority which gives rise to the dissatisfaction.

Fiscal Review Board

Constitution of Fiscal Review Board

11. The Fiscal Review Board, when constituted from time to time, shall consist of the senior permanent officer of the Tax Authority in each State, or the delegate of that person (provided that the delegate shall not otherwise be a member of the Fiscal Review Board). Upon a Notice of Appeal being given requiring the constitution of a Fiscal Review Board, each State shall procure that its representative on that Fiscal Review Board is duly appointed and duly attends to the business of that Fiscal Review Board.

12. Each of the members of the Fiscal Review Board shall in respect of the business of that Fiscal Review Board act solely as a member of the Fiscal Review Board and not as representative of any department or agency of any State and shall act in an independent and impartial manner. Each Appellant and Respondent shall be entitled to a fair and impartial hearing.

Content of notice

13. Any notice given as described in paragraphs F.3 to F.10 (a ***Notice of Appeal***) shall (a) list the Applicable Person making the appeal (each an ***Appellant*** and together the ***Appellants***); (b) list the State or States imposing the liability to Tax that is being appealed (each a ***Respondent*** and together the ***Respondents***); and (c) provide a summary of the grounds of appeal (which summary shall not act to restrict the detailed statement of appeal to be submitted by the Appellant or Appellants as

described further at paragraph F.16 below or to restrict the findings of the Fiscal Review Board).

14. Where the Appellant or Appellants are appealing a liability to Tax only in part, the Appellant or Appellants shall make payment in respect of the part of the liability to Tax that is not disputed and such payment shall be taken into account by the Fiscal Review Board in assessing the amount of any liability to Tax and interest, if any, due under paragraph F.31 below following its judgment.

Pre-hearing procedure

15. On receipt of the Notice of Appeal, the Fiscal Review Board shall within 10 days send to each Appellant and each Respondent a notice of hearing. The notice of hearing shall specify a date for the appeal to be heard by the Fiscal Review Board (the ***Hearing***), which date shall be not less than 90 days and not more than 120 days after the date on which the WAGP Authority received the Notice of Appeal. The date specified for the Hearing (as adjusted in accordance with paragraph F.21 below) shall be the ***Hearing Date***.

16. Not less than 60 days before the Hearing Date, the Appellant (or the Appellants together) shall submit to the Fiscal Review Board, with a copy to each Respondent, a detailed statement of grounds for appeal. The statement of appeal shall set out all material facts as they are understood by the Appellant or Appellants and shall include submissions as to law and as to the application of the law to the relevant facts.

17. No less than 45 days before the Hearing Date, the Respondent (or the Respondents together) shall submit to the Fiscal Review Board, with a copy to each Appellant, a statement of response. The statement of response shall specify that the Respondent or Respondents agree with the facts as set out in the statement of appeal or shall specify those facts within the statement of appeal with which the Respondent or Respondents do not agree and any additional facts that the Respondent or Respondents consider to be material to the appeal. The statement of response shall also include submissions as to law and as to the application of the law to the relevant facts.

18. Not less than 30 days before the Hearing Date, the Respondent (or the Respondents together) and the Appellant (or the Appellants together) shall each submit to the Fiscal Review Board, with a copy to the other party, a copy of each document within its possession which it considers is material to the appeal. No Respondent or, as the case may be, Appellant shall be obliged to disclose any document which it reasonably considers contains legal advice provided by a legal advisor (including for the avoidance of doubt any legal advisor employed as such by such party) in respect of the appeal or otherwise and shall be entitled to disclose parts only of documents where part of such document is relevant to the appeal but parts are not, or parts contain legal advice that the Respondent or, as the case may be, the Appellant concerned is not obliged to disclose and parts do not.

19. Not less than 20 days before the Hearing Date the Appellant or Appellants and the Respondent or Respondents shall meet and endeavour to agree a statement setting

out the facts of the appeal. To the extent that they are not able to agree on any given facts, the statement of facts shall set out the views of each party in respect of those facts. They shall submit to the Fiscal Review Board a statement of the agreed and disputed facts no later than 10 days before the Hearing Date, together with (a) an updated statement of appeal or as the case may be statement of response and (b) a file containing the documents that either or both party considers to be material.

20. No later than 5 days before the Hearing Date, the Fiscal Review Board shall issue a revised notice of hearing, which shall set out the date, time and location of the Hearing and specify the members of the Fiscal Review Board for that Hearing.

21. The Fiscal Review Board may (and, if it considers it essential or advantageous to reaching a just and fair conclusion, shall) on the written application of any Appellant or Respondent order that the Hearing Date shall be delayed by any period that it considers reasonable and any time limit in paragraphs F.15 to F.20 above that has not at that time passed shall be adjusted in accordance with the new Hearing Date. The Fiscal Review Board shall inform each Appellant and each Respondent of the new Hearing Date and of the time limits adjusted as above as soon as reasonably practicable after such order.

Consolidation of Appeals

22. The Fiscal Review Board may on the written application of any of the Appellants concerned or all of the Respondents concerned order that any number of appeals shall be heard at one Hearing if it considers that the subject matter of each dispute is substantially the same or the appeals each raise substantially the same question of law and/or of fact. The Fiscal Review Board shall inform each Appellant and each Respondent concerned of the occurrence of such consolidation, of the new Hearing Date and of any adjustments to the time limits in paragraph F.15 to F.20 above (provided that the Fiscal Review Board may not adjust such time limits under this paragraph F.22 so as to reduce the period of time before any such time limit falls to a period less than that which would have applied if no such consolidation and adjustment had taken place) as soon as reasonably practicable after such order.

Settlement/withdrawal of appeal

23. Once a Notice of Appeal has been validly given, that Notice of Appeal may not be withdrawn other than with the consent of each Appellant and each Respondent.

24. The Appellant or Appellants and the Respondent or Respondents shall be free to settle the appeal by agreement of all such parties on such terms as they see fit at any time, including during the Hearing, in which case the appeal and the Hearing shall, to the extent of the settlement, come to an end and no further appeal shall be available. Any such agreement shall not be effective until it is recorded in writing signed by the appropriate representative of all such parties.

The Hearing

25. Each Appellant and Respondent shall be entitled to submit evidence to the Fiscal Review Board during the course of the Hearing, including witnesses and the

evidence of experts. All evidence shall be admissible, but the Fiscal Review Board shall be entitled to conclude as to the weight to be applied to any particular evidence taking into account all the circumstances of the evidence and in which the evidence arises.

26. The Hearing shall be conducted in English.

27. The Fiscal Review Board may (and, if they consider it to be essential or advantageous to reaching a fair and just conclusion, shall) allow on the written application of any Appellant or Respondent an adjournment during the course of the Hearing of any period not exceeding 10 days (which may be extended by the same amount on not more than two occasions).

28. Any Appellant and any Respondent may apply to the Fiscal Appeal Tribunal if they are dissatisfied with a refusal of the Fiscal Review Board of an adjournment under paragraph F.27 above. The Fiscal Appeal Tribunal shall meet as soon as reasonably practicable thereafter, shall hear whatsoever submissions they consider fit and shall decide on whether an adjournment shall be allowed.

The Decision

29. The Fiscal Review Board shall conclude, on the basis of the information and evidence submitted to them, what the correct amount of Tax due from, or repayment of Tax due to, the Appellant or Appellants should be, being satisfied on the balance of probabilities. The Fiscal Review Board shall reach its determination fairly, in accordance with the facts and in accordance with the governing law and all relevant agreements (including, for the avoidance of doubt, this Agreement). If the Fiscal Review Board is unable to agree unanimously on its decision, a majority decision shall apply and shall be binding on the Appellant or Appellants and the Respondent or Respondents, subject to the right to appeal to the Fiscal Appeal Tribunal. A decision of the Fiscal Review Board shall constitute an administrative decision of each Tax Authority.

30. The Fiscal Review Board shall deliver its decision not later than 30 days after the last date of the Hearing and shall deliver its decision in writing with a full explanation, with full reasons for the decision and with a statement of each of its findings of fact.

31. The Fiscal Review Board may in reaching its judgment, grant to either party a right to receive from the other party a payment in respect of the costs of the first party. The Fiscal Review Board may also order that interest is payable at a rate not exceeding the Applicable Rate for any period it considers to be reasonable. Any amount of costs or interest under this paragraph F.31 received by an Appellant shall not be taxable in the hands of that Appellant and no payment by an Appellant shall be deductible as an Allowable Expense.

Right of appeal to the Fiscal Appeal Tribunal

32. Any Appellant and any Respondent may apply to the Fiscal Appeal Tribunal if they are dissatisfied with the findings of the Fiscal Review Board so far as that

finding is a finding of law, but shall not be so entitled if that finding is a finding of fact. Whether a finding is a finding of law or of fact shall be the decision of the Fiscal Review Board acting reasonably and in good faith and taking into account the submissions of each Appellant and Respondent. Any such decision may be appealed to the Fiscal Appeal Tribunal by any of the Appellants or any of the Respondents.

33. The Fiscal Appeal Tribunal shall, subject to the provisions of the Constitution in a State, be the only body which can hear and determine appeals from a decision of a Tax Authority or the Fiscal Review Board in respect of matters arising under Part B of this Schedule 8.

34. An appeal to the Fiscal Appeal Tribunal under paragraph F.32 above shall be made by written notice to the WAGP Authority, copied to each other Appellant or Respondent in the appeal to the Fiscal Review Board.

35. Such notice must be given within 30 days of the date on which the Fiscal Review Board delivers its decision in writing in accordance with paragraph F.29 above or, if later, the decision of the Fiscal Review Board or the Fiscal Appeal Tribunal as to whether a finding is a finding of law or of fact.

Fiscal Appeal Tribunal

Constitution of Fiscal Appeal Tribunal

36. The Fiscal Appeal Tribunal shall consist of one judge appointed to the highest court of appeal in each State having jurisdiction in fiscal matters and a fifth presiding judge appointed by the President from time to time of ECOWAS, such judge being a judge appointed to the highest court having jurisdiction in fiscal matters in an ECOWAS State other than any of the States. Each of the members of the Fiscal Appeal Tribunal shall in respect of the Hearing concerned act solely as a member of the Fiscal Appeal Tribunal and not as a representative of any department or agency of any State or, as the case may be, of any ECOWAS State and shall act in an independent and impartial manner. Each Appellant and Respondent shall be entitled to a fair and impartial hearing.

Content of notice

37. Any notice given as described in paragraphs F.32 to F.35 (a ***Notice of Further Appeal***) shall (a) list the person or persons making the appeal (each a ***Further Appellant*** and together the ***Further Appellants***); (b) list each person who was a Respondent or an Appellant in respect of the appeal to the Fiscal Review Board which is being appealed (each a ***Further Respondent*** and together the ***Further Respondents***); and (c) provide a summary of the grounds of appeal (which summary shall not act to restrict the detailed statement of appeal to be submitted by the Further Appellant or Further Appellants as described further at paragraph F.40 below or to restrict the findings of the Fiscal Appeal Tribunal).

38. Where the Further Appellant or Further Appellants are appealing a decision of the Fiscal Review Board only in part, the Applicable Person or Applicable Persons concerned shall make payment in respect of the part (if any) of the liability to Tax that

is not disputed and such payment shall be taken into account by the Fiscal Appeal Tribunal in assessing the amount of any liability to Tax and interest, if any, due under paragraph F.51 below following its judgment.

Pre-hearing procedure

39. On receipt of a Notice of Further Appeal, the WAGP Authority shall within 10 days send to each Further Appellant and each Further Respondent a notice of hearing. The notice of hearing shall specify a date for the appeal to be heard by the Fiscal Appeal Tribunal (the ***Further Hearing***), which date shall be not less than 50 days and not more than 80 days after the date on which the WAGP Authority received the relevant Notice of Further Appeal. The date specified for the Further Hearing (as adjusted in accordance with paragraph F.43 below) shall be the ***Further Hearing Date***.

40. Not less than 30 days before the Further Hearing Date, the Further Appellant (or the Further Appellants together) shall submit to the Fiscal Appeal Tribunal, with a copy to each Further Respondent, a detailed statement of grounds for appeal. The statement of appeal shall include submissions as to law and as to the application of the law to the relevant facts.

41. No less than 15 days before the Further Hearing Date, the Further Respondent (or the Further Respondents together) shall submit to the Fiscal Appeal Tribunal, with a copy to each Further Appellant, a statement of response. The statement of response shall include submissions as to law and as to the application of the law to the relevant facts.

42. No later than 5 days before the Further Hearing Date, the Fiscal Appeal Tribunal shall issue a revised notice of hearing, which shall set out the date, time and location of the Further Hearing and specify the members of the Fiscal Appeal Tribunal for that Further Hearing.

43. The Fiscal Appeal Tribunal may (and, if it considers it essential or advantageous to reaching a just and fair conclusion, shall) on the written application of any Further Appellant or Further Respondent order that the Further Hearing Date shall be delayed by any period that it considers reasonable and any time limit in paragraphs F.39 to F.42 above that has not at that time passed shall be adjusted in accordance with the new Further Hearing Date. The Fiscal Appeal Tribunal shall inform each Further Appellant and each Further Respondent of the new Further Hearing Date and of the time limits adjusted as above as soon as reasonably practicable after such order.

Consolidation of Appeals

44. The Fiscal Appeal Tribunal may on the written application of any of the Further Appellants or the Further Respondents concerned order that any number of appeals shall be heard at one Further Hearing if it considers that the subject matter of each dispute is substantially the same or the appeals each raise substantially the same question of law and/or of fact. The Fiscal Appeal Tribunal shall inform each Further Appellant and each Further Respondent concerned of the occurrence of such

consolidation, of the new Further Hearing Date and of any adjustments to the time limits in paragraph F.39 to F.42 above (provided that the Fiscal Appeal Tribunal may not adjust such time limits under this paragraph F.44 so as to reduce the period of time before any such time limit falls to a period less than that which would have applied if no such consolidation and adjustment had taken place) as soon as reasonably practicable after such order.

Settlement/withdrawal of appeal

45. Once a Notice of Further Appeal has been validly given, that Notice of Further Appeal may be withdrawn without the consent of the other party or parties to the Further Appeal, but such withdrawal shall be without prejudice to the powers of the Fiscal Appeal Tribunal to make orders in respect of costs under paragraph F.51 below.

46. The Further Appellant or Further Appellants and the Further Respondent or Further Respondents shall be free to settle the appeal by agreement of all such parties on such terms as they see fit at any time, including during the Further Hearing, in which case the appeal and the Further Hearing shall, to the extent of the settlement, come to an end and no further appeal shall be available. Any such agreement shall not be effective until it is recorded in writing signed by the appropriate representative of all such parties.

The Further Hearing

47. The Further Hearing shall be conducted in English.

48. The Fiscal Appeal Tribunal may (and, if they consider it to be essential or advantageous to reaching a fair and just conclusion, shall) allow on the written application of any Further Appellant or Further Respondent an adjournment during the course of the Further Hearing of any period not exceeding 10 days (which may be extended by the same amount on not more than two occasions).

49. The Fiscal Appeal Tribunal shall be required to conclude, on the basis of the information and findings of fact submitted to them, what the correct amount of Tax due from, or repayment of Tax due to, the Applicable Person or Applicable Persons should be, being satisfied on the balance of probabilities. The Fiscal Appeal Tribunal shall reach its determination fairly, in accordance with the facts and in accordance with the governing law and all relevant agreements (including, for the avoidance of doubt, this Agreement). If the Fiscal Appeal Tribunal is unable to agree unanimously on its decision, a majority decision shall apply and shall be binding on the Further Appellant or Further Appellants and the Further Respondent or Further Respondents.

50. The Fiscal Appeal Tribunal shall deliver its decision not later than 30 days after the last date of the Further Hearing and shall deliver its decision in writing with a full explanation and with full reasons for the decision.

51. The Fiscal Appeal Tribunal may grant to either party a right to receive from the other party a payment in respect of the costs of the first party in respect of the appeal to the Fiscal Appeal Tribunal. The Fiscal Appeal Tribunal may also order that

interest is payable at a rate not exceeding the Applicable Rate for any period it considers to be reasonable. Any amount of costs or interest under this paragraph F.51 received by any Applicable Person shall not be taxable in the hands of that Applicable Person and no payment by a Applicable Person shall be deductible as an Allowable Expense.

Role of WAGP Authority

52. In all appeals under this Part F and in all Hearings of appeals, the WAGP Authority shall provide the administration of the Fiscal Review Board or the Fiscal Appeal Tribunal, as the case may be. Documents to be served on the Fiscal Review Board or the Fiscal Appeal Tribunal shall be served on the WAGP Authority, and documents to be served by the Fiscal Review Board or the Fiscal Appeal Tribunal shall be served by the WAGP Authority on their behalf.

States and WAGP Authority to facilitate

53. The States and the WAGP Authority shall use their best endeavours to facilitate the process of any appeals under this Part F. Each State shall procure that a representative from that State is duly appointed to the Fiscal Review Board or the Fiscal Appeal Tribunal, as the case may be, and that that person duly participates in the business of the Fiscal Review Board or Fiscal Appeal Tribunal in accordance with this Agreement.

Decisions binding on State Authorities

54. Subject in the case of the Fiscal Review Board to any appeal to the Fiscal Appeal Tribunal, the decisions of the Fiscal Review Board or the Fiscal Appeal Tribunal shall be binding on all State Authorities in a State.

G. PENALTIES

Poer to Impose Penalties

General

1. .

Penalties to Apply

General

2. .

[***To be agreed***]

SCHEDULE 9

AGREED DESIGN STANDARDS

1. OFFSHORE PIPELINE CODES AND SPECIFICATIONS

Governing design code

1.1 ANSI/ASME B31.8 – 2000 Edition (or latest) "Gas Transmission and Distribution Piping Systems".

Supplemental recommended practices

1.2 API RP 1111 – 1999 Edition (or latest) "Design, Construction, Operation, and Maintenance of Offshore Hydrocarbon Pipelines".

1.3 API RP 14C – 6th edition (or latest) "Recommended Practice for Analysis, Design, Installation and Testing of Basic Surface Safety Systems for Offshore Production Platforms".

1.4 DNV Offshore Standard OS-F101 "Submarine Pipeline Systems" January 2000 Edition (or latest).

Major offshore pipeline component specifications as referenced in B31.8

1.5 Line Pipe Specification – API 5L – 42nd Edition (or latest) "Specification for Line Pipe".

1.6 Welding Specification – API 1104 – 1999 Edition (or latest) "Standard for Welding Pipelines and Related Facilities".

1.7 Corrosion Protection – NACE RP0675 (latest edition) "Control of External Corrosion on Offshore Steel Pipelines".

1.8 Pipeline Valves – API 6D – 21st Edition (or latest) "Specification for Pipeline Valves".

1.9 Pipeline Flanges – ASME B16.5 – 1996 Edition (or latest) "Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24".

1.10 Pipeline Fittings – ASME B16.9 – 2001 Edition (or latest) "Factory-Made Wrought Butt-welding Fittings".

2. ONSHORE PIPELINE CODES AND SPECIFICATIONS

Governing design code

2.1 ANSI/ASME B31.8 – 2000 Edition (or latest) "Gas Transmission and Distribution Piping Systems".

Major onshore pipeline component specifications as referenced in ANSI/ASME B31.8

2.2 Line Pipe Specification – API 5L – 42nd Edition (or latest) "Specification for Line Pipe".

2.3 Welding Specification – API 1104 – 1999 Edition (or latest) "Standard for Welding Pipelines and Related Facilities".

2.4 Corrosion Protection – NACE RP0169 (latest edition) "Control of External Corrosion on Underground or Submerged Steel Pipelines".

2.5 Pipeline Valves – API 6D – 21st Edition (or latest) "Specification for Pipeline Valves".

2.6 Pipeline Flanges – ASME B16.5 – 1996 Edition (or latest) "Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24".

2.7 Pipeline Fittings – ASME B16.9 – 2001 Edition (or latest) "Factory-Made Wrought Butt-welding Fittings".

3. ONSHORE COMPRESSOR STATION CODES AND SPECIFICATIONS

Governing design code

3.1 ANSI/ASME B31.8 – 2000 Edition (or latest) "Gas Transmission and Distribution Piping Systems".

Major compressor station component specifications as referenced in ANSI/ASME B31.8

3.2 Piping Materials -ASTM materials in accordance with B31.8.

3.3 Welding Specification – In accordance with ASME Section IX requirements as provided in ANSI B 31.8.

3.4 Pipeline Valves – API 6D – 21st Edition (or latest) "Specification for Pipeline Valves".

3.5 Pipeline Flanges – ASME B16.5 – 1996 Edition (or latest) "Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24".

3.6 Pipeline Fittings – ASME B16.9 – 2001 Edition (or latest) "Factory-Made Wrought Butt-welding Fittings".

Other component codes or specification for compressor station

3.7 Electrical Code – British Standards, CENELEC, IEC, ISO, NEMA.

3.8 Instrument Code – ISA, API RP 551, IEC, NEMA.

3.9 Fire Protection Code – NFPA.

3.10 Compressor Code – API Standard 617 – 1995 Edition (or latest) "Centrifugal Compressors for Petroleum, Chemical, and Gas Service Industries".

3.11 Power turbines – API 616.

3.12 Gas Measurement Code – API MPMS 14.3 - 1995 Edition (or latest) "Manual of Petroleum Measurement Standards Chapter 14 – latest edition "Natural Gas Fluids Measurement Section 3 - Concentric, Square-Edged Orifice Meters Part 1 - General Equations and Uncertainty Guidelines" or ISO 5167.

3.13 Pressure Vessel Code – ASME Sec VIII D1 – 1998 Edition (or latest) "BPVC SECTION VIII Rules for Construction of Pressure Vessels DIVISION 1".

4. ONSHORE REGULATION AND METERING STATIONS AND TERMINALS CODES AND SPECIFICATIONS

Governing design code

4.1 ANSI/ASME B31.8 – 2000 Edition (or latest) "Gas Transmission and Distribution Piping Systems".

Major R&M station component specifications as referenced in ANSI/ASME B31.8

4.2 Materials : ASTM/API in line with the requirements of ANSI B31.8.

4.3 Welding Specification – API 1104 – 1999 Edition (or latest) "Standard for Welding Pipelines and Related Facilities".

4.4 Pipeline Valves – API 6D – 21st Edition (or latest) "Specification for Pipeline Valves".

4.5 Pipeline Flanges – ASME B16.5 – 1996 Edition (or latest) "Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24".

4.6 Pipeline Fittings – ASME B16.9 – 2001 Edition (or latest) "Factory-Made Wrought Butt-welding Fittings".

Other component codes or specification for R&M stations

4.7 Electrical Code – British Standards (BS), CENELEC, IEC, ISO, NEMA.

4.8 Instrument Code – ISA, API RP 551, IEC, NEMA.

4.9 Fire Protection Code – NFPA.

4.10 Gas Measurement Code – API MPMS 14.3 - 1995 Edition (or latest) "Manual of Petroleum Measurement Standards Chapter 14 – latest edition

"Natural Gas Fluids Measurement Section 3 - Concentric, Square-Edged Orifice Meters Part 1 - General Equations and Uncertainty Guidelines" or ISO 5167.

4.11 Pressure Vessel Code – ASME Sec VIII D1 – 1998 Edition (or latest) "BPVC SECTION VIII Rules for Construction of Pressure Vessels DIV1".

5. OTHER MISCELLANEOUS FACILITIES

Buildings

5.1 Local Building codes in each country shall be applicable.

Civil works

5.2 British Standards, EN, ISO.

6. OTHER DESIGN REQUIREMENTS

6.1 DNV will be used as a supplement in areas of deficiency of ANSI B31.8 with emphasis on stability calculations and its verifications.

6.2 Anodes shall be utilised to ensure maintenance design life for the offshore pipeline of between 40 and 50 years.

6.3 Pig traps will be provided for internal intelligent pigging inspection, including on spur lines. The WAGP Regulations shall provide for the use of intelligent pigging and remotely operated vehicles for inspection, at periods to be agreed which shall not adversely affect Project economics.

6.4 A maintenance philosophy and emergency management plan shall be established in accordance with this Agreement, covering maintenance and emergency response and repair procedures. The Company shall maintain stocks of spare parts and training of staff consistent with the agreed maintenance philosophy and plan. To the extent practicable and as agreed to between the Company and the WAGP Authority, maintenance standards as contained in the design standards above will be followed.

SCHEDULE 10

ACCESS CODE PRINCIPLES

1. UNBUNDLING OF GAS SALES AND TRANSPORTATION

1.1 The Company will be established as a transportation provider, and will not engage in natural gas sales activities.

1.2 Affiliates or Shareholders of the Company who are engaged in natural gas sales activities and who enter into Gas Transportation Agreements with the Company will be required to do so on an arms' length basis.

1.3 The Access Code will apply to all facilities that comprise the Pipeline System under the Approved Pipeline Development Plan.

1.4 The services provided by WAGP in addition to transportation will include:

(a) Measurement of gas volumes;

(b) Monitoring gas quality at the receipt points;

(c) Compression and maintenance of delivery pressures;

(d) Billing for gas deliveries to Shippers; and

(e) Accounting for balancing of deliveries.

1.5 The charge for all of the above services will be included in the tariffs set out below.

1.6 Access to the Pipeline Facilities with be at the interconnection with the ELPS and such other points as designated in the Approved Pipeline Development Plan.

1.7 Shippers and prospective Shippers for service shall have the right to receive upon request information regarding:

(a) The record of Pipeline System reliability together with information of upset conditions that resulted in service being suspended for periods of more than 24 hours;

(b) The delivery efficiency of the Pipeline System and record of fuel use for compression or to maintain operating pressures; and

(c) The Company's most recent financial statement.

1.8 Applications for service should be processed within 45 days.

2. FIRM TRANSPORTATION CAPACITY RIGHTS

2.1 The Company will ensure that any "spare" transportation capacity (available transportation capacity which the Company is not required under Gas Transportation Agreements to reserve for existing Shippers) is made available to all qualified users on a firm basis, with unrestricted rights to sell or assign the associated transportation capacity. 'Qualified users' requires any prospective Shipper to meet certain fundamental criteria, including creditworthiness, a bona fide transportation requirement, the requirement to ship only natural gas meeting certain quality specifications and a requirement to ship some nominal minimum volume. Prior to the Open Access Commencement Date, only those potential Shippers proposing to ship natural gas referred to in Clauses 26.4 and 26.5 can be regarded as qualified.

2.2 Transportation capacity rights under an existing contract will at all times be respected. "Spare" transportation capacity rights include rights that become available as contracts expire. Allocation of rights should be non-discriminatory and existing rights holders should not receive preferential treatment, except for contract renewal "rights of first refusal" provisions in existing contracts.

2.3 Initially, the Company will allocate spare firm transportation capacity among potential Shippers on a first-come, first-served basis.

3. FIRM CAPACITY RIGHTS TRADING

3.1 Prior to the time when the Company has firm contracts for all of its available transportation capacity, firm transportation capacity rights should be tradable with no requirements for advance notification or consent from the Company, except to ensure that new Shippers meet financial credit requirements of the Company and otherwise comply with all requirements of the Access Code. When transportation capacity rights are traded, the original party contracting for the transportation capacity will remain a contracting party and thus liable to the Company. The new (replacement) party receiving use of the transportation capacity rights must execute a replacement contract with the Company. The Company will collect transportation revenues from the replacement Shipper, and use those revenues to reimburse the original Shipper in the subsequent accounting month. The Company may set a minimum time period for trading of transportation capacity, but not greater than 1 year.

3.2 The Company will be required to publish timely information on the existing and projected availability of spare firm capacity on its system.

4. INTERRUPTIBLE SERVICE

4.1 After the pipeline has firm contracts for all of its available capacity, the Company will offer a short-term interruptible ("on-demand") service.

4.2 The Company will publish timely and detailed information about the use of the system and its capacity.

5. PRICING OF SERVICES

5.1 Unless otherwise agreed by the WAGP Authority, the Company's transportation services will be priced in accordance with the Approved Tariff Methodology. The WAGP Authority shall have authority to agree with the Company changes to the Approved Tariff Methodology, or that the Approved Tariff Methodology shall not apply to particular cases or to particular classes of service or Gas Transportation Agreements.

5.2 The Company will publish a tariff of transportation charges for its services, including all terms of service and credit requirements for Shippers.

5.3 Tariff price structures for firm transportation service will be structured as a two-part rate, involving both a capacity charge and a usage charge. The fixed costs of the transportation system will be allocated to the capacity charge, while variable costs will be allocated to the usage charge. In addition, the Company will charge Shippers the WAGP Authority Charge referred to in Clause 9.4.

5.4 Interruptible service can be priced above short-term variable cost. The price for interruptible service will be capped at the price of firm service on a 100% load-factor basis. Users of interruptible service will not be charged on a ship-or-pay basis.

6. REQUIREMENT FOR PRO-FORMA SERVICE CONTRACTS

6.1 The Company will publish pro-forma natural gas transportation contracts for all types of services it offers as an obligation of the Access Code. The pro-forma contract will make clear to any potential Shipper the terms under which the Company will offer a specific type of service.

6.2 Pro-forma contracts should be published for firm transportation capacity service, interruptible service (at the time it is initially offered), and any other services offered by the Company.

6.3 Pro-forma contracts should include at least the following information:

(a) creditworthiness requirements;

(b) current cost for the particular service;

(c) provisions for any line-pack and compressor fuel;

(d) nomination procedures;

(e) gas quality specification;

(f) billing and payment procedures;

(g) definition of limitation of the Company liability for gas losses in transit; and

(h) dispute resolution procedures.

6.4 The Company will develop and publish a procedure on how prospective Shippers can request transportation services.

7. OBLIGATION TO EXPAND THE CAPACITY OF THE PIPELINE SYSTEM

7.1 The Company will have an obligation to expand the transportation capacity of the Pipeline System up to the ultimate transportation capacity specified in the Approved Pipeline Development Plan to meet the requests of qualified Shippers, provided that the following commercial investment criteria are met:

(a) requests from qualified prospective Shippers must be for firm transportation capacity, for a term of at least 5 years, with a binding contractual commitment to pay for the service under a valid gas transportation contract if the Company undertakes the expansion to create the capacity.

(b) the Company must have, in the aggregate, enough commitments for the expanded capacity to ensure a minimum acceptable return on the incremental investment necessary to facilitate the expansion.

8. BALANCING RULES AND IMBALANCE CHARGES

8.1 There should be consistency between the stringency of the balancing tolerances required, and the size of any imbalance penalties imposed on Shippers.

8.2 Unless it can be demonstrated otherwise as necessary by the Company, balancing on a less than monthly basis should not be imposed.

8.3 Shippers will be allowed to aggregate and/or trade their imbalance positions. The Company will provide regular and timely information to each Shipper as to the size of its imbalance position and the coincident imbalance status of the system.

9. STANDARDISATION

9.1 Where it is required as the extent of the natural gas infrastructure grows, standardisation should be promoted via voluntary industry action rather than regulatory or legislative fiat.

10. DISPUTES WITH PROSPECTIVE SHIPPERS

10.1 The following shall be the procedures to resolve disputes arising out of any refusal by the Company to enter into Gas Transportation Agreements with prospective Shippers:

(e) In the event of any dispute between the Company and a prospective Shipper as to whether that person is entitled to enter into a Gas Transportation Agreement with the Company, or on the terms, the Company will first attempt to resolve such dispute through good faith negotiations. An aggrieved prospective Shipper may serve on the Company a request in writing for such negotiations to be conducted, and the Company shall thereafter negotiate with that person

in a good faith attempt to resolve the issue in dispute in accordance with the terms of the Access Code.

(f) If, at the expiry of 28 days after the date of the service of that request, the Company and the prospective Shipper have been unable to resolve the dispute, the Company will refer the dispute to the WAGP Authority, which will act as mediator.

(g) The Company and the aggrieved prospective will bear their own expenses and an equal share of the costs of the WAGP Authority in the mediation process.

(h) If the dispute has not been resolved pursuant to the aforesaid mediation procedure within 42 days of the commencement of such procedure, or if either the Company or the prospective Shipper refuses to participate in such a mediation, the dispute may be referred to arbitration under the Rules of Arbitration of the International Chamber of Commerce. If the aggrieved prospective Shipper so refers the dispute, the Company shall accept such referral and shall comply with the rules and procedures of the International Chamber of Commerce for such arbitrations.

(i) In the arbitration procedure:

(i) The number of arbitrators shall be one;

(ii) The substantive law of England shall be applicable; and

(iii) The arbitration will take place in Paris and will be carried out in English.

SCHEDULE 11

BIDDING PROCEDURES

1. INTRODUCTION

Applicability

1.1 These Bidding Procedures shall apply to all procurement by the Company in respect of Major Contracts.

Objectives and guiding principles

1.2 The objective of these Bidding Procedures is to establish the minimum standards which obtains the greatest value for all stakeholders considering safety, quality, cost, schedule, and balanced risk allocation. Consistent with this objective, the overall goals of contracting efforts shall be in conformity with international procurement standards and will meet the following guiding principles:

(a) maintain fully transparent, confidential and fair contracting and procurement practices, avoiding even the appearance of conflicts of interest;

(b) maintain a competitive environment, balancing scope definition, cost, schedule, risk and administrative burden resulting in selection of the best-qualified contractors on a world-wide basis;

(c) maximize the opportunities for local contractors and suppliers to participate in the Project, subject to the requirements of this Agreement;

(d) maximize contracted resources focused on creating value for the Shareholders; and

(e) maintain full compliance with prevailing governmental regulations in the States.

Business ethics

1.3 All contracts shall contain provisions requiring the parties thereto to comply with the provisions of this Agreement and all applicable local laws, treaties and regulations of each State. Additionally, all contracts shall contain provisions requiring the parties to comply with the General Agreement on Tariffs and Trade, the United States Foreign Corrupt Practices Act and the OECD Convention on Combating Bribery.

1.4 Contractors shall establish and maintain such standards, guidelines and controls as are necessary to avoid any real or apparent impropriety in connection with the Work and any adverse impact on the interest of the Contractor, the Company, or any Affiliate. Contractors shall review with the Company such standards, guidelines and controls related to the placement and administration of purchase orders and subcontracts and those related to the activities of subcontractors' employees and

agents and their relationship with Contractors' or the Company's employees, agents, and representatives, and with third parties.

Local content

1.5 Local content will be an evaluation point of both the pre-qualification and the tender evaluation process. Contractors will be required as part of their tender submittals to include specific local content utilization plans.

2. OVERVIEW OF CONTRACTING PROCESS

The Bidding Procedures shall cover the following activities:

(a) scope development initiation of the contracting process;

(b) public notification for prequlification;

(c) qualifying contractors/vendors – bid lists;

(d) preparation of tender document requirements;

(e) proposal receipts;

(f) technical and financial evaluation;

(g) preparation of contract documents;

(h) contract administration and changes;

(i) contractor reporting requirements;

(j) contractor invoicing;

(k) contractor insurance and bonding requirements;

(l) contractor/vendor dispute resolution and arbitration provisions; and

(m) audit.

3. SCOPE DEVELOPMENT AND INITIATION OF THE CONTRACTING PROCESS

3.1 All proposed construction material or service packages or pipeline operations contracts must have approved funding that has been approved as part of a contracting plan by the appropriate delegation of authority. If work package and or funding have not been approved, the requestor shall prepare a cost trend and contract plan amendment for approval as required to fund the requested contract services or material.

3.2 Contract requisition (scope of work) statement is initially prepared by [end user], project engineering and/or engineering contractor, operations representative and submitted with a complete technical documents list of drawings, specifications and

standards. [Contract/PO Requisition] is approved in accordance with the appropriate [Delegation of Authority (DOA)] for projects and or operations before it is submitted for bidding.

3.3 Scope of work statements shall be written as performance specification only. Limiting perimeters such as installation methodologies and specific manufactures of major sub components shall not be included so as not to create any competitive advantage for any potential contractors.

3.4 The contract requisition is the method by which a requestor authorizes initiation of the contracting process with companies outside the Company. Expenditure approval is vested with the requestor's commitment authority and is delegated in accordance with appropriate Delegation of Authority (DOA) for projects and/or operations.

4. PUBLIC NOTIFICATION FOR PRE-QUALIFICATION

4.1 The steps necessary to complete activities for pre-qualification of contractors in a competitive and public manner are:

(a) international public notification;

(b) pre-qualification evaluation;

(c) recommendation of the qualified bidders list; and

(d) approval of the qualified bidders list.

4.2 For major construction packages the project manager will have prime responsibility for the successful implementation of the [public contractor pre-qualification process]. For pipeline operations contracts, the [operations manager] will have prime responsibility for the successful implementation of the [public contractor pre-qualification process]. The [engineering manager] will have responsibility for technical evaluation of the pre-qualification submittal documentation. The [business/contracts Manager] will have responsibility for the commercial evaluation of the pre-qualification submittal documentation and will have the responsibility for implementation of the [guideline], maintain appropriate levels of confidentiality and produce reports.

4.3 The process shall include:

(a) target areas for placement of advertisements are: USA, EU, Asia and West Africa;

(b) the pre-qualification evaluation team and process will be objective, audible and finalised prior to release of the public tender notification (newspaper advertisement);

(c) the Company will conduct the pre-qualification evaluation and determine a qualified bidders list; and

(d) a non-refundable financial fee/bond will be required from each prospective tenderer wishing to pre-qualify to ensure that serious credible companies are being considered.

[Steps]

1. Combine Pre-qualification with public tender notification process (newspaper advertisement).

2. Request for pre-qualification documentation will require documentation that outline each tenderers' technical and commercial capabilities, related experience and local content program.

3. Prospective tenderers will be required to submit a non-refundable pre-qualification fee of US $2,000.

4. Tenderers will be approved as a pre-qualified contractor prior to submitting detailed technical and commercial proposals.

5. All of the responses that are received with non-refundable pre-qualification fee to the Public Tender Advertisement will be evaluated by the Team and considered for subsequent development of the 'Short List of Tenderers'.

6. The optimum number of Tenderers for inclusion in the Recommended List of Tenderers for the Lump Sum EPC Contract for Construction is set at a maximum of five. This optimum number has been established in recognition of the following:

- Need to ensure Tenderers' commitment to Project and that Tenders are of excellent quality and substance by establishing a good basis of potential success.
- Costs of submission of Tender, which are non-reimbursable to unsuccessful Tenderers.
- Requirements of Overall Project Schedule.
- Impact on size of Project Team for increased numbers of Tenderers.

5. EVALUATION OF PUBLIC PRE-QUALIFICATION SUBMITTALS

5.1 The starting point for the contractor investigation shall be the receipt of all complete responses by the official published cut off date to the [Public Tender Advertisement].

5.2 The evaluation of pre-qualification submissions shall be executed at two levels:

(a) [Evaluation Level 1] shall reduce the total list of respondents to a "Long List" of contractors that appear potentially capable of executing the work scope.

(b) [Evaluation Level 2] shall develop the "Long List" into a "Short List" of contractors whose capabilities most closely fit the scope requirements. This short list shall form the [List of Tenderers] adopted by the Company.

5.3 The Company shall receive and log all responses to the [Public Tender Advertisement] for pre-qualification, and pass the complete package to the [Evaluation Team] for evaluation and preparation of the final [List of Tenderers]. Any pre-qualification packages received after the official published cut off date shall be returned unopened to the [Tenderer].

5.4 Upon receipt of the pre-qualification responses and supporting documentation, the documents will be distributed for comments to the [evaluation team].

5.5 Generally, the following discipline groups or personnel shall be involved in the evaluation process and evaluated areas outlined below:

(a) construction;

(b) planning and control;

(c) project engineering;

(d) finance;

(e) contracts;

(f) HSE- Health, Safety & Environmental;

(g) industrial and community relations; and

(h) [QA/QC].

6. CRITERIA FOR PRE-QUALIFICATION [EVALUATION LEVEL 1]

6.1 This initial evaluation shall be executed as a "yes" or "no" checklist on the basis of appropriateness of information submitted in response to the public notification.

6.2 The evaluation criteria would therefore be set by the [Public Tender Notification] wherein contractors are requested to respond on 12 main issues:

(a) company profile;

(b) audited accounts and financial statements;

(c) manpower and equipment resources;

(d) evidence of West African and international construction/pipeline operations experience;

(e) HSE compliance and statistics;

(f) evidence of ISO 9000 and ISO 14000 standards;

(g) evidence of ability to meet insurance and or bonding standards;

(h) financial viability of any proposed joint ventures;

(i) Nigerian Department of Petroleum Resources (DPR) registration, or willingness to obtain same prior to any contract award and or appropriate certifications from Togo, Ghana and Benin as required;

(j) willingness to pursue a credible program of West African local content.

In addition the following are to be recorded against each contractor:

(k) ownership of appropriate equipment to perform the specified scope of work; and

(l) previous execution of a similar contract scope greater than US$20 million in value.

6.3 Failure to submit any portion of the above may exclude a contractor from further consideration.

7. CRITERIA FOR PRE-QUALIFICATION [EVALUATION LEVEL 2]

7.1 [Evaluation Level 2] shall develop the above [Long List] into a [Short List] of contractors whose capabilities most closely fit the specific tender requirements. This [Short List] shall form the [List of Tenderers] presented for approval.

7.2 A more detailed analysis shall be undertaken of the submitted information and objectively recorded in the pre-qualification selection criteria summary. An evaluation score of 60% or higher shall be required for a contractor to be added to the [Short List].

7.3 In general the selection exercise shall utilize pre-qualification information supplied. On occasions, it will be necessary to supplement this information, either by obtaining testimonies of Contractor's past performance or by raising written clarifications and/or visiting a company prior to its inclusion on a recommended [Tender List] in order to establish that the required facilities, equipment, expertise etc. are available. Supplementary information will be requested from any of the contractors if it is considered that such information would facilitate the pre-qualification evaluation.

8. PRE-QUALIFICATION EVALUATION REPORT

8.1 It is the contracts group's responsibility to prepare a [Tender Evaluation Report] which chronicles the development of a [List of Tenderers] from inception, through the pre-qualification exercise, to the final recommendation. The [Tender Evaluation Report] shall follow the general format detailed below:

(a) executive summary: A summary of the report's recommendations and conclusions;

(b) introduction: A brief description of the site, the overall scope of work, the work package under consideration, any special requirements or constraints, the basis of the proposed tender ([Lump Sum], [Bills of Quantities], etc) the tendering program, the estimated tender value, etc;

(c) pre-qualification: A summary of the pre-qualification process detailing all contractors evaluated for tendering;

(d) analysis: A comparative and objective analysis of the companies pre-qualified, covering all aspects of their submissions; and

(e) conclusion: A recommendation as to which contractors should be included on the [Final List of Tenderers] for approval.

9. PREPARATION OF TENDER DOCUMENT REQUIREMENTS

9.1 Contracts group is responsible for the preparation of the [Contract Request for Proposal (RFP)] and prepares the instructions to bidders, commercial requirements, bid forms and administrative requirements. The draft RFP is distributed to the assigned legal representative, engineers, managers and Project controls as required for comment and review. [Contract Administrator] assimilates and incorporates final comments into a [contract Request for Proposal (RFP) Package] and submits this package for final review and approval.

9.2 The [Project Manager] or [Managing Director] or designee will sign the Request for Proposal letters.

9.3 The Request for Proposal (RFP) is the document, which is used to solicit proposals from the [Final Approved Contractors Bid List] for the required services. The [RFP Package] should include all requirements for the services and specific instructions for preparation and submittal of the requested proposal. At a minimum, the RFP should include the following:

(a) Guidelines regarding submittal of exceptions to the RFP;

(b) Proposal due date;

(c) Company contact person to whom questions can be directed;

(d) Legal and Commercial Terms and Conditions;

(e) Compensation Exhibit or guidelines, including a pay item structure that indicates all pricing information that the contractor should provide. For example, many RFPs should request man-hour rates; lump sum cost items, unit pricing, expenses, mobilization/demobilization, etc.;

(f) Scope of work;

(g) Technical specifications and drawings;

(h) Technical Documents List;

(i) Contractors Administrative Requirements;

(j) Tax implications;

(k) Safety and Security Requirements;

(l) Quality Control/Quality Assurance;

(m) Project Controls;

(n) Reporting Requirements;

(o) Procurement & Subcontracts Issues;

(p) Project Schedule Requirements;

(q) Sealed Bid Requirements;

(r) Change Orders, Amendments and Claims;

(s) Compensation Basis;

(t) Country Specific Issues-Taxes, Currencies, Etc.;

(u) Insurance;

(v) Local content requirements;

(w) Confidentiality Agreement. If the RFP will contain information that is proprietary to WAPCo or any third party contractors, a Confidentiality Agreement may be required. If in doubt about the need for a Confidentiality Agreement, consult the legal unit;

(x) FCPA and import – export Requirements;

(y). Letters of Credit or Bonds;

(z) Invoicing terms and instructions;

(aa) Completion and Work Acceptance;

(bb) Right to Audit;

(cc) Dispute Resolution; and

(dd) Travel requirements and restrictions.

10. PROPOSAL RECEIPTS

10.1 Separate [Technical and commercial Sealed Bids] shall be required for all major contracts. A [Bid Opening Committee] will be established which shall be selected before the RFP Packages are issued for bid. The responsibility for the selection of this committee shall be the [Project Manager] for construction and the [Operations Manager] for [Pipeline Operations] contracts. A minimum of three persons shall attend each opening. The [Bid Committee] shall meet in a private area to open the sealed bids, when all the bids are received or on the bid due date. If a bid is received after the due date return it to the bidder unopened. Upon opening the bid, write the date and time of opening on the original of each bid, and have each member of the [Bid Committee] sign it. The [Bid Committee] will also sign the bid opening log which summarizes the unevaluated bids. Priced copies of the opened bids shall be kept confidential. Access prices shall be restricted on a strict need-to-know basis.

10.2 RFP shall include specific [Instructions] to bidders to submit their proposals in accordance with the sealed bid procedures. Bidders not submitting proposals in accordance with the sealed bid requirements proposals shall be rejected and returned. All sealed bids received shall be maintained in a secure location until all bids are received or until the bid due date. Extensions to the bid due date should be discouraged; however, in situations where it is reasonable to allow extra time to any bidder, then all bidders must be advised and allowed the equivalent additional time. All bid due date extensions shall be approved by the [Project Manager] for construction and the [Operations Manager for Pipeline Operations].

11. TECHNICAL AND FINANCIAL EVALUATIONS

11.1 The [Proposal Review Team] will be established which shall be selected before the RFP Packages are distributed. The responsibility for the selection of this team shall be the [Project Manager] for construction and the [Operations Manager for Pipeline Operations contracts]. The [Contracts Group] will coordinate the interface between the technical and commercial evaluations. The [Technical Bid Review Team] shall proceed with a complete technical evaluation of the bidders technical proposals to determine if the minimum technical requirements of the RFP have been met. A technical conditioning meeting may be held with the contractors to clarify their technical offerings before the commercial proposals are opened. Upon completion of the technical evaluation the bidders will be ranked. All technically acceptable bids will be summarized and submitted for approval to proceed with the financial proposal evaluation. For any proposals found to be not technically acceptable, the financial proposal will be noted as received and opened, but no further financial evaluation shall be conducted. Final evaluation shall note such bidder's proposal as received and opened but not technically acceptable.

Technical Evaluation

11.2 This evaluation involves an analysis of factors by the evaluator which are important to the successful performance of the work.

11.3 The technical evaluation of the bids received shall be performed by qualified personnel and shall be completed in such detail as required to determine the technical

acceptability of the bids. The depth of this evaluation will be determined by the specific requirements and the complexity of those requirements. This may include material take-off, man-hour estimate checks, specification compliance, schedule impact and reasonableness of the bidder's man-hours with relation to the schedule requirements as well as a proposed personnel, equipment analysis, and work execution plan for suitability.

11.4 As part of the technical evaluation, the Quality Assurance/Quality Control and Health Safety and environmental programs provided by the bidders shall be evaluated. All technical evaluations shall be made in writing and the written evaluation shall be summarized on a technical evaluation review summary for approval to proceed with the financial evaluation.

Financial Evaluation

11.5 This evaluation may be a simple comparison of firm or lump sum prices or a complex analysis of prices, rates, man-hours and other components of cost compared to an independent or in-house estimate in order to asses reasonableness and realism of contractor proposals. The evaluation shall include, if applicable, an analysis of possible/probable expansions to the scope of work based upon unit prices or [T&M] prices based upon the completeness of the inquiry package drawings, specifications and understanding of the scope of work.

11.6 The financial evaluation also includes reviewing those considerations that bear on the Contractor's financial capability to perform the required Work and his agreement to the terms and conditions of the [contract Agreement]. Particularly important items are insurance coverage, liability exceptions, financial and payment arrangements and the Contractor's agreement to the various indemnities required for the specific project.

11.7 Bid clarifications and adjustments that may be required to equalize and evaluate the proposals from the selected contractors who all requested adjustments shall be included in the final evaluation. A final [Financial Proposal Analysis] format shall be developed for approval. The [Proposal Analysis] is submitted through the appropriate representatives for signature as required in appropriate Delegation of Authority (DOA) for projects and/ or operations.

12. PREPARATION OF CONTRACT DOCUMENTS

12.1 After selection of the successful contractor, copies of all bids, along with a copy of the signed bid summary are placed in the confidential contract[/PO] files. All the unsuccessful bidders are notified in writing. Upon approval to proceed with the contract award a draft contract document will be prepared that will include all the accepted negotiated revisions made during the evaluation process. No changes to the contractual terms and conditions of the standard contract forms shall be made except with the guidance of appropriate legal departments. Contracts shall be prepared using standard contract forms approved by the Company.

12.2 The contract package draft will include all the revised technical documents and all the latest revisions of drawings and specifications. All pricing information

shall be included in the draft contract document including pricing for the base scope of work and all other price schedules for extra or out of scope work. The project management and controls requirements will include all reporting requirements and administrative and control guidelines. The contract package will be issued for appropriate review and approval before issuance to the selected contractor.

13. CONTRACT ADMINISTRATION AND CHANGES

13.1 It is the intent that all contracts be awarded based upon the latest scope of work, drawings and specifications available. After a contract has been awarded, revisions to the scope of work, drawings or specifications shall be the basis for contract amendments as required. Any amendments requested by the Contractor shall be analyzed with regard to cost and/or schedule impact. It is also necessary to identify each drawing/specification as to the expected impact of incorporating any material change into the Contractor's scope of work.

13.2 A complete executed [Contract Change Amendment] must be in place before the contractor can invoice for the additional or changed work scope. It is anticipated that after award, but not necessarily as a result of engineering design changes or revised drawings, changing site conditions and the normal course of construction work could result in minor scope changes and/or extra work requirements.

13.3 A [Change Amendment] shall be issued to identify each addition, omission or deviation from the requirements of the contract. Change amendments shall include a description of the change in the work scope, the change in schedule, and the change in compensation. Each Change Amendment shall include a contract cost recap with:

(a) original contract value;

(b) total of previous changes;

(c) value of this change; and

(d) new contract value.

13.4 Approval of [Changes] shall be in accordance with the guideline described as to contract terms and conditions, and shall normally be made in an [Amendment to the Contract] approved by the appropriate delegations of authority. [Contract Change Log,] shall be maintained for each contract.

14. CONTRACTOR REPORTING REQUIREMENTS

14.1 This section outlines the minimum requirements for Contractor's project controls and progress reporting activities.

14.2 Contractor shall be responsible for all Project controls activities required for performance of the Work, including, but not limited to, the following:

(a) cost engineering control;

(b) planning and scheduling;

(c) progress control and reporting;

(d) document control;

(e) subcontracts, material and equipment status monitoring control; and

(f) local content utilization.

15. CONTRACTOR INVOICING

15.1 The objectives of the Invoicing and Payment Guideline are to:

(a) establish contents and flow of data for the monthly invoicing cycle;

(b) ensure all work requirements are complete for payment being processed;

(c) ensure appropriate Delegation of Authority (DOA) for projects and or operations are satisfied.

General

15.2 Contractor is responsible for ensuring that accurate, timely invoices are prepared according to the terms and conditions of their contract. Contractor is also responsible for incorporating the requirements of this guideline into their own internal guidelines. All invoices will be reviewed and approved for processing by the [Operations/Project Contract Representative] and forwarded to [Operations/Project Finance] for payment. In all cases, supporting documentation shall be submitted or maintained by the Contractor in accordance with their contract requirements and be made available for audit purposes.

15.3 Invoiced amounts cannot exceed current budget allocation. All Major Contracts will include provisions for retention of progress payments until completion of all contract requirements.

15.4 All invoices, financial statements, reports, billings and other documents which the contractor, its vendors or its subcontractors issue, shall be complete and accurate and shall properly reflect the facts about all activities and transactions to which they relate. Contractor warrants, and shall cause its vendors and subcontractors to warrant, that company may rely on such documents for all purposes.

16. INSURANCE AND BONDING REQUIREMENTS

All contracts shall contain provisions requiring contractors to provide insurance coverage that complies with the provisions of this Agreement and all applicable local laws of all States. Furthermore, all contracts shall contain provisions requiring contractors to provide insurance coverage and bonds.

17. CONTRACTOR/VENDOR DISPUTE RESOLUTION AND ARBITRATION PROVISIONS

Contract disputes shall be settled under the UNCITRAL Arbitration Rules by 3 arbitrators appointed by the London Court of International Arbitration.

18. AUDIT

18.1 Company audits will be conducted from time to time by the sponsor representatives to assess project compliance with policies and acceptable practices. Audit findings, determinations and recommendations for improvement will be recorded in an audit report.

18.2 Contractors shall establish and maintain such standards, guidelines and controls as are necessary to avoid any real or apparent impropriety in connection with the Work and any adverse impact on the interest of the Company. The contractor shall review with the Company such standards, guidelines, and controls including, without limitation, those related to the placement and administration of purchase orders and subcontracts and those related to the activities of subcontractor's employees, agents and their relations with company's employees, agents, and representatives, and with third parties.

18.3 Contractor will permit and cause its subcontractors to permit, during the performance of the work, and for a period of three years after termination or acceptance of the work, the Company to audit accounting and cost control systems and inspect books, records, accounts and other documents related to the work.

SCHEDULE 12

ACCESS REFERENCE PRICE

The Access Reference Price is calculated as at the relevant time in accordance with the following formula:

ARP = BGP x (0.33 x In/Io+0.67) + Oil Index + US$0.20

Where:

ARP	=	Access Reference Price.
BGP	=	US$0.50 per MMBtu.
Io	=	The Inflation Index.
In	=	The average of the Inflation Index for the Calendar Year prior to the Calendar Year in which ARP is effective.
Oil Index	=	(.25 x (P – Po)/5.82) when P is less than US$ 35 per barrel, and
	=	(.25x (35-Po)/5.82 + .10 x (P -35)/5.82) when P is equal to or greater than US$ 35 per barrel. Except that Oil Index = US$0.00 when P is between US$18.00 per barrel and US$20.00 per barrel.
P	=	The average price of Bonny Light crude oil prices in US$ per barrel. P shall be determined in January and July of each Calendar Year and shall be applicable for the periods 1 January to 30 June and 1 July to 31 December respectively based on the arithmetic average of the mean of Platt's assessments (the daily effective quotations in "Platt's Crude Assessments") for the previous six calendar months. When the calculated value of P is less than US$15.00 per barrel, P shall be deemed to be US$15.00 per barrel.
Po	=	US$ 18.00 per barrel when P is less than US$18.00; and US$ 20.00 per barrel when P is greater than US$20.00.

SCHEDULE 13

ECONOMIC CRITERIA

Part A : Construction Economic Criteria

The amount calculated by adding the net present value of future real-dollar cash flows attributable to Foundation Customers not in default (Foundation Future NPV12) to the net present value of Foundation historical real-dollar cash flows (Foundation Historical NPV12) must be greater than or equal to zero.

The Foundation Future NPV12 shall be calculated by adding together Foundation future after tax net cash flows discounted at a rate of 12% per annum from the date of the evaluation to the date of each projected cash flow occurrence. Foundation future after tax net cash flow shall be forecasted on an annual basis by subtracting all projected Foundation costs in real dollars from projected Foundation tariff revenue in real dollars. Projected costs shall include taxes, fees, operating expenses and capital expenses required to transport Foundation volumes.

The Foundation Historical NPV12 shall be calculated by adding together Foundation historical after tax net cash flows amplified at a rate of 12% per annum from the date of the evaluation to the date of each historical cash flow occurrence. For the purposes of this evaluation, historical monthly cash flows shall be consolidated on an annual basis and converted to real US dollars by applying the Inflation Index.

Part B : Expansion Economic Criteria

The amount calculated by adding the net present value of all future real-dollar cash flows (Future NPV15) to the net present value of all historical real-dollar cash flows (Historical NPV15) must be greater than or equal to zero.

The Future NPV15 shall be calculated by adding together all future after tax net cash flows discounted at a rate of 15% per annum from the date of the evaluation to the date of each projected cash flow occurrence. Future after tax net cash flow shall be forecasted on an annual basis by subtracting all projected costs in real dollars from projected tariff revenue in real dollars. Projected costs shall include taxes, fees, operating expenses and capital expenses required to transport forecasted volumes. Projected tariff revenue shall be calculated annually by adding projected revenues in real dollars from existing Foundation contracts to projected revenue in real dollars from an updated forecast of Standard volumes. The first year of the updated Standard reserved capacity forecast shall be derived by adding the actual Standard contract volumes for the most recent full calendar year to the annual year-over-year increase in the original reserved capacity forecast corresponding to the first year of the updated forecast. Subsequent year volumes shall be derived by adding the forecasted volumes in the prior year of the updated forecast to the annual year-over-year increase in the original reserved capacity forecast corresponding to the same year of the updated forecast.

The Historical NPV15 shall be calculated by adding together all historical after tax net cash flows amplified at a rate of 15% per annum from the date of the evaluation to the date of each historical cash flow occurrence. For the purposes of this evaluation, historical monthly cash flows shall be consolidated on an annual basis and converted to real US dollars by applying the Inflation Index.

Part C : Restoration Economic Criteria

The amount calculated by adding the net present value of future real-dollar cash flows attributable to Foundation Customers not in default (Foundation Future NPV12) to the net present value of Foundation historical real-dollar cash flows (Foundation Historical NPV12) must be greater than or equal to zero.

The Foundation Future NPV12 shall be calculated by adding together Foundation future after tax net cash flows discounted at a rate of 12% per annum from the date of the evaluation to the date of each projected cash flow occurrence. Foundation future after tax net cash flow shall be forecasted on an annual basis by subtracting all projected Foundation costs in real dollars from projected Foundation tariff revenue in real dollars. Projected costs shall include taxes, fees, operating expenses and capital expenses required to transport Foundation volumes.

The Foundation Historical NPV12 shall be calculated by adding together Foundation historical after tax net cash flows amplified at a rate of 12% per annum from the date of the evaluation to the date of each historical cash flow occurrence. For the purposes of this evaluation, historical monthly cash flows shall be consolidated on an annual basis and converted to real US dollars by applying the Inflation Index.

SCHEDULE 14

KEY TERMS OF FOUNDATION GAS TRANSPORTATION AGREEMENTS

1. The Parties.

2. The term, including rights of extension.

3. The capacity reserved, the nature of the reservation (firm, interruptible), and any minimum bill obligations.

4. The receipt and delivery point(s), and if more than one the method of allocation between them.

5. The methodology for calculating the tariff or capacity reservation charge payable, including adjustments over time.

6. The deadlines for construction of the Initial Development and first deliveries of gas, the penalties for failure to achieve those deadlines, and the security to support payment of those penalties.

7. The circumstances in which rights of termination arise, and the consequences of termination.

8. The circumstances which would constitute force majeure events and their consequences.

SCHEDULE 15

COMPANY VALUATION

Company to obtain valuation

1. Upon receipt of a notice given under this Agreement requiring the Company to obtain a Company Valuation, the Company shall procure in accordance with this Schedule the determination of the value of the Company. The value shall be determined in US dollars of the day at the time of the valuation.

Calculation of Company Valuation

2. For the purpose of this Schedule, Valuation Interest means the whole of the assets of the Company, including its receivables, its business and its goodwill, minus all Debt of the Company then outstanding other than Debt owed by the Company to Shareholders or their Affiliates, minus amounts owing to trade creditors or other actual liabilities incurred in the ordinary course of business.

3. The Company Valuation shall be the greater of:

(a) the fair market value of the Valuation Interest, as determined by an independent internationally recognised investment banking firm to be agreed or otherwise determined as set out below, made in accordance with the valuation methodology determined by the valuer as the most appropriate in the circumstances; or

(b) the amount certified by independent auditors of the Company as being the result of the following calculation steps:

(iii) Calculate in real US dollars the amounts paid out by Shareholders or their Affiliates to or on behalf of the Company or for the purposes of the Project for each month prior to the time of valuation by applying the Inflation Index;

(iv) Calculate in real US dollars the amounts received by Shareholders or their Affiliates from the Company or otherwise by way of return from the Project in each month prior to the time of valuation by applying the Inflation Index;

(v) For each month subtract the real-dollar amounts received (step (ii)) from the real-dollar amounts paid out (step (i)) to determine the monthly net investment by (return to) the Shareholders or their Affiliates;

(vi) For each month add a real rate of return by multiplying the net amounts (as derived in step (iii)) by monthly return factors calculated as follows: return factor = (1.01171491692)^(number of months from time of valuation);

(vii) Add together all monthly net investment (return) amounts including real rate of return (as derived in step (iv)) (the sum total is the real-dollar payment required to yield a real rate of return of 15%); and

(viii) Calculate the value of the Valuation Interest in money of the day by applying the Inflation Index to the real-dollar payment (as derived in step (v)).

Appointment and Expenses

4. The Company and the Relevant Ministers or their delegates shall, promptly following the giving of a notice requiring a Company Valuation, meet to agree on the independent investment banking firm to determine the fair market value of the Valuation Interest (or if agreement cannot be reached then each shall nominate a valuer and procure the appointment of the valuer by the Chairman of the Oil and Gas Committee of the American Institute of Certified Public Accountants Inc., and the Company shall procure that the fair market value is determined in accordance with sub-paragraph (a) of paragraph 3 above and the certification by the Company's auditors in accordance with paragraph (b) of paragraph 3 above is obtained. The Company shall pay the reasonable costs of obtaining the valuation by the valuer and the certification by the auditors.

Notification of Company Valuation

5. The Company shall, promptly following determination of the value of the Company Valuation, notify the Relevant Ministers of the amount of the Company Valuation and provide to them copies of all reports provided to the Company for that purpose by the valuer and the auditor.

SCHEDULE 16

PRE-DEVELOPMENT COSTS

In this Agreement, ***Pre-Development Costs*** means:

(a) All expenditure made by the Company after the Execution Date and prior to the Construction Commitment Date for the purposes of the Project, including where appropriate estimates of expenditure still to be incurred prior to the Construction Commitment Date;

(b) All expenditure made by the Company or the Shareholders or their Affiliates prior to the Execution Date which is made for the purposes of the Project, including the cost of all studies and of negotiation of the Commercial Agreements, but excluding all expenditure in respect of which a Shareholder or an Affiliate of a Shareholder has claimed or received any benefit or reduction in any taxation which would otherwise have been payable in a State; and

(c) All payments made by the Company or the Shareholders or their Affiliates for or towards the costs of the States in the negotiation of this Agreement or in carrying out their functions or the functions of the WAGP Authority as set out in this Agreement, but excluding any amount included in the calculation of the WAGP Authority Charge in accordance with Clause 9.4.

SCHEDULE 17

PROCESS FOR APPROVING PIPELINE DEVELOPMENT PLAN

Oversight and Co-ordination

1. The WAGP Authority shall be responsible for implementing, overseeing and co-ordinating the review and approval processes set out below, including consultation with the Technical Authorities and State Environmental Protection Authorities. The technical review and approval process set out below is intended to cover all technical approvals necessary for the Initial Development.

2. During the period when the Pipeline Development Plan is being prepared by the Company, the Company shall permit a single representative of the WAGP Authority to observe work being carried out by the Company on the design of the Pipeline System and the plans for its fabrication and construction, and to participate in accordance with Clause 16.2 and this Schedule 17. The Company shall provide the representative with normal office accommodation in the place where the design of the Pipeline System is being carried out. All other costs of the representative in travelling to and remaining in that place shall be borne by the States.

Conceptual Studies

3. The Company will conduct (in 2 stages) conceptual studies for the Pipeline System equivalent to the following:

(a) 1st Conceptual Study Stage:

(i) Concept Safety Evaluation Study;

(ii) Qualitative Risk Assessment Review; and

(iii) Process Flow Diagram and Process and Instrumentation Diagram Reviews.

(b) 2nd Conceptual Study Stage:

(i) Coarse Hazard and Operability Review;

(ii) Coarse Hazard Identification Review;

(iii) Project Specifications Review; and

(iv) Project Health, Safety and Environmental Review.

4. The WAGP Authority, the Technical Authorities and the State Environmental Protection Authorities shall participate in these studies in a manner to be agreed with the Company. Prior to conducting these studies, Company will provide to those organisations documentation and other information necessary to conduct the studies.

Conceptual Design Package

5. The Company will submit to the WAGP Authority a Conceptual Design Package based on survey and design work done up to that time, and the results of the studies conducted in accordance with paragraph 3 above. The Conceptual Design package will be submitted to the WAGP Authority concurrently with the submittal of the Preliminary Environmental Impact Assessment and Environmental Management Plan, in accordance with paragraph 4 of Part C of Schedule 2. The Conceptual Design Package will consist of:

(a) A description of the general project concept, comprising block and line drawings which include the proposed facilities layout, information on interconnecting pipelines and their capacities, main valve locations, general equipment layout, simple process and mechanical flow diagrams, metering system(s) and ancillary facilities (with throughputs); and

(b) A preliminary survey report, including initial maps of the proposed pipeline routing and siting of facilities.

6. The WAGP Authority shall, immediately following receipt of the Conceptual Design Package from the Company, distribute copies thereof together with any accompanying documentation to each Technical Authority, and consult with the Technical Authorities thereon.

7. No later than 30 days after the State Environmental Authorities provide comments to the Company in accordance with paragraph 4 of Part C of Schedule 2, the WAGP Authority shall, in consultation with the Technical Authorities, provide written comments to the Company on the Conceptual Design Package, and meet with the Company to provide additional feedback thereon, focussed on:

(a) the content of the Front End Engineering Design Package;

(b) the public notice and formal public hearing provided for in paragraphs 14 and 15 below; and

(c) the content of the draft Pipeline Development Plan to be submitted by the Company.

Further Studies

8. Following the submission of the Conceptual Design Package and the receipt of written comments and feedback thereon, the Company will conduct further studies for the Pipeline System equivalent to the following:

(a) Detailed Hazard Operability Studies, Safety and Operability Studies, Instruments Protective Functions Classification and/or Hazards Analysis Reviews;

(b) Quantitative Risk Assessment Review/Study;

(c) Equipment Layout;

(d) Hazardous Area Classification;

(e) Fire / Explosion Study;

(f) Fire Protection Analysis;

(g) Escape / Evacuation / Rescue Studies;

(h) Safety Review/Criticality Ranking of Major Equipment; and

(i) Project Specification Review.

9. The Company shall involve the WAGP Authority, the Technical Authorities and the State Environmental Protection Authorities in these studies.

Front End Engineering Design Package

10. The Company will submit to the WAGP Authority a Front End Engineering Design Package based on all survey and design work done up to that time, and the results of the studies conducted in accordance with paragraph 8 above. The Front End Engineering Design package will be submitted to the WAGP Authority concurrently with the submittal of the Initial Environmental Impact Assessment and Environmental Management Plan, in accordance with paragraph 5 of Part C of Schedule 2. The Front End Engineering Design Package will consist of:

(a) A survey report on the proposed route of the Initial Development, including:

(i) a survey description, in accordance with the National Grid or Coordinate systems of each State, of the total route of the pipeline; the Right of Way (***ROW***) width; co-ordinates at various points along the route; and a topographic map covering at least 100 metres each side of the proposed ROW;

(ii) identification of lands suitable for pipeline construction;

(iii) geophysical and geotechnical information necessary for design considerations to ensure a safe and reliable pipeline;

(iv) maps and drawings, and a plan and profile, showing (where applicable) highway crossings, railroad crossings, waterway crossings, power line crossings, pipeline crossings within the same ROW, pipeline crossings within 100 metres of the ROW, and areas of human habitation and industrial facilities that are within 1 kilometre of the ROW;

(b) A technical report on the proposed Initial Development, including pipeline specifications (including inner and outer diameter), anticipated fluid characteristics (including the gas specification), location and operation of cathodic protection devices, main line valves and emergency shut-down devices, pigging details (both operations and receiving points and tie-ins),

hydraulic profile including position of pumping or booster stations, ancillary facilities along the pipeline route, terminal ends, compressor stations, manifolds, meter banks, operating pressure, pipeline capacity and control systems;

(c) An estate report, including:

(i) identification by surveyed location of lands affected by the Initial Development, including whether public or private land;

(ii) a listing of all landowners along the proposed pipeline route;

(iii) a listing of the types of rights to be acquired in respect of such land and the proposed method of acquisition; and

(iv) a statement of the principles and procedures for quantifying the amount of compensation payable by the Company.

(d) A construction report, setting out the Company's proposals for fabrication and construction of the Initial Development;

(e) The estimated construction cost of the Initial Development;

(f) A list of the construction companies being considered;

(g) The results of the studies conducted under paragraph 8 above; and

(h) A description of services to be provided by the Pipeline.

11. The WAGP Authority shall, immediately following receipt of the Front End Engineering Design Package from the Company, distribute copies thereof together with any accompanying documentation to each Technical Authority.

12. No later than 30 days after the State Environmental Authorities provide comments to the Company in accordance with paragraph 5 of Part C of Schedule 2, the WAGP Authority shall, in consultation with the Technical Authorities, provide written comments to the Company on the Front End Engineering Design Package, and meet with the Company to provide additional feedback thereon, focussed on:

(a) the public notice and formal public hearing provided for in paragraphs 14 and 15 below; and

(b) the content of the draft Pipeline Development Plan.

13. No later than 21 days following receipt of the comments from the WAGP Authority on the Front End Engineering Design Package and from the State Environmental Agencies on the Initial Environmental Impact Assessment and Environmental Management Plan, the Company shall modify the Front End Engineering Design Package having regard to the comments received, and re-submit the revised Front End Engineering Design Package to the WAGP Authority. The re-submitted Front End Engineering Design Package shall identify which of its parts are

proposed by the Company to be released for public consultation and review in accordance with paragraph 14 below. The WAGP Authority, in consultation with the Technical Authorities, shall meet with the Company to agree on the contents to be released for public consultation and review, and following agreement being reached it shall formally approve those contents for public release.

Public Notice and Hearings

14. Following approval by the WAGP Authority of the content of the information to be publicly released, the Company shall prepare and publish public notices in each State, as required by the laws of each State, and make copies of the agreed Front End Engineering Design Package elements available for public review in the areas through which the Initial Development will pass. The Company will also provide a copy of the appropriate parts of the Front End Engineering Design Package to all relevant State Authorities (including all local government bodies within whose jurisdiction the Initial Development will lie).

15. The Company and the WAGP Authority (in consultation with the relevant Technical Authorities) shall conduct a formal public hearing on the parts of the Front End Engineering Design Package which have been publicly released, in accordance with the laws of each State. Each State shall ensure that its Technical Authorities shall commence and complete a formal public hearing within a period of 21 days following the expiration of posted public notice periods in accordance with the laws of that State.

Pipeline Development Plan

16. In due course, the Company will prepare and submit to the WAGP Authority a draft of the Pipeline Development Plan, excluding the information contained in the Conceptual Design Package and the Front End Engineering Design Package. The first draft of the Pipeline Development Plan shall be submitted by the Company not later than the day on which it submits the Front End Engineering Design Package in accordance with paragraph 10 above.

17. The WAGP Authority shall, immediately following receipt of the draft Pipeline Development Plan from the Company, distribute copies thereof to each Technical Authority, and shall, in consultation with the Technical Authorities, provide written comments to the Company thereon, and as soon as possible thereafter meet with the Company to provide any further feedback thereon which has not been provided in accordance with paragraph 12 above.

18. Following the public notice and formal public hearing provided for in paragraphs 14 and 15 above, the Company shall submit to the WAGP Authority an amended Pipeline Development Plan, that is complete and accurate and incorporates all information required in the Front End Engineering Design Package and having regard to comments received during the public notice period and formal public hearing.

19. The Company and the WAGP Authority shall thereafter meet to agree on the content of the Pipeline Development Plan, including the conditions on which the

Pipeline Licences will be issued. The WAGP Authority shall negotiate with the Company on the content of the final Pipeline Development Plan in consultation with the Technical Authorities.

Approval of Pipeline Development Plan

20. Following agreement between the Company and the WAGP Authority on the terms of the final Pipeline Development Plan, the WAGP Authority shall formally approve the Pipeline Development Plan in writing in accordance with Clause 18.3, and recommend to the States that, following completion of all necessary formalities by the Company, the Pipeline Licences be issued to the Company by the Relevant Ministers on the conditions agreed in the Approved Pipeline Development Plan.

Issue of Pipeline Licences

21. The Company shall, following its Final Investment Decision and the approval of the Pipeline Development Plan in accordance with paragraph 20, make formal application for the issue of the Pipeline Licences in accordance with the then prevailing law in each State, and complete all other formalities required for the issue of the Pipeline Licences.

22. Either before, or by no later than 30 days after, the last to occur of:

(a) the approvals of the Environmental Impact Assessment and Environmental Management Plan in accordance with Clause 19 and Schedule 2; and

(b) the formal application by the Company for the Pipeline Licences and the completion by the Company of all other formalities required for the issue of the Pipeline Licence under the then prevailing laws in each State,

the Relevant Minister in each State shall issue the Pipeline Licences to the Company, subject only to the conditions agreed by the WAGP Authority and the Company in the Approved Pipeline Development Plan.

SCHEDULE 18

REQUIREMENTS FOR APPROVAL TO OPERATE

In the case of the Approval to Operate the Initial Development:

(a) Detailed commissioning and start-up plans for the Initial Development;

(b) A copy of the full operation and maintenance plan for the Pipeline System; and

(c) A full manpower plan for the Operating Period.

In the case of the Approval to Operate additional facilities:

(a) Detailed commissioning and start-up plans for the additional facilities; and

(b) A copy of the revised operation and maintenance plan for the Pipeline System, taking into account the new facilities.

SCHEDULE 19

AUTHORISED EXPANSIONS

Notification to WAGP Authority

1. Where the Company proposes to make an Authorised Expansion, it shall give written notice thereof to the WAGP Authority accompanied by an Authorised Expansion Approval Package.

Authorised Expansion Approval Package

2. The Authorised Expansion Approval Package shall include, to the extent applicable to the Company's proposal:

(a) A technical report on the facilities it proposes should be installed (and if applicable removed), containing equivalent information (to the extent applicable) to the technical report included in the Front End Engineering Design Package for the Initial Development;

(b) A statement of the health, safety, environmental and socio-economic impacts (if any) arising from the Authorised Expansion which are not addressed in the Approved Pipeline Development Plan as at that time or in the Environmental Impact Assessment or Environmental Management Plan as at that time, or impacts which are subject to new or modified laws or regulations of the States that have been adopted since the Initial Development;

(c) A statement of the changes to the Approved Pipeline Development Plan which the Company proposes should be made; and

(d) A statement of the changes (if any) to the terms and conditions of existing Project Authorisations sought by the Company, or additional Project Authorisations and their proposed terms and conditions, and the fees (if any) which would be payable for such additional Project Authorisations.

3. Within 7 days of receipt of an Authorised Expansion Approval Package the WAGP Authority shall provide copies thereof to the Technical Authorities and the State Environmental Protection Authorities within whose area of jurisdiction the new facilities would be situated. Within 30 days of receipt thereof those agencies shall review the material provided, and advise the WAGP Authority and/or meet with the Company as follows.

4. The relevant State Environmental Protection Authorities shall within that period advise the WAGP Authority and the Company in writing of their analysis of the Authorised Expansion Package, and if necessary setting out additional details of the issues and proposals for addressing such issues, and meet with the Company to discuss and agree upon a resolution of the issues. If appropriate, the Environmental

Management Plan may be amended in accordance with Clause 19.7 to resolve such issues.

5. If there are no environmental issues, or when the issues and concerns are adequately addressed to the satisfaction of the relevant State Environmental Protection Authorities, the relevant State Environmental Protection Authorities shall advise the WAGP Authority and the Company in writing that they have no objections to the proposals being implemented.

6. The WAGP Authority shall within that period, in consultation with the relevant Technical Authorities, advise the Company whether it has any issues with the technical aspects of the proposal. If it has, it shall meet with the Company to agree upon a resolution of the issues. If it has no issues, or when agreement is reached to resolve the issues, the WAGP Authority shall advise the Company in writing that it has no issues with the proposal. The WAGP Authority and the Company shall thereupon agree upon an amendment to the Approved Pipeline Development Plan to encompass the Authorised Expansion, including the details of the terms and conditions on which existing Project Authorisations should continue or new Project Authorisations should be issued.

7. Upon the relevant State Environmental Protection Authorities notifying in accordance with paragraph 5 that they have no objections to the proposals being implemented and an amendment to the Approved Pipeline Development Plan being agreed, each State shall ensure that all relevant Project Authorisations are renewed or amended or issued as provided for in the amended Approved Pipeline Development Plan.

SCHEDULE 20

EXCHANGE CONTROL REGIME

The following regime shall apply in respect of the Project:

General benefits, exemptions and consents

1. The WAGP Companies, the Shareholders, the Project Contractors, the Buyers, the Sellers and the Shippers, and their counter parties, shall be entitled (solely in connection with the Project or the transportation of natural gas in, and/or the sale of natural gas transported or to be transported through, the Pipeline System, or the provision of security for their obligations under agreements in respect of the foregoing) to do the following:

(a) open, maintain and operate bank accounts in Foreign Currency both inside and outside the States and receive payments of any kind (including without limitation revenues in connection with the sale or transportation of natural gas) directly into all or any such accounts and retain the proceeds therein and make payments from such accounts as it should think fit;

(b) transfer Foreign Currency into each of the States;

(c) purchase local currency at the most favourable rate available and in any event at a rate not less favourable than that generally made available by the central bank of each State;

(d) convert local currency into Foreign Currency at the most favourable rate available and in any event at a rate not less favourable than that generally made available by the central bank of each State;

(e) transfer, export and hold Foreign Currency outside of each State;

(f) obtain and use letters of credit in Foreign Currency;

(g) utilise Foreign Currency in each State without restriction (but local costs incurred in a single State with suppliers of goods or services who are residents of that State should be paid in the currency of that State);

(h) be exempt from any rule or regulation of each State requiring the repatriation or mandatory conversion of Foreign Currency into local or any other currency;

(i) pay in Foreign Currency all salaries, allowances and other benefits due to any of their employees in connection with or relating to the Project, other than residents of a State who are engaged in relation to one State only;

(j) pay in Foreign Currency any amounts due to foreign Project Contractors, Shareholders or lenders in connection with the Project;

(k) make any other payments due in connection with or relating to the Project in Foreign Currency, other than costs incurred solely in a State with residents of that State; and

(l) enter into contracts with each other for services or the sale of goods, and to make payment for such goods or services, in any Foreign Currency.

Additional benefits and exemptions for Company

2. To the extent that the following is not included in paragraph 1 above, the Company shall be entitled to do the following:

(a) borrow money or raise equity in Foreign Currency from any source in each case without the requirement for any further approval, consent or administrative act of any State or any State Authority;

(b) remit to the Shareholders out of the States any dividend derived from the Company or any Affiliate of the Company in any of the States or return of capital without any deduction, withholding or other cost, in each case without the requirement for any further approval, consent or administrative act of the State or any State Authority;

(c) grant security over any property of the Company or any Affiliate of the Company in any of the States or elsewhere to lenders or other creditors or potential creditors, including balances in local and Foreign Currency bank accounts onshore or offshore;

(d) service or repay foreign borrowings and pay associated fees and indemnities in any currency without being subject to any Tax and/or withholding obligation or deduction; and

(e) remit to its lenders any principal, interest, fees or other borrowing costs owed or payable by the Company or any Affiliate of the Company in any of the States without any deduction, withholding or other cost in each case without, the requirement for any further approval, consent or administrative act by the State or any State Authority.

SCHEDULE 21

ANTI-TRUST REGIME

The following anti-trust regime shall apply in respect of the Project:

1. Subject to paragraph 2 below, nothing done by:

(a) the Company pursuant to the terms of this Agreement; or

(b) a Shipper in delivering natural gas to a State; or

(c) a Buyer in acquiring natural gas for delivery into or accepting delivered natural gas in a State; or

(d) the Shareholders in relation to the formation of the Company; or

(e) the shareholders or members of any group or consortium forming a Buyer or Seller or Shipper,

shall constitute a breach of any law of any of the States prohibiting or restricting any person from acting in concert or combination in relation to competition in a market or the fixing of prices.

2. Except in relation to conduct specifically contemplated in this Agreement or the Access Code, this Schedule does not permit or authorise unreasonable discrimination against Buyers or Shippers, or conduct by the Company, a Buyer, a Seller or a Shipper which constitutes the abuse of a dominant market position.

SCHEDULE 22

LEGISLATIVE OUTLINE – BENIN

PART I
CORPORATE MATTERS

1. LOCAL INCORPORATION

Shippers and Buyers

1.1 Any Shipper or Buyer who in Benin:

(a) acquires natural gas for transmission through the Pipeline System; or

(b) contracts with the Company to transport natural gas through the Pipeline System; or

(c) contracts with another person to transport natural gas through other pipeline facilities to the Pipeline System,

may do so in its own right and shall not be required to incorporate and/or act through a subsidiary in Benin by reason only of that acquisition or transmission.

Other Persons

1.2 Any person who in Benin, either on its own behalf or on behalf of another person:

(a) offers for sale or promotes the sale of or sells natural gas to be transported through the Pipeline System; or

(b) delivers gas through the Pipeline System,

may do so in its own right and shall not be required to incorporate and/or act through a subsidiary in Benin by reason only of that activity.

2. TREATMENT AS A FOREIGN CORPORATION

Registration

2.1 The Company may establish a legal presence in Benin by registering as a branch of a foreign corporation with the Régistre du Commerce et du Crédit Mobilier in Porto Novo (***the Registrar***).

Provision of information on registration

2.2 Upon registration in accordance with paragraph 2.1 above, the Company shall provide to the Registrar the following information (in such number of copies as may be required by the Registrar):

(a) The name of the Company;

(b) its country of incorporation, its registration number and the identity of the register in its country of incorporation;

(c) the address of its registered office in its country of incorporation;

(d) copies of its constitutional documents;

(e) details of its directors and secretaries;

(f) the amount of its authorised and issued share capital;

(g) the address of any office of the Company within Benin; and

(h) the name and address of all persons resident in Benin who are authorised to accept service on behalf of the Company in respect of the business of the branch.

Ongoing filing obligations

2.3 When registered in accordance with paragraph 2.1 above, the Company shall not be required to comply with any reporting and filing requirements under any other law, but shall comply with the following reporting and filing requirements:

(a) The Company shall within 28 days of the change occurring, notify the Registrar of any change to the information notified under paragraph 2.2 above.

(b) The Company shall within 6 months of the end of each Tax Year prepare and submit to the Registrar audited financial reports prepared in accordance with paragraph 3.2 below.

Share transfers

2.4 Any restrictions under the law of Benin that would otherwise operate to restrict the transfer of shares in the Company, shall not apply to any transfers by the Shareholders of shares in the Company or any transfer of ownership of a Shareholder. No transfer of shares in the Company or ownership of a Shareholder shall give rise to any right to revoke a Project Authorisation or Project Right or amend the terms or conditions thereof.

Security over project assets

2.5 A registry shall be created and maintained by the Ministère d'Energy, for the purposes of registering title, security interests and all other third party rights over the property and other assets of the Company situated in Benin, including without limitation the Pipeline System and the Pipeline Licence (***WAGP Registry***).

2.6 The Company or a transferee of title from the Company may register on the WAGP Registry its title to all of its property and other assets situated in Benin.

2.7 If the Company creates a mortgage, charge or other security interest over its property situated in Benin, or any other person claims a property or security interest in the property of the Company situated in Benin, the Company or the holder of the security interest or such other person may register the security interest or its claimed rights on the WAGP Registry.

3. ACCOUNTS AND FINANCIAL INFORMATION

Currency of accounts

3.1 The Company and any of its branches, places of business or subsidiaries in Benin shall have no obligation to maintain accounts in the currency of Benin.

Financial reports

3.2 All financial reports to be prepared and submitted by the Company or any subsidiaries to any applicable authorities in Benin shall be prepared in US dollars in accordance with the Accounting Principles.

Branch accounts

3.3 The Company shall have no obligation to prepare or maintain or file branch accounts in respect of its branches, places of business or subsidiaries in Benin or in respect only of its activities in Benin.

PART II
THE WAGP AUTHORITY

4. THE WAGP AUTHORITY

Grant of power and authority

4.1 The Minister having jurisdiction over the matters that the WAGP Authority will be chartered to regulate in Benin shall immediately upon entry into force of this law delegate to the WAGP Authority power and authority to perform the functions assigned to it under the WAGP Treaty in Benin, and to monitor compliance by the Company with, and to exercise the powers conferred on it under, the WAGP Regulations.

Reporting and monitoring of the WAGP Authority

4.2 The WAGP Authority shall report to, and be subject to the direction of, the Relevant Ministers. The Relevant Ministers shall receive reports prepared by the WAGP Authority, monitor the performance by the WAGP Authority of its functions and compliance with its obligations, direct the WAGP Authority, and meet from time to time for the purpose of the foregoing. The Relevant Ministers shall determine their own procedures for making decisions and giving directions in relation to the WAGP Authority.

Reliance on WAGP Authority actions and authorisations

4.3 The Company and each Buyer, Seller and Shipper shall be entitled to act in reliance on the exercise by the WAGP Authority of the powers conferred upon it by this law and/or the WAGP Regulations. Benin shall be bound by the WAGP Authority's actions and decisions to the extent of the powers conferred upon it by this law and/or the WAGP Regulations.

Funding of the WAGP Authority

4.4 The consolidated revenue of Benin shall be charged with the share of the operating costs of the WAGP Authority attributable to Benin in accordance with the WAGP Treaty.

PART III
LICENSING

5. PIPELINE LICENCES

Requirement for Pipeline Licence

5.1 The Company shall not construct or operate the Pipeline System except pursuant to a licence granted under this Part.

Minister may grant Pipeline Licence

5.2 The Relevant Minister may grant to the Company a licence to construct and operate the Pipeline System. A licence may be granted hereunder in respect of any part of Benin including any section of the seabed offshore of Benin.

Application for Pipeline Licence

5.3 An application for the grant of a licence under this Part may be made in such form, and shall contain such information, and shall be processed in accordance with such procedures, as may be specified in the WAGP Regulations or agreed between the Company and Benin.

Grant of licence subject to conditions

5.4 The Relevant Minister may grant a licence under this Part subject to the conditions set out in respect of that licence in the Approved Pipeline Development Plan.

Amendments to licence conditions

5.5 The Relevant Minister may modify the terms and conditions of a licence granted under this Part, in accordance with modifications agreed in the Approved Pipeline Development Plan.

Duration of licence

5.6 A licence granted under this Part may be granted for a period of up to 50 years.

Renewal of licence

5.7 A licence granted under this Part may be renewed by the Relevant Minister on application by the Company.

Rights conferred by licence

5.8 Subject to this law, a licence granted under this Part shall confer upon the Company the following rights:

(a) To enter upon, take non-exclusive possession of and use a strip of land or seabed or subsoil of a width specified in the Approved Pipeline Development Plan either side of the route specified in the Approved Pipeline Development Plan and thereon, thereover or thereunder to construct, maintain and operate the Pipeline System;

(b) To construct, maintain and operate on that strip of land all other installations that are ancillary to the construction, maintenance and operation of the Pipeline System, including roadways, telephone and telegraph lines, fibre optic cables, electric power cables, compression stations, storage facilities and such other ancillary installations as are identified in the Approved Pipeline Development Plan;

(c) To dig and get, free of charge, any gravel, sand, clay, stone, or other similar substance within any land included within the area covered by the licence; and

(d) To enter onto any land, whether or not covered by the terms of the licence, as is necessary to construct, make safe, repair and/or replace the Pipeline System.

Approval to operate

5.9 The Company shall not commence the commissioning or operation of the Pipeline System, or any newly installed part thereof, without an Approval to Operate being given by the WAGP Authority. The WAGP Authority shall have the power to grant an Approval to Operate. The Company and the WAGP Authority shall follow such procedures as may be agreed in applying for and processing an application for an Approval to Operate.

No other licence needed

5.10 Except as set out in this Part, no other licence or permit or authorisation shall be required by the Company or any Project Contractor for the construction and operation of the Pipeline System.

6. OTHER LICENCES

Transmission, export or import of natural gas

6.1 No transit, export or import permit, licence or other authorisation shall be required by the Company, a Buyer, a Seller or a Shipper for:

(a) the export of natural gas from Benin by means of the Pipeline System;

(b) the transit of natural gas through the territory of Benin by means of the Pipeline System; or

(c) the import of natural gas into Benin by means of the Pipeline System.

Dealings in natural gas transported: Shippers and Buyers

6.2 Any Shipper or Buyer who:

(a) acquires natural gas in Benin for transmission through the Pipeline System; or

(b) ships natural gas through the Pipeline System; or

(c) ships natural gas through other pipeline facilities to the Pipeline System,

shall not be required to obtain any licence or permit by reason only of that acquisition or transmission.

Dealings in natural gas transported: Other Persons

6.3 Any person who in Benin (either on its own behalf or on behalf of another person):

(a) offers for sale or promotes the sale of or sells natural gas to be transported through the Pipeline System; or

(b) delivers gas through the Pipeline System,

shall not be required to obtain any licence or permit by reason only of that offer, promotion, sale or delivery.

Emergency restrictions

6.4 The transmission of natural gas through Benin or across its territorial boundaries shall not be restricted other than in the event of a national emergency declared by the Legislature in accordance with the Constitution. Upon the cessation of such national emergency, any restrictions placed on the transmission of natural gas through Benin or across its territorial boundaries shall cease.

PART IV
WAGP REGULATIONS

7. THE WAGP REGULATIONS

Power to develop, adopt and implement

7.1 The Relevant Minister may adopt and implement, as delegated legislation, the WAGP Regulations.

Regulations to be harmonised

7.2 Regulations adopted by Relevant Minister hereunder, including any amendments or supplements thereto, shall be:

(a) Consistent with similar regulations adopted in Ghana, Nigeria and Togo; and

(b) consistent with the WAGP Treaty.

Power to administer and apply WAGP Regulations

7.3 The WAGP Authority shall have exclusive competence to administer and enforce the WAGP Regulations in Benin.

WAGP Regulations exclusive

7.4 In respect of the subject matter identified in Schedule 6, the Pipeline System and the Company will be regulated exclusively by the WAGP Regulations in Benin to the exclusion of any other laws or regulations that would otherwise apply to the Pipeline System and/or the Company in respect of that subject matter.

Power to amend and supplement

7.5 The Relevant Minister may amend or supplement the WAGP Regulations to the extent such amendment or supplement is consistent with this law and with the obligations of Benin under the WAGP Treaty.

PART V
FINANCIAL MATTERS

8. AGREED FISCAL REGIME

[Provisions applying the Agreed Fiscal Regime as law in Benin.]

9. AUTHORITY FOR ARBITRATION AND IMMUNITY

Arbitration

9.1 For the purpose of resolution of disputes arising between Benin and the Company from the application or interpretation of this Agreement, the State shall be

authorised to submit to arbitration of such disputes under ICSID rules, or if ICSID declines jurisdiction, to arbitration conducted under UNCITRAL arbitration rules.

Immunity

9.2 On behalf of themselves and their respective assets and revenues, Benin unconditionally waives any immunity from suit, execution or other legal process in connection with any actions or proceedings to obtain or enforce an ICSID/UNCITRAL arbitral award in relation to the Project subject to the exceptions contained in Clause 44.2 of this Agreement.

PART VI
LAND MATTERS

10. LAND MATTERS

Declaration of Public Interest

10.1 This law and the Pipeline Licence issued in accordance with Section 5 shall include a declaration of public interest in respect of all land, seabed and space above or under the same, as has been determined by the Approved Pipeline Development Plan as required for the construction, laying, operation and maintenance of the Pipeline System.

Public Domain

10.2 Benin or the relevant local authority shall conclude with the Company public domain occupation agreements in respect of all public domain under their jurisdiction that has been determined in the Approved Pipeline Development Plan as required for the construction, laying, operation and maintenance of the Pipeline System. The public domain occupation agreements shall be concluded for durations at least equivalent to the duration of the Pipeline Licence and shall not be suspended or revoked unless for reasons that have legally justified the revocation of the Pipeline Licence. If the Pipeline Licence is renewed or extended, the public domain occupation agreements shall be extended accordingly. The public domain occupation agreements shall entitle the Company to use, on a non-exclusive basis, the public domain for all purposes contemplated in the Approved Pipeline Development Plan or in this law. The public domain occupation agreements shall be concluded at no cost to the Company.

10.3 To the extent the Approved Pipeline Development Plan contemplates the exclusive occupation by the Company of the public domain, for inter alia any compression stations or other buildings, Benin (or the relevant local authority) shall, on the basis of the declaration of public interest, declassify the public domain and transfer the relevant land to the Company free of charge. To the extent any such declassification should not be possible, Benin (or the relevant local authority) shall conclude with the Company a public domain occupation agreement giving the Company exclusive rights of permanent occupation of the relevant land, for the duration and subject to extension in accordance with paragraph 10.2** above, and subject only to the rights of revocation contemplated in Paragraph 10.2** above.

Private domain land

10.4 Benin or the relevant local authority shall grant to the Company a public interest easement over all private domain under its jurisdiction which is identified in the Approved Pipeline Development Plan as being required for the construction, laying, operation and maintenance of the Pipeline System. Such easements shall remain in force for the duration of the Pipeline Licence, and shall be extended as the Pipeline Licence is extended or renewed. The easement deeds shall be established by [notary][the Services des Domaines][the Pipeline Licence shall constitute the easement deed]**. The easement deed shall not contain any charge, encumbrance or condition inconsistent with the provisions of this Agreement, the Approved Pipeline Development Plan or the Pipeline Licence.

Private Land

10.5 In the event the Company and the lawful owners or occupants of all private land identified in the Approved Pipeline Development Plan as being required for the construction, laying, operation or maintenance of the Pipeline System do not reach an agreement for the sale to the Company of said land or the granting to the Company of an easement over the said land (as the case may be, depending on the requirements identified in the Approved Pipeline Development Plan), Benin shall, upon written request from the Company, implement an expropriation procedure, on the basis of the declaration of public interest contained in this law, to acquire the relevant real estate ownership or easement rights over the relevant land.

10.6 In the event that Benin does not implement the expropriation procedure within [?] days of receipt of the written request from the Company, the Company shall be authorised to proceed, on the basis of Benin's delegated authority, to expropriate the relevant land.

10.7 Subject to the following adjustments, the expropriation procedures existing in the law shall apply to the expropriations conducted for the account of the Company:

(a) any undisputed expropriation indemnity shall be paid by Benin to the land owner or occupier after the prior posting by the Company of the security deposit with the [services des domaines]. Benin shall transfer ownership of the land or the easement right (as the case may be) upon release of the security deposit to its account;

(b) the Company shall be able to direct Benin to challenge the amount of any expropriation indemnity assessed by the [administrative tribunal]; and

(c) in the event that the land owner or occupier should challenge the amount of the expropriation indemnity, the expropriations court shall be able to authorise Benin to take possession of the land, subject to prior payment of a security deposit to be determined by the judge and to be deposited with a escrow agent appointed by the parties and the Company. In such event, the Company shall be able to require Benin to hand over possession of the land upon payment of the security deposit on behalf of Benin.

10.8 The Company (or its successors and assigns) shall be entitled to on-sell the expropriated land to the extent it is no longer required for the purposes of the Project.

PART VII
COMPENSATION

11. COMPENSATION

11.1 The consolidated revenue of Benin shall be charged with any payments which are required to be made by Benin under this Agreement.

11.2 To the extent permitted by the Constitution, Benin shall use its best efforts, including diplomatic action and all its rights under the treaties to which it is a party, to prevent the adoption of any international treaty, regulation, rule or decision inconsistent with, or likely to adversely affect, the rights, benefits and protections of the Company contemplated in this law, the WAGP Treaty or this Agreement.

PART VIII
ENVIRONMENTAL

12. ENVIRONMENTAL

Company

12.1 Neither the Company, nor any of its Shareholders, their Affiliates, the Company's lenders or the Project Contractors shall have any liability in respect of any environmental damage that was not directly caused by the Project Activities. Any environmental damage or other circumstances identified in the environmental baseline study shall be conclusively deemed to have existed prior to the commencement of the Project Activities and not to have been caused by these parties.

Buyers, Sellers and Shippers

12.2 No Buyer, Seller or Shipper shall have any liability in respect of environmental damage that was not directly caused by its activities.

PART IX
MISCELLANEOUS

13. MISCELLANEOUS

Access to Pipeline System

13.1 The Relevant Minister may, upon receipt of a notice from the WAGP Authority given in accordance with Article 5(1)(17) of Schedule 1 of the WAGP Treaty, adopt regulations requiring as a matter of law that the Company comply with the provisions of the Access Code.

Electricity/Telecommunications

13.2 The Company may construct, own and operate:

(a) an electricity generating plant [not exceeding [_____] MW in size] as part of the Pipeline System, subject to relevant provisions of [*identify relevant statute*];

(b) such communication facilities as are necessary to implement the Project.

Administrative Contract Issues

13.3 This Agreement is a contract of a private nature and not of a public nature, and shall not be treated as an administrative contract. Accordingly:

(a) The project assets are the exclusive property of the Company (or of its successors and assigns) and that they are not, by construction, to be assimilated to public domain property (domaine public artificiel); and

(b) Benin shall not assert any rights, powers or prerogatives that may be derived from the application of internal administrative law to unilaterally decide, enforce, require or assert any of the following actions or rights, except to the extent expressly agreed in this Agreement:

(i) the amendment of any terms of this Agreement;

(ii) the suspension of the performance by Benin of its obligations under this Agreement;

(iii) the suspension of the performance by the Company of its rights under the this Agreement;

(iv) the termination of the International Project Agreement;

(v) the imposition on the Company of any obligations that are not contemplated by this Agreement;

(vi) the repossession, requisition or placement under administration of the Pipeline System or of any assets of the Company either by way of mise sous séquestre, mise en régie or déchéance;

(vii) the imposition on the Company of uniform tariffs;

(viii) the imposition of any developments or extension of pipeline capacity, or any new investments required to service any requirements not contemplated in the Pipeline Development Plan or to provide access to any customers not contemplated under the Pipeline Development Plan;

(ix) the assertion of any ownership rights over any part of the Pipeline System during the term and beyond the term of this Agreement under any theory of bien de retour, biens de reprise or domaine public artificiel;

(x) the revocation of any rights of the Company to occupy, use or cross the public domain of Benin; and

(xi) the right to bring proceedings against the Company or the right to require the Company to bring proceedings against it in the administrative courts under its jurisdiction.

(xii) the right to enjoin the Company to continue operation of the pipeline (directly or through a substitute operator) after abandonment, if the Ministry of Energy feels it is in the public interest to do so.

Anti-trust Issues

13.4 Subject to paragraph 14.5 below, nothing done by:

(a) the Company pursuant to the terms of this Agreement; or

(b) a Shipper in delivering natural gas to Benin; or

(c) a Buyer in acquiring natural gas for delivery into or accepting delivered natural gas in Benin; or

(d) the Shareholders in relation to the formation of the Company; or

(e) the shareholders or members of any group or consortium forming a Buyer or Seller or Shipper,

shall constitute a breach of any law prohibiting or restricting any person from acting in concert or combination in relation to competition in a market or the fixing of prices.

13.5 Except in relation to conduct specifically contemplated in this Agreement or the Access Code, paragraph 14.4 does not permit or authorise unreasonable discrimination against Buyers or Shippers, or conduct by the Company, a Buyer, a Seller or a Shipper which constitutes the abuse of a dominant market position.

Title and ownership

13.6 The Pipeline System when placed in, under or over land, in accordance with the terms of the licence, shall remain the property of the Company, notwithstanding a suspension, termination, cancellation or expiry of the licence. No third party may acquire an ownership interest in the Pipeline System merely by the fact of its situation in, under or over land in which that third party has an interest.

PART X
DEROGATIONS/DISAPPLICATION OF EXISTING LAWS

14. DEROGATIONS/DISAPPLICATION OF EXISTING LAWS

14.1 The following laws shall not apply to the Company, or to other persons in respect of the Project:

(a) Decree 95-139-3

(b) Petroleum Code (Ordonnance n.73-33 du 13 avril 1973) and of the Petroleum Ordinance (Ordonnance n.73-34 du 13 avril 1973);

(c) Investment Code of Benin of 9 May 1990 to the extent the new fiscal regime is inconsistent with it.

(d) Article 26 of the Labour Code.

14.2 The laws of Benin not expressly referred to above shall be deemed amended (for the purpose only of the Project) to the extent inconsistent with this law.

SCHEDULE 23

LEGISLATIVE OUTLINE – GHANA

PART I
CORPORATE MATTERS

1. LOCAL INCORPORATION

The Company

1.1 The Company shall be entitled to carry out and perform the functions contemplated for it by the terms of this Agreement in its own right, and shall not be required to incorporate a subsidiary in Ghana or conduct its operations in Ghana through a subsidiary by reason only of:

(a) the grant or exercise of the Project Rights or the Project Authorisations;

(b) the establishment in Ghana of a place of business for the purpose of the Project; or

(c) the implementation of the Project.

Shippers and Buyers

1.2 Any Shipper or Buyer who in Ghana:

(a) acquires natural gas for transmission through the Pipeline System; or

(b) contracts with the Company to transport natural gas through the Pipeline System; or

(c) contracts with another person to transport natural gas through other pipeline facilities to the Pipeline System,

may do so in its own right and shall not be required to incorporate and/or act through a subsidiary in Ghana by reason only of that acquisition or transmission.

Other Persons

1.3 Any person who in Ghana, either on its own behalf or on behalf of another person:

(a) offers for sale or promotes the sale of or sells natural gas to be transported through the Pipeline System; or

(b) delivers gas through the Pipeline System,

may do so in its own right and shall not be required to incorporate and/or act through a subsidiary in Ghana by reason only of that activity.

2. TREATMENT AS A FOREIGN OR EXTERNAL CORPORATION

Provision of information on registration

2.1 Upon registration as an external company, in accordance with Section 303 of the Companies Code, the Company shall provide to the Companies Registrar the following information:

(a) The name of the Company;

(b) its country of incorporation, its registration number and the identity of the register in its country of incorporation;

(c) the address of its registered office in its country of incorporation;

(d) copies of its constitutional documents;

(e) details of its directors and secretaries;

(f) the amount of its authorised and issued share capital;

(g) the address of any office of the Company within Ghana; and

(h) the name and address of all persons resident in Ghana who are authorised to accept service on behalf of the Company in respect of the business of the branch.

Ongoing filing obligations

2.2 When registered under Section 303 of the Companies Code, the Company shall not be required to comply with any reporting and filing requirements under any other law, but shall comply with the following reporting and filing requirements:

(a) The Company shall within 28 days of the change occurring, notify the Companies Registrar of any change to the information notified under paragraph 2.1 above.

(b) The Company shall within 6 months of the end of each Tax Year prepare and submit to the Companies Registrar audited financial reports prepared in accordance with paragraph 3.2 below.

Share Transfers

2.3 Any restrictions under the law of Ghana that would otherwise operate to restrict the transfer of shares in the Company, shall not apply to any transfers by the Shareholder. No transfers of shares in the Company or ownership of a Shareholder shall give rise to any right to revoke a Project Authorisation or Project Right or amend the terms or conditions thereof.

Charges

2.4 If the Company creates a mortgage, charge or other security interest over property situated in Ghana, the Company or the holder of the security interest may register the charge with the Companies Registrar, or with any other appropriate registry in the same manner as a company incorporated in Ghana.

3. ACCOUNTS AND FINANCIAL INFORMATION

Currency of accounts

3.1 The Company and any of its branches, places of business or subsidiaries in Ghana shall have no obligation to maintain accounts in Ghanaian cedis.

Financial reports

3.2 All financial reports to be prepared and submitted by the Company or any subsidiaries to any applicable authorities in Ghana shall be prepared in US dollars in accordance with the Accounting Principles.

Branch accounts

3.3 The Company shall have no obligation to prepare or maintain or file branch accounts in respect of its branches, places of business or subsidiaries in Ghana or in respect only of its activities in Ghana.

PART II
THE WAGP AUTHORITY

4. THE WAGP AUTHORITY

Grant of power and authority

4.1 The WAGP Authority shall have the power and authority to perform the functions assigned to it under the WAGP Treaty, and to monitor compliance by the Company with, and to exercise the powers conferred on it under, the WAGP Regulations.

Reporting and monitoring of the WAGP Authority

4.2 The WAGP Authority shall report to, and be subject to the direction of, the Relevant Ministers. The Relevant Ministers shall receive reports prepared by the WAGP Authority, monitor the performance by the WAGP Authority of its functions and compliance with its obligations, direct the WAGP Authority and meet from time to time for the purpose of the foregoing. The Relevant Ministers shall determine their own procedures for making decisions and giving directions in relation to the WAGP Authority.

Reliance on WAGP Authority actions and authorisations

4.3 The Company and each Buyer, Seller and Shipper shall be entitled to act in reliance on the exercise by the WAGP Authority of the powers conferred upon it by this law and/or the WAGP Regulations. Ghana shall be bound by the WAGP Authority's actions and decisions to the extent of the powers conferred upon it by this law and/or the WAGP Regulations.

Funding of the WAGP Authority

4.4 The consolidated revenue of Ghana shall be charged with the share of the operating costs of the WAGP Authority attributable to Ghana, in accordance with the WAGP Treaty.

PART III
LICENSING

5. PIPELINE LICENCES

Requirement for Pipeline Licence

5.1 The Company shall not construct or operate the Pipeline System except pursuant to a licence granted under this Part.

Minister may grant Pipeline Licence

5.2 The Relevant Minister may grant to the Company a licence to construct and operate the Pipeline System. A licence may be granted hereunder in respect of any part of Ghana including any section of the seabed offshore of Ghana.

Application for Pipeline Licence

5.3 An application for the grant of a licence under this Part may be made in such form, and shall contain such information, and shall be processed in accordance with such procedures, as may be specified in the WAGP Regulations or agreed between the Company and Ghana.

Grant of licence subject to conditions

5.4 The Relevant Minister may grant a licence under this Part subject to the conditions set out in respect of that licence in the Approved Pipeline Development Plan.

Amendments to licence conditions

5.5 The Relevant Minister may modify the terms and conditions of a licence granted under this Part, in accordance with modifications agreed in the Approved Pipeline Development Plan.

Duration of licence

5.6 A licence granted under this Part may be granted for a period of up to 50 years.

Renewal of licence

5.7 A licence granted under this Part may be renewed by the Relevant Minister on application by the Company.

Rights conferred by licence

5.8 Subject to this law, a licence granted under this Part shall confer upon the Company the following rights:

(a) To enter upon, take non-exclusive possession of and use a strip of land or seabed or subsoil of a width specified in the Approved Pipeline Development Plan either side of the route specified in the Approved Pipeline Development Plan and thereon, thereover or thereunder to construct, maintain and operate the Pipeline System;

(b) To construct, maintain and operate on that strip of land all other installations that are ancillary to the construction, maintenance and operation of the Pipeline System, including roadways, telephone and telegraph lines, fibre optic cables, electric power cables, compression stations, storage facilities and such other ancillary installations as are identified in the Approved Pipeline Development Plan;

(c) To dig and get, free of charge, any gravel, sand, clay, stone, or other similar substance within any land included within the area covered by the licence; and

(d) To enter onto any land, whether or not covered by the terms of the licence, as is necessary to construct, make safe, repair and/or replace the Pipeline System.

Approval to operate

5.9 The Company shall not commence the commissioning or operation of the Pipeline System, or any newly installed part thereof, without an Approval to Operate being given by the WAGP Authority. The WAGP Authority shall have the power to grant an Approval to Operate. The Company and the WAGP Authority shall follow such procedures as may be agreed in applying for and processing an application for an Approval to Operate.

No other licence needed

5.10 Except as set out in this Part, no other licence or permit or authorisation shall be required by the Company or any Project Contractor for the construction and operation of the Pipeline System.

6. OTHER LICENCES

Transmission, export or import of natural gas

6.1 No transit, export or import permit, licence or other authorisation shall be required by the Company, a Buyer, a Seller or a Shipper for:

(a) the export of natural gas from Ghana by means of the Pipeline System;

(b) the transit of natural gas through Ghana by means of the Pipeline System; or

(c) the import of natural gas into Ghana by means of the Pipeline System.

Dealings in natural gas transported: Shippers and Buyers

6.2 Any Shipper or Buyer who:

(a) acquires natural gas in Ghana for transmission through the Pipeline System; or

(b) ships natural gas through the Pipeline System; or

(c) ships natural gas through other pipeline facilities to the Pipeline System,

shall not be required to obtain any licence or permit by reason only of that acquisition or transmission.

Dealings in natural gas transported: Other Persons

6.3 Any person who in Ghana (either on its own behalf or on behalf of another person):

(a) offers for sale or promotes the sale of or sells natural gas to be transported through the Pipeline System; or

(b) delivers gas through the Pipeline System,

shall not be required to obtain any licence or permit by reason only of that offer, promotion, sale or delivery.

Emergency restrictions

6.4 The transmission of natural gas through Ghana or across its territorial boundaries shall not be restricted other than in the event of a national emergency declared by the Legislature in accordance with the Constitution. Upon the cessation of such national emergency, any restrictions placed on the transmission of natural gas through Ghana or across its territorial boundaries shall cease.

PART IV
WAGP REGULATIONS

7. THE WAGP REGULATIONS

Power to develop, adopt and implement

7.1 The Relevant Minister may adopt and implement, as delegated legislation, the WAGP Regulations.

Regulations to be harmonised

7.2 Regulations adopted by the Relevant Minister hereunder, including any amendments or supplements thereto, shall be:

(a) Consistent with similar regulations adopted in Benin, Nigeria and Togo; and

(b) consistent with the WAGP Treaty.

Power to administer and apply WAGP Regulations

7.3 The WAGP Authority shall have exclusive competence to administer and enforce the WAGP Regulations in Ghana.

WAGP Regulations exclusive

7.4 In respect of the subject matter identified in Schedule 6, the Pipeline System and the Company will be regulated exclusively by the WAGP Regulations in Ghana to the exclusion of any other laws or regulations that would otherwise apply to the Pipeline System and/or the Company in respect of that subject matter.

Power to amend and supplement

7.5 The Relevant Minister may amend or supplement the WAGP Regulations to the extent such amendment or supplement is consistent with this law and with the obligations of Ghana under the WAGP Treaty.

PART V
FINANCIAL MATTERS

8. AGREED FISCAL REGIME

[Provisions applying the Agreed Fiscal Regime as law in Ghana.]

9. FOREIGN CURRENCY ARRANGEMENTS

9.1 [Provisions applying the Exchange Control Regime as law in Ghana.]

9.2 The Volta River Authority shall be entitled (solely in connection with the Project or the transportation of natural gas in, and/or the sale of natural gas

transported or to be transported through, the Pipeline System, or the provision of security for their obligations under agreements in respect of the foregoing) to:

(a) pay N-Gas offshore in Foreign Currency; and

(b) issue letters of credit in Foreign Currency.

10. AUTHORITY, SECURITY AND GUARANTEES

Authority of Volta River Authority

10.1 The Volta River Authority is entitled to enter into, and to undertake the commitments by it in, any agreement relating to the Project to which it is a party.

Security from Volta River Authority

10.2 In addition to the provisions of section 22(3) of the Volta River Development Act 1961, the Volta River Authority may charge its assets, undertakings and revenues as security for the performance of its payment obligations under any agreement relating to the Project to which it is a party and may do all other things necessary for or incidental to the creation of such security. Any such charge shall be capable of registration with the Companies Registrar.

Guarantee

10.3 In the name of, and on behalf of Ghana, the President may in writing guarantee the performance by the Volta River Authority of its undertakings under any agreement relating to the Project to which it is a party. Moneys payable under such guarantee shall be charged to the Consolidated Fund.

Immunity

10.4 On behalf of themselves and their respective assets and revenues, Ghana and the Volta River Authority unconditionally waive any immunity from suit, execution or other legal process in connection with any actions or proceedings to obtain or enforce an arbitral award in relation to the Project subject to the exceptions contained in the Commercial Agreements to which it is a party. The amount of any award obtained against the Volta River Authority under a dispute resolution procedure in any agreement to the Project to which it is a party will constitute conclusive evidence of the existence and amount of the claim against it.

PART VI
COMPENSATION

11. COMPENSATION

11.1 The consolidated revenue of Ghana will be charged with any payments which are required to be made by Ghana under this Agreement.

PART VII
ENVIRONMENTAL

12. ENVIRONMENTAL

Company

12.1 Neither the Company, nor any of its Shareholders, their Affiliates, the Company's lenders or the Project Contractors shall have any liability in respect of any environmental damage that was not directly caused by the Project Activities. Any environmental damage or other circumstances identified in the environmental baseline study shall be conclusively deemed to have existed prior to the commencement of the Project Activities and not to have been caused by these parties.

Buyers, Sellers and Shippers

12.2 No Buyer, Seller or Shipper shall have any liability in respect of environmental damage that was not directly caused by its activities.

PART VIII
MISCELLANEOUS

13. MISCELLANEOUS

Access to Pipeline System

13.1 The Relevant Minister may, upon receipt of a notice from the WAGP Authority given in accordance with Article 5(1)(17) of Schedule 1 of the WAGP Treaty, adopt regulations requiring as a matter of law that the Company comply with the provisions of the Access Code.

Electricity/Telecommunications

13.2 The Company may construct, own and operate:

(a) an electricity generating plant [not exceeding [_____] MW in size] as part of the Pipeline System, subject to relevant provisions of [*identify relevant statute*];

(b) such communication facilities as are necessary to implement the Project.

Anti-trust Issues

13.3 Subject to paragraph 2 above, nothing done by:

(a) the Company pursuant to the terms of this Agreement; or

(b) a Shipper in delivering natural gas to Ghana; or

(c) a Buyer in acquiring natural gas for delivery into or accepting delivered natural gas in Ghana; or

(d) the Shareholders in relation to the formation of the Company; or

(e) the shareholders or members of any group or consortium forming a Buyer or Seller or Shipper,

shall constitute a breach of any law prohibiting or restricting any person from acting in concert or combination in relation to competition in a market or the fixing of prices.

13.4 Except in relation to conduct specifically contemplated in this Agreement or the Access Code, paragraph 14.3 does not permit or authorise unreasonable discrimination against Buyers or Shippers, or conduct by the Company, a Buyer, a Seller or a Shipper which constitutes the abuse of a dominant market position.

Title and ownership

13.5 The Pipeline System when placed in, under or over land, in accordance with the terms of the licence, shall remain the property of the Company notwithstanding a suspension, termination, cancellation or expiry of the licence. No third party may acquire an ownership interest in the Pipeline System merely by the fact of its situation in, under or over land in which that third party has an interest.

PART IX
DEROGATIONS/DISAPPLICATION OF EXISTING LAWS

14. DEROGATIONS/DISAPPLICATIONS OF EXISTING LAWS

14.1 The following laws shall not apply to the Company, or to other persons in respect of the Project:

(a) The Energy Commission Act 1997

(b) Maritime Authority Act

(c) Investment Centre Promotion Act

(d) Exchange Control Act 1961 and all regulations developed thereunder.

14.2 The laws of Ghana not expressly referred to above shall be deemed amended (for the purpose only of the Project) to the extent inconsistent with this law.

SCHEDULE 24

LEGISLATIVE OUTLINE – NIGERIA

PART I
CORPORATE MATTERS

1. LOCAL INCORPORATION

The Company

1.1 The Company shall be entitled to carry out and perform the functions contemplated for it by the terms of this Agreement in its own right, and shall not be required to incorporate a subsidiary in Nigeria or conduct its operations in Nigeria through a subsidiary by reason only of:

(a) the grant or exercise of the Project Rights or the Project Authorisations;

(b) the establishment in Nigeria of a place of business for the purpose of the Project; or

(c) the implementation of the Project.

Shippers and Buyers

1.2 Any Shipper or Buyer who in Nigeria:

(a) acquires natural gas for transmission through the Pipeline System; or

(b) contracts with the Company to transport natural gas through the Pipeline System; or

(c) contracts with another person to transport natural gas through other pipeline facilities to the Pipeline System,

may do so in its own right and shall not be required to incorporate and/or act through a subsidiary in Nigeria by reason only of that acquisition or transmission.

Other Persons

1.3 Any person who in Nigeria, either on its own behalf or on behalf of another person:

(a) offers for sale or promotes the sale of or sells natural gas to be transported through the Pipeline System; or

(b) delivers gas through the Pipeline System,

may do so in its own right and shall not be required to incorporate and/or act through a subsidiary in Nigeria by reason only of that activity.

2. TREATMENT AS A FOREIGN OR EXTERNAL CORPORATION

Registration

2.1 The Company may establish a legal presence in Nigeria and shall be exempted, in accordance with Section 56 of the Companies and Allied Matters Act, from the requirement to incorporate as a separate entity..

Provision of information on registration

2.2 Despite its status as an unregistered company, the Company shall provide to the Registrar of Companies the following information:

(a) The name of the Company;

(b) its country of incorporation, its registration number and the identity of the register in its country of incorporation;

(c) the address of its registered office in its country of incorporation;

(d) copies of its constitutional documents;

(e) details of its directors and secretaries;

(f) the amount of its authorised and issued share capital;

(g) the address of any office of the Company within Nigeria; and

(h) the name and address of all persons resident in Nigeria who are authorised to accept service on behalf of the Company in respect of the business of the branch.

Ongoing filing obligations

2.3 When exempted in accordance with paragraph 2.1 above, the Company shall not be required to comply with any reporting and filing requirements under any other law, but shall comply with the following reporting requirements:

(a) The Company shall within 28 days of the change occurring, notify the Registrar of Companies of any change to the information notified under paragraph 2.2 above.

(b) The Company shall within 6 months of the end of each Tax Year prepare and submit to the Registrar of Companies audited financial reports prepared in accordance with paragraph 3.2 below.

Share Transfers

2.4 Any restrictions under the law of Nigeria that would otherwise operate to restrict the transfer of shares in the Company, shall not apply to any transfers by the Shareholder. No transfers of shares in the Company or ownership of a Shareholder

shall give rise to any right to revoke a Project Authorisation or Project Right or amend the terms or conditions thereof.

Charges

2.5 If the Company creates a mortgage, charge or other security interest over property situated in Nigeria, the Company or the holder of the security interest may register the charge with the Registrar of Companies, or with any other appropriate registry in the same manner as a company incorporated in Nigeria.

3. ACCOUNTS AND FINANCIAL INFORMATION

Currency of accounts

3.1 The Company and any of its branches, places of business or subsidiaries in Nigeria shall have no obligation to maintain accounts in the currency of Nigeria.

Financial reports

3.2 All financial reports to be prepared and submitted by the Company or any subsidiaries to any applicable authorities in Nigeria shall be prepared in US dollars in accordance with the Accounting Principles.

Branch accounts

3.3 The Company shall have no obligation to prepare or maintain or file branch accounts in respect of its branches, places of business or subsidiaries in Nigeria or in respect only of its activities in Nigeria.

PART II
THE WAGP AUTHORITY

4. THE WAGP AUTHORITY

Grant of power and authority

4.1 The WAGP Authority shall have the power and authority to perform the functions assigned to it under the WAGP Treaty, and to monitor compliance by the Company with, and to exercise the powers conferred on it under, the WAGP Regulations.

Reporting and monitoring of the WAGP Authority

4.2 The WAGP Authority shall report to, and be subject to the direction of, the Relevant Ministers. The Relevant Ministers shall receive reports prepared by the WAGP Authority, monitor the performance by the WAGP Authority of its functions and compliance with its obligations, direct the WAGP Authority and meet from time to time for the purpose of the foregoing. The Relevant Ministers shall determine their own procedures for making decisions and giving directions in relation to the WAGP Authority.

Reliance on WAGP Authority actions and authorisations

4.3 The Company and each Buyer, Seller and Shipper shall be entitled to act in reliance on the exercise by the WAGP Authority of the powers conferred upon it by this law and/or the WAGP Regulations. The Government of Nigeria shall be bound by the WAGP Authority's actions and decisions to the extent of the powers conferred upon it by this law and/or the WAGP Regulations.

Funding of the WAGP Authority

4.4 The consolidated revenue of Nigeria shall be charged with the share attributable to Nigeria, in accordance with the WAGP Treaty, of the operating costs of the WAGP Authority.

PART III
LICENSING

5. PIPELINE LICENCES

Requirement for Pipeline Licence

5.1 The Company shall not construct or operate the Pipeline System except pursuant to a licence granted by the Minister of Petroleum Resources in accordance with the provisions of the Oil Pipelines Act

Requirement for Building Permit

5.2 The Company shall not construct the Pipeline System except pursuant to a building permit granted by the Town and County Planning Department.

Duration of licence

5.3 For the purposes of the Project, a licence granted under the Oil Pipelines Act may be granted for a period of up to 50 years.

Mortgage of Licence

5.4 The Company may create a mortgage over the oil pipeline licence.

Renewal of licence

5.5 A licence granted under this Part may be renewed by the Relevant Minister on application by the Company.

Rights conferred by licence

5.6 A licence granted under this Part shall confer upon the Company the following rights:

(a) To enter upon, take non-exclusive possession of and use a strip of land or seabed or subsoil of a width specified in the Approved Pipeline Development

Plan either side of the route specified in the Approved Pipeline Development Plan and thereon, thereover or thereunder to construct, maintain and operate the Pipeline System;

(b) To construct, maintain and operate on that strip of land all other installations that are ancillary to the construction, maintenance and operation of the Pipeline System, including roadways, telephone and telegraph lines, fibre optic cables, electric power cables, compression stations, storage facilities and such other ancillary installations as are identified in the Approved Pipeline Development Plan;

(c) To dig and get, free of charge, any gravel, sand, clay, stone, or other similar substance within any land included within the area covered by the licence; and

(d) To enter onto any land, whether or not covered by the terms of the licence, as is necessary to construct, make safe, repair and/or replace the Pipeline System.

Approval to operate

5.7 The Company shall not commence the commissioning or operation of the Pipeline System, or any newly installed part thereof, without an Approval to Operate being given by the WAGP Authority. The WAGP Authority shall have the power to grant an Approval to Operate. The Company and the WAGP Authority shall follow such procedures as may be agreed in applying for and processing an application for an Approval to Operate.

No other licence needed

5.8 Except as set out in this Part, no other licence or permit or authorisation shall be required by the Company or any Project Contractor for the construction and operation of the Pipeline System.

6. OTHER LICENCES

Transmission, export or import of natural gas

6.1 No transit, export or import permit, licence or other authorisation shall be required by the Company, a Buyer, a Seller or a Shipper for:

(a) the export of natural gas from Nigeria by means of the Pipeline System;

(b) the transit of natural gas through Nigeria by means of the Pipeline System; or

(c) the import of natural gas into Nigeria by means of the Pipeline System.

Dealings in natural gas transported: Shippers and Buyers

6.2 Any Shipper or Buyer who:

(a) acquires natural gas in Nigeria for transmission through the Pipeline System; or

(b) ships natural gas through the Pipeline System; or

(c) ships natural gas through other pipeline facilities to the Pipeline System,

shall not be required to obtain any licence or permit by reason only of that acquisition or transmission.

Dealings in natural gas transported: Other Persons

6.3 Any person who in Nigeria (either on its own behalf or on behalf of another person):

(a) offers for sale or promotes the sale of or sells natural gas to be transported through the Pipeline System; or

(b) delivers gas through the Pipeline System,

shall not be required to obtain any licence or permit by reason only of that offer, promotion, sale or delivery.

Emergency restrictions

6.4 The transmission of natural gas through Nigeria or across its territorial boundaries shall not be restricted other than in the event of a national emergency declared by the Legislature in accordance with the Constitution. Upon the cessation of such national emergency, any restrictions placed on the transmission of natural gas through Nigeria or across its territorial boundaries shall cease.

PART IV
WAGP REGULATIONS

7. THE WAGP REGULATIONS

Power to develop, adopt and implement

7.1 The Relevant Minister may adopt and implement, as delegated legislation, the WAGP Regulations.

Regulations to be harmonised

7.2 Regulations adopted by Relevant Minister hereunder, including any amendments or supplements thereto, shall be:

(a) Consistent with similar regulations adopted in Benin, Ghana and Togo; and

(b) consistent with the WAGP Treaty.

Power to administer and apply WAGP Regulations

7.3 The WAGP Authority shall have exclusive competence to administer and enforce the WAGP Regulations in Nigeria.

WAGP Regulations exclusive

7.4 In respect of the subject matter identified in Schedule 6, the Pipeline System and the Company will be regulated exclusively by the WAGP Regulations in Nigeria to the exclusion of any other laws or regulations in Nigeria that would otherwise apply to the Pipeline System and/or the Company in respect of that subject matter.

Power to amend and supplement

7.5 The Relevant Minister may amend or supplement the WAGP Regulations to the extent such amendment or supplement is consistent with this law and with the obligations of Nigeria under the WAGP Treaty.

PART V
FINANCIAL MATTERS

8. AGREED FISCAL REGIME

[Provisions applying the Agreed Fiscal Regime as law in Nigeria.]

9. FOREIGN CURRENCY ARRANGEMENTS

[Provisions applying the Exchange Control Regime as law in Nigeria.]

10. SECURITY AND GUARANTEES

Authority of Nigerian National Petroleum Corporation

10.1 The Nigerian National Petroleum Corporation is entitled to enter into, and to undertake the commitments undertaken by it in, the Commercial Agreements to which it is a party.

Security over assets

10.2 In addition to the provisions of section 2 of the Nigerian National Petroleum Corporation (Projects) Decree 1993, the Nigerian National Petroleum Corporation and any of its subsidiaries may charge such of their assets, revenues and accounts as are set aside for the Project as security for the performance of their obligations under any agreement relating to the Project to which they are a party.

Guarantee

10.3 In the name of, and on behalf of, Nigeria, the President may, in writing, guarantee the performance by Nigerian National Petroleum Corporation of its undertakings under any agreement relating to the Project to which it is a party.

Immunity

10.4 On behalf of themselves and their respective assets and revenues, Nigeria and the Nigerian National Petroleum Corporation unconditionally waives any immunity from suit, execution or other legal process in connection with any actions or

proceedings to obtain or enforce an arbitral award in relation to the Project subject to the exceptions contained in the Commercial Agreements to which the Nigerian National Petroleum Corporation is a party. The amount of any reward obtained against Nigeria or the Nigerian National Petroleum Corporation under a dispute resolution procedure in an agreement relating to the Project to which it is a party will constitute conclusive evidence of the existence and amount of the claim against it.

PART VI
COMPENSATION

11. COMPENSATION

11.1 The consolidated revenue of Nigeria shall be charged with any payments which are required to be made by Nigeria under this Agreement.

PART VII
ENVIRONMENTAL

12. ENVIRONMENTAL

Company

12.1 Neither the Company, nor any of its Shareholders, their Affiliates, the Company's lenders or the Project Contractors shall have any liability in respect of any environmental damage that was not directly caused by the Project Activities. Any environmental damage or other circumstances identified in the environmental baseline study shall be conclusively deemed to have existed prior to the commencement of the Project Activities and not to have been caused by these parties.

Buyers, Sellers and Shippers

12.2 No Buyer, Seller or Shipper shall have any liability in respect of environmental damage that was not directly caused by its activities.

PART VIII
MISCELLANEOUS

13. MISCELLANEOUS

Access to Pipeline System

13.1 The Relevant Minister may, upon receipt of a notice from the WAGP Authority given in accordance with Article 5(1)(17) of Schedule 1 of the WAGP Treaty, adopt regulations requiring as a matter of law that the Company comply with the provisions of the Access Code.

Electricity/Telecommunications

13.2 The Company may construct, own and operate:

(a) an electricity generating plant [not exceeding [_____] MW in size] as part of the Pipeline System, subject to relevant provisions of the Electricity Act;

(b) such communication facilities as are necessary to implement the Project.

Anti-trust Issues

13.3 Subject to paragraph 2 above, nothing done by:

(a) the Company pursuant to the terms of this Agreement; or

(b) a Shipper in delivering natural gas to Nigeria; or

(c) a Buyer in acquiring natural gas for delivery into or accepting delivered natural gas in Nigeria; or

(d) the Shareholders in relation to the formation of the Company; or

(e) the shareholders or members of any group or consortium forming a Buyer or Seller or Shipper,

shall constitute a breach of any law prohibiting or restricting any person from acting in concert or combination in relation to competition in a market or the fixing of prices.

13.4 Except in relation to conduct specifically contemplated in this Agreement or the Access Code, paragraph 14.3 does not permit or authorise unreasonable discrimination against Buyers or Shippers, or conduct by the Company, a Buyer, a Seller or a Shipper which constitutes the abuse of a dominant market position.

Title and ownership

13.5 The Pipeline System when placed in, under or over land, in accordance with the terms of the licence, shall remain the property of the Company, notwithstanding a suspension, termination, cancellation or expiry of the licence. No third party may acquire an ownership interest in the Pipeline System merely by the fact of its situation in, under or over land in which that third party has an interest.

PART IX
DEROGATIONS/DISAPPLICATION OF EXISTING LAWS

14. DEROGATIONS/DISAPPLICATIONS

14.1 The following laws shall not apply to the Company, or to other persons in respect of the Project:

(a) Section 18 of the Oil Pipelines Act Cap. 338.

(b) The Petroleum Act and the Export (Incentives and Miscellaneous) Act (cap 118 of 1990)

(c) Wireless Telegraphy Act (Cap 469)

(d) Nigerian Investments Promotion Commission Act 1995

(e) Investment and Securities Decree

14.2 The law s of Nigeria not expressly referred to above shall be deemed amended (for the purposes only of the Project) to the extent inconsistent with this law.

SCHEDULE 25

LEGISLATIVE OUTLINE – TOGO

PART I
CORPORATE MATTERS

1. LOCAL INCORPORATION

Shippers and Buyers

1.1 Any Shipper or Buyer who in Togo:

(a) acquires natural gas for transmission through the Pipeline System; or

(b) contracts with the Company to transport natural gas through the Pipeline System; or

(c) contracts with another person to transport natural gas through other pipeline facilities to the Pipeline System,

may do so in its own right and shall not be required to incorporate and/or act through a subsidiary in Togo by reason only of that acquisition or transmission.

Other Persons

1.2 Any person who in Togo, either on its own behalf or on behalf of another person:

(a) offers for sale or promotes the sale of or sells natural gas to be transported through the Pipeline System; or

(b) delivers gas through the Pipeline System,

may do so in its own right and shall not be required to incorporate and/or act through a subsidiary in Togo by reason only of that activity.

2. TREATMENT AS A FOREIGN CORPORATION

Registration

2.1 The Company may establish a legal presence in Togo by registering as a branch of a foreign corporation with the Régistre du Commerce et du Crédit Mobilier in Lomé (***the Registrar***).

Provision of information on registration

2.2 Upon registration in accordance with paragraph 2.1 above, the Company shall provide to the Registrar the following information (in such number of copies as may be required by the Registrar):

(a) The name of the Company;

(b) its country of incorporation, its registration number and the identity of the register in its country of incorporation;

(c) the address of its registered office in its country of incorporation;

(d) copies of its constitutional documents;

(e) details of its directors and secretaries;

(f) the amount of its authorised and issued share capital;

(g) the address of any office of the Company within Togo; and

(h) the name and address of all persons resident in Togo who are authorised to accept service on behalf of the Company in respect of the business of the branch.

Ongoing filing obligations

2.3 When registered in accordance with paragraph 2.1 above, the Company shall not be required to comply with any reporting and filing requirements under any other law, but shall comply with the following reporting and filing requirements:

(a) The Company shall within 28 days of the change occurring, notify the Registrar of any change to the information notified under paragraph 2.2 above.

(b) The Company shall within 6 months of the end of each Tax Year prepare and submit to the Registrar audited financial reports prepared in accordance with paragraph 3.2 below.

Share transfers

2.4 Any restrictions under the law of Togo that would otherwise operate to restrict the transfer of shares in the Company, shall not apply to any transfers by the Shareholders of shares in the Company or any transfer of ownership of a Shareholder. No transfer of shares in the Company or ownership of a Shareholder shall give rise to any right to revoke a Project Authorisation or Project Right or amend the terms or conditions thereof.

Security over project assets

2.5 A registry shall be created and maintained by the Direction Generale des Mines et de la Geologie, for the purposes of registering title, security interests and all other third party rights over the property and other assets of the Company situated in Togo, including without limitation the Pipeline System and the Pipeline Licence (***WAGP Registry***).

2.6 The Company or a transferee of title from the Company may register on the WAGP Registry its title to all of its property and other assets situated in Togo.

2.7 If the Company creates a mortgage, charge or other security interest over its property situated in Togo, or any other person claims a property or security interest in the property of the Company situated in Togo, the Company or the holder of the security interest or such other person may register the security interest or its claimed rights on the WAGP Registry.

3. ACCOUNTS AND FINANCIAL INFORMATION

Currency of accounts

3.1 The Company and any of its branches, places of business or subsidiaries in Togo shall have no obligation to maintain accounts in the currency of Togo.

Financial reports

3.2 All financial reports to be prepared and submitted by the Company or any subsidiaries to any applicable authorities in Togo shall be prepared in US dollars in accordance with the Accounting Principles.

Branch accounts

3.3 The Company shall have no obligation to prepare or maintain or file branch accounts in respect of its branches, places of business or subsidiaries in Togo or in respect only of its activities in Togo.

PART II
THE WAGP AUTHORITY

4. THE WAGP AUTHORITY

Grant of power and authority

4.1 The Minister having jurisdiction over the matters that the WAGP Authority will be chartered to regulate in Togo shall immediately upon entry into force of this law delegate to the WAGP Authority power and authority to perform the functions assigned to it under the WAGP Treaty in Togo, and to monitor compliance by the Company with, and to exercise the powers conferred on it under, the WAGP Regulations.

Reporting and monitoring of the WAGP Authority

4.2 The WAGP Authority shall report to, and be subject to the direction of, the Relevant Ministers. The Relevant Ministers shall receive reports prepared by the WAGP Authority, monitor the performance by the WAGP Authority of its functions and compliance with its obligations, direct the WAGP Authority, and meet from time to time for the purpose of the foregoing. The Relevant Ministers shall determine their own procedures for making decisions and giving directions in relation to the WAGP Authority.

Reliance on WAGP Authority actions and authorisations

4.3 The Company and each Buyer, Seller and Shipper shall be entitled to act in reliance on the exercise by the WAGP Authority of the powers conferred upon it by this law and/or the WAGP Regulations. Togo shall be bound by the WAGP Authority's actions and decisions to the extent of the powers conferred upon it by this law and/or the WAGP Regulations.

Funding of the WAGP Authority

4.4 The consolidated revenue of Togo shall be charged with the share of the operating costs of the WAGP Authority attributable to Togo in accordance with the WAGP Treaty.

PART III
LICENSING

5. PIPELINE LICENCES

Requirement for Pipeline Licence

5.1 The Company shall not construct or operate the Pipeline System except pursuant to a licence granted under this Part.

Minister may grant Pipeline Licence

5.2 The Relevant Minister may grant to the Company a licence to construct and operate the Pipeline System. A licence may be granted hereunder in respect of any part of Togo including any section of the seabed offshore of Togo.

Application for Pipeline Licence

5.3 An application for the grant of a licence under this Part may be made in such form, and shall contain such information, and shall be processed in accordance with such procedures, as may be specified in the WAGP Regulations or agreed between the Company and Togo.

Grant of licence subject to conditions

5.4 The Relevant Minister may grant a licence under this Part subject to the conditions set out in respect of that licence in the Approved Pipeline Development Plan.

Amendments to licence conditions

5.5 The Relevant Minister may modify the terms and conditions of a licence granted under this Part, in accordance with modifications agreed in the Approved Pipeline Development Plan.

Duration of licence

5.6 A licence granted under this Part may be granted for a period of up to 50 years.

Renewal of licence

5.7 A licence granted under this Part may be renewed by the Relevant Minister on application by the Company.

Rights conferred by licence

5.8 Subject to this law, a licence granted under this Part shall confer upon the Company the following rights:

(a) To enter upon, take non-exclusive possession of and use a strip of land or seabed or subsoil of a width specified in the Approved Pipeline Development Plan either side of the route specified in the Approved Pipeline Development Plan and thereon, thereover or thereunder to construct, maintain and operate the Pipeline System;

(b) To construct, maintain and operate on that strip of land all other installations that are ancillary to the construction, maintenance and operation of the Pipeline System, including roadways, telephone and telegraph lines, fibre optic cables, electric power cables, compression stations, storage facilities and such other ancillary installations as are identified in the Approved Pipeline Development Plan;

(c) To dig and get, free of charge, any gravel, sand, clay, stone, or other similar substance within any land included within the area covered by the licence; and

(d) To enter onto any land, whether or not covered by the terms of the licence, as is necessary to construct, make safe, repair and/or replace the Pipeline System.

Approval to operate

5.9 The Company shall not commence the commissioning or operation of the Pipeline System, or any newly installed part thereof, without an Approval to Operate being given by the WAGP Authority. The WAGP Authority shall have the power to grant an Approval to Operate. The Company and the WAGP Authority shall follow such procedures as may be agreed in applying for and processing an application for an Approval to Operate.

No other licence needed

5.10 Except as set out in this Part, no other licence or permit or authorisation shall be required by the Company or any Project Contractor for the construction and operation of the Pipeline System.

6. OTHER LICENCES

Transmission, export or import of natural gas

6.1 No transit, export or import permit, licence or other authorisation shall be required by the Company, a Buyer, a Seller or a Shipper for:

(a) the export of natural gas from Togo by means of the Pipeline System;

(b) the transit of natural gas through Togo by means of the Pipeline System; or

(c) the import of natural gas into Togo by means of the Pipeline System.

Dealings in natural gas transported: Shippers and Buyers

6.2 Any Shipper or Buyer who:

(a) acquires natural gas in Togo for transmission through the Pipeline System; or

(b) ships natural gas through the Pipeline System; or

(c) ships natural gas through other pipeline facilities to the Pipeline System,

shall not be required to obtain any licence or permit by reason only of that acquisition or transmission.

Dealings in natural gas transported: Other Persons

6.3 Any person who in Togo (either on its own behalf or on behalf of another person):

(a) offers for sale or promotes the sale of or sells natural gas to be transported through the Pipeline System; or

(b) delivers gas through the Pipeline System,

shall not be required to obtain any licence or permit by reason only of that offer, promotion, sale or delivery.

Emergency restrictions

6.4 The transmission of natural gas through Togo or across its territorial boundaries shall not be restricted other than in the event of a national emergency declared by the Legislature in accordance with the Constitution. Upon the cessation of such national emergency, any restrictions placed on the transmission of natural gas through Togo or across its territorial boundaries shall cease.

PART IV
WAGP REGULATIONS

7. THE WAGP REGULATIONS

Power to develop, adopt and implement

7.1 The Relevant Minister may adopt and implement, as delegated legislation, the WAGP Regulations.

Regulations to be harmonised

7.2 Regulations adopted by the Relevant Minister hereunder, including any amendments or supplements thereto, shall be:

(a) Consistent with similar regulations adopted in Benin, Ghana and Nigeria; and

(b) consistent with the WAGP Treaty.

Power to administer and apply WAGP Regulations

7.3 The WAGP Authority shall have exclusive competence to administer and enforce the WAGP Regulations in Togo.

WAGP Regulations exclusive

7.4 In respect of the subject matter identified in Schedule 6, the Pipeline System and the Company will be regulated exclusively by the WAGP Regulations in Togo to the exclusion of any other laws or regulations that would otherwise apply to the Pipeline System and/or the Company in respect of that subject matter.

Power to amend and supplement

7.5 The Relevant Minister may amend or supplement the WAGP Regulations to the extent such amendment or supplement is consistent with this law and with the obligations of Togo under the WAGP Treaty.

PART V
FINANCIAL MATTERS

8. AGREED FISCAL REGIME

[Provisions applying the Agreed Fiscal Regime as law in Togo.]

9. AUTHORITY FOR ARBITRATION AND IMMUNITY

Arbitration

9.1 For the purpose of resolution of disputes arising between Togo and the Company from the application or interpretation of this Agreement, the State shall be

authorised to submit to arbitration of such disputes under ICSID rules, or if ICSID declines jurisdiction, to arbitration conducted under UNCITRAL arbitration rules.

Immunity

9.2 On behalf of themselves and their respective assets and revenues, the State of Togo unconditionally waives any immunity from suit, execution or other legal process in connection with any actions or proceedings to obtain or enforce an ICSID/UNCITRAL arbitral award in relation to the Project subject to the exceptions contained in Clause 44.2 of this Agreement.

PART VI
LAND MATTERS

10. LAND MATTERS

Declaration of Public Interest

10.1 This law and the Pipeline Licence issued in accordance with Section 5 shall include a declaration of public interest in respect of all land, seabed and space above or under the same, as has been determined by the Approved Pipeline Development Plan as required for the construction, laying, operation and maintenance of the Pipeline System.

Public Domain

10.2 Togo or the relevant local authority shall conclude with the Company public domain occupation agreements in respect of all public domain under their jurisdiction that has been determined in the Approved Pipeline Development Plan as being required for the construction, laying, operation and maintenance of the Pipeline System. The public domain occupation agreements shall be concluded for durations at least equivalent to the duration of the Pipeline Licence and shall not be suspended or revoked unless for reasons that have legally justified the revocation of the Pipeline Licence. If the Pipeline Licence is renewed or extended, the public domain occupation agreements shall be extended accordingly. The public domain occupation agreements shall entitle the Company to use, on a non-exclusive basis, the public domain for all purposes contemplated in the Approved Pipeline Development Plan or in this Agreement. The public domain occupation agreements shall be concluded at no cost to the Company.

10.3 To the extent the Approved Pipeline Development Plan provides for the exclusive occupation by the Company of the public domain, for inter alia any compression stations or other buildings, Togo (or the relevant local authority) shall, on the basis of the declaration of public interest, declassify the public domain and transfer the relevant land to the Company free of charge. To the extent any such declassification should not be possible, Togo (or the relevant local authority) shall conclude with the Company a public domain occupation agreement giving the Company exclusive rights of permanent occupation of the relevant land, for the duration and subject to extension in accordance with paragraph 10.2** above, and subject only to the rights of revocation contemplated in paragraph 10.2** above.

Private domain land

10.4 Togo or the relevant local authority shall grant to the Company a public interest easement over all private domain under their jurisdiction that has been determined in the Approved Pipeline Development Plan as being required for the construction, laying, operation and maintenance of the Pipeline System. Such easements shall remain in force for the duration of the Pipeline Licence. The easement deeds shall be established by [notary][the Services des Domaines][the Pipeline Licence shall constitute the easement deed]. The easement deed shall not contain any charge, encumbrance or condition inconsistent with the provisions of this Agreement or the Pipeline Licence.

Private Land

10.5 In the event the Company and the lawful owners or occupants of all private land identified in the Approved Pipeline Development Plan as being required for the construction, laying, operation or maintenance of the Pipeline System do not reach an agreement for the sale to the Company of said land or the granting to the Company of an easement over the said land (as the case may be, depending on the requirements identified in the Approved Pipeline Development Plan), Togo shall, upon written request from the Company, implement an expropriation procedure, on the basis of the declaration of public interest contained in this law, to acquire the relevant real estate ownership or easement rights over the relevant land.

10.6 In the event that Togo does not implement the expropriation procedure within [?] days of receipt of the written request from the Company, the Company shall be authorised to proceed, on the basis of Togo's delegated authority, to expropriate the relevant land.

10.7 Subject to the following adjustments, the expropriation procedures existing in the law shall apply to the expropriations conducted for the account of the Company:

(a) any undisputed expropriation indemnity shall be paid by Togo to the land owner or occupier after the prior posting by the Company of the security deposit with the [services des domaines]. Togo shall transfer ownership of the land or the easement right (as the case may be) upon release of the security deposit to its account;

(b) the Company shall be able to direct Togo to challenge the amount of any expropriation indemnity assessed by the [administrative tribunal]; and

(c) in the event that the land owner or occupier should challenge the amount of the expropriation indemnity, the expropriations court shall be able to authorise Togo to take possession of the land, subject to prior payment of a security deposit to be determined by the judge and to be deposited with a escrow agent appointed by the parties and the Company. In such event, the Company shall be able to require Togo to hand over possession of the land upon payment of the security deposit on behalf of Togo.

10.8 The Company (or its successors and assigns) shall be entitled to on-sell the expropriated land to the extent it is no longer required for the purposes of the Project.

PART VII
COMPENSATION

11. COMPENSATION

11.1 The consolidated revenue of Togo shall be charged with any payments which are required to be made by Togo under this Agreement.

11.2 To the extent permitted by the Constitution, Togo shall use its best efforts, including diplomatic action and all its rights under the treaties to which it is a party, to prevent the adoption of any international treaty, regulation, rule or decision inconsistent with, or likely to adversely affect, the rights, benefits and protections of the Company contemplated in this law, the WAGP Treaty or this Agreement.

PART VIII
ENVIRONMENTAL

12. ENVIRONMENTAL

Company

12.1 Neither the Company, nor any of its Shareholders, their Affiliates, the Company's lenders or the Project Contractors shall have any liability in respect of any environmental damage that was not directly caused by the Project Activities. Any environmental damage or other circumstances identified in the environmental baseline study shall be conclusively deemed to have existed prior to the commencement of the Project Activities and not to have been caused by these parties.

Buyers, Sellers and Shippers

12.2 No Buyer, Seller or Shipper shall have any liability in respect of environmental damage that was not directly caused by its activities.

PART IX
MISCELLANEOUS

13. MISCELLANEOUS

Access to Pipeline System

13.1 The Relevant Minister may, upon receipt of a notice from the WAGP Authority given in accordance with Article 5(1)(17) of Schedule 1 of the WAGP Treaty, adopt regulations requiring as a matter of law that the Company comply with the provisions of the Access Code.

Electricity/Telecommunications

13.2 The Company may construct, own and operate:

(a) an electricity generating plant [not exceeding [_____] MW in size] as part of the Pipeline System, subject to relevant provisions of [*identify relevant statute*];

(b) such communication facilities as are necessary to implement the Project.

Administrative Contracts issues

13.3 This Agreement is a contract of a private nature and not of a public nature, and shall not be treated as an administrative contract. Accordingly:

(a) The project assets are the exclusive property of the Company (or of its successors and assigns) and that they are not, by construction, to be assimilated to public domain property (domaine public artificiel); and

(b) Togo shall not assert any rights, powers or prerogatives that may be derived from the application of internal administrative law to unilaterally decide, enforce, require or assert any of the following actions or rights, except to the extent expressly agreed in this Agreement:

(i) the amendment of any terms of this Agreement;

(ii) the suspension of the performance by the States Togo of its obligations under this Agreement;

(iii) the suspension of the performance by the Company of its rights under this Agreement;

(iv) the termination of this Agreement;

(v) the imposition on the Company of any obligations that are not contemplated by this Agreement;

(vi) the repossession, requisition or placement under administration of the Pipeline System or of any assets of the Company either by way of mise sous séquestre, mise en régie or déchéance;

(vii) the imposition on the Company of uniform tariffs;

(viii) the imposition of any developments or extension of pipeline capacity, or any new investments required to service any requirements not contemplated in the Pipeline Development Plan or to provide access to any customers not contemplated under the Pipeline Development Plan;

(ix) the assertion of any ownership rights over any part of the Pipeline System during the term and beyond the term of this Agreement under any theory of bien de retour, biens de reprise or domaine public artificiel;

(x) the revocation of any rights of the Company to occupy, use or cross the public domain of Togo; and

(xi) the right to bring proceedings against the Company or the right to require the Company to bring proceedings against it in the administrative courts under its jurisdiction.

(xii) the right to enjoin the Company to continue operation of the pipeline (directly or through a substitute operator) after abandonment, if the Ministry of Energy feels it is in the public interest to do so.

Anti-trust Issues

13.4 Subject to paragraph14.5 below, nothing done by:

(a) the Company pursuant to the terms of this Agreement; or

(b) a Shipper in delivering natural gas to Togo; or

(c) a Buyer in acquiring natural gas for delivery into or accepting delivered natural gas in Togo; or

(d) the Shareholders in relation to the formation of the Company; or

(e) the shareholders or members of any group or consortium forming a Buyer or Seller or Shipper,

shall constitute a breach of any law prohibiting or restricting any person from acting in concert or combination in relation to competition in a market or the fixing of prices.

13.5 Except in relation to conduct specifically contemplated in this Agreement or the Access Code, paragraph 14.3 does not permit or authorise unreasonable discrimination against Buyers or Shippers, or conduct by the Company, a Buyer, a Seller or a Shipper which constitutes the abuse of a dominant market position.

Title and ownership

13.6 The Pipeline System when placed in, under or over land, in accordance with the terms of the licence, shall remain the property of the Company, notwithstanding a suspension, termination, cancellation or expiry of the licence. No third party may acquire an ownership interest in the Pipeline System merely by the fact of its situation in, under or over land in which that third party has an interest.

PART X
DEROGATIONS/DISAPPLICATION OF EXISTING LAWS

14. DEROGATIONS/DISAPPLICATION OF EXISTING LAWS

14.1 The following laws shall not apply to the Company, or to other persons in respect of the Project:

(a) Law n.99-003 of 18 February 1999 enacting Hydrocarbons Code

(b) Law No. 99.011 of 28 December 1999

(c) Decret n.88-146 du 5 Septembre 1988

(d) The Law n° 60-26 of 5t August 1960 and its implementing Decree (Decree n° 61.6 of 30 January 1961)

(e) The Investment Code of Togo (Loi 89-22 du 31 octobre 1989) to the extent the new fiscal regime is inconsistent with it.

(f) The Environment Code of Togo (Loi 88-14 du 3 novembre 1988)

(g) Article 16(e) of the Ordonnance du 6 février 1974 fixant le regime foncier et domanial

14.2 The laws of Togo not expressly referred to above shall be deemed amended (for the purpose only of the Project) to the extent inconsistent with this law.

[Draft: 13 September 2002]

THE REPUBLIC OF BENIN
(*Benin*)

THE REPUBLIC OF GHANA
(*Ghana*)

THE FEDERAL REPUBLIC OF NIGERIA
(*Nigeria*)

THE REPUBLICOF TOGO
(*Togo*)

WEST AFRICAN GAS PIPELINE COMPANY
(the *Company*)

WEST AFRICAN GAS PIPELINE INTERNATIONAL PROJECT AGREEMENT

FRESHFIELDS BRUCKHAUS DERINGER

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Release Draft 2
13.9.02

TREATY

CONCERNING THE WEST AFRICAN PIPELINE PROJECT

BETWEEN

THE REPUBLIC OF BENIN

THE REPUBLIC OF GHANA

THE FEDERAL REPUBLIC OF NIGERIA

AND

THE REPUBLIC OF TOGO

CONCERNING THE WEST AFRICAN GAS PIPELINE PROJECT

[Instruments of ratification have not been deposited]

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TREATY
BETWEEN
THE REPUBLIC OF BENIN,
THE REPUBLIC OF GHANA,
THE FEDERAL REPUBLIC OF NIGERIA
AND
THE REPUBLIC OF TOGO
(THE "*STATES PARTIES*")
CONCERNING THE WEST AFRICAN GAS PIPELINE PROJECT (THE "*TREATY*")

The States Parties to the present Treaty

CONFIDENT that a natural gas pipeline will provide a new market for natural gas and expanded sources of energy in the West African Region, will greatly improve the balance of energy requirements and resources in the Region and will further closer relations between the States Parties;

DESIROUS to contribute to the development of relations and exchanges between the Members States Parties of the Economic Community of West African States and to the development of their energy programmes in accordance with Article 28 of the ECOWAS Treaty;

DESIROUS ALSO to permit the construction and operation of a natural gas pipeline by a private enterprise;

RECOGNISING that the laws governing gas pipelines are different in each State Party and have not been designed to apply to an international gas pipeline.

RECOGNISING THEREFORE that the effective and harmonised implementation of the West African Gas Pipeline project will require that each State adopt specific legislation to exclusively govern the West African Gas Pipeline System within its jurisdiction, consistently with the terms of this Treaty, the International Project Agreement and the specific legislation adopted in the other States Parties

***

IT IS THEREFORE AGREED

ARTICLE I
Interpretation

(1) The words and expressions defined below and appearing in this Treaty (including the Annexes hereto) shall have the respective meanings given to them below:

Agreed Fiscal Regime means the harmonised fiscal regime which shall apply in each State Party to determine the tax payable by the Company in respect of its activities, as set out in Schedule 8 of the International Project Agreement.

[***Arbitral Tribunal*** means the arbitral tribunal to be set up to resolve disputes arising hereunder, in accordance with Article X.]

Authority means the West African Gas Pipeline Authority established under Article IV;

the Company means the West African Gas Pipeline Company

Enabling Legislation means such domestic legislation (with primary or subordinate) as may be necessary or expedient to make provisions of this Treaty and of the International Project Agreement fully effective under its domestic law as the prevailing legal regime of each State Party in respect of the West African Gas Pipeline including (without prejudice of the generality of the foregoing) the legislation necessary to give effect to the obligation of the State set out in Article III (3) of this Treaty.

International Project Agreement means the agreement made between the States Parties and the Company of even date with this Treaty and attached hereto as Exhibit 1;

Oversight Committee means the committee to be set up in accordance with Article IV(9) to review the actions of the Authority from time to time.

West African Gas Pipeline (*or WAGP*) means a natural gas pipeline constructed and operated by a private enterprise which shall be laid on or under the land territory and territorial sea of the four States Parties, with the purpose of delivering to Ghana, Togo and Benin natural gas extracted in Nigeria and/or the other States Parties (together with any extension of that pipeline as may be from time to time agreed upon by the States Parties or by the States Parties and any other States Parties.

(2) All other terms and expressions that appear in this Treaty (including in the Annexes hereto) shall have the meaning ascribed to them in the International Project Agreement (or the Schedules attached thereto).

ARTICLE II
General Principles

(1) The States Parties undertake to permit the construction and operation of the West African Gas Pipeline and to take, whether jointly or severally, all such measures as may be necessary or expedient for its construction and operation.

(2) The West African Gas Pipeline shall be developed and operated in accordance with the terms of this Treaty, of any Protocols or other instruments made in pursuance of its provisions[1] and the International Project Agreement.

(3) The West African Gas Pipeline, as more particularly described in the International Project Agreement, shall be a high pressure natural gas pipeline, with associated compression and metering stations and interconnection terminals which in its initial form shall link [the outlet point of the Escravos-Lagos natural gas pipeline at Alagbado (Nigeria)] to Effasu (Ghana) with intermediate outlets in Cotonou (Benin), Lomé (Togo), Tema (Ghana) and Takoradi (Ghana) (together with such further extensions or expansions as the States Parties shall from time to time agree) and in accordance with the Enabling Legislation. The West African Gas Pipeline in its initial form shall transport natural gas to electricity-generating companies and other buyers and users of natural gas in Ghana, Togo and Benin.[2]

ARTICLE III
International, Legislative and Regulatory Measures

(1) The States Parties shall take all measures which may be necessary or appropriate to ensure that the construction and operation of the West African Gas Pipeline shall be consistent with the provisions of any treaties to which they or any of them are parties and with the general principles of international law.

(2) To the extent required under its Constitution, each State Party shall as soon as practicable after signature of this Treaty:-

(i) present this Treaty to its national legislature for ratification and/or acceptance in order to give effect in its domestic law to the obligations incurred by that State Party under its provisions, and

(ii) use its best endeavours to secure any such ratification and/or acceptance.

(3) Each State Party shall promptly and properly take all steps necessary to present drafts of the Enabling Legislation to its domestic legislature and shall use its best endeavours to secure its enactment and implementation. In each State Party, the West African Gas Pipeline

[1] Provides for any future developments without the need to amend the Treaty or call a meeting of the States Parties.
[2] Additional wording accommodates any physical expansion of the pipeline system.

shall be specifically and exclusively governed by the Enabling Legislation .

(4) The Enabling Legislation and/or WAGP Regulations shall grant or delegate to the Authority the powers necessary to enable it to perform the functions assigned to it under this Treaty and, in particular to monitor compliance with, and enforce, the WAGP Regulations. Each State Party shall take all necessary steps to ensure that such powers as the Authority will require to perform its functions under this Treaty and the International Project Agreement are granted or delegated to the Authority in full.

ARTICLE IV
West African Gas Pipeline Authority

Establishment

(1) The States Parties hereby establish the Authority which shall constitute an international institution having the authority to supervise the construction and operation of the West African Gas Pipeline.

(2) The Authority shall in each of the States Parties be recognised as a legal person capable under the laws of that State Party of assuming rights and obligations and of being a party to legal proceedings before the courts of that State Party.

(3) The provisions of Annex I to this Treaty shall apply to the Authority.

Functions and jurisdiction

(4) The Authority shall exercise the functions, and be vested with the powers, contemplated in Annex I of this Treaty and in the WAGP Regulations. Any action or decision of the Authority exceeding its powers under Annex I or the WAGP Regulations or the exercise by the Authority of any functions not contemplated by Annex I of this Treaty or the WAGP Regulations shall not be recognised by any of the States Parties and shall be deprived of any legal effect within their respective legal systems.

(5) The Authority shall have exclusive jurisdiction to exercise the powers and functions contemplated in Annex I of this Treaty and in the WAGP Regulations. The decisions of the Authority shall be immediately and directly applicable in the legal system of each State Party, and each State Party shall accord those decisions a force at least equivalent to that accorded to final decisions of that State Party's highest national authorities having jurisdiction over the subject matter of such decisions. The Company or a WAGP Company will be able to require the Oversight Committee to review the merits of such decisions or their legality with respect to the WAGP Regulations, this Treaty or the Enabling Legislation. The Oversight Committee shall be empowered to set aside the decisions of the Authority found to be inconsistent with this treaty, the Enabling Legislation or the WAGP Regulations.

(6) The actions or decisions of the Authority shall be deemed to have been taken in the name and on behalf of all the States Parties and shall bind all the States Parties to assume in full any obligations or any liabilities to third parties deriving therefrom.

Funding

(7) The costs of the Authority shall be funded primarily from the WAGP Authority Charge to be paid by the users of the West African Gas Pipeline. The States Parties shall ensure at all times, and particularly in the event of any shortfall of the WAGP Authority Charge (irrespective of the reason for such shortfall), that the costs of the Authority in excess of available resources are funded from the States Parties' budget so as to allow the Authority to continue to properly perform its functions. The States Parties shall further ensure that staffing levels and other costs incurred by the Authority are reasonable having regard to the functions of the Authority as contemplated by this Treaty and the WAGP Regulations. The costs of the Authority not covered by the WAGP Authority Charge shall be assumed by the States Parties in proportion to the respective Apportionment Percentage applying to each in accordance with the Agreed Fiscal Regime.

State Support

(8) The States Parties shall procure that the Authority carries out and performs its functions and obligations set out in, and complies in all respects with, the International Project Agreement.

Oversight Committee

(9) It is hereby created an Oversight Committee to review the actions of the Authority. The Oversight Committee shall be composed of the [Ministers of Energy of each State Party][•]. The Oversight Committee shall meet for the follwowing purposes:

(i) to hear administrative appeals from the decisions of the Authority. The Oversight Committee shall have jurisdiction to either set aside or confirm the decisions of the Authority. In the event a decision is set aside, the Oversight Committee shall not be able to substitute its decisions in any matter that is within the exclusive jurisdiction of the Authority.

(ii) appointment, revocation and replacement of the Director General of the Authority;

(iii) give its prior consent to any decisions or actions of the Director General of the Authority contemplated by Article 5(2) of Annex 1;

(iv) exercise a periodic review of the actions of the Director General;

(v) decide to change the location of the headquarters of the Authority;

(vi) approve the funding requirements of the Authority

(10) The decisions of the Oversight Committee shall be taken by a simple majority of

members present or represented. Each member of the Oversight Committee shall have one vote. The Oversight Committee shall convene at the request of any of its members, of the Authority or of the Company. The required quorum shall be two members present. One member shall be able to grant a proxy to another member to vote in its name. The decisions of the Oversight Committee shall be final. The hearing before the Oversight Committee when it adjudicates on any matter contemplated in paragraph (9)(i) shall be public and shall give each party in dispute adequate opportunity to present its case.

Transitional Arrangements

(11) All such functions and powers conferred on the Authority under this Treaty and the International Project Agreement which were previously exercised in each State Party by the Steering Committee established by the States Parties under Article 4.1 of the Heads of Agreement between them dated 5 September 1995 shall cease to be exercised by the Steering Committee in each State Party and shall vest in the Authority as of the date that the Authority is empowered to exercise its authority within the States Parties in accordance with the provisions of this Treaty.

[Records][Immunities][3]

(12) [The premises, archives and records (and all documents belonging to them or held in them) of the Authority shall be inviolable at all times and wherever they may be located.] The Authority and its staff shall enjoy in the territory of each of the States Parties such privileges and immunities as are necessary for the discharge of its functions under this Treaty.

ARTICLE V
Agreed Fiscal Regime, Fiscal Review Board and Fiscal Appeal Tribunal

General

(1) The States Parties hereby agree to, and shall ensure that their respective Tax Authorities shall fully implement, the Agreed Fiscal Regime to the Company and all Applicable Persons.

(2) The States Parties further agree that if the Company or any Applicable Person is dissatisfied with the application of the Agreed Fiscal Regime by any Tax Authorities of the States Parties, the Company or any such Applicable Person shall be entitled to apply for a review of any such decision to a Fiscal Review Board, and beyond to a Fiscal Appeal Tribunal, to be established hereunder.

[3] The alternative wording is the standard UN specialised agency wording – slightly broader than the original draft.

(3) A State Party or State Authority which is aggrieved by or dissatisfied with a decision of the Fiscal Review Board may appeal the decision of the Fiscal Review Board to the Fiscal Appeal Tribunal in accordance with this Article V, provided that, if the matter being appealed is a matter solely relating to Income Tax, then an appeal lies only if all States Parties or the equivalent State Authority in all States Parties joins in the appeal.

Fiscal Review Board

(4) A Fiscal Review Board is hereby established, which shall be constituted [as and when required] to hear all appeals from any final decisions of the Tax Authorities of any State Party in respect of the application of the Agreed Fiscal Regime.

(5) The Fiscal Review Board shall consist of the senior permanent officer of the Tax Authority in each State Party, or any suitably qualified person nominated by that person. Upon a Notice of Appeal, the Fiscal Review Board shall be constituted on the receipt by the Authority of a Notice of Appeal. Each State Party shall procure that its representative on that Fiscal Review Board is duly appointed and duly participates in the hearing and determination of the appeal to that Fiscal Review Board.

(6) Each of the members of the Fiscal Review Board shall in respect of the business of that Fiscal Review Board act solely as a member of the Fiscal Review Board as an independent decision-maker and not as representative of any State Party or of any [State Authority] or other department or agency of any State Party and shall conduct the hearing and determination of the appeal in an independent and impartial manner in accordance with the general principles of international law. Each Appellant and Respondent shall be entitled to a fair and impartial hearing.

(7) The requirements and procedure applying to notices, pre-hearings, hearings, consolidation of appeals, settlement/withdrawal of appeals, the decision of the Fiscal Review Board and all other procedural matters in respect thereof are set out in Annex II to this Treaty. The States Parties shall take all steps necessary to give full effect to, and comply with, the procedural requirements and provisions of Annex II to this Treaty.

Fiscal Appeal Tribunal

(8) A Fiscal Appeal Tribunal is hereby established, which shall be constituted from time to time [as and when necessary] to hear all appeals from any final decisions of the Fiscal Review Board.

(9) The Fiscal Appeal Tribunal shall consist of one judge appointed to the highest court of appeal having jurisdiction in fiscal matters in each State Party and a fifth judge (who shall be the presiding judge) appointed by the President for the time being of ECOWAS, such judge being a judge appointed to the highest court having jurisdiction in fiscal matters in an ECOWAS State other than any of the States Parties. Each member of the Fiscal Appeal Tribunal shall in respect of the Hearing of any appeal from the Fiscal Review Board act solely as a member of the Fiscal Appeal Tribunal as an independent decision-maker and not as a

representative of any State Party or of any [State Authority] or other department or agency of any State Party or, as the case may be, of any ECOWAS State and shall conduct the hearing and determination of the appeal in an independent and impartial manner in accordance with the general principles of international law. Each Appellant and Respondent shall be entitled to a fair and impartial hearing.

(10) The requirements and procedure applying to notices, pre-hearings, hearings, consolidation of appeals, settlement/withdrawal of appeals, the decision of the Fiscal Review Board and all other procedural matters in respect thereof are set out in Annex II to this Treaty. The States Parties shall implement all steps necessary to give full effect to, and comply with, the procedural requirements and provisions of Annex II to this Treaty.

Role of Authority

(11) In relation to all appeals under this Article V, the Authority shall provide the administration of the Fiscal Review Board or the Fiscal Appeal Tribunal, as the case may be. Documents to be served on the Fiscal Review Board or the Fiscal Appeal Tribunal shall be served on the Authority, and documents to be served by the Fiscal Review Board or the Fiscal Appeal Tribunal shall be served by the Authority on their behalf.

States Parties and Authority to facilitate

(12) The States Parties and the Authority shall use their best endeavours to facilitate the process of any appeals under this Article V. Each State shall procure that a representative from that State is duly appointed to the Fiscal Review Board or the Fiscal Appeal Tribunal, as the case may be, and that that person duly participates in the business of the Fiscal Review Board or Fiscal Appeal Tribunal in accordance with this Agreement.

Decisions binding on State Authorities

(13) Subject in the case of the Fiscal Review Board to any appeal to the Fiscal Appeal Tribunal, the decisions of the Fiscal Review Board or the Fiscal Appeal Tribunal shall be binding and immediately enforceable on all State Authorities in all States Parties, pursuant to the rules of enforcement applying to judgments of the highest courts of each State Party having jurisdiction in tax matters.

ARTICLE VI
Project Documentation
(Entire Agreement and Stability)

(1) The States Parties recognise and agree with one another that the West African Gas Pipeline, and the rights and obligations of the States Parties, the Company and the Authority in respect thereof, shall be exclusively governed by this Treaty, the International Project Agreement and the Enabling Legislation of each State, together with the general principles of international law.

(2) The States Parties further recognise and agree with one another that the harmonised and stable application of the International Project Agreement and the Enabling Legislation by all the States Parties, throughout the duration of the International Project Agreement and across all four jurisdictions, is essential to protect the rights and interests of each of the States Parties in maintaining the West African Gas Pipeline as a common source of gas supply and/or as a common means of transport for indigenous gas.

(3) Each State Party therefore hereby agrees and undertakes to the other States Parties that:

(a) it shall fulfil and perform its duties and obligations under the International Project Agreement and the Enabling Legislation;

(b) it shall entirely respect the rights of the Company (and any third parties in respect of which rights are recognised) under the International Project Agreement and the Enabling Legislation;

(c) it shall not (and shall not pass any law or regulation entitling it to) revoke, suspend, amend or terminate the International Project Agreement, or any right of the Company or obligations of such State Party thereunder, by way of unilateral decision (or otherwise) unless specifically entitled to do so under the International Project Agreement or the Enabling Legislation.

(d) it shall not repudiate, terminate or suspend performance of this Treaty for any reasons other than as may be contemplated in this Treaty;

(e) it shall not enter into any treaty or international agreement, promulgate any regulations or take any decisions applying to the Company or the West African Gas Pipeline which is inconsistent with the provisions of this Treaty, the provisions of the International Project Agreement and the Enabling Legislation;

(f) it shall use its best efforts to ensure that its legislature does not pass any laws inconsistent with the provisions of this Treaty, the International Project Agreement or the Enabling Legislation and does not repeal or suspend the application of the Enabling Legislation, and specifically undertakes:

(i) not to propose or present to its legislature for enactment any draft legislation that would restrict, invalidate or disable the legal effect of, the International Project Agreement, the Enabling Legislation or the provisions of this Treaty;

(ii) only to make such proposals to its legislature for the amendment or variation of the Enabling Legislation, either by way of direct amendment or by way of repeal by subsequent inconsistent provision, as have been discussed and agreed with the other States Parties, the Authority and (other than changes to the Fiscal Laws) the Company;

(iii) to co-ordinate the enactment and effectiveness of any such changes as have been agreed in accordance with paragraph (ii) above with the enactment and effectiveness of similar changes to the Enabling Legislation in the other States Parties;

(iv) in the event of any proposal being made within its legislature by persons other than a department, agency or sub-division of the State party to amend the Enabling Legislation other than in accordance with a proposal presented by the State to the State Legislature agreed in accordance with paragraph (ii) above to take all such steps as are available to it to prevent such proposal taking effect in its domestic law or so to amend that proposal that it is in conformity with the terms of the International Project Agreement, the Enabling Legislation and the provisions of this Treaty; and

(v) to procure that all changes made to the Enabling Legislation are made consistently in each State Party, so as to maintain the harmonised investment regime provided for in the International Project Agreement.

(4) Each State acknowledges and agrees with the other States Parties party that in the event of the effectiveness of the Treaty, the International Project Agreement or the Enabling Legislation is affected by any actions or enactments of its government or legislature:

(a) the provisions of the International Project Agreement shall apply to determine any consultative, corrective or compensatory measures to be taken in respect of the Company (and any other party entitled to a remedy thereunder);

(b) the other States Parties (or any of them) having sustained a loss as a result of any such actions or enactments shall be entitled to compensation, which shall be limited to the actual and direct loss sustained by that other State Party and shall exclude any indirect loss or damage. No compensation shall be payable with respect to an interruption or termination of the construction or operation of the West African Gas Pipeline on grounds of national defence [where it serves the defence interests of all the States Parties].

ARTICLE VII
Transit of Natural gas

(1) Each State Party in which natural gas is produced for transportation through the West African Gas Pipeline and/or tendered to the Company for transportation under a Gas Transportation Agreement and each State Party into or through which such natural gas passes in the West African Gas Pipeline hereby consents for the duration of the International Project Agreement to, and shall at all times allow, the export and the transit through the West African Gas Pipeline within its territory or territorial sea of that natural gas without discrimination as to the origin, destination or ownership of that natural gas.

(2) Each State Party shall take the necessary measures to facilitate the transit of natural gas through the West African Gas Pipeline consistently with the principle of freedom of transit in Article 45.2 of the ECOWAS Treaty [and Article 7 of the ECOWAS Energy Protocol] and will observe the general principles of public international law (including, without limitation, the Barcelona Convention and the General Agreement on Tariffs and Trade) in relation to the transit of natural gas across its territory.

(3) No export or transit licence or permit or right shall be required of the Company, a Buyer, Seller or Shipper for the export from or transit through the territory or territorial sea of a State Party of such natural gas in the West African Gas Pipeline.

(4) Each State Party undertakes that any provisions of its domestic law in respect of transport of natural gas and the use of natural gas pipelines shall treat the natural gas in transit through the West African Gas Pipeline in no less favourable a manner than its provisions treat such natural gas originating in or destined for its own market an shall not apply any distinction as to the origin, destination or ownership of such natural gas or discrimination as to pricing on the basis of such distinctions, nor impose any unreasonable delays, restrictions or charges.

(5) A State Party shall not, in the event of a dispute over any matter arising from the transit of natural gas within its territory or territorial sea or across its territorial boundaries interrupt or reduce, permit any entity subject to its jurisdiction or control to interrupt or reduce, or require any entity subject to its jurisdiction or control to interrupt or reduce the existing flow of natural gas prior to the conclusion of the dispute resolution procedures set out in Article IX and X except as specifically provided for in the International Project Agreement.

(6) Each State Party reserves the right, acting in good faith, to restrict by lawful regulation the transit of natural gas within its territory or across its territorial boundaries in the event of a national emergency declared by the legislature of that State in accordance with its constitution. Any such restriction shall be strictly proportionate to the exigencies of the situation. Each State Party acknowledges, consents and agrees that any such restriction shall be in force only for as long as the national emergency requires it to be in force, and thereafter the State Party in question shall take all necessary or appropriate steps to lift any restrictions imposed and assist the Company to restore its operations.

(7) Each State Party acknowledges and agrees with the others that if a State Party takes any action, fails to take any action or suffers or permits the taking of any action or the occurrence of an event which interrupts or otherwise impedes, or threatens to interrupt or impede, the West African Gas Pipeline project, such State Party shall use all lawful and reasonable endeavours to eliminate the threat and rectify any interruption or impediment and promote restoration of all West African Gas Pipeline project activities at the earliest opportunity.

(8) The States Parties shall, in respect of the West African Gas Pipeline, observe the rules and general principles of international law [and of Article 13 of the ECOWAS Energy Protocol] applying to the permissibility and consequences of expropriation, taking of property

or other restrictions to the peaceful enjoyment of property.

ARTICLE VIII
Termination of the International Project Agreement

Upon the termination of the International Project Agreement, whether at the term of the International Project Agreement or prematurely for whatever reason, the rights enjoyed by the Company over the West African Gas Pipeline, including without limitation the pipeline, the pipeline structures and equipment, whether on land or offshore, and all such real property rights and easements required for the construction, operation, maintenance or ownership of the pipeline and pipeline structures and equipment shall remain vested in or otherwise with the Company, and the States Parties expressly relinquish all rights under their domestic laws to take possession or otherwise claim ownership rights over such assets.

ARTICLE IX
[Meeting of the States Parties and]Consultation between States Parties

[(1) The States Parties shall meet every [six (6) months] in order to:-

(a) receive report from the Authority on the operation and implementation of this Treaty and of the International Project Agreement; and

(b) agree any further measures which may be necessary or expedient to achieve the objectives of this Treaty].

The first such meeting of the States Parties shall be convened no more than [3] months after the entry into force of this Treaty.]

[2] Upon the request of any State Party, the States Parties shall consult in good faith:

(a) on any matter relating to the interpretation or implementation of this Treaty, of the Enabling Legislation or of the International Project Agreement;

(b) on the consequences of any measures announced or taken which do or could substantially affect the construction or the operation of the West African Gas Pipeline;

(c) on any action proposed in relation to any rights or obligations of the States Parties under this Treaty, the Enabling Legislation or the International Project Agreement;

(d) on the future use of the West African Gas Pipeline and its continued development and operations, in the event of termination of the International Project Agreement for any reason.

[3] Subject to the provisions of Article XVII, the States Parties shall meet [at least once every [5 years] to review the implementation of this Treaty over the preceding years and shall, as appropriate, consider and adopt any amendments or additional protocols to this Treaty which may be proposed by any of the States Parties in accordance with Article XVI.

ARTICLE X
Dispute Resolution

(1) In the event that any dispute should arise between two or more States Parties from the interpretation or application of this Treaty, the relevant States Parties shall endeavour to settle such dispute in accordance with the procedure set out in Article IX. If the relevant States Parties are not able to reach an agreement within a period of [six(6) months], the dispute shall be referred by any of the parties to the dispute to :

[the ECOWAS Court of Justice, which shall finally resolve the dispute in accordance with the Rules of Procedure of the ECOWAS Court of Justice];

[an Arbitral Tribunal composed of three members, which shall resolve the dispute in accordance with the Permanent Court of Arbitration Optional Rules for Arbitrating Disputes between States Parties. The Appointing Authority shall be the Secretary General of ECOWAS. The seat of the Arbitral Tribunal shall be determined by the Arbitral Tribunal and shall be in a state member of ECOWAS other than any of the States Parties which are parties to the dispute pending before the Arbitral Tribunal. The language of the arbitration shall be both English and French. The proceedings shall be conducted in accordance with the terms of reference of the Arbitral Tribunal. The Arbitral Tribunal shall take decisions by a majority vote. No arbitrator may abstain. The Arbitral Tribunal may at the request of one of the parties to the dispute, interpret its own decisions. Decisions of the Arbitral Tribunal shall be final and binding on the parties to the dispute.

ARTICLE XI
Signature

This Treaty shall be open for signature at [•] from [•] to [•] by the States Parties.

ARTICLE XII
Depositary

This Treaty, of which the English and French texts are equally authentic, shall be deposited in the archives of the Executive Secretary of the Economic Community of West African States

Parties. Duly certified copies will be transmitted by the Executive Secretary the Economic Community of West African States Parties to the Governments of the signatories.

ARTICLE XIII
Ratification and/or Acceptance

This Treaty shall be subject to ratification by the States Parties. Instruments of ratification and/or acceptance shall be deposited with the Depositary.

ARTICLE XIV
Entry into Force

(1) Subject to paragraph (2) of this Article XIV, this Treaty shall enter into force on the [30th] day after the date of deposit of the last instrument of ratification by the States Parties.

(2) The States Parties agree that the obligations contained in Article III(2) and (3) of this Treaty only shall have the effect of creating binding international obligations on each of the States Parties as from the date of signature of this Treaty by that State Party.

(3) For each State other than a State Party which accedes thereto after the deposit of the last instrument of ratification, this Treaty shall enter into force on the [30th] day after the date of deposit by such state of its instrument of accession.

ARTICLE XV
Accession

This Treaty shall be open for accession by States Parties other than the States Parties on terms to be approved by the States Parties, from the date of the deposit of the last instrument of ratification by the States Parties. The instruments of accession of States Parties other than the States Parties shall be deposited with the Depositary.

ARTICLE XVI
Amendment and Review

(1) Subject to the restrictions contemplated in Article VI(3), any State Party may propose to the depositary an amendment to this Treaty, which shall be considered by the States Parties at a meeting arranged in accordance with Article IX.

(2) The text of any amendments shall be adopted by unanimous decision of the States Parties to this Treaty.

(3) Any amendment to this Treaty which is adopted by the States Parties shall enter into force upon the receipt by the depositary of the instruments of ratification, acceptance or approval by all of the States Parties, or on such later date as may be specified in the amendment.

(4) The depositary shall notify all of the States Parties of the entry into force of an amendment.

ARTICLE XVII
Termination and Withdrawal

(1) The States Parties shall be entitled to terminate or withdraw from this Treaty only upon or after the term of the International Project Agreement, unless the International Project Agreement is terminated earlier in accordance with Clause 38 of the International Project Agreement.

(2) In the event the International Project Agreement is terminated prior to its term in accordance with Clause 38 of the International Project Agreement, this Treaty shall remain in force for the time, and to the extent, required by any States Parties or by the Company to assert any rights arising from, protect any interests endangered by or bring any proceedings resulting from termination of the International Project Agreement.

(3) The termination of this Treaty in accordance with paragraphs 2 and 3 of this Article shall be subject to the prior consent of all States Parties.

(4) The withdrawal from the Treaty by any individual State Party in accordance with paragraphs 2 and 3 shall be subject to the prior consent of all other States Parties.

(5) The States Parties shall not be able to require the denunciation, withdrawal, suspension or termination of this Treaty in any circumstances other than those contemplated in paragraphs 1 and 2 of this Article, including in the event of material breach, supervening impossibility of performance, fundamental change of circumstances, severance of diplomatic or consular relations, or any other causes recognised under international law.

***

IN WITNESS WHEREOF, the undersigned, being duly authorised by their respective Governments, have signed this Treaty.

Done in quadruplicate at [•], this [•], each being drawn up in four authentic texts in the English and French languages.

For the Government of the Republic of Benin

By:_____

For the Government of the Republic of Ghana

By:_____

For the Government of the Federal Republic of Nigeria

By:_____

For the Government of the Republic of Togo

By:_____

WITNESSETH

Executive Secretary of the Economic Community of West African States Parties

By:_____

ANNEX I

[To be supplemented with input from Nexant]

THE AUTHORITY

1. Composition and governance

(1) The Authority shall comprise [•] members, at least [•] of which shall be citizens of each of the States Parties.

(2) The office of Director General of the Authority shall be held for a period of [four (4)] years. The Director General shall be appointed by [the Oversight Committee][the States Parties] from candidates that are qualified for the position by virtue of their education, training and experience. The [Oversight Committee][States Parties] shall select the Director General [The States Parties] [Oversight Committee] may appoint to the office of Director General of the Authority:-

(i) their own nationals;

(ii) nationals of other States Parties; or

(iii) nationals of any other State.

(3) The Oversight Committee shall be able to remove the Director General at any time subject to a reasonable notice. The Director General shall be replaced at the end of his term of office unless expressly maintained in office for a new four year term by a decision of the Oversight Committee.

(4) The Director General shall be the legal representative of the Autority and his decisions and actions shall bind the Authority. The decisions and actions of the Director General shall be subject to the [annual] review of the Oversight Committee. Furthermore, the decisions of the Director General contemplated in Article 5(2) of this Annex 1 shall be subject to the prior consent of the Oversight Committee.

2. Site of the Authority

The Authority shall be located in [•] or any other location as may be decided by the Oversight Committee.

3. Official languages of the Authority

The official languages of the Authority shall be English and French.

4. Secretariat and Staff

(1) The Authority may establish a permanent Secretariat to carry out the functions conferred on the Authority by this Treaty. The Authority may retain or engage experts, consultants and other specialist staff, as may be necessary or appropriate to enable it to discharge its functions.

(2) The Director General and the members of the Secretariat and the staff of the Authority (including consultants engaged by it) shall have no financial interest in the West African Gas Pipeline [or any Shipper[4]]. They shall not disclose (either during their term of office or thereafter) any confidential information to which they may have access by virtue of their functions within the Secretariat or their employment by the Authority.

(3) [The Director General and all staff of the Authority which directly reports to him] shall have diplomatic immunity within the State Party [with which the Authority has signed a headquarters agreement]

(4) he salary and benefits of the Director General and the staff of the Authority shall be determined on the basis of salary scales and benefit plans of ECOWAS staff [*Nexant to provide further info*]

5. Functions

(1) The Authority shall have the following specific functions and powers:

1. Monitoring compliance by the Company with its obligations under the International Project Agreement;

2. Receiving reports from the Company as specified in International Project Agreement or in the WAGP Regulations ;

3. Giving interim [and final] approvals to the Company of the design of the Pipeline System and the plans for its fabrication or construction, in accordance with Clause 16 and Schedule 17 of the International Project Agreement;

4. Receiving, reviewing, consulting with the Technical Authorities and commenting on [and approving] the Conceptual Design Package and the Front End Engineering Design Package in accordance with Schedule 17 of the International Project Agreement;

5. Receiving, reviewing, responding to the draft and final Pipeline Development Plan, agreeing the terms of the Pipeline Development Plan with the Company and approving it on behalf of the States Parties;

6. Agreeing with the Company the terms of amendments to the Approved Pipeline Development Plan [and approving it on behalf of the States Parties];

[4] Consider whether there are other groups associated with the project which present potential conflicts of interest

7. Facilitating the grant, renewal or extension of Project Authorisations and Supplemental Authorisations in accordance with Clauses 16 and 17 of the International Project Agreement;

8. Receiving, reviewing, responding to the draft and final Environmental Impact Assessment and Environmental Management Plan, co-ordinating and facilitating all necessary environmental approvals, and agreeing on behalf of the States Parties amendments to the Environmental Management Plan, in accordance with Clause 19 and Schedule 2 of the International Project Agreement;

9. Receiving, reviewing, responding to the Company submissions associated with Approvals to Operate and granting on behalf of the States Parties Approvals to Operate, in accordance with Clause 16.5 of the International Project Agreement;

10. Agreeing on behalf of the States Parties with the Company the terms of the Access Code and any amendments thereto, in accordance with Clause 26 of the International Project Agreement;

11. Agreeing on behalf of the States Parties with the Company waivers of the requirements of the Access Code or of Clause 26 of the International Project Agreement, as contemplated in Clause 26 of the International Project Agreement;

12. [Agreeing with the Company on behalf of the States Parties the text of the WAGP Regulations and consulting with the Company on the terms of any amendments thereto, in accordance with Clause 12.1 of the International Project Agreement;]

13. Inspecting the design, construction and operation of the Pipeline System in accordance with Clauses 16.5 and 22.7 of the International Project Agreement and the WAGP Regulations ;

14. Approving on behalf of the States Parties the appointment of a third party operator of the Pipeline System in accordance with Clause 23.2 of the International Project Agreement;

15. Agreeing with the Company on behalf of the States Parties proposals for amendment to the Enabling Legislation, in accordance with Clause 41.1 of the International Project Agreement;

16. Agreeing with the Company on behalf of the States Parties any matters arising in connection with any expansion of the Pipeline System as contemplated in Clause 24 of the International Project Agreement;

17. Giving to the Company notice of failure to comply with the Access Code, in accordance with Clause 26.7 of the International Project Agreement;

18. Giving to the Company notice to remedy a breach of the International Project Agreement, in accordance with Clause 37.2 of the International Project Agreement;

19. Giving to the Company a Notice of Default, in accordance with Clause 37.7 of the International Project Agreement;

20. Resolving on behalf of the States Parties the consequences of a default of the International Project Agreement by the Company, in accordance with Clause 37 of the International Project Agreement;

21. Co-ordinating on behalf of the States Parties the administration of the Fiscal Laws in accordance with Schedule 8 of the International Project Agreement, including the giving of Notices of Assessment, agreeing interest rate deductibility mechanisms or approving the terms of loan agreements for interest rate deductibility purposes, and auditing the Company;

22. Providing administrative services for the Fiscal Review Board and the Fiscal Appeal Tribunal in accordance with Annex II to this Treaty;

23. Providing administrative services for the meetings of the Authority [and the States Parties referred to in Article VIII(1) of this Treaty];

24. Exercising the powers and responsibilities conferred on it under the WAGP Regulations ;

25. Exercising the powers and responsibilities provided for it in the Access Code ;

26. Acting on behalf of the States Parties' respective tax authorities in respect of any proceedings brought by the Company against any or all of the States Parties before the Fiscal Appeal Tribunal;

27. Reporting to the [meeting of the] States Parties on the implementation by the States Parties of their obligations under this Treaty and, in particular, where it appears that a State Party or State Authority is failing to comply with the provisions of this Treaty or the Enabling Legislation to the detriment of a WAGP Company, a Project Contractor, a Buyer, a Seller or a Shipper, drawing that mater to the attention of the State Party or State Authority with a view to procuring the compliance by that State Party or State Authority with the International Project Agreement or the Enabling Legislation.

28. Carrying out any other functions which the Authority may from time to time be directed by the [Oversight Committee] to discharge in order to achieve the objectives of this Treaty.

(2) The decisions of the Authority contemplated in sub-paragraphs 5,6,10,14,16 and 20 of paragraph (1) of this Article 5 shall be subject to the prior consent f the Oversight Committee.

6. Financing of the Authority

(1) At the latest [3 months] prior to the commencement of each [calendar] year, the Director General shall establish the funding requirements of the Authority [as contemplated in Article 9.4 of the International Project Agreement]. Within [15 days] of the establishment of the draft funding requirements, the Director general shall notify to the Oversight Committee the draft funding requirements, with all appropriate details necessary for it to be discussed by the Oversight Committee. The Oversight Committee shall meet within [1 month] of receipt of the draft funding requirements, to review such draft funding requirements in view of either approving, rejecting or requesting amendments to the same. The Over sight Committee shall take a decision based on the Authority's reasonable funding requirements and their consistency with the functions and powers of the Authority , as set out in this Treaty and the WAGP Regulations.

(2) in the event that the Oversight Committee should request changes to the draft funding requirements, the Director General shall establish revised funding requirements which shall be notified to the Oversight Committee within [15 days] from the decision of the Oversight Committee. The Oversight Committee shall subsequently meet, in the presence of the Director General, with [15 days] of the notification by the Director General of the revised funding requirement, with a view to finally resolving any outstanding issues and to adopt the final funding requirements of the Authority. The decision of the Oversight Committee shall be final.

(3) The final funding requirements shall be notified by the Director General to the Company and to the States Parties, in accordance with Article 9.4 of the International Project Agreement.

ANNEX II

RULES OF PROCEDURE OF THE FISCAL REVIEW BOARD AND THE FISCAL APPEAL TRIBUNAL

Right of appeal

General

1. If any Applicable Person is aggrieved or dissatisfied by a decision or action or inaction of a State, a Tax Authority, any other State Authority or the WAGP Authority in relation to the application of the Fiscal Laws, that Applicable Person may apply to the Fiscal Review Board, and beyond it to the Fiscal Appeal Tribunal, for a review of or to appeal that decision or action or inaction or for a direction to such State, Tax Authority, other State Authority or WAGP Authority in respect of such matter, in accordance with this Annex II. The right of appeal or review under this Annex II extends to all matters covered by the Agreed Fiscal Regime, including Non-WAGP Regime matters which are modified by the implementation of the Agreed Fiscal Regime.

2. A State or State Authority which is aggrieved or dissatisfied by a decision of the Fiscal Review Board may appeal the decision of the Fiscal Review Board in accordance with this Annex II, provided that if the matter being appealed is a matter arising under Part B of Schedule 8 of the International Project Agreement then an appeal lies only if all States Parties or the equivalent State Authority in all States Parties joins in the appeal.

Income Tax

3. If any Applicable Person is dissatisfied with (a) any Assessment or any amended or altered Assessment issued by any State or (b) the failure of any State to issue an amended Assessment following the submission of amended Returns in accordance with paragraph B.41 above, it may appeal to the Fiscal Review Board by written notice to the WAGP Authority, copied to the Tax Authority in each State.

4. Such notice must be given (in the case of paragraph F. 3(a) above) within [30] days of the date on which the Assessment, amended Assessment or altered Assessment is issued or (in the case of paragraph F. 3(b) above) within [135] days of the submission of the amended Returns as referred to in paragraph B.41 above.

VAT

5. If any Applicable Person is dissatisfied with (a) any refund of VAT by any State or State Authority, or any refusal by any State or State Authority to make a repayment of VAT (in either case including as to the amount of any interest due), or any requirement of a State or State Authority that VAT be paid or charged, or any refusal in whole or in part by any State or State Authority to allow a credit for Tax in respect of VAT paid and not refunded, it may

appeal to the Fiscal Review Board by written notice to the WAGP Authority, copied to the Tax Authority of the State concerned and to any other State Authority involved.

6. Such notice must be given within 60 days of the matters giving rise to the dissatisfaction of the Applicable Person coming to its attention.

Customs Duties

7. If any Applicable Person is dissatisfied with any imposition of any customs duties pursuant to Part D of Schedule 8 of the International Project Agreement by any State, it may appeal to the Fiscal Review Board by written notice to the WAGP Authority, copied to the Tax Authority of the State concerned.

8. Such notice must be given within [60] days of the matters giving rise to the dissatisfaction of the Applicable Person coming to its attention.

Other Taxes/Discrimination/Non-WAGP Regime

9. If any Applicable Person is dissatisfied with any imposition of any Tax by any State or State Authority contrary to the provisions of the Fiscal Laws or by the failure of a State or State Authority or the WAGP Authority to comply with the Fiscal Laws or to correctly apply the Non-WAGP Regime as modified by the implementation of the Agreed Fiscal Regime, it may appeal to the Fiscal Review Board by written notice to the WAGP Authority, copied to the Tax Authority and any other relevant State Authority of the State concerned.

10. Such notice must be given within [90] days of the date on which the State concerned seeks to impose the Tax concerned or the final decision of the State or State Authority which gives rise to the dissatisfaction.

Fiscal Review Board

Constitution of Fiscal Review Board

11. The Fiscal Review Board, when constituted from time to time, shall consist of the senior permanent officer of the Tax Authority in each State, or the delegate of that person. Upon a Notice of Appeal being given requiring the constitution of a Fiscal Review Board, each State shall procure that its representative on that Fiscal Review Board is duly appointed and duly attends to the business of that Fiscal Review Board.

12. Each of the members of the Fiscal Review Board shall in respect of the business of that Fiscal Review Board act solely as a member of the Fiscal Review Board and not as representative of any department or agency of any State and shall act in an independent and impartial manner. Each Appellant and Respondent shall be entitled to a fair and impartial hearing.

Content of notice

13. Any notice given as described in paragraphs 3 to 10 (a ***Notice of Appeal***) shall (a) list the Applicable Person making the appeal (each an ***Appellant*** and together the ***Appellants***); (b) list the State or States Parties imposing the liability to Tax that is being appealed (each a ***Respondent*** and together the ***Respondents***); and (c) provide a summary of the grounds of appeal (which summary shall not act to restrict the detailed statement of appeal to be submitted by the Appellant or Appellants as described further at paragraph 16 below or to restrict the findings of the Fiscal Review Board).

14. Where the Appellant or Appellants are appealing a liability to Tax only in part, the Appellant or Appellants shall make payment in respect of the part of the liability to Tax that is not disputed and such payment shall be taken into account by the Fiscal Review Board in assessing the amount of any liability to Tax and interest, if any, due under paragraph 31 below following its judgment.

Pre-hearing procedure

15. On receipt of the Notice of Appeal, the Fiscal Review Board shall within 10 days send to each Appellant and each Respondent a notice of hearing. The notice of hearing shall specify a date for the appeal to be heard by the Fiscal Review Board (the ***Hearing***), which date shall be not less than [90 days] and not more than [120 days] after the date on which the WAGP Authority received the Notice of Appeal. The date specified for the Hearing (as adjusted in accordance with paragraph F.21 below) shall be the ***Hearing Date***.

16. Not less than [60 days] before the Hearing Date, the Appellant (or the Appellants together) shall submit to the Fiscal Review Board, with a copy to each Respondent, a detailed statement of grounds for appeal. The statement of appeal shall set out all material facts as they are understood by the Appellant or Appellants and shall include submissions as to law and as to the application of the law to the relevant facts.

17. No less than [45 days] before the Hearing Date, the Respondent (or the Respondents together) shall submit to the Fiscal Review Board, with a copy to each Appellant, a statement of response. The statement of response shall specify that the Respondent or Respondents agree with the facts as set out in the statement of appeal or shall specify those facts within the statement of appeal with which the Respondent or Respondents do not agree and any additional facts that the Respondent or Respondents consider to be material to the appeal. The statement of response shall also include submissions as to law and as to the application of the law to the relevant facts.

18. Not less than [30 days] before the Hearing Date, the Respondent (or the Respondents together) and the Appellant (or the Appellants together) shall each submit to the Fiscal Review Board, with a copy to the other party, a copy of each document within its possession which it considers is material to the appeal. No Respondent or, as the case may be, Appellant shall be obliged to disclose any document which it reasonably considers contains legal advice provided by a legal advisor (including for the avoidance of doubt any legal advisor employed

as such by such party) in respect of the appeal or otherwise and shall be entitled to disclose parts only of documents where part of such document is relevant to the appeal but parts are not, or parts contain legal advice that the Respondent or, as the case may be, the Appellant concerned is not obliged to disclose and parts do not.

19. Not less than [20 days] before the Hearing Date the Appellant or Appellants and the Respondent or Respondents shall meet and endeavour to agree a statement setting out the facts of the appeal. To the extent that they are not able to agree on any given facts, the statement of facts shall set out the views of each party in respect of those facts. They shall submit to the Fiscal Review Board a statement of the agreed and disputed facts no later than [10 days] before the Hearing Date, together with (a) an updated statement of appeal or as the case may be statement of response and (b) a file containing the documents that either or both party considers to be material.

20. No later than 5 days before the Hearing Date, the Fiscal Review Board shall issue a revised notice of hearing, which shall set out the date, time and location of the Hearing and specify the members of the Fiscal Review Board for that Hearing.

21. The Fiscal Review Board may (and, if it considers it essential or advantageous to reaching a just and fair conclusion, shall) on the written application of any Appellant or Respondent order that the Hearing Date shall be delayed by any period that it considers reasonable and any time limit in paragraphs 15 to 20 above that has not at that time passed shall be adjusted in accordance with the new Hearing Date. The Fiscal Review Board shall inform each Appellant and each Respondent of the new Hearing Date and of the time limits adjusted as above as soon as reasonably practicable after such order.

Consolidation of Appeals

22. The Fiscal Review Board may on the written application of any of the Appellants concerned or all of the Respondents concerned order that any number of appeals shall be heard at one Hearing if it considers that the subject matter of each dispute is substantially the same or the appeals each raise substantially the same question of law and/or of fact. The Fiscal Review Board shall inform each Appellant and each Respondent concerned of the occurrence of such consolidation, of the new Hearing Date and of any adjustments to the time limits in paragraph F.15 to F.20 above (provided that the Fiscal Review Board may not adjust such time limits under this paragraph F.22 so as to reduce the period of time before any such time limit falls to a period less than that which would have applied if no such consolidation and adjustment had taken place) as soon as reasonably practicable after such order.

Settlement/withdrawal of appeal

23. Once a Notice of Appeal has been validly given, that Notice of Appeal may not be withdrawn other than with the consent of each Appellant and each Respondent.

24. The Appellant or Appellants and the Respondent or Respondents shall be free to settle the appeal by agreement of all such parties on such terms as they see fit at any time,

including during the Hearing, in which case the appeal and the Hearing shall, to the extent of the settlement, come to an end and no further appeal shall be available. Any such agreement shall not be effective until it is recorded in writing signed by the appropriate representative of all such parties.

The Hearing

25. Each Appellant and Respondent shall be entitled to submit evidence to the Fiscal Review Board during the course of the Hearing, including witnesses and the evidence of experts. All evidence shall be admissible, but the Fiscal Review Board shall be entitled to conclude as to the weight to be applied to any particular evidence taking into account all the circumstances of the evidence and in which the evidence arises.

26. The Hearing shall be conducted in English.

27. The Fiscal Review Board may (and, if they consider it to be essential or advantageous to reaching a fair and just conclusion, shall) allow on the written application of any Appellant or Respondent an adjournment during the course of the Hearing of any period not exceeding 10 days (which may be extended by the same amount on not more than two occasions).

28. Any Appellant and any Respondent may apply to the Fiscal Appeal Tribunal if they are dissatisfied with a refusal of the Fiscal Review Board of an adjournment under paragraph F.27 above. The Fiscal Appeal Tribunal shall meet as soon as reasonably practicable thereafter, shall hear whatsoever submissions they consider fit and shall decide on whether an adjournment shall be allowed.

The Decision

29. The Fiscal Review Board shall conclude, on the basis of the information and evidence submitted to them, what the correct amount of Tax due from, or repayment of Tax due to, the Appellant or Appellants should be, being satisfied on the balance of probabilities. The Fiscal Review Board shall reach its determination fairly, in accordance with the facts and in accordance with the governing law and all relevant agreements (including, for the avoidance of doubt, this Agreement). If the Fiscal Review Board is unable to agree unanimously on its decision, a majority decision shall apply and shall be binding on the Appellant or Appellants and the Respondent or Respondents, subject to the right to appeal to the Fiscal Appeal Tribunal. A decision of the Fiscal Review Board shall constitute an administrative decision of each Tax Authority.

30. The Fiscal Review Board shall deliver its decision not later than [30 days] after the last date of the Hearing and shall deliver its decision in writing with a full explanation, with full reasons for the decision and with a statement of each of its findings of fact.

31. The Fiscal Review Board may in reaching its judgment, grant to either party a right to receive from the other party a payment in respect of the costs of the first party. The Fiscal Review Board may also order that interest is payable at a rate not exceeding the Applicable

Rate for any period it considers to be reasonable. Any amount of costs or interest under this paragraph F.31 received by an Appellant shall not be taxable in the hands of that Appellant and no payment by an Appellant shall be deductible as an Allowable Expense.

Right of appeal to the Fiscal Appeal Tribunal

32. Any Appellant and any Respondent may apply to the Fiscal Appeal Tribunal if they are dissatisfied with the findings of the Fiscal Review Board so far as that finding is a finding of law, but shall not be so entitled if that finding is a finding of fact. Whether a finding is a finding of law or of fact shall be the decision of the Fiscal Review Board acting reasonably and in good faith and taking into account the submissions of each Appellant and Respondent. Any such decision may be appealed to the Fiscal Appeal Tribunal by any of the Appellants or any of the Respondents.

33. The Fiscal Appeal Tribunal shall, subject to the provisions of the Constitution in a State, be the only body which can hear and determine appeals from a decision of a Tax Authority or the Fiscal Review Board in respect of matters arising under Part B of Schedule 8 of the International Project Agreement.

34. An appeal to the Fiscal Appeal Tribunal under paragraph F.32 above shall be made by written notice to the WAGP Authority, copied to each other Appellant or Respondent in the appeal to the Fiscal Review Board.

35. Such notice must be given within [30] days of the date on which the Fiscal Review Board delivers its decision in writing in accordance with paragraph F.29 above or, if later, the decision of the Fiscal Review Board or the Fiscal Appeal Tribunal as to whether a finding is a finding of law or of fact.

Fiscal Appeal Tribunal

Constitution of Fiscal Appeal Tribunal

36. The Fiscal Appeal Tribunal shall consist of one judge appointed to the highest court of appeal in each State having jurisdiction in fiscal matters and a fifth presiding judge appointed by the President from time to time of ECOWAS, such judge being a judge appointed to the highest court having jurisdiction in fiscal matters in an ECOWAS State other than any of the States Parties. Each of the members of the Fiscal Appeal Tribunal shall in respect of the Hearing concerned act solely as a member of the Fiscal Appeal Tribunal and not as a representative of any department or agency of any State or, as the case may be, of any ECOWAS State and shall act in an independent and impartial manner. Each Appellant and Respondent shall be entitled to a fair and impartial hearing.

Content of notice

37. Any notice given as described in paragraphs 0 to 35 (a ***Notice of Further Appeal***) shall (a) list the person or persons making the appeal (each a ***Further Appellant*** and together the ***Further Appellants***); (b) list each person who was a Respondent or an Appellant in

respect of the appeal to the Fiscal Review Board which is being appealed (each a ***Further Respondent*** and together the ***Further Respondents***); and (c) provide a summary of the grounds of appeal (which summary shall not act to restrict the detailed statement of appeal to be submitted by the Further Appellant or Further Appellants as described further at paragraph F.40 below or to restrict the findings of the Fiscal Appeal Tribunal).

38. Where the Further Appellant or Further Appellants are appealing a decision of the Fiscal Review Board only in part, the Applicable Person or Applicable Persons concerned shall make payment in respect of the part (if any) of the liability to Tax that is not disputed and such payment shall be taken into account by the Fiscal Appeal Tribunal in assessing the amount of any liability to Tax and interest, if any, due under paragraph F.51 below following its judgment.

Pre-hearing procedure

39. On receipt of a Notice of Further Appeal, the WAGP Authority shall within 10 days send to each Further Appellant and each Further Respondent a notice of hearing. The notice of hearing shall specify a date for the appeal to be heard by the Fiscal Appeal Tribunal (the ***Further Hearing***), which date shall be not less than [50 days] and not more than [80 days] after the date on which the WAGP Authority received the relevant Notice of Further Appeal. The date specified for the Further Hearing (as adjusted in accordance with paragraph F.43 below) shall be the ***Further Hearing Date***.

40. Not less than [30 days] before the Further Hearing Date, the Further Appellant (or the Further Appellants together) shall submit to the Fiscal Appeal Tribunal, with a copy to each Further Respondent, a detailed statement of grounds for appeal. The statement of appeal shall include submissions as to law and as to the application of the law to the relevant facts.

41. No less than [15 days] before the Further Hearing Date, the Further Respondent (or the Further Respondents together) shall submit to the Fiscal Appeal Tribunal, with a copy to each Further Appellant, a statement of response. The statement of response shall include submissions as to law and as to the application of the law to the relevant facts.

42. No later than 5 days before the Further Hearing Date, the Fiscal Appeal Tribunal shall issue a revised notice of hearing, which shall set out the date, time and location of the Further Hearing and specify the members of the Fiscal Appeal Tribunal for that Further Hearing.

43. The Fiscal Appeal Tribunal may (and, if it considers it essential or advantageous to reaching a just and fair conclusion, shall) on the written application of any Further Appellant or Further Respondent order that the Further Hearing Date shall be delayed by any period that it considers reasonable and any time limit in paragraphs F.39 to F.42 above that has not at that time passed shall be adjusted in accordance with the new Further Hearing Date. The Fiscal Appeal Tribunal shall inform each Further Appellant and each Further Respondent of the new Further Hearing Date and of the time limits adjusted as above as soon as reasonably practicable after such order.

Consolidation of Appeals

44. The Fiscal Appeal Tribunal may on the written application of any of the Further Appellants or the Further Respondents concerned order that any number of appeals shall be heard at one Further Hearing if it considers that the subject matter of each dispute is substantially the same or the appeals each raise substantially the same question of law and/or of fact. The Fiscal Appeal Tribunal shall inform each Further Appellant and each Further Respondent concerned of the occurrence of such consolidation, of the new Further Hearing Date and of any adjustments to the time limits in paragraph F.39 to F.42 above (provided that the Fiscal Appeal Tribunal may not adjust such time limits under this paragraph F.44 so as to reduce the period of time before any such time limit falls to a period less than that which would have applied if no such consolidation and adjustment had taken place) as soon as reasonably practicable after such order.

Settlement/withdrawal of appeal

45. Once a Notice of Further Appeal has been validly given, that Notice of Further Appeal may be withdrawn without the consent of the other party or parties to the Further Appeal, but such withdrawal shall be without prejudice to the powers of the Fiscal Appeal Tribunal to make orders in respect of costs under paragraph F.51 below.

46. The Further Appellant or Further Appellants and the Further Respondent or Further Respondents shall be free to settle the appeal by agreement of all such parties on such terms as they see fit at any time, including during the Further Hearing, in which case the appeal and the Further Hearing shall, to the extent of the settlement, come to an end and no further appeal shall be available. Any such agreement shall not be effective until it is recorded in writing signed by the appropriate representative of all such parties.

The Further Hearing

47. The Further Hearing shall be conducted in English.

48. The Fiscal Appeal Tribunal may (and, if they consider it to be essential or advantageous to reaching a fair and just conclusion, shall) allow on the written application of any Further Appellant or Further Respondent an adjournment during the course of the Further Hearing of any period not exceeding 10 days (which may be extended by the same amount on not more than two occasions).

49. The Fiscal Appeal Tribunal shall be required to conclude, on the basis of the information and findings of fact submitted to them, what the correct amount of Tax due from, or repayment of Tax due to, the Applicable Person or Applicable Persons should be, being satisfied on the balance of probabilities. The Fiscal Appeal Tribunal shall reach its determination fairly, in accordance with the facts and in accordance with the governing law and all relevant agreements (including, for the avoidance of doubt, this Agreement). If the Fiscal Appeal Tribunal is unable to agree unanimously on its decision, a majority decision

shall apply and shall be binding on the Further Appellant or Further Appellants and the Further Respondent or Further Respondents.

50. The Fiscal Appeal Tribunal shall deliver its decision not later than [30 days] after the last date of the Further Hearing and shall deliver its decision in writing with a full explanation and with full reasons for the decision.

51. The Fiscal Appeal Tribunal may grant to either party a right to receive from the other party a payment in respect of the costs of the first party in respect of the appeal to the Fiscal Appeal Tribunal. The Fiscal Appeal Tribunal may also order that interest is payable at a rate not exceeding the Applicable Rate for any period it considers to be reasonable. Any amount of costs or interest under this paragraph F.51 received by any Applicable Person shall not be taxable in the hands of that Applicable Person and no payment by a Applicable Person shall be deductible as an Allowable Expense.

Role of WAGP Authority

52. In all appeals under this Annex II and in all Hearings of appeals, the WAGP Authority shall provide the administration of the Fiscal Review Board or the Fiscal Appeal Tribunal, as the case may be. Documents to be served on the Fiscal Review Board or the Fiscal Appeal Tribunal shall be served on the WAGP Authority, and documents to be served by the Fiscal Review Board or the Fiscal Appeal Tribunal shall be served by the WAGP Authority on their behalf.

States Parties and WAGP Authority to facilitate

53. The States Parties and the WAGP Authority shall use their best endeavours to facilitate the process of any appeals under this Annex II. Each State shall procure that a representative from that State is duly appointed to the Fiscal Review Board or the Fiscal Appeal Tribunal, as the case may be, and that that person duly participates in the business of the Fiscal Review Board or Fiscal Appeal Tribunal in accordance with this Agreement.

Decisions binding on State Authorities

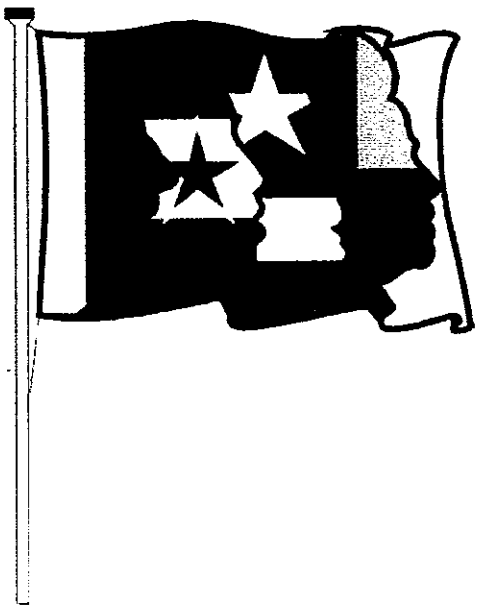
54. Subject in the case of the Fiscal Review Board to any appeal to the Fiscal Appeal Tribunal, the decisions of the Fiscal Review Board or the Fiscal Appeal Tribunal shall be binding on all State Authorities in a State.

EXHIBIT 1

INTERNATIONAL PROJECT AGREEMENT

WEST AFRICA GAS PIPELINE PROJECT

Institutional Framework of West African Gas Pipeline Authority



NEXANT Limited

In Association with

Dennis C. Stickley JD, LLM-Energy Law

USAID
The US Agency for International Development

Nexant

West African Gas Pipeline Authority 3

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Schedule 5. Time Table For Implementation 18

West African Gas Pipeline Authority

The Parties to the Intergovernmental Agreement (IGA) agree to the establishment of an Administrative Body. The Administrative Body shall be referred to as the West African Gas Pipeline Authority ("WAGPA").

This Institutional Framework is the part of the Concession Agreement (CA) and shall be fully implemented when the Concession Agreement has been adopted as law by the States. Prior to the adoption of this legislation, the provisions concerning facilitation and monitoring shall be observed on a contractual basis as part of the Concession Agreement. This Institutional Framework establishes WAGPA to its composition and functions and gives the interim authority to exercise WAGPA's facilitation functions before Concession Agreement is signed. It will become effective after 14 days of signature by the respective authorized representatives of each State and the West African Gas Pipeline Company (WAPCo).

The WAGPA is established on behalf of the States primarily for the purpose of monitoring the performance of WAPCo under the terms and conditions of the Concession Agreement.

The WAGPA will perform additional functions that are assigned to it under the Concession Agreement. The States are bound by the actions of the WAGPA and WAPCo is entitled to act in reliance on actions taken by the WAGPA that are taken in accordance with these Institutional Framework or the provisions of the Concession Agreement.

1. THE ROLE OF WEST AFRICAN GAS PIPELINE AUTHORITY

The role of the WAGPA is three-fold: (1) Facilitation; (2) CA Monitoring; and (3) Regulation of WAGP.

1.1 FACILITATION

The principal areas where WAGPA will function as a facilitator for the WAGP are:

1) Issuance of licenses and permits ("Project Rights) that are to be granted by the relevant state authorities as they appear on Schedule 1;
2) Coordinating the review of the Environmental Impact Assessment and Environmental Management Plan;
3) Review and comment the Pipeline Development Plan as well as approve it in consultation with relevant state authorities;
4) Receipt of status reports from WAPCo prior to and during construction;
5) Ensuring in local business participation in project procurement;
6) Coordination and representation of States in Dispute Resolution with WAPCo;
7) Coordination of Fiscal issues.

In addition, the WAPCo may request that the WAGPA use its good offices to provide assistance and facilitation with other aspects of the project. In its discretion, WAGPA may undertake to use its good offices to provide the assistance and facilitation requested by WAPCo, which shall be without prejudice to itself or the States.

1.2. CONCESSION AGREEMENT MONITORING

The WAGPA will have the authority to monitor the following reporting obligations of WAPCo:

1) Submission of Quarterly Statements of Monthly Transportation and Sales Data;
2) Providing System Flow Diagrams and Capacity for Point to Point Deliveries;
3) Submission of Semi-Annual Report on estimates and production of economically recoverable reserves based upon reports provided by the field operator;
4) Notification of Service Interruptions;
5) Index of Customers;
6) Notification of Requests to Provide Transportation Services;
7) Submission of Annual Pipeline Operations Report.

Most information will be provided in the Annual Pipeline Operations Report. For purposes of transparency, this material would be available to the public. More frequent submissions are required for transportation and sales information as well as notification of interruption of service and third party requests for transportation. Commercially sensitive information such as prices and customer identity will be subject to conditions of confidentiality as agreed between WAPCo and the WAGPA. The development of the appropriate reporting forms will be the primary responsibility of the Directors of Fiscal Reporting and Pipeline Operations

1.3. REGULATION

WAGPA has not been established as an independent regulatory commission. The WAGPA is to jointly exercise the sovereign authority that the States expressly reserved for regulation of WAGP if, in light of operational experience or a breach of the Access Code WAPCo is found to have abused its monopoly position further regulations can be imposed through the WAGPA.

The principle areas where the WAGPA will have specific but limited regulatory authority for the WAGP are:

1) Enlargement of pipeline capacity;
2) Approval and revision of WAGP's Access Code including the determination that the Access Code is to be implemented as a regulatory instrument;
3) Development and implementation of WAGP Regulations governing pipeline construction and operation;
4) WAPCo's financial ability to satisfy abandonment obligations.

The Access Code, including tariff methodology and the WAGP Regulations will be settled between the States and the Commercial Group as part of the Concession Agreement.

As the regulator for the WAGP, the WAGPA (within the provisions of the Concession Agreement) will have the authority to determine requirements, including but not limited to the following:

1) The nature and extent to which gas sector transactions (sales, transmission, and distribution) will be made transparent either through unbundling or reporting;
2) The procedure for obtaining licenses for the construction of cross-border pipelines and whether authorizations will be granted on an exclusive basis;

3) Acceptable methodology. (Net-Back. Cost-of-Service. Thermal Equivalency) for setting sales prices to users other than power generators;
4) Rate design practices for transportation tariffs. including valuation methodology for pipeline facilities;
5) Whether prior consent from any State is needed either to export or import natural gas;
6) To Ensure that gas produced in Togo. Benin or Ghana gains access to Pipeline System;
7) Taxation of pipeline income according to the proportion of revenue received or tax base (pipeline facilities) located in each State;
8) Insurance for risks and pipeline facilities under a unified insurance programme;
9) Application of laws from another jurisdiction in those circumstance where the law of the State where the obligation is to be performed is either silent or is in conflict with the Concession Agreement;
10) Adoption and administration of a Dispute Resolution process between the States and WAGP prior to resorting to binding arbitration conducted by international bodies.

WAGPA will prevent discrimination and abuse of monopoly power by WAPCo and its affiliates. Regulations will be adopted that address the standard of conduct that is to be observed in dealings between WAPCo and its gas marketing affiliate N-GAS. Preparation and implementation of these regulatory instruments will be the responsibility of the Director of Market Surveillance.

2. ORGANISATION

WAGPA will employ a corporate administrative model in order to have clear assignment of responsibility and reporting. WAGPA will have three-tiered organisational structure. In descending order they are:

Board of Governors;

Director General/ Directorates; and

Divisional Staff

A Board of Governors will preside over deliberations and be the decision-making body of the WAGPA. The States will further elaborate the structure for the Board of Governors. The Director General would be the Head of WAGPA and its chief administrative officer. Day-to-day operations are the responsibility of the three functional Directorates headed by Directors. reporting to the Director General:

Pipeline Operations;

Market Surveillance; and

Fiscal & Reporting.

Technical staff will report upward to one of the three Directors. In turn. the Director General and the three Directors are subject to the oversight of the Board.

ECOWAS representative shell be the ex-officio member of the Board of Directors.

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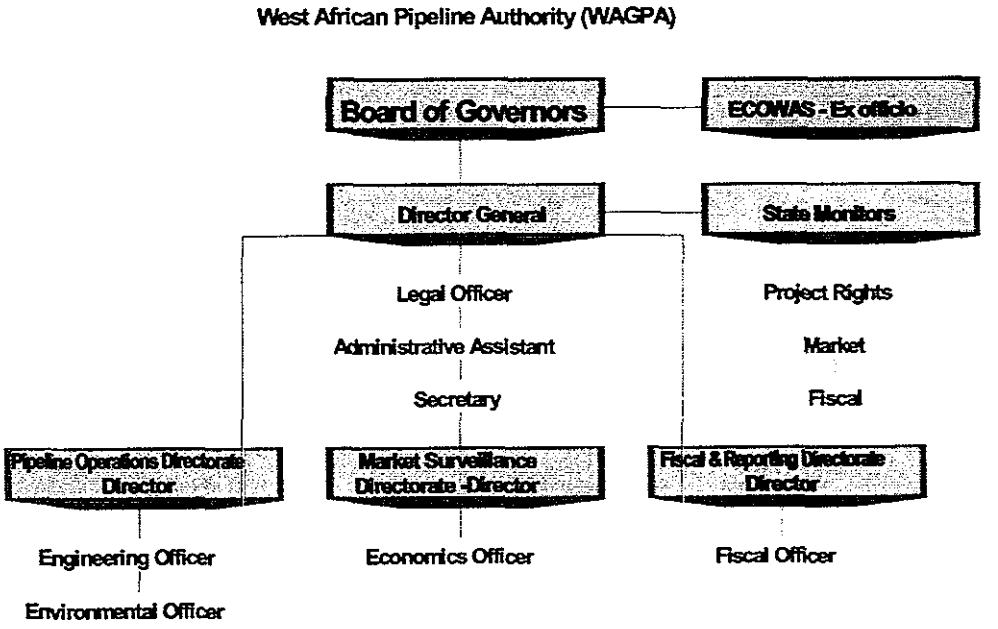
State Monitors

WAGPA will have correspondents in the States governmental agencies called State Monitors. State Monitors will be assigned to each of the three Directorates within each of the States. The individual State Monitors will be senior public officials that have been designated by their respective governments to be the point of contact for the particular tasks for Facilitation and Regulation that have been assigned to the individual Directorates under these Institutional Framework. The State Monitors are not part of WAGPA's technical and support staff and their positions are not funded by the WAGPA budget.

Location

Initially, WAGPA will be based at the Economic Community of West African States (ECOWAS) in Abuja, Nigeria. Once the pipeline is operation, WAGPA may be relocated to the city, where the commercial group will elect to have its headquarters for administrative and commercial convenience.

The following diagram contains the recommended structure for the WAGP:



2.1. STAFFING AND FUNDING

WAGPA will have the following number of permanent staff:

Director General's Office	4
Pipeline Operations Directorate	3
Market Surveillance Directorate	2
Fiscal Directorate	2
Total Staff	11

WAGP would be expected to fund the 11 permanent positions in the Director General's Office and Directorates.

In addition, WAPCo would cover the costs of meetings of the members of the Board of Governors, which would meet quarterly until construction is complete and semi-annually once the system is in operation.

Position descriptions and compensation packages for the senior personnel are contained in Schedule 2, and for the technical and support staff - in Schedule 3. Staff grading, salary scales and benefit packages are based on existing conditions at the ECOWAS Secretariat in Abuja.

The Director General and Directors would be expected to have had at least 10 years of relevant experience in business or government as well as appropriate university degrees or technical training.

The junior staff within the Secretariat and Directorates would be expected to be university graduates in their respective disciplines (law, engineering, environmental science, economics and accounting).

In selecting of the WAGPA staff, preference should be given to the bilingual professionals;

2.2. Functional Responsibilities

The Director General's Office and each of the three Directorates will have the following functional responsibilities:

[redacted]

Functions

Receive notice of Force Majeure from WAPCo and to give notice of State Force Majeure

Receive and give notice of default in CA obligations and requests for Dispute Resolution regarding interpretation of the Concession Agreement

Arbitrate disputes between WAPCo and Shippers that arise under the Access Code

Mediate alleged conflicts between local law and the CA

[redacted]

Functions

Provide technical assistance to the relevant state authorities in processing all other licenses, permits and consents contemplated in the Concession Agreement as listed in Schedule 1.

Consider the final Environmental Impact Assessment and the final Environmental Management Plan; to act in conjunction with the relevant state authorities, and make recommendations to the relevant state authorities for the approval of and for further amendments

Provide assistance to and consult with the relevant state authorities responsible for issuing Pre-Development Rights and Land Rights

Pipeline Development Plan approval issues other than Access Code

Receive and evaluate status reports during construction

Approve Pipeline System operator

Approve Pipeline System Enlargement

Provide assistance to and consult with the relevant state authorities responsible for granting of project rights

Adopt and monitor compliance with the WAGP Regulations

- HSE
- Maintenance
- Reporting

Approve Competitive Bidding Procedures

[redacted]

Functions

Approve Access Code as part of Pipeline Development Plan

Monitor compliance with the Access Code

Implement Access Code as regulations

Approve any changes to the transportation services pricing or tariff methodology

Review summary of key terms and conditions in gas transportation agreements

Ensure that gas produced in Togo, Benin or Ghana gains access to Pipeline System

Monitor gas sellers Access Reference Price

Provide technical assistance to gas distribution utilities in the States

[redacted]

Functions

Prepare and issue the notices of assessment for payments WAPCo is obliged to make to the States under the fiscal regime

Facilitate taxation administration on behalf of or in conjunction with each of four State's local Taxation Authorities

Monitor Tax returns sent by WAPCo to each relevant Taxation Authorities in each country (copied to WAGPA)

WAPCo follows up directly with the Taxation Authorities

WAGPA intervenes in case WAPCo or any Taxation Authority feels the Concession Agreement is not correctly applied. WAGPA decisions on taxation matters are not binding neither for Taxation Authorities nor for WAPCo

Monitor compliance with insurance obligations

2.3. LANGUAGE CONSIDERATIONS

1) Official Language of WAGPA should be both English and French;
2) Official WAGPA documentation should be translated in both languages;
3) Board Meetings (taking place twice a year) should have the simultaneous translation;

4) Rest of the meetings (internal WAGPA or with WAPCo) should not be the subject of simultaneous translation.

3. WAGPA AGENDA

3.1. EARLY ESTABLISHMENT OF WAGPA

WAGPA will become operational early enough to provide technical assistance to the States in satisfying the conditions precedent that are contained in the Concession Agreement. Mainly, this would involve the facilitation tasks, which are very front-end loaded such as permits, environmental impact assessments, environmental management plan, construction and operation regulations, and review of the Pipeline Development Plan.

The Parties of the Concession Agreement agree that WAGPA should be established not later than 1 April 2002 so that it can assist in the development of the objective criteria for the evaluation of the Pipeline Development Plan. These criteria will be incorporated in the CA.

Senior positions should be filled by 1 April 2002. WAGPA will be at full strength and training completed by 1 July 2002. A timetable for these activities is contained in Schedule 4.

3.2. DESIGNATION OF THE STATE MONITORS

The first order of business for WAGPA is to establish the liaison procedures with the permitting and licensing divisions of the respective States. Once senior staff is appointed, the Board of Governors should require State Administration to designate their respective State Monitors. This activity will be the primary responsibility of the Director General and the Director of Pipeline Operations.

3.3. RELATIONSHIP BETWEEN WAGPA AND THE STATES

The WAGPA is to jointly exercise the sovereign authority that the States expressly reserved for regulation of WAGP.

WAGPA shell get support from the Board of Governors in order to fulfil its role in providing technical assistance and facilitating project implementation.

3.4. DISPUTE RESOLUTION

WAGPA is to be the forum for resolving disputes between shippers and WAPCo. Pursuant to the Concession Agreement WAGPA will determine dispute resolution procedures for a dispute as to the alleged failure to comply with the Access Code. WAGPA is to arbitrate disputes between WAPCo and Shippers that arise under the Access Code.

3.5. FUNDING WAGPA

Under Clause 36.6 of the CATS, "WAPCo will contribute to the cost of operating the Administrative Body". WAPCo's obligation to contribute may not arise until the CA is signed. However there is a definite need to establish the WAGPA in advance of concluding the CA. Therefore parties to the Concession Agreement hereby agree that WAGPCo will take an obligation to cover the costs of operating WAGPA from the date of its establishment under this Institutional Framework.

Schedule 1. Licenses and Permits Required as Project Rights for WAGP

A preliminary list of the licenses, permits and consents required by WAPCo in Nigeria, Benin, Togo and Ghana for the pipeline construction and commissioning activities is given in the table below.

Item	Nigeria	Benin	Togo	Ghana
Vessel Travel/Access to Territorial Waters	Navy	Ministere Travaux Publics & Transports Direction de la Marine Marchande	Ministere de la Defense Marine Nationale	Navy
Permit to Survey (onshore & offshore)	DPR	Ministere de l'Environnement	Ministere de l'Environnement & de la Production Forestiere - PNAE	N/A
Environmental Impact Assessment aka Environmental Impact Statement	DPR FMOE	Ministere de l'Environnement Agence Beninoise pour l'Environnement	Ministere de l'Environnement & de la Production Forestiere - PNAE	EPA
Oil Pipeline License	Minister of Petroleum	Ministere des Mines	Ministere de l'Equipement & de l'Energie Dir. Gen. des Mines & Geologie (DGMG)	MOME
Design Review (including safety stds)	DPR	Office Beninois des Recherches Geologiques & Minieres (OBRGM)	Ministere de l'Equipement & de l'Energie DGMG / DGE	TBD
Authority to Construct	DPR	Ministere des Mines	Idem	TBD
Authority to Operate	DPR	Ministere des Mines	Idem	EC
Laterals-Routing through the Ports	NPA	Ministere Travaux Publics & Transports Port Autonome de Cotonou	Port Autonome de Lome	TBD
Land Acquisition	Fed. Ministry of Works (federal govt. lands); State Governor (State govt. lands and land in urban areas); and Local Govt. Council (land in "non-urban" areas)	Ministere des Finances & de l'Economie (Service des Domaines) Ministere de l'Interieur (Service des Affaires Domaniales des Prefectures)	Ministere de l'Interieur (Service du Domaine) Ministere du Plan & de l'Amenagement du Territoire	Lands Commission (public lands); Regional Lands Commissions ("Stool land")

Institutional Framework for the West African Gas Pipeline Authority

Item	Nigeria	Benin	Togo	Ghana
Effluent Discharge Permits (For hydrotesting at least)	DPR	Ministere de l'Environnement	Ministere de l'Environnement & de la Production Forestiere - PNAE	EPA Districts
Factory and Premises Inspections	FEPA / Ministry of Labour	Ministere des Mines Direction de l'Energie - OBRGM	Ministere de l'Equipement & de l'Energie DGMG	Ministry of labour
Business Registration / Company Incorporation	Registrar of Companies	Ministere du Commerce et de l'Industrie	Ministere du Commerce	Registrar of Companies
Immigration	Ministry of Internal Affairs	Ministere de l'Interieur	Ministere de l'Interieur	GIS
Customs	NCS	Ministere des Finances & de l'Economie Direction Generale des Douanes & Droits Indirects	Ministere de l'Interieur Service des Douanes	CEPS
Chemical Importation Hazardous Materials Management, etc.	NAFDAC	Ministere des Mines - OBRGM	Min. de l'Equipement & de l'En. / DGMG	EPA
Public Safety		Minist. des Mines (Securite Industrielle)	Min. de l'Equipement & de l'En. / DGMG	
Telecommunications	Ministry of Communications	Minist. des Telecommunications - OPT	Ministere de l'Equipement & de l'Energie Autorite de Regulation du Secteur des Telecommunications - Min. de l'Equipm	Minister of Posts, Telecommunications and Energy
Natural Gas Import/Export	DPR Ministry of Trade & Industries	Ministere du Commerce	Ministere du Commerce	MOME
Inland Waterways	Minister of Transport; NIWA	N/A	N/A	N/A
Wetlands	TBD	Ministere de l'Environnement	Ministere de l'Environnement & de la Production Forestiere - PNAE	TBD
Foreign Exchange Transfers / Opening of foreign exchange accounts	Any Authorised Bank	Ministere des Finances & de l'Economie Direction de la Monnaie et du Credit Banque Centrale de l'Afrique de l'Ouest	Ministere des Finances Banque Centrale de l'Afrique de l'Ouest	Any Authorised Bank

Schedule 2. Position Descriptions for Senior Staff

Position:	Director General
Based:	ECOWAS HQ. Abuja. Nigeria
Reporting:	Board of Governors
Duties:	Chief executive and administrative officer for the WAGPA. Supervises and coordinates the activities of the Directors. Manage interface between the WAGPA and WAGP and the States. Arrange for meetings and telephone consultations for the BOG. Determine policy for internal administration of staff. Set annual budget. Supervise staff that are assigned to the Secretariat.
Credentials:	Post graduate degree in public administration, law or business administration. Minimum of 10 years previous work experience of which half is relevant to the energy sector. Fluency in speaking and writing English and French. Age Limit: between 40 and 50. Mandate: 4 (four) Years, subject to one renewal
Compensation:	Salary Scale D
Commences:	1 April 2002

Position:	Director, Pipeline Operations Director, Market Surveillance Director, Fiscal Reporting
Based:	ECOWAS, HQ Abuja, Nigeria
Reporting:	Director General
Duties:	Management of the functional responsibilities of the relevant Directorates according to WAGPA Institutional Framework and the Concession Agreement. Day to day supervision of the staff assigned to each unit.
Credentials:	Post graduate degree in relevant areas, e.g. Engineering for Pipeline Operations; Economics/Business Administration for Market Surveillance; and Accounting/Finance/Taxation for Fiscal Reporting. Minimum of 10 years previous work experience. The Director Pipeline Operations must have had some previous experience with natural gas pipelines.
Compensation:	Salary Scale P5

Commences: 1 April 2002

Schedule 3. Position Descriptions for Technical and Support Staff

Position: Secretariat Legal Officer

Based: ECOWAS HQ, Abuja, Nigeria

Reporting: Director General

Duties: Legal advisor to WAGPA, supervise external counsel, represent WAGPA in Dispute Resolution with WAGP, liaisons with legal advisors for the States.

Credentials: Law degree from recognized university with LLM or other graduate degree preferred, understanding of common and civil law, minimum of 5 years experience preferably with international organisation or corporation. Knowledge of petroleum industry would be an advantage as well as fluency in English and French.

Compensation: Salary Scale P4

Commences: 1 July 2002

Position: Administrative Assistant To Director General

Based: ECOWAS HQ, Abuja, Nigeria

Reporting: Director General

Duties: Office management, arranging meetings for Board of Governors, coordination of documents circulated between WAGPA, the States and WAGP. Personal assistant to the Director General.

Credentials: General secretarial and word processing skills a certificate or degree as a paralegal is preferred. Ability to arrange meetings and coordinate travel schedules as well as an understanding of board procedures. Priorities will be given to the candidate with both transnational and interpretational skills, and the ability to handle delicate translation issues:

Compensation: Grade I - Salary Scale G5, P2 or P3

Commences: 1 July 2002

Position: Secretary

Based: ECOWAS HQ, Abuja, Nigeria

Reporting: Director General

Duties:	Clerical and secretarial work for Secretariat and three Directors. Maintain WAGP filing system.
Credentials:	General secretarial and word processing skills, knowledge of filing systems as well as fluency in English and French.
Compensation:	Bilingual Secretary Grade I, Salary Scale G6; or Bilingual Secretary Grade II, Salary Scale G5
Commences:	1 April 2002

Position:	Engineering Officer
Based:	ECOWAS HQ, Abuja, Nigeria
Reporting:	Director – Pipeline Operations
Duties:	Review Pipeline Development Plan, WAGP Regulations on pipeline operations, oversee construction progress and reports to WAGPA, assist securing permits and licenses, liaisons with State Monitors responsible for Pipeline Operations.
Credentials:	Degree in Civil or Mechanical Engineering, with postgraduate degree preferred. Minimums of 5 years work experience with petroleum or natural gas pipelines preferably as inspector of works or health, safety and environmental officer.
Compensation:	Salary Scale P4
Commences:	1 July 2002

Position:	Environmental Officer
Based:	ECOWAS HQ, Abuja, Nigeria
Reporting:	Director – Pipeline Operations
Duties:	Review environmental impact assessments and environmental management plan for WAGP, WAGP Regulations regarding environmental compliance, assist in securing permits and licenses, liaisons with State Monitors responsible for HSE issues.
Credentials:	Degree in Environmental Sciences, with postgraduate degree preferred. Minimums of 5 years work experience in monitoring environmental compliance in one of the States where WAGP will operate. Knowledge of procedures for assessing environmental impact.
Compensation:	Salary Scale P4
Commences:	1 July 2002

Position:	Economics Officer
Based:	ECOWAS HQ, Abuja, Nigeria
Reporting:	Director – Market Surveillance
Duties:	Review conducts of WAGP and affiliates including compliance with Access Code monitor growth of gas market in States. Oversee pipeline reporting obligations.
Credentials:	Degree in Economics with graduate degree or MBA preferred. Minimums of 5 years previous work experience in transportation or network utility sectors. Some knowledge of the petroleum industry would be preferred.
Compensation:	Salary Scale P4
Commences:	1 July 2002

Position:	Fiscal Officer
Based:	ECOWAS HQ, Abuja, Nigeria
Reporting:	Director – Fiscal and Reporting
Duties:	Review assessments in lieu of taxes on WAGP, audit returns and arranged for disbursements to States. Prepare WAGPA's annual budgets for funding by WAGP.
Credentials:	Degree in accounting. Minimum of 5 years previous work experience with background in corporate auditing preferred. Some knowledge of the petroleum industry is preferable.
Compensation:	Salary Scale P4
Commences:	1 September 2002

Appendix A. Salary Scales

Annual Salary Scales (UA)

Categories: Professional (D); Professional (P); & General Services (G)

Grade		1	2	3	4	5	6	7	8	9	10
D 1	Year	27174.91	27871.33	28567.74	29264.17	29966.42	30715.58	31480.39	32260.30		
	Month	2264.58	2322.61	2380.65	2438.68	2497.20	2559.63	2623.37	2688.36		
P 5	Year	24598.90	24962.45	25325.10	25684.05	26047.45	26410	26769.80	27117.59	27492.88	27811.20
	Month	2049.91	2080.20	2110.43	2140.34	2170.62	2200.84	2230.82	2259.80	2291.07	2317.60
P 4	Year	20860.26	21222.91	21707.45	22064.16	22428.46	22788.73	23152.13	23513.31	23877.45	24299.55
	Month	1738.36	1768.58	1808.95	1838.68	1869.04	1899.06	1929.34	1959.44	1989.79	2024.96
P 3	Year	17364.47	17725.65	18086.30	18447.24	18812.13	19172.56	19534.48	19895.65	20319.25	20956.79
	Month	1447.04	1477.14	1507.36	153.27	1567.68	1597.71	1627.87	1657.97	1693.27	1743.90
P 2	Year	14469.90	14831.81	15194.47	15555.65	15918.30	16279.47	16640.65	17003.30	17505.55	18031.79
	Month	1205.83	1235.98	1266.21	1296.30	1326.53	1356.62	1386.72	1416.94	1458.80	1502.65
G 6	Year	1160.20	11824.06	12047.93	12267.86	12491.12	12714.99	12937.34	13161.16	13383.56	13456.17
	Month	966.68	985.34	1003.99	1022.32	1040.93	1059.58	1078.11	1096.76	1115.30	1121.35
G 5	Year	9368.34	9592.96	9815.42	10039.19	10263.05	10485.40	10706.75	10931.62	11155.49	11377.84
	Month	780.70	799.41	817.95	836.60	855.25	873.78	892.23	910.97	929.62	948.15

Category Professional (D)

N.B. Depend Allowance Wife: UA 20.16
Depend Allowance: Child: UA 15:21

Category Professional (P)

N.B. Depend Allowance Wife: UA 20.16
Depend Allowance: Child: UA 15:21

Category: General Services (G)

N.B. Leave Transport Allowance: G5 & G6 = UA 42.50
Depend Allowance Wife: UA 7.80
Depend Allowance: Child: UA 5:92

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Schedule 4. WAGPA Training and Capacity Building Programme

1. Management Techniques
   - Improving Management Techniques
   - WAGPA Internal procedures

2. AB Role Specifics
   - WAGPA Institutional Positioning
   - WAGPA Regulatory Role
   - Project Schedule
   - WAGP Regulations
   - Access Code
   - Market Development
   - Fiscal & Customs
   - HSE
   - Other Concession Agreement specifics

3. Structure And Operations Of Natural Gas Pipelines

Schedule 5. Time Table For Implementation

Date	Activity
7 November 2001	PIC Reviews and Approves WAGPA Institutional Framework
December 2001	Commercial Group accepts WAGPA Institutional Framework
Next Steering Committee meeting	Steering Committee adopts WAGPA Institutional Framework
PCE + 15 days	Advertise positions for Director General, Directors, and clerical secretary for WAGPA
End of February 2002	NEXANT submits training programme and budget for WAGPA senior staff to Board of Governors
PCE + 2 month	Appointments are announced for senior staff. WAGP funds budget for first year.
PCE + 2.5 month	Senior Staff commence services
PCE + 3 month	Advertise technical and support staff positions
May 2002	NEXANT conducts 2-week training programme for senior staff.
PCE + 5 month	Appointments of technical and support staff are announced.
June 2002	Technical and support staff commence services
PCE + 5 month	NEXANT conducts 1 week training programme for technical and support staff and provides on-the-job support for 30 days.

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CARBON CREDITS AND THE WEST AFRICA GAS PIPELINE

1. EXECUTIVE SUMMARY

The West African nations of Nigeria, Ghana, Togo, and Benin have an opportunity to benefit from the accumulation and sale of certified carbon emission reductions (CERs) resulting from natural gas-fired power generation fueled by the planned West African Gas Pipeline (WAGP). There may even be an opportunity to use the CER sales to help finance each country's share of the WAGP.

However, it should be noted that using revenues from CER sales to help finance the WAGP will be problematic on three counts:

- First, there are more CERs available worldwide than there are buyers. So the price per CER unit will be low and the overall revenues will be low.

- Second, host countries will need to provide funds to the WAGP developers in the near term, while most of the revenues from the CER sales will not be available until the emission reductions occur. There are techniques for structuring the CER sales to provide some of the sales revenue up-front, but the volume of these revenues will be modest in comparison to the host countries' overall WAGP equity requirements.

- Third, there are CER ownership issues that must be addressed. For example, although Nigeria is the source of the WAGP gas, it is the power projects that generate the emission reductions (through replacement of oil and other high-carbon fuels with gas). These projects will be in Ghana, Togo, and Benin; thus it is not clear what claim Nigeria will have to these projects' CERs. In addition, the power projects are generally owned by private or quasi-private institutions, so it is not clear what claim *any* government will have to the CERs. Ownership issues can be resolved through negotiation or possibly by the international body that overseas and certifies the crediting of carbon emissions reductions.

The section of the Kyoto Protocol under which developing country projects can qualify for certified emission reductions is the "Clean Development Mechanism" (CDM). The CDM rules, which are still being promulgated by a "CDM Executive Board," lay out a set of actions that must be undertaken before the emission reductions can be certified as legitimate commodities for sale. The two most important actions are:

- The establishment of a project baseline to show what level of greenhouse gas emissions would have taken place without the CDM project and consequently what level of emissions reduction "additionality" the CDM project will provide; and

- The establishment of a monitoring and verification plan or "protocol" to measure whether the anticipated emissions reductions actually materialize. CDM rules specify that the verification activities be performed by independent, accredited "designated operational entities" (DOE), which can be private firms, non-governmental organizations, or a combination thereof.

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The most recent CDM rules are embodied in the "Marrakesh Accords," which can be viewed (or downloaded) at the web site of the United Nations Framework Convention on Climate Change (http://www.unfccc.de).

This paper examines the potential for the WAGP-fueled projects to qualify for certified emission reductions (CERs) under the Kytoto Protocol. It also examines the potential for Nigeria, Ghana, Togo, and Benin to use CER sales to help finance the WAGP.

2. THE REGULATORY ENVIRONMENT

A. The UNFCCC and the Kyoto Protocol

Corporations in industrialized countries are beginning to invest in activities and projects that reduce their greenhouse gas (GHG) emissions. For the most part, they are not required to do so by their governments. But they are anticipating eventual international agreement and forthcoming regulatory structures that will require reductions in their GHG emissions. One of the ways for these corporations to reduce emissions is to invest in GHG reductions in developing countries through the CDM. The CDM's origins lie in the UNFCCC, which came into being at the Rio Earth Summit in 1992.

The objective of the UNFCCC was to stabilize atmospheric concentrations of GHGs. Today, 183 governments and the European Union are Parties to the convention. The Parties are divided into two groups -- Annex I Parties, and non-Annex I Parties. The Annex I Parties include the countries that were members of the Organization for Economic Co-Operation and Development (OECD) at the time they signed the Convention, as well as countries that were classified as having economies in transition at the time.[1] The transition countries agreed to binding GHG emission reductions targets. The non-Annex I Parties are, all the remaining countries in the world, essentially the developing countries.

The Convention laid out broad goals but lacked a roadmap for achieving them. Building on the Convention was the Kyoto Protocol, agreed to in Kyoto, Japan in 1997. The Protocol sets a target for industrialized countries as a whole to reduce their GHG emissions by 5.2% from their 1990 GHG emission levels by the 2008-2012 period. It also sets GHG reduction targets for each Annex I country. The idea of industrialized countries achieving some portion of their GHG reduction targets through investments in developing countries was raised in the Kyoto Protocol, but there were no details included regarding how the idea would work. The Protocol has not yet entered into force, as it is legally binding only when at least 55 countries, accounting for at least 55% of the industrialized countries' emissions, have ratified it. So far, only 40 countries have ratified the Protocol.

Thus, while international efforts are underway to work out operational details of the Kyoto Protocol under the assumption that it will one day be ratified, governments are still operating under the more general guidance of the Convention. This is important to note because it means that none of the rules being established for, among other things, investing in developing country emission reductions, are binding. However, all parties are acting as though the rules *will* be binding. Even if the Kyoto Protocol is never ratified, governments and corporations will likely abide by the Protocol's procedural rules, including the CDM rules, in order to preserve the sanctity of a system for certifying, crediting, and trading GHG reductions. Theoretically, deals can be struck outside the rubric of the CDM, but it is

[1]These include Russia and the countries of Central and Eastern Europe.

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unlikely a buyer could be found for non-certified emissions reductions, particularly if and when the Kyoto Protocol (or a substitute treaty) is eventually ratified.

B. The Kyoto Mechanisms

The Kyoto Protocol recognized the value of market mechanisms to reduce greenhouse gas emissions. The concept involves an industrialized country government requiring its GHG polluting firms to reduce their pollution either through modifications to their own facilities or through the purchase of someone else's emissions reductions. Participating governments allot each polluting firm a quota for how much greenhouse gas it can emit. Some polluters will be able to reduce their emissions relatively easily and cheaply. They can then make additional reductions and sell them to other firms that find it expensive to cut their own emissions. The Kyoto Protocol allows for the trading of GHG emissions in this way to meet reduction targets. A tradable emission permit system is currently being used in the U.S. for the pollutants NO_x and SO_x. Under both the U.S. and Kyoto systems, each GHG polluter can decide for itself how best to comply with the quota.

The Kyoto Protocol establishes three flexible market mechanisms that can be used by industrialized country institutions to achieve emission reductions through measures in other countries. They are Joint Implementation (JI), Emissions Trading (ET), and the Clean Development Mechanism (CDM). Only the CDM, established in Article 12 of the Protocol, applies to developing countries. However, the other two mechanisms are worth noting because international buyers of emissions reductions will have a choice of which of the three mechanisms they will use. In general, the buyers' top priority will be to purchase emissions reductions (or otherwise comply with any governmental emission reduction requirements) at the lowest possible cost. They will not purchase CERs or invest in CDM projects if they are more expensive than the emission reductions offered by the other two mechanisms.[2]

Joint Implementation (JI) involves industrialized countries investing in greenhouse gas reducing projects in other industrialized countries or countries in transition, thereby generating *Emission Reduction Units (ERUs)*. These ERUs can either be used to satisfy domestic emission reduction requirements or sold on the international emission trading market. Since West African countries are not industrialized countries, they cannot participate in JI.

Emissions Trading (ET) or Allowance Trading involves a system wherein each industrialized country will be allocated *Assigned Amount Units (AAUs)* based on the total amount of emissions they are allowed under their commitment in the Kyoto Protocol. Each industrialized country government will then allocate emission permits to emission sources within their country. These firms that own these sources will then be able to trade with other firms (both domestically and internationally) who possess or need AAUs. Since West African countries have not made emissions reduction commitments under the Kyoto Protocol, they will not be able to participate in this market.

The **Clean Development Mechanism (CDM)**, as discussed, allows firms from industrialized countries to invest in GHG emission reducing projects in developing countries. Under the terms of the Kyoto Protocol, Nigeria, Ghana, Togo, and Benin qualify for CDM investments. They do not have to ratify the Protocol in order to participate, although they may have to in the future.

[2]Edwards, Garth, "The CDM Market: Present and Future," World Business Council for Sustainable Development, (no publication date – 1998?) See http://weathervane.rff.org/negtable/cop6/cop%5Fedwards.htm

Once emission reductions are authenticated and approved by the CDM's governing body - the CDM Executive Board - they become certified emission reductions (CERs), and can be bought, sold or traded internationally. The initial ownership of the CERs will depend on negotiations between the project investors, developers/sponsors, and the host government(s). In general, the party who is investing in or otherwise sponsoring the project that generates emissions reductions is likely to have the better negotiating position. In the case of the WAGP, this would be the investors and developers of the WAGP-fueled power plants that use the gas to replace higher-carbon fuels. But there are no rules on this matter, so it should be addressed as part of the overall project development as well as the fuel supply contracts and licenses.

Even though its rules are not finalized and its Executive Board only began work in November 2001, the CDM is operational. Few projects are moving through the certification process at this time, in large part because there are few investors. But investment will certainly increase over time, particularly if the CERs can be bought at a lower price than the ERUs under Joint Implementation or the AAUs under Emissions Trading. If approved by the Executive Board, the WAGP-facilitated emission reductions would constitute the largest CDM project on record.

C. Regional Aggregation and Certification

Suggestions have been made that perhaps a West African regional approach should be taken toward aggregation and/or certification of CERs. Aggregation, it is suggested, might reduce the administrative duplication of each country going it alone, and might allow for economies of scale, thus enhancing the value of CERs. However, under initial examination, it is not clear that a regional approach will generate economies of scale, certainly not in relation to the WAGP and highly unlikely in relation to WAGP-fueled power projects.

Scale has not been a problem in GHG markets, where trades have been small. More significant problems are the establishment of project baselines and the preparation of certifiable projects, which involve technical and financial analyses that cannot be aggregated. Each project in each country must establish its own baseline, regardless of any regional effort to present projects in a portfolio. Likewise, each project must go through a rigorous design and certification process regardless of any subsequent aggregation. Even after a group of projects are designed and certified, it is not clear that pooling them will fetch a higher CER selling price. This is because investors will need to conduct their own due diligence assessment on each project. They will not simply buy into a blind trust. So a pool provides no advantage to the investor, who must disaggregate the pool into individual projects, and then pick and choose among them.

There may be some advantage to pooling CERs if a number of CDM projects in the region are nearly identical. For example, if several natural gas-fired projects intended to displace oil, use the same technology, the same EPC contractor, the same power off-taker, the same type of power purchase agreement, the same insurance provider, etc, then investors may, after moving forward with the first project on a one-off basis, have comfort in investing in a package of nearly identical projects. Still, the investors will not be willing to ignore the varying taxation and regulatory approaches among the countries. The pooling approach stands a better chance if all the pooled projects are in the same country.

Some aggregation activities might be needed if the proposed West African Power Pool (WAPP) is established. For example, with the possibility of electricity generated by natural gas-fired power plants

in Ghana replacing oil consumption in Togo, there may be scope for a regional baseline. However, the WAPP is proposed to include 16 West African countries, not just the four envisioned for the WAGP aggregation. The cost and effort of coordinating these 16 countries in order to aggregate CER credits would be prohibitive. A baseline for Ghana could nevertheless incorporate assumptions about electricity exports (and imports). But given the complexity of tracking which users are using electricity from what source, Ghana would probably not receive credit for its electricity exports helping to displace oil in the other 15 countries. Under this circumstance, the WAPP would tend to decrease the number of CER credits Ghana, Togo, and Benin could expect to receive from the WAGP-fueled power plants.

As for certification, there may be some scope for a coordinated CDM project certification approach among the four nations. A uniform approach may attract CER investors, since they might view the region as a single source of a large number of CERs instead of as a conglomeration of separate rules and regulations. But any project certification undertaken by the four countries individually or together is subservient to the final certification undertaken by the CDM Executive Board. So it is unclear what advantage will be gained from regional certification.

The one area where there may well be some benefit from a regional approach is in monitoring and verification. Given the significant costs to each country from preparing its own protocol, a joint approach could lower costs. While each project type will require some unique M&V approaches and each project will require its own M&V activities, there may be some economies from adopting some standardized M&V procedures.

3. THE PIPELINE AND THE OPPORTUNITY IT PRESENTS FOR THE HOST COUNTRIES

A. Background

At present, Nigeria consumes 13 percent of the natural gas it recovers, re-injects another 12 percent to enhance the oil recovery process, and flares the remaining 75 percent.[3] The major oil companies operating in Nigeria have announced that they will phase-out gas flaring by the following dates: Agip, 2005; TotalFinaElf, 2008; Shell, 2008; Chevron, 2008; Texaco, 2005/6; and ExxonMobil, 2004. The government of Nigeria has stated that gas flaring will end by 2003, but it remains to be seen which target will be met.

There is little domestic demand for natural gas in Nigeria, and while plans are underway to expand domestic applications, the main plan for the flared gas is to capture it and transport it via the proposed West Africa Natural Gas Pipeline (WAGP) to the neighboring countries of Ghana, Benin, and Togo. The $500 million pipeline will run 620 km from a tie-in to an existing gas pipeline in Nigeria, to the Nigerian coast, and then offshore with landfall spur connections to coastal sites in Benin, Togo and Ghana.

The WAGP will bring initially approximately 130 Mmscf/d of Nigerian natural gas to the three West African nations, which the World Bank estimates could save almost $500 million in energy costs over a 20-year period. A section of the pipeline has already been constructed, delivering gas to Lagos. This

[3] U.S. Energy Information Administration, Nigeria country brief, http://www.eia.doe.gov/emeu/cabs/nigeria.html, January 2002.

section, the Escravos-Lagos pipeline (ELP), supplies natural gas to Nigeria's Egbin power plant and other industrial consumers in the Ogun State. This current section of the pipeline has the capacity to handle approximately 900 million cubic feet per day (Mmcf/d), but this capacity is not currently being fully exploited. The pipeline is scheduled to transport 130 Mmscf/d of gas to Ghana, Benin and Togo beginning in 2005. This figure will gradually ramp up to 400 Mmcf/d by the end of 2020. Construction will commence after the engineering study and the environmental impact assessment are completed, early 2004.

The gas will, in many cases, offset the use of oil or other fuels with high carbon content, thereby contributing to a reduction in greenhouse gas emissions (GHGs). The project developers have stated that the reduction of air pollutants, specifically GHGs, is a major objective of the WAGP project. While the piping of natural gas itself is not considered a source of emissions reductions, the activities upstream (such as the capturing of the gas) and downstream of a pipeline (such as substituting the gas for oil in power plants) can contribute to emissions reductions.

B. The Pipeline Agreements

After a report was published by the World Bank in the early 1990's indicating that a pipeline transporting Nigerian natural gas to Benin, Togo and Ghana was commercially viable, the governments of the four nations signed a **Heads of Agreement (HOA)** in 1995 outlining the joint participation in the possible development of the pipeline.[4]

In August 1998, a consortium of Chevron, Shell, Nigerian National Petroleum Corporation (NNPC), Ghana National Petroleum Corp. (GNPC), Societe Togolaise de Gaz (SoToGaz), Societe Beninoise de Gaz (SoBeGaz) signed an agreement to conduct a feasibility study of the West Africa Gas Pipeline (WAGP). The results of the study, completed in 1999, affirmed that the project was commercially and technically viable.[5]

In August 1999, a **Memorandum of Understanding,** signed by the four countries and the corporate consortium, established the legal framework for the WAGP. Shortly thereafter, a **Joint Venture Agreement** was signed naming Chevron as the WAGP project manager.[6]

In February 2000, the four national governments signed an **Inter-Governmental Agreement (IGA),** which established the framework for moving forward on the pipeline venture. The IGA includes the governments' commitment to the pipeline owners and gas distributors on the conditions for the development, construction and operation of the pipeline, as well as fiscal and customs policies for the project.[7]

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[4]U.S. Energy Information Administration, "West Africa Gas pipeline Project," http://www.eia.doe.gov/emeu/wagp.html, April 2001

[5] ibid., U.S. Energy Information Administration

[6] ibid., U.S. Energy Information Administration

[7] ibid., U.S. Energy Information Administration

4. THE WAGP AND CERTIFIED EMISSION REDUCTIONS

A. Sources of Credit Generation

Grid-Connected Power Generation

Electricity in Ghana, Togo, and Benin is generated mainly with oil and hydropower. In the absence of the WAGP, future power plants will be mainly oil-fired. The WAGP-supplied gas will thus facilitate emissions reductions in both existing and future oil-fired plants.

Industrial Sector

A variety of industrial facilities require both electricity and heat. Although the existing electricity grids in West Africa supply electricity to industrial facilities, some facilities generate their own power either because they are not near the electricity distribution grid or because they want more reliable power. In some cases, such as the pulp and paper industry, the facilities may have access to their own feedstock fuels, which are used to provide less expensive power than that from the electricity grid. In addition to consuming electricity, many industrial facilities burn oil, wood, and other fuels to provide process heat.

Natural gas provided by the WAGP could certainly replace a portion of the higher-carbon fuels currently in use for industrial power and heat. This will particularly be the case for facilities that are either near the electricity grids powered by WAGP gas or are near the WAGP landfall spurs, where short pipelines could supply them with WAGP gas directly. But estimating the amount of industrial fuel that WAGP gas will replace is highly speculative and will require further study of industrial fuel uses, prices, demand, and availability in Ghana, Togo, and Benin.

Other Sectors

Natural gas from the WAGP could replace high-carbon fuels currently in use in the commercial, residential, agriculture, and transport sectors. However, the energy use in these sectors is highly dispersed and it will not be cost-effective, even with the sale of CERs, to replace current fuels - mainly oil, kerosene, and wood - with natural gas, at least in the near-term. Over time, it may make sense to install natural gas distribution systems in urban areas for commercial and residential space cooling, hot water heating, and cooking. Compressed natural gas is use around the world for fueling buses and other transportation fleets, and there may be some scope for this in the transport sector of West Africa as well. These will require further study.

B. Volume and Value of Emission Reductions

The volume of Certified Emissions Reductions (CERs) that might result from the WAGP-fueled power projects was analyzed in a consultant study in 1999.[8] The study presented greenhouse gas emissions scenarios for the four West African countries, and made assumptions about possible future emissions and emission reductions based on different levels of economic growth and resulting energy demand. Table 1 shows the levels of carbon dioxide and methane emissions and reductions assuming a low-to-medium level of future natural gas demand in Ghana, Benin, and Togo; and Table 2 shows the same under a medium-to-high level of demand. Under the first scenario, greenhouse gas reductions could amount to 88.7 million metric tons per year over 20 years. Under the second scenario, the reduction could reach 99.9 million metric tons per year.

Further analysis is needed to refine the assumptions and figures in this study. It should be noted that the consultant study may have double-counted emission reductions by including both Nigeria's gas flaring reductions and the other three countries' use of that gas to substitute for higher-carbon fuels. As previously discussed, if flared gas is captured and combusted elsewhere, there has been no net reduction in gas combustion or greenhouse gas emission reductions. The reductions only occur if the gas is not combusted or if it is combusted in order to replace higher-carbon fuels.

Table 1: Estimated Greenhouse Gas Emission Reductions With the WAGP Project: Mid-Low Development Scenario

Emissions	Total Emissions for Years 2001-2020 (Million Metric Tons)		Emission Reduction Or Increase
	Baseline	With Project: Mid-Low Gas Demand Scenario	
Greenhouse Gases			
Carbon Dioxide	306.88	218.33	-88.55
Methane (CO_2 Equivalents)[9]	6.45	6.28	-0.17 (-2.6%)
Total GHG (CO_2 Equivalents)	313.34	224.62	-88.7

Source: Lague, 1999

Table 2: Estimated Greenhouse Gas Emission Reductions With the WAGP Project: Mid-High Development Scenario

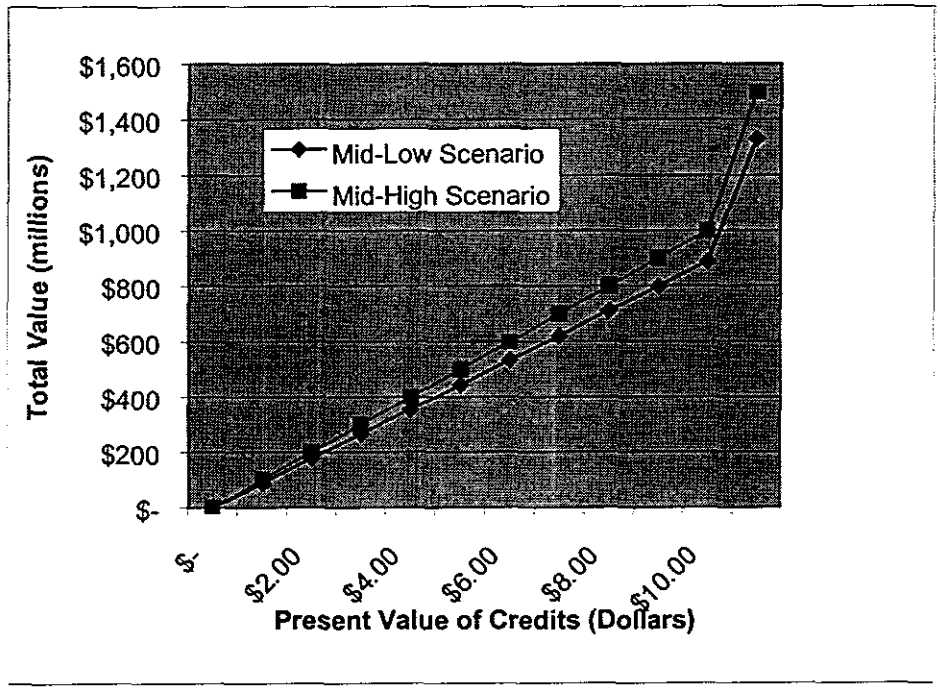
Emissions	Total Emissions for Years 2001-2020 (Million Metric Tons)		Emission Reduction Or Increase
	No Project Scenario	With Project: Mid-High Gas Demand Scenario	
Greenhouse Gases			
Carbon Dioxide	318.11	218.33	-99.78
Methane Global Warming Potential (CO_2 Equivalents)	6.46	6.28	-0.18 (-2.8%)
Total GHG (CO_2 Equivalents)	324.57	224.62	-99.9

Source: Lague, 1999

[8] Lague, John S., "Emissions Reductions Achievable by Means of the Proposed West Africa Gas Pipeline, 1999.
[9] Methane global warming intensity of 21 times that of Carbon Dioxide (in CO_2 equivalents).

The potential value of the CERs is displayed in Figure 1 below. It is important to note that, at present, the sale price at which any credits generated in West Africa will achieve is not known due to uncertainty in the carbon market. The figure below shows a range of $0 to $15 for the present value of the future price of any CERs sold. While prices for verified emission reductions (not yet officially considered CERs) have ranged from $.25 to $9 in recent years, the price has largely stabilized at $1 to $3.[10] So a selling price of $2.50 per metric ton of carbon dioxide equivalent will yield $221-224 million over 20 years, or $11.05-11.25 million per year.

Figure 2: Twenty-Year Value of Potential Carbon Credits Generated from Natural Gas in West Africa (2001-2020)



C. The Issue of Ownership of the Emissions Reductions

A key issue in the development of the WAGP and associated power projects will be the determination of who owns the carbon emission reductions. As discussed, this is something that should be resolved through negotiation among the involved parties. The first step in determining ownership is to determine who exactly are the involved parties. Many parties may participate in the process of making a project happen, and they all may lay claim to the emission reductions that take place. The Kyoto Protocol does not address the ownership issue, instead leaving it up to the host country regulators to decide the most appropriate course of action. At present there are three approaches to credit ownership:

> Downstream Ownership: The project or activity at the point of emissions reduction. In this case, downstream ownership would refer to the developers, investors, and owners of the power

[10] Neil Cohen, NatSource, presentation at Earth Technologies Forum, Washington, D.C., March 2002.

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plants using WAGP gas to replace oil, plus any industrial plant or other party using WAGP gas to replace higher-carbon fuels;

Upstream Claim: A project, action, or participant several steps removed from the point of emissions reduction. In this case, upstream claimants would include the developers, investors, and owners of the WAGP, plus the supplier of the WAGP gas.

Credit Pooling: Ownership is passed on to a party not directly related to the emission reduction. In this case, the credit pooling entity might be Ecowas or some other regional or non-governmental body, or it might be a private authority designated to hold the credits in trust for servicing the WAGP debt.

Current international opinion, while not at a consensus, indicates that the downstream entity or owner of the site where a technology or process change takes place, and who also pays for the activities that reduce GHG emissions, is the true owner of any CERs generated.

In this way, the issue of credits ownership is basically one of *project boundary*. By drawing a relatively tight line around the *project activity* a project owner will insure a clear definition of ownership in the certification process. Those projects that draw the line too wide will have trouble claiming ownership of any emissions reductions generated.

Specifically, the emissions reductions that result from activities that take place downstream from a government's or business's location are difficult (if not impossible) to lay claim to. That is, Nigeria and the WAGP owners will have difficulty claiming ownership of the emissions reductions resulting from the fuel substitution in Ghana, Benin, and Togo. Nigeria will also have difficulty claiming ownership of the emissions reductions resulting from the reduction of gas flaring as long as the captured gas is subsequently released for combustion elsewhere.

If Nigeria were to take the otherwise flared gas and somehow inject it back into the earth or some place where it could not be accessed and combusted, then the flaring reduction would constitute a CDM project whose ownership and boundaries are clear.

The Downstream/Upstream issue can be illustrated by a hypothetical situation in which several equipment suppliers and engineering firms contribute to a series of energy efficiency improvements to a privately owned factory. Each of these suppliers and firms are paid fair market value for their goods and services. Under this scenario it is conceivable that both a provider of a service and the factory owner would claim ownership of the emissions reductions. The service provider could claim that the factory owner did not possess the necessary skills or knowledge to make the emission reductions possible, therefore they are actually producing (and thus own) the reductions.

While it is clear that the factory owner would not have been able to produce these improvements on his own, the suppliers of the inputs would not have done the work without financial compensation. And when trying to define the project boundary, the supplier would not have regular access to the site of reduction and could not monitor or confirm that emission reductions were taking place. Under the other scenario, the factory owner could easily monitor and verify the emission reductions from this activity. All equipment suppliers and consultants were adequately compensated and the factory owner does not have any outstanding financial obligations. It is not enough to say that contributing to a project entitles an individual or group to ownership or partial ownership of the CERs produced. If this

project were certified as a CDM project, the factory own would retain all rights to the CER credits generated.

D. The Market for West African Credits: Are there Buyers?

At present, the market for verified GHG emission reductions is small. It is even smaller for those reductions originating in developing countries. Europe and North America constitute small-but-growing markets, and an increasing number of private firms are buying emission reductions on their own. At present, the main buyers of developing world emission reduction credits (they cannot yet be called "Certified Emission Reductions") are the World Bank's Prototype Carbon Fund (PDF), the Dutch CarbonCredits.nl program, and private businesses. But other government and private emission reduction programs that are currently focused on domestic reductions will expand to international purchases of emission reductions, including those from developing countries.

The **Prototype Carbon Fund** (PCF), launched by the World Bank in January 2000 and capitalized by six donor governments and 17 private corporations, invests in GHG reduction projects exclusively in World Bank client countries. In February 2002, it raised its subscribed capital from $145 million to $180 million in anticipation of increased demand for its funds. To date, the PCF has completed or nearly completed 5-6 investments, including one in Africa, and has a series of planned projects. It expects to place all its funds by mid-2004, and is scheduled to terminate in 2012.

The **European Union** (EU) is drafting a directive that will require each member state to implement a domestic CO_2 emissions trading program beginning in 2005. Unlike the UK system it will not be voluntary and firms will face financial penalties if they fail to reach emission reduction targets either through investment in their own facilities or through the purchase of emissions reductions from other parties. Initially, it will not include joint implementation (JI) or CDM. A separate proposal for their inclusion will be made once international JI and CDM rules have been adopted. It is not yet clear to what extent the EU directive will supercede the programs of member states.

The Netherlands' Carboncredits.nl is the new name for the *Emission Reduction Units Procurement Tender Program (ERU-PT)* which facilitated emission reductions purchases exclusively from projects in Central and Eastern Europe (CEE). The new program, administered by the Dutch Ministry of Economic Affairs, allows Dutch corporations to buy credits from projects in either CEE or developing countries to offset their own emissions. To date, the Dutch government has signed contracts to purchase emission reductions from five projects in CEE. The purchases involve more than 4 million metric tons of CO_2 at a cost of US$30 million. Prices for the tenders average US$7.50 per ton of CO_2.

The Danish government is perhaps the most progressive government in pursuing GHG emission reductions. In the early 1990s the Danish government set a goal of reducing domestic CO_2 emissions by 50 percent by 2030. A program launched last year to meet this goal provides CO_2 emissions allowances to eight electric power companies and places emissions caps on about 500 electricity producers, most of which are very small combined heat and power plants. It allows emissions trading and banking, but leaves the issue of participating in the CDM or other international mechanisms up to the Energy Ministry, which has not yet made a decision on such participation.. However, the

government will likely ratify the Kyoto Protocol in the coming year and thus link the Kyoto Mechanisms, including the CDM, with the current domestic program.

The **United Kingdom** held a reverse auction in March 2002 in which British companies bid for government subsidies in exchange for committing to a certain number of tons of GHG reduction. That is, those companies committing themselves to the most reductions for a specific level of subsidy were the auction winners. The companies can now trade their reductions amongst each other. The auction required that the participating companies only submit domestic emission reductions, although future auctions may allow overseas reductions, including those purchased in developing countries.

A "Climate Change Projects Office" (CCPO) will be launched by the British government this summer (2002) to provide advice and support for British businesses interested in carrying out projects under Joint Implementation (JI) and the CDM.

Even with the **United States'** current Administration lacking enthusiasm for the Kyoto Protocol, the U.S. has several forms of climate change legislation (at the state and national level) currently under consideration. The U.S. represents the largest possible market for emission reduction credits and should not be overlooked simply due to current the lack of support for the Kyoto Protocol. If and/or when the U.S. adopts a climate change policy involving credit trading it will represent a major force in the market.

A number of state government initiatives, most notably those in Oregon, New Jersey, and Massachusetts, are aimed at reducing GHG emissions. The Oregon Climate Trust is a fund developed under state regulatory guidelines to offset utility-based GHG emissions. It purchases emissions reductions from U.S. and international emissions reduction projects for use by utilities to meet their emissions targets. In addition to the state programs, a new emissions trading exchange is in development. The Chicago Climate Exchange will seek to standardize or "commoditize" GHG emission reductions so that they can be traded among buyers and sellers in the same way as other commodities. While both the state programs and the Chicago Exchange are interested in international emissions reduction projects, their current focus is on domestic emission reductions.[11]

Canada does not have plans to institute mandatory emissions reductions but has 28 voluntary climate change initiatives under way that are intended to cut GHG emissions by more than 23.7 million metric tonnes by 2010. These programs will offer Canadians several choices to reduce emissions, including: cleaner energy, more energy-efficient buildings and homes, and greener transportation. The funding comes from the US$700 million for climate change commitments. When fully implemented, the initiatives are expected to meet about a third of the nation's commitment under the Kyoto Protocol to reduce its GHG emissions by 6 percent from 1990 levels.

A Tradable Permits Working Group (TPWG) has been formed to explore the potential for a mandatory domestic emissions trading system to achieve GHG reductions.

The number of **private corporations** proceeding with voluntary GHG emission projects is rapidly increasing, particularly since the Marrakesh meeting, now that more of the international rules are in place. Much of the increased activity, at least on the part of U.S. corporations, is due to their belief that the U.S. government will eventually sign the Kyoto Protocol or otherwise implement GHG emission reduction regulations. The corporations are acting now in order to reduce the future costs associated

[11] Some companies in Brazil will be participating in the Chicago Climate Exchange.

with the new regulations. In addition to reducing emissions at their own facilities, many have chosen to purchase credits from international projects.

There are several consortia of firms that have made major announcements about their intent to take aggressive action to reduce their GHG "footprint." The Partnership for Climate Action, organized by the environmental group Environmental Defense, includes Alcan, British Petroleum, Entergy, Ontario Power Generation, Pechiney, Shell International, and Suncor Energy. Other corporate consortia are coordinated by the Pew Center on Global Climate Change and the World Wildlife Fund.

5. RECOMMENDATIONS

A. Begin CDM Project Preparations

While it is unlikely that West African nations will be able to rely on the sale of certified emissions reductions to help finance the WAGP, it is possible that CDM projects, including the WAGP-fueled power projects, can qualify for CERs which can be sold on the international market. But preparing projects for CDM certification is costly and time-consuming. West African countries should begin the process of defining the CDM project(s), determining project boundaries, and negotiating ownership of the resulting CERs. They will then need to start preparing their project baselines, monitoring & verification plans, and other elements of the Project Design Document for presentation to the CDM Executive Board. These activities need to start as soon as possible, as it will be more difficult to convince the Executive Board that the WAGP-fueled projects constitute additionality after the projects are already built.

B. Present A CDM Portfolio

There is some opposition in the international community to natural gas projects qualifying for CDM status and receiving carbon credits. The breadth of this opposition is not clear. Certain environmental organizations oppose natural gas projects, largely on the grounds that the projects would probably happen regardless of the CDM and would thus not constitute additionality. They also believe that CDM credits for natural gas projects put renewable energy and energy efficiency projects, already struggling for economic viability, at a further competitive disadvantage relative to the gas projects.

Given these concerns, it may make strategic sense to present the WAGP-fueled power projects to the CDM Executive Board and the international community as part of a package of projects that includes renewable energy (RE) and energy-efficiency (EE) projects. This will show that the RE and EE projects are not being pushed out of the CDM project pipeline by natural gas projects. It also will put the gas projects in the company of projects that more clearly represent additionality. And it will strengthen West Africa's environmental stature by presenting a well-rounded global environmental project portfolio that reflects the spirit of the Kyoto Protocol.

The packaging of the natural gas projects with the RE and EE projects would be for presentation purposes, not financing purposes. That is, investors will not buy into a diverse package of projects, but will pick and choose among the projects. The RE and EE project proposals will have to stand on their own both as legitimate CDM projects and as projects warranting investment from other parties such as the World Bank, bilateral agencies, and private institutions. It should be noted that the submission of the RE and EE projects as CDM projects will require additional administrative/transaction costs (e.g. for the preparation of additional project baselines, monitoring and verification plans, etc.).

C. Consider Government Ownership of CERs Versus Government Levy on CERs

As discussed, the initial ownership of CERs is subject to negotiation between project investors, project sponsors/developers, and host governments. The Kyoto Protocol calls for the allocation of a portion of CERs produced by a project to be allocated to the government to cover any expenses associated with the regulation and certification of clean development mechanism projects. But it is silent on how large this portion might be. In addition, the latest Kyoto Protocol negotiations call for a 2 percent levy for the "cost of adaptation." While "adaptation" refers to the measures countries take to respond or otherwise "adapt" to climate change, and an adaptation levy would not be relevant to a CDM project, the Kyoto approval of an adaptation levy may constitute a precedent for climate-related levies in general, including those assessed on CERs. Of course, regardless of any endorsement from Kyoto negotiations, host governments are certainly free to apply CER levies or taxes if they so choose. In the case of the WAGP-related projects, based on volume and value calculations, a levy of 10 percent could produce a revenue stream of $2.2 to 2.5 million/year (for all four countries) based on a credit value of $2.50 per ton CO_2 equivalent.

However, taxes and levies could kill the CER deals. Ideally, the distribution of CERs and the revenues from their sale should be agreed to in advance through negotiation, not through subsequent taxation. A host government could earn the same revenues through the sale of its negotiated share of CERs as through taxation of other parties' CERs. Negotiated ownership is superior to taxation in the additional sense that the host government can choose whether to sell its CERs or bank some portion of them in speculation of a higher selling price or in anticipation of complying with future emissions reduction targets.

Draft Final Report

West Africa Pipeline Project

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Prepared For:

West Africa Gas Pipeline
Project Implementation Committee

Nexant

Griffin House, 1st Floor South, 161 Hammersmith Road, London W6 8BS, UK
Tel: +44 20 7950 1600 Fax: +44 20 7950 1550

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Executive Summary

Introduction

The Gas Market Promotion Strategies (GMPS) Study was implemented by Nexant between November 2001 and June 2002 at the request of the West Africa Gas Pipeline (WAGP) Project Implementation Committee (PIC).

The purpose of the Study is to determine the possible usages of the WAGP gas in the Purchasing Countries, and to define the conditions, such as the design of the pipeline networks and the national markets institutional frameworks, that would allow WAGP gas to be delivered in the Purchasing Countries, with the aim of promoting the growth of the WAGP gas market.

At the request of the PIC, the Study reviews the power and industrial markets in Benin and Togo, and the industrial market in Ghana. It also privileges the short-term requirement of the development of the WAGP.

The study addresses a number of key areas as described by the chapter headings below.

Overview of Gas Applications

The objective of this Chapter is to inform the governments about the general usage of natural gas worldwide, and to narrow it down to the possible usages of WAGP gas in the context of West Africa. In particular, the Chapter:

Prepare a world-wide overview of the gas usage and highlight the market drivers for the main industries using Methane gas as feedstock or fuel:

- Develop a world-wide and regional summary of the supply and demand for the main gas usages
- Highlight the key success factors of the specific industries using gas and their competitive strategies
- Present the basic economics of the gas industries analysed, with a view to assessing the feasibility of the various gas usages in the WAGP Purchasing Countries.

The conclusions of the gas paper are that, among the possible usages of WAGP gas in the Purchasing Countries:

1. Power production is by far the main opportunity
2. Industries using gas for heating processes are a significant potential market
3. WAGP gas has limited scope in commercial and residential applications due to the higher cost associated with developing these markets, and the ability of consumers to pay a premium for this service
4. Compressed Natural Gas (CNG) in motor vehicles could be viable but much depends on governmental policies and incentives available

Other gas applications such as petrochemicals cannot compete in the global market if produced at the end of the WAGP. In order to be competitive, primary petrochemicals (e.g. fertilizers) need to be produced proximal to gas fields to avoid bearing excessively high gas transportation cost.

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Market Assessment

The Consultant conducted Assessment Visits in the four countries to collect the data necessary for the Study. A supplementary survey was also conducted for those potential consumers that it was not possible to visit through the issue of approximately sixty questionnaires. From these it was determined that Ghana and Togo have a significantly larger market, regardless of growth forecasts taken, followed by Benin. As Benin's market is also more dispersed compared to Togo it is to be expected that the Benin market will incur higher development costs, hence higher tariffs, which may or may not prove a disadvantage in attracting enough customers to convert to gas.

The Consultant was able to verify and update the findings of the studies previously conducted by others. The Study generally confirms the content of these existing studies. However, the Consultant went further in assessing as accurately as possible the costs of the energy sources currently used by the potential gas buyers. Therefore, the Study presents a comparative analysis of the anticipated delivered cost of WAGP gas and its competing sources of energy and in so doing a more accurate picture of the true secondary gas market size to be found in the purchasing countries.

Design of Local networks

Having identified the potential WAGP gas users, the Consultant has drawn the secondary networks and calculated their related cost based on tested formula. Four secondary networks are proposed, originating from the points of delivery of the Primary System: Cotonou, Lomé, Tema and Takoradi.

It should be noted that in designing / developing a network a network operator needs to decide the overcapacity to be built into the design so as to allow for future growth projections. This invariably means that higher tariffs will result in the initial phases of a networks life in order to ensure sufficient liquidity is maintained for the pipeline operating company, with tariff then declining with volume growth in future. However, even with the best forecasts, it is likely that most network designs will develop bottlenecks as demand growth occurs faster than or in areas not predicted. Networks must therefore be designed with the flexibility for "looping", i.e. the process of running a parallel line along a constricted section to increase throughput. In this way additional capital expenditure can be minimized while maximising revenue. Consideration must therefore be given to this when rights of ways are allocated to a developer.

Development Scenarios

The Study presents several development scenarios in each country, based on the variation of the following parameters:

- Volume of contracted capacity and gas delivered based on growth forecasts
- WAGP gas Tariffs derived from the Concession Agreement Term Sheet (CATS) Tariff Methodology (TM)

The study condenses its analysis into three distinct growth scenarios, namely:

- Present Demand (the existing market demand as observed, without growth predictions requiring capital investment)
- Expansion/Demand Growth Scenario (as above with customer own growth forecasts)
- "Strategic Projects" Scenario (based on identified strategic projects e.g. PVC & Salt recovery in Tema).

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The Study results show that, on the basis of the present terms of the Concession Agreement Term Sheet (CATS) Tariff Methodology, secondary networks to deliver the industrial market may exist in Ghana, and possibly Togo, but no secondary network is likely to be developed in Benin for several years.

Nevertheless, the Study suggests the recognition of two separate gas markets (power market and industrial market) and that the WAGP should endeavour to both serve. The industrial market, for its larger share, is characterised by: a) a lower existing cost of energy and b) a location away from the WAGP delivery points, necessitating the construction of secondary networks.

Therefore, in order that the industrial market be reached, the Study suggests reconsidering the terms of the CATS TM in a way that would be more favourable to low cost energy users. A successful negotiation would likely allow creating a secondary network in Togo. In fact, the Study demonstrates that such reconsideration could be beneficial to all stakeholders, including the WAGP Developers.

Government Policies

The Study recommends that the Purchasing Countries governments should do to allow and promote the development of the secondary networks and the establishment of local gas markets.

Establish National Gas Regulations

The national regulations shall reproduce, when applicable, the main features of the WAGP Concession Agreement on the secondary networks, including Access Code and Tariff Methodology. Moreover, National Regulatory Authorities should be put in place to enforce the national regulations and supervise the development of the secondary networks.

The Study also suggests that the policies of incitation contained in the Concession Agreement Term Sheet in favour of the WAGP project, such as the Fiscal Regime, be reproduced in the national regulations in order to promote the development of the national gas markets.

Select Appropriate Market Management Options

The Study sets forth the need for local "Aggregators" who will be responsible for development, operation and management of each secondary Network. The Study further defines the profile and the mode of selection of the "Aggregator".

The particular cases of Benin, Togo and Ghana are addressed, with a view to resolving the issues currently being debated between the stakeholders in the three countries. The Study concludes as follows:

- Location of Delivery Points: those points should coincide with the location of the Foundation Customers in the three countries
- Secondary Network Tariffs: the secondary network transportation price should be calculated on the basis of a postage stamp price applicable to all customers, irrespective of there location on the network, based on a regulated rate of return assessed on the network-invested capital.
- Aggregators Capital and Balance Sheet: Investments required from the Aggregators are important, especially in Benin and Togo where pre-selected Aggregators are also investors in the primary network. Therefore, there is an opportunity for national markets major stakeholders to participate in the increase of capital of the Aggregators. This would benefit the Aggregators several ways: it will improve the Aggregators know how, increase their financial strength and enhance their motivation towards the development of the secondary Markets. Moreover, Aggregators could be carriers only, not merchants, when delivering to major customers, to reduce the exposure of their balance sheet.

It is proposed that the tariff the applied to secondary networks by an Aggregator be regulated on a Rate of Return basis similar to that of the CATS TM. However, rate of return regulation in it's simplest form can lead to what is commonly referred to as "gold-plating", where a pipeline operator over invests in provision of services and infrastructure which do not add value for the consumer. In order then to realise the target rate of return, tariffs would need to be higher than would otherwise be the case with more optimal investments. There is in other words a disincentive for attracting new customers and growing the local market since the upper limit rate of return can be achieved via the same network size. To this effect other principles of regulation such as price capping, and possibly a demand-linked formula based n target market penetration and market demand growth may also be necessary.

Furthermore, market value approach to tariff setting (i.e. replacement cost of alternative fuels) may not be sufficient to ensure the full benefits of a gas network and of lower transportation costs in the long term are passed to end customers. To this effect, an open accounting policy must be put in place for aggregators (gas distribution companies) to prevent aggregation of costs incurred in gas network management and gas distribution so as to prevent excessive profit taking.

Provisions also need to be made for regular (6 monthly or yearly) revision of tariffs to account for over/under recovery of costs by the Aggregator.

Country Market Promotion Strategies

Togo

The Study shows that on the basis of the CATS Tariff Methodology, the cost of delivering gas to WACEM and IFG would be higher than their current cost of energy, and therefore no secondary network would be developed in the country. However, with a price of WAGP gas "on the beach" closer to the Industrial Development Tariff (IDT) of the CATS, gas would be attractive and a secondary network could probably be developed in Togo earlier. The Study recommends that the rules pertaining to the application of the IDT be revised.

Benin

The market in Benin is not as favourable as in Togo. Regardless to the application of the IDT, the economical conditions in Benin do not allow an early construction of the secondary network except with CEB participation in the network. This conflicts with the interests of other stakeholders and requires timely resolution for the greater benefit of the Benin energy market.

Ghana

The market in Ghana, both Tema and Takoradi, are the most favourable for development of gas markets, requiring little further incentive other than the choice of a suitable aggregator and one with the financial capacity and technical know-how to proceed. Development of a residential and consumer market though would need appropriately targeted pricing to cover the higher levels of investment required to serve these markets – this philosophy obviously goes against the postage stamp pricing adopted in this study, but can easily be incorporated within it by the application of a capacity utilization charge for higher cost consumers.

Study Follow Up and Implementation Plan

Study Follow Up

The Consultant proposes specific presentations of the Study to the PIC, the Steering Committee, the Commercial Group. Thereafter, the Study would be presented and tested to the market stakeholders in each country through three "roundtables".

Study Implementation Plan

The Consultant is willing, subject to availability of USAID funds, to assist the Purchasing Countries during the Implementation Stage of the Study.

Two successive steps could be envisaged:

1. Assist countries establish National Gas Regulations
2. Assist Governments, as appropriate, in the development of the national secondary networks.

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1 Introduction

1.1 The WAGP Project

Worldwide, natural gas has become the fastest growing primary source of energy, far outstripping all other sources of primary energy. By sharp contrast, the gas usage share of the energy market in Africa, especially in sub-Saharan Africa, has remained relatively stable. In fact, it constitutes the lowest portion of total energy consumption in Africa generally.

In industrialized nations, the changeover from other fossil fuels (particularly coal) as power station fuel has largely driven this rapid growth, spurred on by economic factors as well as environmental constraints. In developing nations, a large proportion of demand growth is associated with power generation, but there is also a good spread of demand growth across energy intensive industries such as petrochemical applications.

Striving for economic growth and greater industrialization in Africa will result in increased demand for primary energy. Inexorably a significant portion of this energy demand will have to be met by natural gas. Policies and infrastructure to satisfy, and even promote this demand are key to realizing the greater long-term policies of full industrialization in these countries.

The proposed West Africa Gas Pipeline (WAGP) is a major gas pipeline project with the design intent of delivering abundant Nigerian natural gas resources to participating member states, namely; Bénin, Togo and Ghana (henceforth termed "Consumer States"), in order to meet potential demand within these states.

On August 11 1999, six companies, namely Chevron Nigeria, Nigeria National Petroleum Corporation (NNPC), Shell Nigeria, Ghana National Petroleum Corporation (GNPC), Société Béninoise de Gaz (SoBeGaz) and Société Togolaise de Gaz (SoToGaz) collectively referred to as the Commercial Group (CG), came together and executed with the States of Benin, Ghana, Nigeria and Togo ("the States") the Definitional Phase Memorandum of Understanding (MOU) for the purpose of constructing a cross-border gas pipeline from Nigeria to Benin, Togo and Ghana. Sequel to the execution of the MOU, the CG became the Developer of the project called West Africa Gas Pipeline (WAGP).

The WAGP is a world scale project for a 600-kilometre 18 inch offshore pipeline running parallel to the West Africa coastline to deliver up to 400 MMSCFD of Methane gas produced in the Niger Delta to four terminal points in Cotonou (Benin), Lomé (Togo), Tema and Takoradi (Ghana), through 12 inch lateral spurs.

The full potential of demand for gas and the identification of the potential gas users in Ghana, Togo and Benin remain to be fully ascertained. The design of optimal gas transmission capacities within the four countries, enabling promotion of a regional market for gas, will depend on the attraction of interested domestic gas customers and on the implementation of adequate promotion strategies.

Finally, the success of this project is ultimately linked to the proper development and fostering of the right economic climate for attracting domestic and international investment to these markets to enable secondary supply infrastructure to be instituted. This climate will include amongst other things; strategies for promotion of gas utilization within the markets themselves to provide a clear vision of market growth for potential investors, strategies for industry types to be targeted initially (e.g. power and industrial heating), and government strategies (tax, fiscal, concessions etc.) to promote establishment and retention of private investment in these markets. These are the challenges that face this promising project.

1.2 The Gas Market Promotion Strategies (GMPS) Study Context

In August 1999, the Executive Secretariat of the Economic Community of the West African States ("the ECOWAS") and the USAID/Ghana signed a Technical Assistance Memorandum of Understanding (the "MOU") aiming at funding a technical assistance program ("the Technical Assistance") supporting the States in the development of the WAGP project.

In application of the MOU, the ECOWAS and the Project Implementation Committee (PIC), which is representing the States in the negotiation of the WAGP Concession Agreement, approved the USAID-recommended selection, following competitive bidding, of Bechtel Consulting & Technology (later to become Nexant, "the Contractor"), to provide technical assistance on the project. The Contractor is to provide the technical assistance in line with the USAID Indefinite Quantities Contract (IQC) procedure.

In this context, the Contractor was requested by the PIC to implement the Gas Market Promotion Strategies Study to answer the needs expressed by the States in the development of the WAGP project market base. Based on the PIC-issued Terms of Reference, the Contractor submitted a Proposal to implement the GMPS Study. The Proposal was subsequently accepted by the PIC.

The Study Terms of Reference (outline)

Study Objectives:

1. Determine the usage that the gas delivered in Benin, Togo and Ghana should be dedicated to, and

2. Define the means through which potential users in the three countries will develop their access to gas.

Field of Application:

1. Benin and Togo: Power and Industrial markets

2. In the case of Ghana, the focus should be on the development of potential industrial gas users.

1.3 The Gas Market Promotion Strategies (GMPS) Study

This GMPS Study, and the present Report, have been conducted and presented in order to respond to the PIC-issued Term of Reference and to the needs of the purchasing countries as perceived during the Assessment.

The Study Report involves the following chapters:

Section 2: Overview of Gas Applications

Review of relevant gas utilization worldwide and of experiences from countries in the region and evaluation of successful market developments to draw conclusions for potential uses of gas in the Consumer States

Section 3: Market Assessment

Assessment of potential WAGP gas consumers in Benin, Ghana and Togo, and ascertain their potential for gas uptake. Assessment was made through site visits, consultation of relevant past studies that have been conducted on the development of gas markets in the Consumer States, and complementary questionnaires sent to identify potential gas users.

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Section 4: Design and Costing of Secondary Networks

Design of local networks and estimation of the cost of delivery of the WAGP gas to identified gas users.

Section 5: Development Scenarios

Presentation of gas market development scenarios based on the aforementioned collected data and analysis.

Section 6: Government Policies

This Section includes recommendations for the structuring and the regulation of the market, and for the general policies for the promotion of gas utilization.

Section 7: Study Follow-up & Implementation Plan

Proposal of a plan for implementation of the findings/ recommendations of this study to facilitate the start up of the Secondary Networks and secure their sustainability, with an aim at generating a greater uptake of gas in the Consumer States in a regulated environment.

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2 Overview of Gas Applications

This section summarizes the Addendum to this report, The Gas Paper. The Gas Paper was developed to:

- Provide a world-wide view of gas usage
- Develop a world-wide and regional summary of the supply and demand for gas
- Highlight the key factors for success for the industries utilizing gas
- Present the basic economics of industries utilizing with a view to assessing the feasibility of various proposed projects utilizing gas in the WAGP Purchasing countries.

Natural gas is a naturally occurring flammable gas, produced on its own or in association with crude oil. It consists mainly of Methane, Ethane, Propane, Butane and other heavier hydrocarbons generally termed Natural Gas Liquids (NGL) – refer *Section A2* for a more detailed explanation. Methane, the lightest constituent is also by far the most abundant by volume.

There are myriad uses for the various components of natural gas, which can be graphically (though simplistically) depicted as in the figure below.

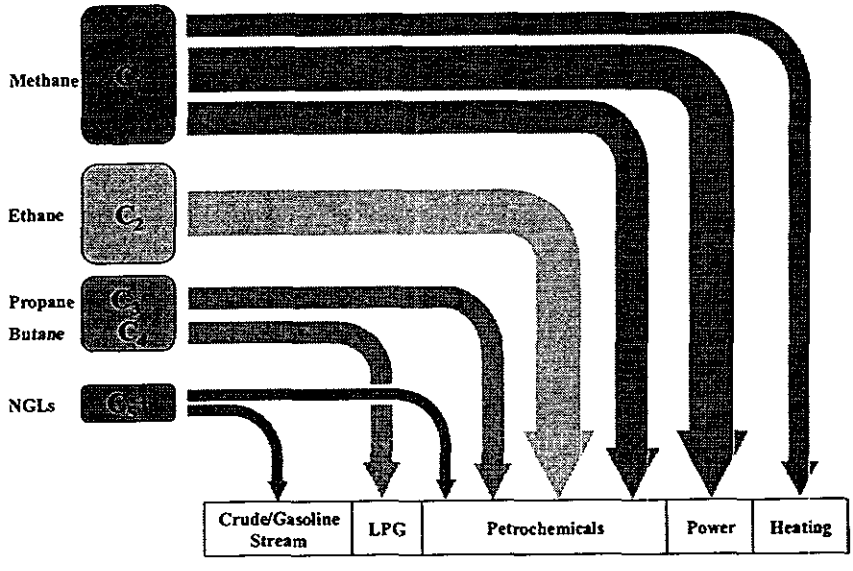

Figure 2-1 Natural Gas Components and Uses

For technical reasons, the gas transported in the WAGP line must be "dry" to prevent damage to compressors and pipeline equipment. This necessitates stripping of the heavier components out of the gas stream leaving primarily methane the applications of which will now be discussed.

World-Wide (Methane) Gas Usage

The main uses found for gas around the word are as follows:

- Power Generation: This industry presently accounts for the largest proportion of growth in the ever-increasing worldwide gas market. This growth though has been particularly dependent on favourable gas prices (generally below US$4.0 / MMBTU), and the advent of the combined cycle gas turbine (CCGT) with its significantly higher generating efficiency over other thermal plants, hence reduced generating cost.

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- Petrochemicals: Methane from natural gas is one of the most important feedstocks to the global petrochemical industry. It is used in the manufacture of: fertilizer (ammonia, urea etc.), methanol (an intermediate for solvents, adhesives and automotive fuels), and pharmaceutical and food additives. The petrochemical industry is a mature industry with little change by way of technological gain or energy efficiency improvements. The main competitive advantage therefore open to players in this market is to try to achieve significant economies of scale by building bigger, significantly BIGGER, than their competitors. This has pushed the minimum economic size of petrochemical plant to such a scale as to constitute an enormous barrier to entry for any new players, particularly ones without indigenous or relatively proximal sources of gas. For success in this field, capital investments of several hundred million dollars are required, and (most importantly) gas at below US$1.0 / MMBTU. Most new petrochemical facilities now being built are in regions with vast quantities of stranded natural gas such as the Middle East, the former Soviet Union (FSU).

- Compressed Natural Gas (CNG): The hunt for cleaner and cheaper automotive fuels, and the need to supplement scarce LPG resources in some instances has led to an increase in interest in CNG. However, in most instances the development of the local CNG market has been favoured by one or more of the following factors: (1) favourable inter-fuel taxation, (2) specific government legislation to promote CNG, (3) abundant local gas resources with no clear alternative use, (4) an existing local gas distribution network, (5) a high local vehicle population making the investment economically justifiable, (6) deterioration of the local environment due to smog from excessive automotive exhaust output. Refer to Gas Paper Addendum for more detailed discussion of CNG applications & economics.

- Industry: Natural gas use in industry plays a significant part in the development of local distribution networks, since most industrial facilities are near or within large towns and tend to be concentrated in estates in order to benefit from common infrastructure savings. Such industries can and do justify the development of gas laterals, which can then be tapped for development of a domestic network at a later date (if this is economically feasible). Industry tends to provide a constant base load for a gas network (if such industries are fully utilized) which is beneficial for a pipeline operator's cash flow.

- Commercial: Natural Gas use in commercial premises is prevalent in developed economies with existing gas distribution infrastructure. It is doubtful that commercial operations alone can justify construction of a gas network in a developing economy since other competing energy sources are electricity, and low cost fuel oil (generally lower than US$4.0 / MMBTU).

- Residential: Natural gas use in cooking and space heating in temperate climates is the present day norm. While this demand is both periodic (at meal times) and seasonal (summer low to winter high), such networks are usually in developed countries with relatively affluent consumers. They therefore are willing to pay a premium for the convenience of gas fired heating, which is automated instead of manual coal heating, and cooking gas on demand without the added need to refill LPG bottles for instance. Gas prices for such customers tend to be in the region US$6-10 / MMBTU or higher.

Regional summary

Africa as a region accounts for a minute portion of worldwide natural gas consumption. This can be easily expressed in terms of the six main areas discussed above.

- Power generation: Generating capacity in Africa has been for too long dependent on hydro-electricity, which at one time provided in excess of local needs. With rapid growth in population and a comparative increase in the expectations and living standards of most Africans, the demand for electricity has far outstripped supply and has coincided with the decline in the economies of a significant number of African states. This has led to shortage of funds to maintain existing infrastructure and for financing any new power projects.

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- Petrochemicals: Most African countries do not have access to abundant sources of cheap natural gas nor do they have the funds to finance the scale of industry necessary to compete in the global market. They are therefore prevented from establishing any significant petrochemical industry by geography. Those that do have abundant sources of gas have been slow to realise its potential but are now actively promoting investment in these industries for export to the developed nations.

- CNG: The advent of CNG in Africa has been relatively recent and limited to two or three major cities such as Cairo with a population of 13 million (and therefore a complementary vehicle population). CNG is an attractive option for a number of African states as significant economies of scale can be achieved, there are vast natural gas resources available, and the high value and easily transportable liquid fuels that would be displaced can be sold to earn foreign currency. CNG along with LPG (or as an alternative) could also be used to limit/prevent deforestation.

- Industry: In Africa industry represents the second largest consumer of energy after power stations. This market can be further expanded by the cost saving potentials open to industries with combined heat and power (CHP) requirements. There is therefore enormous potential for the substitution of liquid fuels in this area, however this is dependent on full capacity utilization of candidate industries as gas pipelines represent a significant capital expenditure outlay, which require substantive cash flow returns to justify the investment. A risk in Africa is the isolated nature of significant industries presently such as the cement, mining and phosphate operations in the consumer countries. The size of these industries can justify the capital investment of a gas pipeline, however this leaves the pipeline operating company exposed to significant risk as its major customer accounts for its largest outlay but also its largest source of revenue. Loss of any one of these customers would be catastrophic for the networks in these countries.

- Commercial: In most African countries today there are few areas with the concentration of large commercial facilities (hotels, hospitals, restaurants) needed to justify the development of a gas distribution network, nor do the facilities that exist have the spare resources available to fund conversion to an alternative fuel source without adequate financial incentive i.e. energy cost savings post conversion to gaseous fuels. The commercial markets that do exist however can be captured by adequate incentives and policies from governments, which could be advantageous in furthering goals to develop the domestic market.

- Domestic: The lack of existing infrastructure, cold evenings and winters, and cities with a large population density pose a significant problem to any potential developer of a domestic network in Africa. These obstacles can be surmounted though once the Industrial and Commercial markets have begun to be tapped.

The figure below gives an indication of the netback pricing calculated for the various sectors discussed above.

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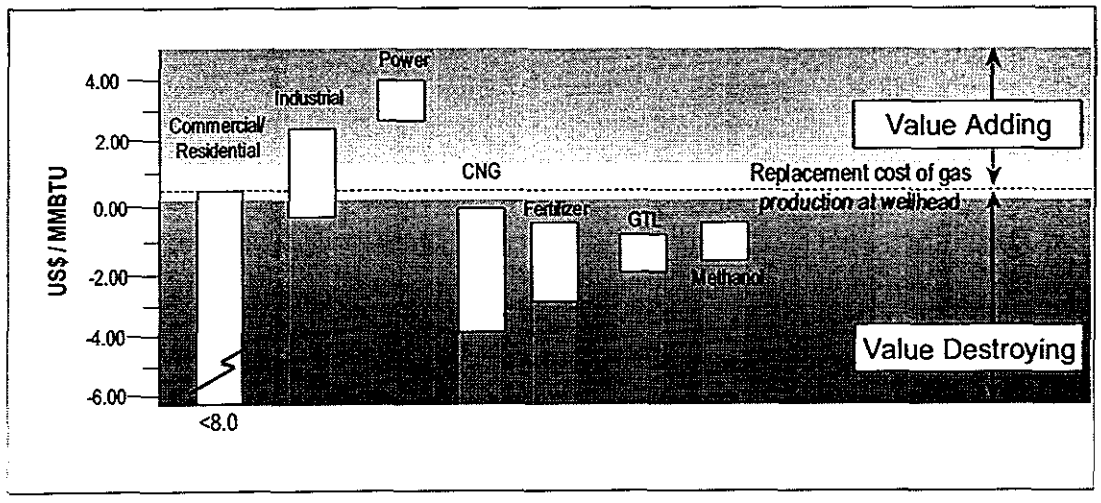

Figure 2-2 Natural Gas Netback Pricing for Various Sectors

Though the above figure shows Residential and CNG use as value destroying, it is important to note that this is against the background of existing competing fuel prices, without positive intervention from the government to aid gas projects.

Key Markets and Factors for Success in Benin, Togo & Ghana

Of the various natural gas applications considered, the key markets in Nexant's opinion in the consumer countries in order of importance are:

1. Power – this is the most attractive sector for gas investment based on return on investment.

2. Industry (Thermal & CHP) – the next most attractive sector.

3. CNG – investments in CNG could be promising, but a lot depends on Governmental assistance (differential taxation etc.), market size (limited to major cities – Accra, Lome, Cotonou?), and a cohesive national natural gas policy.

4. Commercial & Residential – this sector is viewed as a possibility, but may only be developed after other sectors have been harvested and sufficient amortization of gas network investment has taken place.

Due to the fragile nature of each sector, there is a significant level of interdependence between the markets identified, with each depending on the other to a greater or lesser degree. The development of these gas markets in the consumer countries will be very much dependent on an integrated government energy policy, with adequate incentive provision via fiscal measures in the short to medium term (5-10 year period) in order to stimulate growth. These markets are viewed as the most likely to be developed and therefore the areas to which government efforts should be targeted, in the order in which they are presented above.

It is worthy of note that the recent rapid development and growth of natural gas demand in developed countries around the world is large scale privatisation and liberalization of the gas chain, from "well to wire" i.e. from exploration and production through to supply, distribution and all the way to power generation. IPPs therefore constitute a significant part of any gas market promotion strategy and their importance cannot be overlooked. The cost saving and energy efficiency potential afforded to industrial and commercial entities by low cost CHP applications can also not be overlooked in any integrated energy policy.

3 Market Assessment

3.1 Existing Studies

A number of preliminary studies have been undertaken since the WAGP was first conceived in the early nineties. The following studies in particular have been examined:

- Energy Strategy Study for Bénin - Tractebel, 1996
- Ghana Natural Gas Market Assessment (Draft Final Report) - NERA – May 1997
- Bénin Gas Market Study – Beicip-Franlab – December 1997
- Market Study for the Supply of Natural Gas to Togo – Tractebel – April 1998
- West African Gas Pipeline Project – Market Report – Purvin & Gertz – March 2001

The first four of these reports may be regarded as 'scene-setters', having been produced in 1996-98 and in certain respects updated by the Purvin & Gertz report completed in 2001. The latter is the latest report and has been used as the point of departure for much of the analysis in this report, supplemented as appropriate with revised market survey data.

3.1.1 Market Study for the Supply of Natural Gas to Bénin (Tractebel - 1996)

The study undertaken by Tractebel, Sema Group and ACP in 1996 focused on developing a master plan for the energy sector in Bénin having the following objectives:

- How to meet the energy needs in line with the overall economic development, both for the industrial and residential sectors
- How to cater for the environmental protection
- How to stimulate administrative and regulatory functions to increase inter-sectorial correlation on technical financial and social levels

The study analysed several aspects of the energy sector in detail, making recommendations with regards to:

- Overall assessment of the energy sector in Bénin.

  A least cost planning approach was used in modelling the electricity, petroleum and traditional fuels (wood) sectors as well as their interactions during a 25-year period up to 2020. Consequently, the study recommended as possible development routes: (i) improvement of energy conservation in transportation, (ii) reduction of electricity imports or (iii) the introduction of a natural gas market. The preferred strategy was the latter, which also was considered to bring the added benefit of allowing for a more secure electricity supply source based in Cotonou. The study calculated economic cost of delivering natural gas from Nigeria to Bénin was US$0.6 - 0.8/GJ (US$0.63 - 0.84 / MMBTU) based on a gas price at Warri in Nigeria of US$0.3 – 0.4/GJ (or US$0.32 – 0.42 / MMBTU).

- The development and investment strategy for the electricity sector.

  The short-term recommended strategy was to use the existing capacity by refurbishing the diesel units existing in Bénin and Togo and the gas turbines in Togo, thus creating the electricity supply

needed by 2007. In the medium and long-term the recommended option was the introduction of natural gas as fuel for an estimated installed capacity of 360MW in CCNG turbines by 2020.

- Petroleum sector strategy.

  The study concluded that the only viable options for developing a sector, which is entirely demand driven, were to improve the energy efficiency, thus achieving some petroleum products economies and to substitute any petroleum products with cheaper products such as gas especially in the industrial sectors. *However, the study did not provide a measure for the potential gas market in the industrial sector.*

- Institutional and regulatory reform.

  The study recommends the development of a regulatory and institutional structure which can foster the cooperation between various segments of the energy sector in Bénin, the introduction of an adequate pricing and fiscal regime, schemes to promote renewable energy, environmental protection, rural electrification and private participating.

- Traditional energy sectors (wood fuels and kerosene)

  The study recommends the stimulation of the domestic market in substituting kerosene for wood fuel.

3.1.2 Ghana Natural Gas Market Assessment - Draft Final Report (NERA – May 1997)

The gas demand study undertaken by NERA focused on reviewing and assessing current and future potential demand for gas in Ghana.

The study undertook a comprehensive critical review of all previous reports and data provided by various players in the energy sector in Ghana. This was supplemented by NERA's own assessment of gas demand. Growth estimates were categorised as Low, Medium and High based on respective 3%, 5% and 7% demand growth rate assumptions.

A clear conclusion drawn in the report is that industrial gas demand from small and medium-size consumers can only materialise if a gas distribution company is put in place.

The gas demand for the electricity generation sector was estimated between 37 MMSCFD in 1999 and 77 MMSCFD in 2004 for Tema based on their High Estimate case. The natural gas demand for fuel substitution in industrial sectors was estimated at 14.5 MMSCFD for Tema, and 2.0 MMSCFD for Takoradi in 2000, based on their Medium Estimate case.

Their pipeline capital expenditure costs were evaluated based on a US$21 / inch-meter investment cost.

The report goes on to highlight the gas requirements of the strategic projects in Ghana as follows:

- Nyinahin Alumina Plant – mining and processing 1.2 million tons per year of bauxite would require 36.8 MMSCFD.

- Manganese projects – the production of electrolytic manganese dioxide (EMD) and silicon manganese plants would require very stable an uninterrupted power supply. Electricity generation is considered on –site using gas at an estimated 7.9 MMSCFD for both processes. These would require 10-12 MW and respectively 21 MW which will deliver 30,000 tons of EMD and 30,00 tons of silicon per year.

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- Clinker production from Nauli and Buipe Limestone – production of sufficient clinker to satisfy domestic demand would require 12.7 MMSCFD. The report also indicates that it would be physically feasible to produce half of this amount with a single plant at Buipe, suggesting the gas demand for this would be 6.4 MMSCFD. Note that in contrast the gas demand stated for the Buipe project alone in the Purvin & Gertz Market Report under strategic projects is 16.0 MMSCFD, this is stated as including gas demand for combined steam and power. This latter value is used in the Nexant report for strategic project economics analysis.

3.1.3 Bénin Gas Market Study (Beicip-Franlab - 1997)

Beicip-Franlab examined both the power generation and commercial/ industrial sectors. In the power generation sector, Beicip-Franlab effectively looked at two scenarios; one (low) assuming the advent of hydroelectric power, the other (high) not. Beicip-Franlab projected potential gas demand to rise to between 9.1 and 16.9 MMSCFD, depending on the scenario chosen.

In the commercial and industrial sector, Beicip-Franlab identified a number of entities, which were in principle potential clients, namely:

- SCO Onigbolo
- IBCG (Ex-SONICOG) in Cotonou & Porto-Novo
- SoBeTex
- SoBeBra Cotonou
- Others (accounting only for a very small percentage)

All of the entities identified above have been included in the analysis carried out in this report but with updated market information following various site visits.

Aggregate fuel oil demand was seen to rise from 18,000 tonnes in 1996 to 75,000 tonnes in 2010, the overwhelming proportion of the increase being attributable to expected increased activity at the SCO Onigbolo cement works. This evolution was reflected in Beicip-Franlab's projections of potential gas demand, which was expected to rise to between 7.5 and 8.1 MMSCFD, depending on the scenario chosen, the variation being attributable to that of non-SCO Onigbolo clients.

Total gas demand for Bénin therefore was projected to rise to between 16.6 and 25.1 MMSCFD after 10 years depending on scenario.

3.1.4 Market Study for the Supply of Natural Gas to Togo (Tractebel - 1998)

The market study for the supply of natural gas to Togo was prepared by Tractebel and B F Conseil, having as the main objective to assess the natural gas demand in Togo. The report covers the following areas:

- Potential gas demand in the electricity sector

  The electricity sector in Togo was modelled over a 20-year period until 2020 taking into account the investment needed to develop the system, including conversions to natural gas. The main scenarios analysed related to interconnection with Nigeria; gas conversion of CTL in Lome and hydroelectric power plant in Adjarala. The study concludes that there are two sets of natural gas prices for which the consumption in the electricity sector can be determined:

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i. Natural gas price below US$2.5 / GJ (US$2.64 / MMBTU) – for this level of gas prices, the variations in gas consumption is not significant because the electricity system is not elastic vis-à-vis the cost of gas.

ii. Natural gas price above US$3 / GJ (US$3.17 / MMBTU) – for more than US$3.5 / GJ (US$3.7 / MMBTU), the interconnection with Nigeria becomes competitive in economic terms. The gas consumption would be of course diminished in this case.

Their model calculates the volume of imported gas under the various price scenarios.

- Potential gas demand in the industrial sector

The assessment of the gas demand in the industrial sector is based on the netback value of gas delivered to consumers. This methodology relied on assessing the existing energy consumption in 1996 in terms of fuels and volumes and the estimated cost of gas conversion. The study estimated the potential gas demand in the main industrial sectors (phosphates, electricity generation, brewery, metals, cement and vegetal oil sectors. The total estimated gas demand for year 2000 was 29.8 MMCM (1.05 BCF), rising to 177 MMCM (6.25 BCF) by 2020. The study also highlighted the localised character of the gas demand (along the national road 2, close to Kpeme, Tabligbo and Lome-Port). The underlying assumption was that each consumer would switch to natural gas as long as the cost of the gas delivered was lower than its netback value.

- Gas demand in the residential and commercial sectors

The study concluded that the development of a gas network to serve the residential and commercial clients was not viable. In the residential sector, the gas conversion was limited rather by the cost of buying new equipment than the gas price. To access these markets, the study estimated that the gas price should be US$2 / GJ (US$2.11 / MMBTU), for an investment per customer of US$500 and an annual consumption of 120cm (4200 CF). The netback value of the gas delivered to residential and commercial consumers was calculated at US$17 / GJ (US$17.9 / MMBTU), which demonstrated the poor economics of this investment.

- *Usages of natural gas as feedstock*

The main usage of gas as feedstock in the fertilisers and methanol industries was considered as unrealistic for the Togolese market due to the high investment costs necessary in these industries as well as the high transportation costs of gas from its source in Nigeria. Consequently, the study considered that the usage of gas as feedstock in Togo was not economic.

- Structure of the natural gas market in Togo

This section outlined the gas demand over a 20-year period to 2020, structured according to various prices for delivered natural gas scenarios. The maximum gas demand of around 180 MMCM (6.35 BCF), occurred for gas price delivered to the consumer at US$2.5 / GJ (US$2.64 / MMBTU). The main clients (i.e. permanent) were considered to be the electricity generation sector and the cement industry, namely OTP. Most of the other potential consumers were considered temporary clients and their interest in using gas as fuel would be largely determined by the tariff structure wit regards to the conditions of reconnecting to the gas pipeline.

The cost of gas transportation and distribution was also calculated. The cost estimated was developed based on the following main assumptions: (i) spurs made available for OTP, WACEM and Lome and (ii) maintenance costs estimated at 2% of the total capital investment. The transportation cost and distribution costs in Togo were estimated at US$0.28 / GJ (US$0.30 / MMBTU).

- Fiscal, tariffs and marketing issues for the natural gas industry in Togo

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The study recommended the introduction of fuel taxation depending on its energy content regardless of the fuel type. It also recommended a tariff structure based on capacity and commodity charges.

3.1.5 West African Gas Pipeline Project – Market Report (Purvin & Gertz - 2001)

Purvin & Gertz adopted an essentially macro-economic approach making use of probabilistic methods in developing their projections, having regard to exogenous economic variables such as the expected progression of economic growth, the likely evolution of national trading patterns, and so forth. A scenario approach was adopted in respect of all three countries.

The broad picture that emerges from the Purvin & Gertz report is that Ghana will be the principal consumer of gas, its share of the three countries' demand currently estimated at some 85%, with the electricity generation sector accounting for the bulk of national consumption. In comparison, the potential for gas demand in Bénin and Togo is relatively small, but with the power sector again accounting for the greatest proportion of demand, although some industrial demand can be expected.

The Commercial Group calculated an effective gas purchase price of US$3.25 / MMBTU for gas delivered at the landfalls (i.e. an effective 'postage stamp' pricing basis where all consumers pay the same unit price), with a gradual decline over time with demand growth – refer *Figure 5-1*.

The picture viewed by country is as follows.

Bénin

In the power generation sector, Purvin & Gertz identified only the CEB (Communauté Electrique du Bénin) as a potential client, specifying the single 25-MW (nominal capacity) turbine at Cotonou. There was also mention of the possibility of installing a further 25 MW gas turbine, then later converting it to combined cycle operation. This issue was raised as a question in discussions with the CEB but it was found that this remains a possibility only).

Purvin & Gertz combined their forecasts of power sector gas demand for both Bénin and Togo, rising from 11 MMSCFD in 2003 to between 46 and 78 MMSCFD in 2024, depending on scenario. It is understood that this divides equally between the two countries.

In the commercial and industrial sector, Purvin & Gertz did not identify any specific potential clients in Bénin. They did however project demand to rise to between 2.4 and 2.8 MMSCFD in 2024, depending on scenario.

Togo

In the power generation sector, Purvin & Gertz viewed the situation as being very similar to that in Bénin, namely that there exists a single 25 MW turbine (nominal capacity) at Lomé, with the possibility of installing a further 25 MW gas turbine and then converting it to combined cycle operation at a later date (again this question was raised in discussions with the CEB and likewise discovered that this idea remains only a possibility).

As mentioned above, Purvin & Gertz combined their forecasts of power sector gas demand for both Bénin and Togo, rising from 11 MMSCFD in 2003 to between 46 and 78 MMSCFD in 2024, depending on scenario. It is understood that the above volumes divide equally between the two countries. In the commercial and industrial sector in Togo, Purvin & Gertz projected demand to rise to between 20.5 and 21.1 MMSCFD in 2024, depending on scenario.

In the commercial and industrial sector, Purvin & Gertz identified OTP (Office Togolais des Phosphates) and WACEM (West African Cement Company) as potential clients.

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Ghana

Purvin & Gertz have produced projections of gas demand for both the power sector and commercial/industrial sector. Ghana has two landfalls, at Tema and Takoradi. Purvin & Gertz have accordingly produced demand projections for each of these separately. For Tema, commercial and industrial sector demand is projected to rise to between 11.4 and 11.6 MMSCFD by 2024, while at Takoradi it is projected to rise to between 3.2 and 3.6 MMSCFD by that date. In addition they project demand in respect of strategic projects to rise up to 9.3 MMSCFD by 2024.

The industrial projects identified by Purvin and Gertz report and their estimated gas demands are:

- Iron and steel manufacture, Takoradi: 9.3 MMSCFD
- Manganese ore processing, Tarkwa: 9 MMSCFD
- Bauxite processing, Nyinahin: 36.8 MMSCFD
- Limestone clinkerization, Buipe: 16 MMSCFD
- Salt recovery and allied processes, Tema: 0.2 MMSCFD
- Poly Vinyl Chloride (PVC) Manufacture, Tema: 5.3 MMSCFD

The report emphasizes the fact that each of these projects would use gas only if the gas piece is competitive with fuel oil price.

3.2 The Nexant Assessment

For each of the three countries, Purvin & Gertz identified a list of potential clients with an interest in purchasing gas. A number of these are the core or "foundation" customers (i.e. the large energy users – primarily power producers) key to the success of the WAGP project and with whom contracts have been negotiated. Amongst their list, Purvin & Gertz also listed some non-power customers for the consumer countries, and for all of the above, applied three scenarios for predicting future market demand, these were:

- A Low Market Forecast (10% probability of occurring).
- A Mid Market Forecast
- A High Market Forecast (90% probability of occurring).

Nexant's study, which is intended to help formulate gas market promotion strategies for the consumer countries necessarily needed to revisit and re-evaluate the markets in the three countries, in order to ensure that an accurate and realistic picture of market size (both present and future) is presented. This was done in two ways within the limited scope of the study, namely:

a) Market Assessment visits to each country

b) Supplementary market survey questionnaires issued by fax, e-mail and post, and followed up with telephone calls.

To optimise study resources, market assessment visits were limited to institutional and regulatory bodies, and main potential gas consumers identified. The results of these visits were by-and-large positive and encouraging. The co-operation of those organizations visited is acknowledged and was invaluable.

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Though responses to the supplementary market survey were lower than had been hoped for (approximately 20% of questionnaires were returned), the picture that emerged from those respondents served to reinforce the view that a latent market for gas exists in each of the consumer countries, which can be tapped to a lesser or greater extent through the provision of convivial institutional and regulatory policies prior to gas being made available in the countries.

Broadly speaking, this study considered three scenarios for each country:

- A "Present Demand Scenario" without expansion but with GDP growth for those entities where there is no perceived product demand limitation.
- An "Expansion / Demand Scenario" taking account of the expansion plans stated by the potential customers and with GDP growth as applicable, and
- An optimistic or "Strategic Projects Scenario" (where applicable).

So called "strategic projects" are those industrial projects that are under discussion but have yet to be financed or implemented and for which demand projections are therefore much less certain. Projects believed to have credible longer-term potential have been identified and are included in the Expansion / Demand Growth Scenario.

The Purvin & Gertz Mid Market Forecast tariff provided the input cost of landed gas for all cases, and growth rates were taken from the same report to ensure demand growth projection basis conformity between this report and that of Purvin & Gertz.

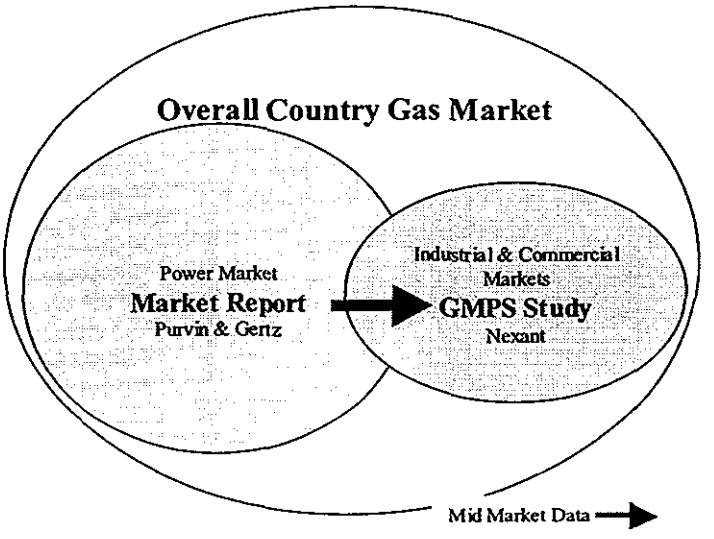

Figure 3-1 Study Interaction

To realize the Study objectives, therefore, we have sought to specify as accurately as possible the potential consumers of gas, and any additional data relevant to the evolution of the overall market for WAGP gas in the three consumer countries. For this purpose, the input of government departments and institutions as well as potential clients has been required, and we have accordingly had extensive contact with these entities.

3.2.1 Financial to Economic Cost Conversions

In order to carry out this analysis on a uniform basis, Nexant has adopted economic principles endeavouring to represent costs in economic terms, i.e. using values, which reflect the real cost to an economy of goods consumed or investments made. In the consumer countries, though true open

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market conditions do not yet exist (with many sectors remaining government controlled and licensed, particularly fuel product importation and distribution). Nexant's assessment is that the only adjustment required to convert financial prices (e.g. of fuel) to economic costs is to make adjustments for (i.e. deduct) taxes. However, with fuel prices, this approach still produced discrepancies as prices were found to vary from customer to customer, even in the same locality (Tema for example).

In the alternative, Nexant established a uniform true cost of fuel products (at the ports) across the consumer countries through product import parity pricing from the nearest surplus market (i.e. the Mediterranean) using the following assumptions:

- An FOB crude oil price of US$21[1] / BBL (Brent basis – approximates to Bonny Light). This value is on the lower end of the OPEC crude oil target price range of US$22 - 28 / BBL.
- NexantChemSystems™ benchmark refinery margins over crude prices for the four fuel products concerned (i.e. Fuel Oil, Diesel, Jet Fuel and LPG)
- Historic shipping costs as appropriate to vessels in that region (10,000-30,000 DWT)
- Insurance costs

The CIF product prices thus obtained were further refined to be location specific by adding in:

- Local fixed costs for demurrage, other levies, storage and handling charges
- A marketers margin
- Road transportation costs (US$ / tonne / km)

These product prices are calculated net of local taxes to give a true economic comparison of liquid fuels with gas. The prices established in this way were corroborated against net-of-taxes product prices supplied by some potential consumers. The table below sets out the pricing used for the various locations in this report.

Country / Region		Delivered Product Price for Economic Comparisons with Gas (US$ / MMBTU)			
		Diesel / Gas Oil	Jet Fuel / Kerosene	LPG (Priced per Diesel pre tax)	Fuel Oil (LSFO)
Bénin	Cotonou	5.61	5.93	5.61	3.69
	Porto Novo	5.69	6.01	5.69	3.77
	Onigbolo	5.87	6.18	5.87	3.96
Togo	Lome	5.61	5.93	5.61	3.69
	Kpeme	5.65	5.97	5.65	3.73
	Tabligbo	5.75	6.06	5.75	3.83

[1] The commercial group's reference/base oil price corresponding to the US$0.50 / MMBTU input gas price in Nigeria, is in the range of 18-20 $US / BBL for Bonny Light. This study bases it's assessment on a crude oil price of US$21 / BBL. This is based on Nexant's high crude oil price scenario. NOTE: the variation in crude oil price is less pronounced on the landed gas price (cf. fuel product prices). A 10% change in crude oil price equates to less than 2% impact on the landed gas price in the consumer countries, due to a high transportation cost element in the landed gas price. Landed gas prices can therefore be assumed to be relatively insensitive to crude oil price movements.

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Country / Region		Delivered Product Price for Economic Comparisons with Gas (US$ / MMBTU)			
		Diesel / Gas Oil	Jet Fuel / Kerosene	LPG (Priced per Diesel pre tax)	Fuel Oil (LSFO)
Ghana	Tema/Accra	5.61	5.93	5.61	3.69
	Buipe	6.52	6.81	6.52	4.61
	Takoradi	5.61	5.93	5.61	3.69
	Tarkwa	5.77	6.08	5.77	3.85
	Nyinahin	6.18	6.49	6.18	4.27

Table 3-1 Calculated Netback Product Prices for Fuels at Various Locations[2]

Nexant's economic analysis has been carried out in light of efforts by all four countries; Nigeria, Togo, Bénin & Ghana to liberalize energy markets, hence no account is taken of the effects of smuggling of subsidized Nigerian fuel on the local price paid for fuel by customers in the consumer countries (Bénin most especially) since it is assumed that the markets will be fully liberalized and therefore closely harmonized by the time the WAGP project is realized, eliminating smuggling altogether.

3.3 Nexant Market Assessment Visits

Visits to Bénin, Togo and Ghana were undertaken with a view to establishing the extent of the potential customer base that could be developed economically and how governments intended to organize and administer the market.

A similar visit to Nigeria was undertaken in order to establish the way in which the gas market has developed there and derive lessons as to how it might be developed in the three consumer countries. The Nigerian Experience is reported on in Section *A4.6* of the Gas Paper Addendum in this report.

The methodology adopted for the visits in Bénin, Ghana & Togo was as follows:

- Visits were made to government departments and institutions, potential clients, including the proposed aggregator in the case of Bénin. Aspects such as fiscality, public financing, competition, and ownership arrangements were investigated.

- The entities visited, together with the principal findings made in respect of potential clients, are summarized in the sections following.

3.3.1 Bénin

Government Departments/Institutions Visited

Ministère des Mines, de l'Energie et de l'Hydraulique
Ministère du Commerce, de l'Artisanat et du Tourisme
Caisse Autonome d'Amortissement
Administrateur des Banques
Ministère de l'Industrie, du Commerce et de la Promotion de l'Emploi – Direction du Commerce Extérieur
Ministère de l'Industrie, du Commerce et de la Promotion de l'Emploi – Direction du Commerce Intérieur

The following were among the principal points to emerge from discussions held:

[2] Refer to *Appendix 5 – Net Back Fuel Prices* for detailed calculation.

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- The Government drew attention to the growing demand for electricity, highlighting the risk of significant deficits. The situation would be exacerbated by the need to raise prices to levels necessary to sustain supply. The lines carrying electricity supply from Ghana into Togo and Bénin are saturated and there is therefore a need for local power production.

- The implications for gas are potentially of interest insofar as if gas can be made available at a price lower than oil (in thermal equivalent terms) for the purposes of electricity generation, then this could offer at least a partial solution.

- Gas is being looked at in the context of an overall energy plan for the country, and energy conservation is also receiving active consideration as a means of solving a potential energy deficit.

- Gas prices could be subject to controls if the present policy on price controls that applies in the case of oil products were to be adopted in respect of gas. It was noted that in the longer run there was an expectation that price liberalization would be progressively introduced.

- Concern was expressed that the existence of an aggregator could act as a brake to competition, given the current moves at parliamentary level to introduce legislation, which was intended to restrict anti-competitive practices and structures. *Nexant notes however that the contrary would be the case since gas would introduce competition to the other fuels presently available.*

- The Government also considers though that the most effective way to arrange for the supply of gas to smaller clients (< 10 MMSCFD) is via an aggregator, in order that a gas industry may be established in the country.

- It was expected that gas would be subject to VAT, currently 18%, plus excise duties. The policy on equipment expenditure is less clear. Nexant though favours the Nigerian policy where gas investments and imports are zero rated for VAT and excise duties, while gas companies enjoy between 5 and 7 years of tax holiday.

Bénin Potential Clients Visited / Contacted

CEB (Communauté Electrique du Bénin)
CimBénin
IBCG (Industrie Béninoise des Corps Gras, ex- SONICOG)
SoBeBra (Société Béninoise de Brasserie)
SBEE (Société Béninoise d'Electricité et d'Eau)
SoBeGaz (Société Béninoise de Gaz) – Proposed Aggregator
SoBeTex
SCO (Société des Ciments du Bénin)
SCO Lafarge (Société des Ciments d'Onigbolo)

Principal points to emerge from the discussions were as follows:

- For the moment there is only one probable client for gas, namely the power generator, CEB. Being a foundation customer their commitment seems assured.

- Other potential clients exist, notably; IBCG, SCO Lafarge, SoBeBra and SoBeTex, all of whom burn oil in furnace or boiler operations and are interested in principle in switching to gas, provided the price is attractive in comparison with those of their current fuels.

- SBEE might also be, theoretically, a client for gas, but the only electricity generation plant it has is in the north of the country and some distance from the beachhead from the point of view of economic viability. The Akpakpa Plant on the outskirts of Cotonou has however been suggested as a potential client for gas. Noting that utilization of this plant is currently below 10%, producing 3 MWe from an installed capacity of 31 MWe, and the fact that almost all of it's

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generation equipment is old and difficult to convert. SBEE is not considered to be a credible gas consumer as they stand in this study.

- During a meeting with the proposed aggregator, SoBeGaz, it was noted that the company is now officially registered with its articles of association. There is however no statute allowing the company the role of gas aggregator and distributor for the country as a whole. In addition, suitable potential clients were yet to commit to participation. Nevertheless, SoBeGaz (along with SoToGaz) was in discussion with N-Gas and CEB[3], the proposed arrangement being that SoBeGaz would purchase gas from N-Gas at the landfall on the beach and sell on to customers such as CEB. SoBeGaz proposed to take responsibility for all the costs of delivering gas to customers as well the latter's costs of converting their current equipment to gas-firing.

Bénin Potential Gas Market

The potential gas market thought to exist in Bénin is tabulated below. Note that in order to define the opportunity cost for gas that would trigger customer switchover from present fuel used to gas, Nexant has arbitrarily defined this as 10%[4] below the current cost of fuel to the customer. It is this cost of energy that is compared to the burner tip or delivered gas price from the secondary network after all connection and conversion costs are taken into account in order to determine the economics of supplying a particular consumer with gas.

Customer	Business & Location	Fuel Used or Energy Equiv.	Yearly Averaged Flow (2006) (MMSCFD)	Daily Maximum Flow (2006) (MMSCFD)	Present Fuel Cost† (US$/MMBTU)	Opportunity Cost of Fuel (present cost less 10%) (US$/MMBTU)
SCO Lafarge	Clinker, Onigbolo	RFO 181.8 TPD	6.87	7.60	3.96	3.56
SoBeBra (Plant)	Brewery, Cotonou	RFO 5.2 TPD	0.20	0.23	3.69	3.32
**(Fork Lifts)		Diesel 0.6 TPD	0.02	0.02	5.61	5.05
SoBeTex	Textiles, Cotonou	FO 6.6 TPD	0.22	0.28	3.69	3.32
SBEE#	Power, Akpakpa	-	-	-	-	-
IBCG	Cotton, Cotonou	476* MMBTU	0.40	0.50	3.69	3.32
IBCG	Cotton, Porto Novo	287* MMBTU	0.24	0.30	3.77	3.39
CEB	Power, Cotonou	JET FUEL 192.7 GWh / Yr	4.52	5.65	5.93	5.34
Raw Potential Demand Total			8.0 (H) 4.5 (P)	8.9 (H) 5.7 (P)		

* Based on hourly steam generation figures.
** Specific use of CNG in forklifts-enquiry from customer.
\# SBEE existing equipment not suitable for gas, and utilization is too low for conversion to be viable.
† Present Fuel Cost calculated by individual customer on import parity basis and net of local taxes.

Table 3-2 Table of Potential Gas Demand in Bénin

[3] The situation since the time of Nexant's visits has evolved in that the commercial group is now seriously considering the delivery of gas directly to CEB as foundation customers in both Benin and Togo, and not through an aggregator so as to be assured of their volumes, which is necessary to finance construction of the laterals to these countries.

[4] According to van Groenendaal (see Willem, J.H. Groenendaal, V. (1998). 'The Economic Appraisal of Natural Gas Projects' Oxford University Press 1998), a company will convert to natural gas if the cost reduction is more than 7% of the total. If the cost is between 2-7%, some will convert, below 2%, none will convert. The study was conducted for developing countries. Nexant has adopted 10% as a conversion threshold after all costs are taken into account.

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The total unadjusted potential gas market in Bénin in 2006 is estimated at 8.0 MMSCFD for heat and 4.5 MMSCFD for power generation on a yearly averaged basis. Note: This assumes a minimum capacity utilization of 80% by all customers, regardless of present plant utilization.

3.3.2 Togo

Government Departments/Institutions Visited

Ministre des Mines, de l'Energie et des Postes et Télécommunications et ses fonctionnaires
Ministère du Commerce, de l'Industrie, des Transports et du Dévelopement de la Zone Franche
Autorité de Réglementation de l'Electricité
MIGA (Multilateral Investment Guarantee Agency, a member of the World Bank Group)
GARI (Guarantee Fund for Private Investments in West Africa)

Principal points to emerge from the discussions were as follows:

- The Minister outlined the legal context within which SoToGaz would be expected to operate. CEB would be the sole purchaser and transporter of gas from producers. IPPs would sell to CEB while SoToGaz would construct and develop the network. Many industries were potential clients in the future, other than WACEM, CimTogo, SoBeBra, CTL and OTP. There are specific hopes that the Zone Portuaire de Lomé will be subject to industrial development, in between CimTogo and OTP.

- The logic for developing the market would have to be demonstrated for each client. Government support for the Project was conditional upon gas delivering cheaper electricity, and support to SoToGaz conditional to delivering cheaper gas.

- The institutions that would be needed for regulating a new gas industry appear for the moment to be evolving. There is the relatively new Autorité de Règlementation de l'Electricité whose current role could be extended to cover gas. Currently there are two regulatory authorities, Energy and Telecommunications (fixed telephone). The domains controlled are concessions, exploitation, conflicts between distributors and consumers, etc. Only area where there is no competence is tariff regulation.

- In regard to the establishment of an aggregator, it was made clear that the Government saw this as a necessary entity in the process.

- Vists to MIGA and GARI proved negative, in that neither would be an appropriate source of funds or guarantees, given their designated roles.

Togo Potential Clients Visited / Contacted

Brasserie BB Lomé
CEB (Communauté Electrique du Bénin)
ElectroTogo
OTP (Office Togolais des Phosphates)
SoToGaz (Société Togolaise de Gaz) – *Proposed Aggregator*
TogoElectricité
WACEM (West African Cement)

Principal points to emerge from the discussions were as follows:

- As in Bénin, CEB is a foundation customer, and their commitment appears assured.

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- All of the other entities visited were in principle interested in gaining access to gas, with the exception of TogoElectricité whose limited production and distance from the proposed secondary network, eliminated any interest in having access to gas.

- The entity with the greatest potential demand was WACEM, greater possibly in due course than CEB. They were, however, also the most distant from the proposed beachhead at Lome.

Togo Potential Gas Market

Customer	Business & Location	Fuel Used or Energy Equiv.	Yearly Averaged Flow (2006) (MMSCFD)	Daily Maximum Flow (2006) (MMSCFD)	Present Fuel Cost† (US$/MMBTU)	Opportunity Cost of Fuel (present cost less 10%) (US$/MMBTU)
OTP (Plant)	Phosphates, Kpeme	RFO 131.2 TPD	4.4	5.48	3.73	3.36
(Power)		-	-	-	-	-
CEB	Power, Lome	192.7 GWh / Yr	4.52	5.65	5.93	5.34
WACEM (Plant)	Cement, Tabligbo	RFO 413.1 TPD	15.61	17.26	3.83	3.45
(Power)		-	-	-	-	-
Brasserie	Brewery, Lome	RFO 9.3 TPD	0.36	0.45	5.61	5.05
ElectroTogo	Power, Lome	394.2 GWh / Yr	5.80	6.42	5.92	5.33
Raw Potential Demand Total			20.4 (H) 10.3 (P)	23.2 (H) 12.1 (P)		

† Present Fuel Cost calculated by individual customer on import parity basis and net of local taxes.

Table 3-3 Table of Potential Gas Demand in Togo

The total unadjusted potential gas market in Togo in 2006 is estimated at 20.4 MMSCFD for heat and 10.3 MMSCFD for power on a yearly averaged basis. Again, this assumes minimum capacity utilization of 80% by all customers once connected to gas and that ElectroTogo, which is considered a strategic project is factored in.

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3.3.3 Ghana

Government Departments/Institutions Visited

Energy Commission
Energy Foundation
Ministry of Energy
PEF (Private Enterprise Foundation)
PURC (Public Utilities Regulatory Commission)

Principal points to emerge from the discussions were as follows:

- The Government of Ghana is keen that as large a market as possible may be developed, thereby improving the overall economics through the reduction of unit costs.

- The PURC (Public Utilities Regulatory Commission) regulates all public entities offering a service, e.g. water, electricity, oil transportation and, potentially, natural gas. Specifically, it would control the tariffs that might be set by an aggregator. In order to be satisfied that the contractual basis for regulation was working effectively, the PURC would require knowledge of the Commercial Group's costs breakdown.

- Much of the administrative mechanisms considered to be necessary are already in place, in the form of some of the institutions above. These were established originally for other purposes, but may easily extend their roles to cover the responsibilities required in respect of an emerging gas industry.

- The Energy Commission is the licensing authority, and is responsible for the setting of technical standards and policing / monitoring these. It is the front-line contact point for energy matters. The Commission would deal with both the aggregator and end-users, monitoring compliance with safety standards and the recommendations emerging from the environmental impact assessment and the requirements of the Environmental Protection Authority. This split of responsibilities between the financial and the safety/environmental compliance monitoring is advantageous in ensuring no conflicts of interest issues such as a need to allow the aggregator make a decent return are allowed to compromise safety and or environmental compliance.

- The Energy Foundation stated that it had participated in the Ghana Natural Gas Market Assessment undertaken by NERA in May 1997. Accordingly, they were in a position to advise as to how the potential market for gas looked at that time, as well as how key aspects had changed, notably as regards changes to the potential customer profile.

- The Energy Foundation, which is in routine contact with the Association of Ghanaian Industries, provided a list of some 50 additional potential clients (see Section *3.4, Complementary Surveys*).

Ghana Potential Clients Visited / Contacted

BOST (Bulk Oil Storage and Transportation Company)
Inter-Afrique Holdings
GTP (Ghana Textile Printing Company)
TOR (Tema Oil Refinery)
VALCO (Volta Aluminium Company)
Tema Steel Company
Unilever

Principal points to emerge from the discussions were as follows:

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- All but two entities visited are potential gas consumers and are in principle interested in gas.

- The other two, BOST and Inter-Afrique Holdings have had experience, which could be relevant to performing the role of aggregator in Ghana. The question of how an aggregator might be selected or established is addressed in detail later (Section *Error! Reference source not found.*).

- All other potential clients visited expressed an interest in principle in switching to gas from current fuels, which they burn in furnace or boiler operations. In addition, a great number of other clients were contacted by fax/e-mail/phone/and postal mail, with a request to complete the WAGP Potential Clients Questionnaire. Some limited success was achieved through this and those respondents expressing a desire to consume gas are included in the demand estimates.

- VALCO made it clear that they were only interested in purchasing gas directly from WAPCo, and not via an aggregator, as this would increase their costs. They are close to the shore and believe they could connect without great technical difficulty to the proposed landfall location at Tema, but as their projected demand of 2 MMSCFD falls below the 10 MMSCFD limit set by the commercial group for direct connection to the WAGP lateral it is unlikely that their requirement can be satisfied. However, VALCO also indicated that they had been in discussions with a potential IPP in Tema for allocation of a section of their land for power generation. If this were to materialise, it may be possible for VALCO to purchase its gas on a pass-through basis from this IPP, which would qualify for direct connection to WAGP.

- VALCO indicated that they would themselves pay for the costs of all lines and connections to the plant, as well as for the costs of conversion of existing plant. Other potential clients were equally satisfied with gas conversion costs financed by an aggregator then amortized into the gas price. Nexant's analysis separates out the conversion costs as an additional cost to the client for clarity.

Ghana (Tema) Potential Gas Market

Customer	Business & Location	Fuel Used or Energy Equiv.	Yearly Averaged Flow (2006) (MMSCFD)	Daily Maximum Flow (2006) (MMSCFD)	Present Fuel Cost[4] (US$/MMBTU)	Opportunity Cost of Fuel (present cost less 10%) (US$/MMBTU)
Valco (Plant)	Aluminium, Tema	Bunker C 2300 MMBTU/d	2.29	2.41	4.68	4.21
Tema Steel (Plant)	Scrap Metal, Tema	FO 9.0 TPD	0.33	0.38	4.68	4.21
Unilever (Plant)	Detergents, Tema	FO 18.8 TPD	0.75	0.79	4.68	4.21
(Power)		10.8 GWh / Yr	0.34[5]	0.35[5]	5.40	4.86
GTP	Textiles, Tema	RFO 20.7 TPD	0.80	0.87	4.68	4.21
		LPG 1.1 TPD	0.05	0.05	5.24	4.72
Pioneer Foods	Foodstuffs, Tema	FO 5.2 TPD	0.16	0.22	4.68	4.21
Nestle	Textiles, Tema	RFO 5.1 TPD	0.16	0.22	4.68	4.21
		Diesel 0.17 TPD	0.01	0.01	5.61	5.05
		LPG 0.05 TPD	0.002	0.002	5.24	4.72
Aluworks	Aluminium, Tema	Diesel 4.0 TPD	0.16	0.17	5.61	5.05
		14 GWh / Yr	-	-	-	-
		LPG 0.06 TPD	0.002	0.003	5.24	4.72

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Customer	Business & Location	Fuel Used or Energy Equiv.	Yearly Averaged Flow (2006) (MMSCFD)	Daily Maximum Flow (2006) (MMSCFD)	Present Fuel Cost† (US$/MMBTU)	Opportunity Cost of Fuel (present cost less 10%) (US$/MMBTU)
Tema Textile	Textiles, Tema	-	0.27*	0.38*	4.68	4.21
Cocoa Processing	Cocoa, Tema	-	0.13*	0.18*	4.68	4.21
GTMC	Unknown, Tema	-	0.27*	0.38*	4.68	4.21
GAFCO	Unknown, Tema	-	0.26*	0.33*	4.68	4.21
Ferro Fabrik	Metalworks, Tema	-	0.22*	0.31*	4.68	4.21
WAHOME	Steel, Tema	-	0.25*	0.35*	4.68	4.21
PVC & Salt**	PVC, Tema	-	5.00**	5.50**	4.68	4.21
Accra Area	Various, Tema	-	0.71	1.00 Assumed	4.68	4.21
Raw Potential Demand Total			6.7 (H)	7.9 (H)		

* Data from NERA report.
§ No plans exist for CHP presently, but this is an ideal project with demand for both heat and power.
† Present Fuel Cost calculated by individual customer on import parity basis and net of local taxes.
†† Assumed based on 24-hour and 5 day a week operation.
# 90% Assumed in order to be competitive with world scale plants.
** Strategic Project – data source: Purvin & Gertz

Table 3-4 Table of Potential Gas Demand in Tema

The total unadjusted potential gas market in Tema in 2002 is estimated at 6.7 MMSCFD on a yearly averaged basis. An additional 5.00 MMSCFD could be captured if the PVC & Salt Recovery projects are implemented in the Tema industrial area (refer Purvin & Gertz report – "Strategic Projects").

Ghana (Takoradi) Potential Gas Market

The potential gas market in Takoradi is less certain on account of a limited number of responses obtained from customers in that area. Data on Takoradi demand was collated from the NERA report and verified against a potential gas demand geographical map of Ghana provided by BOST. The Takoradi area estimated demand is tabulated below.

Customer	Business & Location	Fuel Used or Energy Equiv.	Yearly Averaged Flow (2006) (MMSCFD)	Daily Maximum Flow (2006) (MMSCFD)	Present Fuel Cost† (US$/MMBTU)	Opportunity Cost of Fuel (present cost less 10%) (US$/MMBTU)
Takoradi Existing Industries	Various, Takoradi	Bunker C Assumed	1.50§	1.88§	4.68	4.21
Takoradi Strategic Industry	Iron & Steel, Takoradi††	Bunker C Assumed	7.44'	9.30'	4.64	4.18
Tarkwa Strategic Industry	Manganese Ore, Tarkwa††	Bunker C Assumed	7.20'	9.00'	4.81	4.32
Nyinahin Strategic Industry	Bauxite, Nyinahin††	Bunker C Assumed	29.4'	36.8'	5.22	4.70
Raw Potential Demand Total			1.50 (H)	1.88 (H)		

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Customer	Business & Location	Fuel Used or Energy Equiv.	Yearly Averaged Flow (2006) (MMSCFD)	Daily Maximum Flow (2006) (MMSCFD)	Present Fuel Cost† (US$/MMBTU)	Opportunity Cost of Fuel (present cost less 10%) (US$/MMBTU)

Data from Purvin & Gertz Market Report.
§ Data from NERA Report.
† Present Fuel Cost calculated by individual customer on import parity basis and net of local taxes.
†† Strategic projects in Western Ghana.

Table 3-5 Table of Potential Gas Demand in Takoradi

The total potential gas market in Takoradi for existing projects in 2002 is estimated at 1.50 MMSCFD on a yearly averaged basis. An additional potential market of 7.44 MMSCFD could be realised if the Iron & Steel project is implemented in the Takoradi industrial area.

Further potential gas demands that could be realised if all planned strategic projects are implemented are; 7.20 MMSCFD for Manganese Ore processing in Tarkwa, and 29.4 MMSCFD for Bauxite processing in Nyinahin.

3.4 Complementary Surveys

A complementary survey was carried out for the consumer countries to corroborate and expand the pool of potential customers for the countries. Most notably, Dr Ofusu-Ahenkorah of the Energy Foundation in Ghana, who in collaboration with the Association of Ghanaian Industries identified ca.50 additional potential clients outside of those visited by Nexant, greatly facilitated this process. Enquiries were made to these entities in Ghana and further ones in Bénin and Togo by way of remote communication (e-mail/ordinary mail/ fax/telephone), seeking from them information by means of a. The response received was limited, with approximately only 20% of the entities approached replying. The responses received are incorporated in this report.

Reference was also made to earlier studies, particularly that undertaken by NERA in 1997 in order to identify additional potential clients and volumes. For those entities featuring in the NERA study and in the list provided by the Energy Foundation, demand volumes given in the responses received were broadly consistent with those quoted by NERA. For those entities from whom no responses were forthcoming, Nexant therefore had confidence in adopting NERA's estimates where available. Assumptions as to current fuel type used are made in this study for these entities based on industry type to enable comparison against gas prices. Entities, identified in the NERA study but not featuring in the list provided by the Energy Foundation were excluded, given that the former is now dated.

3.5 Overall Summary of Past & Present Reports

From the available list of potential gas consumers, an analysis has been carried out in this study to determine the real level of demand that can be captured once network development costs and equipment conversion costs are factored in. The results of demand forecasting analysis conducted for the scenarios considered in this study are listed below. Also tabulated below is a summary of the market demand data from the various scenarios from past reports.

Author	Scenario	Potential Gas Demand Projections (MMSCFD)								Comments
		Bénin		Ghana (TEMA)		Ghana (TAKORADI)		Togo		
		Start	Start + 20Yrs	Start	Start + 20Yrs	Start	Start + 20Yrs	Start	Start + 20Yrs	
Beicip (1997)	High	6.2	25.1							
	Mid	6.2	17.2							

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	Low	1.3	16.6							
Tractebel (1998) - Togo	Gas @ $3.17 / MMBTU	- (2.05)	- (16.9)							
NERA (1997)	High			18.1	No Data	5.0	No Data			Source: NERA Report Table 22
	Mid			14.5	29.0	2.0	8			
	Low			-	-	-	-			
Purvin & Gertz (2001)	High	5.6*	41.8*	7.1'	12.0'	1.0'	12.9'	18.4*	60.1*	
	Mid	5.5*	32.6*	6.0'	11.8'	0.6'	8.1'	14.5*	50.8*	
	Low	5.5*	25.4*	5.1'	11.4'	0.3'	3.2'	9.8*	43.5*	
Nexant (2002)	High									
	Mid									
	Low									

* Power demand only (no gas demand data for industry for $3.17 / MMBTU Tractebel landed gas price scenario). Demand is split jointly between Togo & Bénin (see figures in brackets).

' Derived from Table IV-4 & IV-8 of the Purvin & Gertz Market Report. Gas demand for power from Table IV-4 is split between the two countries and then gas demand for industry in each country was added.

: Industrial demand only quoted for Ghana.

Table 3-6 Summary of Demand Estimates from Present & Existing Studies

3.6 Market Assessment Conclusion

In conclusion it can be said that the previous reports, with the exception of the Purvin & Gertz report, focused primarily on demand volumes with limited consideration of cost comparison demand volume validation i.e. gas price versus current fuel cost. Purvin & Gertz, having access to firmer WAGP gas cost estimates, evaluates potential gas demand based on whether a better opportunity cost is available to a customer. Their analysis was however not done in depth for non-power consumers.

Nexant has attempted to go further by verifying potential total demand, and firming these up as actual gas demand volumes only if gas presents a better opportunity to a consumer than their current fuel. To this effect, both the burner tip gas price and the import parity pricing basis applied to present fuels are crucial to determining market volume. Nexant therefore erred on the side of caution in making these calculations and has expended a significant part of the study time in corroboration assumptions and base data.

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4 Design of Local Networks

4.1 Primary Transmission Network

N-Gas will supply natural gas to the consumer countries via beachheads in the consumer countries. Four such beachheads are foreseen:

Bénin: at Cotonou

Ghana: at Tema and Takoradi

Togo: at Lomé

The beachheads are designed as a single supply, each having its own regulating and metering stations for gas conditioning and flow monitoring. This minimizes both costs and administration for N-Gas. It is the intention of N-Gas therefore to limit direct off-takes from its own beachhead to one (and at most two) customers at each location, the first invariable will be the power companies (e.g. VRA in Tema) as the main consumers, and one other. This inevitably dictates that some form of grouping of the smaller industrial users will be required in order that a single administrative and operating body is responsible for the secondary gas off-takes to these smaller consumers.

Nexant envisages therefore that the local area (or secondary) networks serving individual customers will be taken off as one spur line from the primary network serving the power customers. Each spur line will need to be metered at or close to source for accounting purposes. The costs of such metering to be borne by the secondary network operator, the so-called "Aggregator".

4.2 Secondary Transmission Network

4.2.1 Design Philosophy

The secondary networks are defined as the transmission lines starting from the beachheads where the gas is landed from the offshore line.

Area schematics are provided in Sections - *4.5.1, 4.5.2* & *4.5.3* showing the beachheads and conceptual secondary networks, which we propose might be developed beyond them.

The secondary networks are defined as the transmission lines starting from the beachheads where the gas is landed from the offshore line. The secondary network design and system capacity holding for peak demand periods will utilise:

- *Linepacking*[5] but to a lesser extent than the primary network. The ability to utilize linepacking will diminish as the pipeline capacity approaches the operating flow and pressure limits as more customers are taken on.

- A *Diversity Factor*, this being the descriptive term for the fact that not all customers will consume gas at the same time and at each customer's projected maximum demand rate. Though good engineering practice for gas pipeline design is never to design for 100% of gas demand flows (i.e. a diversity factor of 1), but rather a figure lower than this, which accounts for demand distribution, the design utilised for pipeline costing in this report assumes a diversity factor of 1 to be conservative.

[5] "Linepacking" is the industry term used to describe a cost effective method for gas storage for peak demand periods, by using a slightly larger pipeline and/or a higher design pressure pipe thus allowing more gas to be compressed into the line for these periods, and avoiding the need for costly additional storage facilities.

No additional *Design Margin* on normal gas demand flows has been applied to any of the designs in this study. Each network is designed for least cost and maximum flexibility in mind for future expansion/ extension as new customers are found.

4.2.2 General Technical Aspects

The secondary networks for each of the recipient countries will be designed using the same philosophy. The consumers will be supplied by a main trunk pipeline with smaller spur pipelines to each of the consumers. The main pipelines and the longer spur lines will be provided with pig traps to enable inspection using online inspection vehicles, the so called "intelligent pigs". The pipeline systems will operate at between 35 Barg and 20 Barg and will employ ANSI Class 300 fittings. The pipelines will be constructed from steel purchased to comply with Specification API 5L and will use pipe material conforming to API 5L Grade B. The pipelines will be externally coated for corrosion protection and will be cathodicaly protected as a secondary corrosion protection measure. The coating system to be used will be selected during the FEED or detail design stages of the project, but would normally be either factory applied Fusion Bonded Epoxy or 3 Layer Polyethylene for the pipe, with field applied Tar Urethane for the buried fittings. In addition to the external coating, the pipelines will be installed with an impressed current cathodic protection system, supplemented at specific locations by sacrificial anodes. The pipeline routes will be marked with marker posts for both terrestrial and aero survey identification.

For pipeline construction, a strip of land, usually between 10 and 30 metres wide depending on the terrain and pipe size, will be needed to install a pipeline. Once the go-ahead is given, the strip of land is cleared and appropriate preparations made for road, rail and water crossings. The trench must be deep enough to allow the ground to be cultivated without damage to the pipelines once it is installed. These factors are included in the network costing calculation formula.

4.2.2.1 Gas Receipt From WAGP

Gas will be received into the secondary network from the WAGP Pressure Reduction and Metering Station located at the offshore pipeline landfall point. The WAGP pressure reduction and metering equipment will be installed in a secure compound. The secondary network operator equipment at these locations may be installed within the same compound or in an adjacent compound. The secondary network operator equipment would include a pig launcher and a gas odorization unit.

4.2.2.2 Consumer Metering Stations

At the consumer take off points a meter and pressure reduction station will be installed within a secure compound. Where the customer is supplied from a piggable branch line, the pig receiver will be in the same compound that contains the meter.

In the metering compound, the metering station itself will consist of two independent flow meters (see figure below), a dual set of flow control valves and a dual set of emergency isolation valves. The compound will also have gas and heat detectors linked to annunciators in the plant control room, these will automatically shutoff gas supply to the site on detection of a leak or a local source of heat.

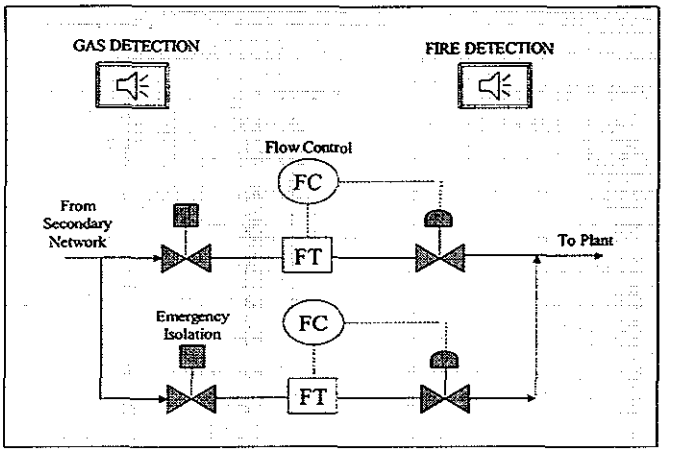

Figure 4-1 Typical Gas Metering Station at Consumer Site

4.2.2.3 Pipeline Routing

Where possible, the pipelines will be routed in open country or agricultural areas. Where this is not possible, the pipelines may be routed along roads, railway easements or other linear reservations. In these cases the pipeline will be installed with additional protection against damage by human intervention. The additional protection required will be selected on a case by case basis during the engineering design phases of the projects, but would normally be provided by increasing the pipeline burial depth and/or by the installation of concrete protection/warning slabs over the pipeline.

4.2.2.4 Pipeline Crossings

At locations on the pipeline route where it is necessary to cross facilities such as roads, railway tracks and rivers, specific measures will be taken to protect both the pipeline and, if necessary, the feature being crossed. Generally crossings will be made in such a way as to minimise the impact on the facility being crossed. The specific method to execute each crossing will be investigated during the engineering design stage of each project.

For crossings of roads the preferred method is to prepare a diversion road and excavate an open trench across the road, install the pipeline then reinstate the road. For busy roads where diversion is impractical or would introduce an unnecessary hazard to road users, the crossing can be made by excavating pits on either side of the crossing and installing the pipe using a thrust or auger boring method. In these methods a boring machine is used in which the pipe section is driven under the road and the spoil is removed through the pipeline carrier pipe. The advantage of the method is that the road surface is undisturbed and the road use is unaffected.

For rail crossings the preferred method is to thrust bore a string of concrete sleeve pipes under the railway then insert the pipeline carrier pipe into the concrete sleeve. This is done because of the higher ground loading on railways.

For river crossings, there are a number of alternative methods depending on the width of the river and the nature of the riverbed. These include:

- Attach the pipeline to an existing bridge or other structure crossing the river. This method is the most economical, particularly for large rivers but consideration must be made to protecting the pipeline from damage and allowing for pipeline expansion.

- Open cut, where a channel is dredged in the riverbed and the pipeline, made up as a pipe string is pulled into the trench. This method is generally the preferred method but requires that the riverbed is stable and the pipeline would not be at risk of damage due to ship movements or ships anchors.

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- Directional drilling, where the pipeline section is installed in a drilled hole using a specialist-drilling rig mounted on an angled transporter. This method is used when the riverbed is unstable or the pipeline would be at risk of damage. With current drilling technology the maximum length of a directionally drilled crossing is approximately 2 km.

4.2.2.5 Pipeline Communication System

The pipeline systems could be operated with a minimal level of remote control but even though the systems are relatively simple, it would be prudent to install a communication system to allow operation from a central control room. Pipeline communication systems can use any of the current technologies as the telecommunication medium but generally the choice is limited to microwave or optical fibre systems.

Of these systems, the most efficient form of communication for pipelines is optical fibre. For a pipeline telecommunication system it is normal to install the optical fibre cable at the same time as the pipeline and in the same trench as the pipeline. The cable would typically be 8 cores and be between 12 mm and 16 mm in diameter. The cable would be terminated at a multiplexer/router unit at each location requiring communications, and would have repeaters at about 60 km intervals.

The communication system would be linked to a System Control And Data Acquisition (SCADA) package which would enable data to be gathered from the meter stations and would allow remote closure of the consumer supply valves.

One of the points to consider with the installation of an optical fibre cable is that there is an opportunity to install a cable with a larger capacity than required and to use this capacity for other users or for public services. In this way, many new pipeline networks around the world have significantly improved their project economics either by: sharing capital costs through co-installation of optical fibre communications networks with companies with a commercial requirement for such equipment, or by offering telecommunications services themselves (country regulatory practices permitting).

4.2.2.6 Pipeline Operational Infrastructure

A fixed infrastructure will be required to support the operation of the secondary networks in each country. This infrastructure will include:

- Operating company management structure
- Corporate management functions
- Financial and billing functions
- Personnel and company administration functions
- System operation functions
- System operation control room
- System maintenance functions
- Workshops/stores facilities.

4.2.2.7 System Operation Control Room

The distribution systems for all the current secondary networks are very simple and the system operating procedures would reflect this. The requirement for a system control room needs to be assessed when the operational procedures are drawn up. If it is decided to install a

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telecommunication system along the pipeline routes, a control room will be required. In any event, 24 hour manning for emergency response is essential and provision must be made for this. Emergency Response Procedures and equipment must be considered and provided for at an early stage in the project planning.

4.2.2.8 System Maintenance

The gas distribution entities of each country will include some form of maintenance function. This may be monitoring and supervision by the operator with the actual work being performed by subcontractors, or it may involve a full in house maintenance organization. For either scenario, the pipeline maintenance function will require specific stores/workshop facilities, transportation and communications to operate effectively. Maintenance vehicles will be required both for routine patrolling and inspection and for emergency response. Field operation and maintenance crews will need a good communication system back to the central control room. This could either be by a private mobile radio system or by using the mobile telephone network. Routine inspections of the pipeline routes by aero survey or ground patrol should be performed at weekly to monthly intervals. Monitoring of the cathodic protection (CP) system should be performed at 6 monthly intervals. Non-invasive external coating inspection surveys should be performed annually. Online inspection (intelligent pig) surveys should be performed at 5 to 10 year intervals.

4.2.2.9 Workshops/Stores facilities

The secondary networks have very few component parts, which require maintenance. However, both permanent and mobile workshop facilities will be required for the repair and maintenance of the above ground equipment such as meter and pressure reduction stations, pig launcher/receivers, odorization unit, SCADA system and the telecommunications equipment.

Whilst failures of pipelines in service are very rare, the pipelines are at risk of damage such as exposure, denting and even rupture due to both natural and external forces. For the most severe type of incident i.e. pipeline rupture and gas release, the highest risk is from the operation of heavy excavation equipment near to the pipeline. If the pipeline is ruptured, immediate action is required by the pipeline operator to isolate the affected section, evacuate the area which may be affected by a secondary fire or explosion, and make a repair. To provide for this type of emergency, equipment must be held in stock to allow rapid depressurization and repair of the pipeline section. This equipment would include temporary vent piping and proprietary repair clamps, which would allow the pipeline to be re-pressured and operated until a permanent repair can be made.

4.2.2.10 Design Notes for Gas Pipelines

Base Data

Proposed design based on ANSI B31.8.

Design Pressure = 49 Barg

Design Factor (ANSI B31.8 Table 841.114A)

- Location Class 1 = 0.72
- Location Class 2 = 0.60
- Location Class 3 = 0.50
- Location Class 4 = 0.40

Longitudinal Joint Factor = 1.0

Temperature Derating Factor = 1.0

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Selected Wall Thickness (ANSI B31.8 Section 841.11)

Proposed Pipe Material API 5L Grade B.

Pipeline Diameter	Location Class 1	Location Class 2	Location Class 3	Location Class 4
Design Factor	0.72	0.6	0.5	0.4
6 NPS	6.34mm	6.34mm	6.34mm	6.34mm
8 NPS	6.34mm	6.34mm	6.34mm	6.34mm
10 NPS	6.34mm	6.34mm	6.34mm	7.80mm
12 NPS	6.34mm	6.34mm	8.38mm	8.38mm
16 NPS	6.34mm	7.92mm	9.53mm	11.13mm

Table 4-1 Pipeline Proposed Wall Thickness

Burial Depth (ANSI B31.8 Section 841.142)

Location Class 1 = 600mm however 900mm is recommended

Location Class 2 = 770mm however 900mm is recommended unless there are agricultural practices which require deep ploughing where 1200mm is recommended.

Location Class 3 = 770mm however 1000mm is recommended

Location Class 4 = 770mm however 1000mm is recommended

Burial depth (beneath drainage culvert on road margin) = 914mm minimum

We recommend that the minimum burial depth beneath the road surface be 1500mm

Road Crossings Type/Burial Depth (ANSI B31.8 Table 841.114B)

Crossing type - Non cased designed to API RP 1102

Pipe wall thickness:

Location Class 1 = Design Factor = 0.60

Location Class 2 = Design Factor = 0.50

Location Class 3 = Design Factor = 0.50

Location Class 4 = Design Factor = 0.40

Section Block Valve Spacing (ANSI B31.8 Section 846.11)

Predominantly location Class 1 = 32 km

Predominantly location Class 2 = 24 km

Predominantly location Class 3 = 16 km

Predominantly location Class 4 = 8 km

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Location Class Definitions (ANSI B31.8 Section 840.21 & 22)

Location Class 1 = Fewer than 10 buildings intended for human occupancy within a zone 200 m each side and 1600m along the pipeline. This would be wasteland, deserts etc

Location Class 2 = More than 10 but fewer than 46 buildings intended for human occupancy within a zone 200 m each side and 1600m along the pipeline. This would be farmland, industrial estates etc

Location Class 3 = More than 46 buildings intended for human occupancy within a zone 200 m each side and 1600m along the pipeline. This would be residential areas, heavy industrial etc

Location Class 4 = Multi story buildings.

4.3 Network Costing

The following sections describe the inputs and assumptions that have been made to determine the likely true cost of developing the secondary networks.

4.3.1 Capital Expenditure

The principal elements of the one-off capital expenditure that will be needed for the development of the gas markets in the consumer countries are twofold: (i) Pipeline Capital expenditure, and (ii) Firing-Equipment Conversion Capital Expenditure. These can be further broken down as follows:

Pipeline CapEx

The elements associated with pipeline CapEx are:

1. Pipeline constructions costs made up of:
   - Pipeline laying costs calculated based on the simple mathematical formula $mx + c$, where: "c" is a constant and accounts for the fact that a right of way preparation cost will be incurred regardless of pipeline size (c = US$100 / metre), "$m$" is a cost constant dependent on pipeline size (m = US$4.8 / inch-metre), and x is the pipeline size in inches.
   - A pipe material (metal) cost based on US$650 / tonne (delivered basis).
   - A pipeline coating cost of US$15 / m^2.
2. A connection cost per customer to account for the tie-in connection for the branch line into the customer's site from the main network, estimated at US$100,000 per customer in year 2002 US$.
3. Compressor costs if applicable (in principle the secondary networks are designed to negate the requirement for recompression in order to minimise costs).
4. Miscellaneous costs - included within the model as a general figure based on 5% of total CapEx.

The formula in "1" above are based on Nexant's pipeline expert's experience and a correlation of project costs from an experience database. The results correlate well with NERA's US$21 per inch-metre combined formula, with results coming in at between US$18-19 per inch-metre. The level of accuracy for such estimates at this stage is no better than ±25%.

Conversion CapEx

Most of the oil burning equipment currently employed by potential clients for WAGP gas will require modification. This is not expected to pose any major technical or economic problems, indeed such conversions are undertaken routinely in the oil refining sector, for example to provide a dual-firing facility which allows the operator the option of choosing to run gas or oil as technical or economic circumstances make appropriate.

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However, the costs of this exercise will have to be borne either by the clients themselves, or by the aggregator companies on a negotiated agreement basis to be passed through in the gas price, or by N-Gas, or by government, or by some combination of these entities. In any event it is an essential part of the economic analysis of the development of the secondary networks and must be accounted for in the burner tip gas price to enable a true comparison to be made with present fuel costs.

Nexant has contacted furnace, burner and turbine manufacturers and contractors to obtain indicative costs for conceptual planning purposes. That is to say, the costs obtained should therefore be regarded as typical for such an exercise. They may not however be used for the purpose of making investment decisions without further reference to equipment vendors.

The main elements associated with conversion costs are:

1. Prices to re-burner a furnace were found to range between US$23,000 –43,000 per burner on an installed basis depending on burner type and size. This would cover the supply and installation of the burners themselves. In the case of boiler firing, the costs of conversion are somewhat higher, given the greater complexity of the burner arrangements. Conversion costs here were found to range between US$49,000-73,000 per burner.

2. An additional cost of US$28,000[6] allocated for training staff at the facility on using the new equipment to cover expatriate staff person(s)'s airfare, lodgings, transport and per diem for a 2-3 week period of commissioning and post commissioning.

3. Metering station costs estimated at US$40,000 per facility for the meters, control valves, emergency isolation valves, gas and heat detection and control room linkup (refer *Figure 4-1*).

The above criteria were applied to the technical circumstances of individual potential clients, as could be determined from information supplied by the clients following enquires in Nexant's Assessment Visits and Complementary Surveys. Where this data was not sufficiently comprehensive, Nexant made educated assumptions as to: whether the potential client's activity involves furnace operations or steam-raising, and the likely number of burners, in order to derive a cost for the analysis.

The resulting additional capital expenditure for conversion to gas were annuitised and expressed in US$ / MMBTU terms based on customer gas demand, then added to the gas price and transportation cost elements of WAGP gas to arrive at burner tip gas prices. The annuity value of the conversion CapEx was calculated based on an IRR to the company of 15%, and a 15-year equipment life.

4.3.2 Operating Expenditure

The main elements associated with OpEx costs are:

1. An operating expenditure allowance of 2% of cumulative CapEx to cover: field staff, pipeline inspection, repair and maintenance (cf. pipeline average O&M of approximately 1.5%).

2. An administrative manning level of 10 is assumed with a median salary of US$2,000 pa.

3. Network insurance costs are assumed to be 0.5% of cumulative CapEx.

4. Compressor running costs taken as nil as re-compression is designed out of secondary networks.

5. Local taxes of US$10,000 for vehicle road tax, local government rates, permits etc. These are unrelated to corporation tax from which the company would be initially exempt (see tax holiday period assumed in *Table 4-2* below).

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[6] Based on information supplied by Hamworthy Combustion and Foster Wheeler fired Heaters Division, Reading, UK.

6. An annual administrative cost of US$75,000 to cover building rent, and general overheads.

The above sections constitute the financial basis for the economic assessment of the secondary network lifecycle costs in the models developed by Nexant.

4.4 Economic Assessment

The final elements incorporated in the economic analysis of the development of the secondary networks are the financial assumptions and fiscal tax regimes applied.

4.4.1 Discount Rate

The incentive for development of a secondary network, and subsequent phases of such a network thereafter by an aggregator is assumed to be the opportunity to earn a better rate of return. This provides the reward for taking on board the increased risks associated with building and operating a larger network. Therefore a minimum real rate of return on investment of 12% with a maximum of 15% (using the WAGP model) is taken as the basis for evaluating the life cycle costs of the secondary network. In all cases, Phase 1 of the network is taken to have a 12% IRR to minimise initial tariffs. Phases 2 and 3 where applicable are assumed to have IRRs of 14% and 15% respectively.

4.4.2 Pipeline Financing & Corporation Tax Assumptions

Assumption	Value
Debt/Equity Ratio	70%
Cost of Debt	10%*
Pipeline Depreciation Balance	25% Declining Balance Years
Tax Rate	35%'
Tax Holiday Period	5 Years
Cost of Equity	12%(min)-15%(max)**

* The cost of debt in US$ was estimated based on international base lending rates (LIBOR basis) currently 2.5%, a lending premium over base rate, and a country risk premium. These are estimated at 6% maximum from African Development Bank public sector loan publication. Nexant's estimate of 10% is therefore conservative.
\# Same basis as WAGP.
** Scenario dependent (see Section *4.4.1* for further detail).

Table 4-2 Pipeline Financing & Tax Rate Assumptions

4.4.3 Inflation

Unless otherwise indicated, real prices have been used throughout this report. However, for a true economic analysis to be done, taxation effects were incorporated in the secondary network model requiring inflation of real monetary values to a nominal basis, then deflating these back to real values post corporation tax deduction. The inflation rate utilised in this respect is 2%, the same rate as that nominated in the Commercial Group Market Report prepared by Purvin & Gertz.

4.4.4 Evaluation Period

The evaluation period taken for the secondary network analysis is 20 years from 2006 (the expected date of realization of the WAGP project).

4.5 Network Routing

4.5.1 Bénin

The most promising prospective consumers in Bénin are located in three main areas, namely: Cotonou, Porto Novo and Onigbolo. Nexant conducted a high level review of the pipeline route. One of the most cost effective routes (subject to a comprehensive route survey) to come out of this review appears to be one taking WAGP gas from the beachhead, through Cotonou, onto Porto Novo and finally Onigbolo (see *Figure 4-2* below).

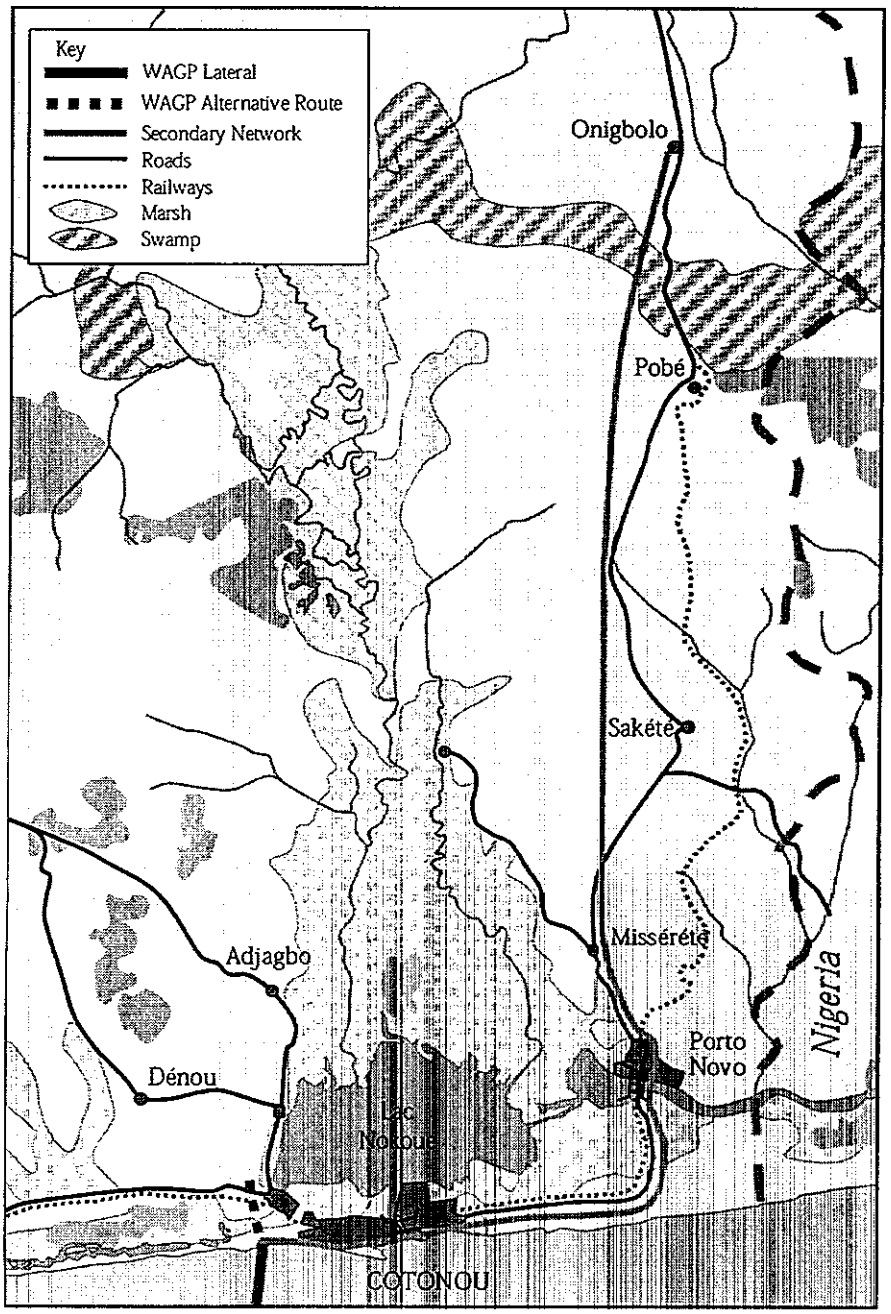

Figure 4-2 Example Bénin Pipeline Route

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The routing assumed for the secondary network from the WAGP lateral is for a single mains line first servicing customers in Cotonou, then routing east (parallel to the coast line) then north across some marsh land towards Porto Novo, and finally routing north to Onigbolo. This proposed route takes advantage of two road bridges[7] in Cotonou and near Porto Novo to minimise costs and avoid the need for expensive water (submerged) crossings.

It should be noted that the Commercial Group has been in discussion with CEB about an alternative route, and the effect of this will be reviewed as a specific scenario for Bénin later in this section. This alternate route is shown as a dotted continuation of the WAGP lateral in *Figure 4-2* above and requires physical relocation of CEB infrastructure.

The table below gives an idea of the order of cost for full development of the Benin network assuming all customers qualify for gas commercially.

Section		Size	Distance	Cost
From	**To**	(Inches)	(km)	(US$ millions)
WAGP	CEB	8	5.00	0.90
CEB	SOBERA	8	8.00	1.44
SOBERA	SBEE	8	0.70	0.13
SBEE	ICGB (Cotonou)	8	0.80	0.14
ICGB (Cotonou)	SoBeTex	8	0.50	0.09
SoBeTex	ICGB (Porto Novo)	8	25.00	4.49
ICGB (Porto Novo)	SCO Lafarge	6	80.00	12.51
			Total	19.7*

* Based on Present Demand Scenario and all customers qualifying.

Table 4-3 Estimated Capital Expenditure Breakdown for Bénin Network

[7] Subject to the appropriate planning consents being obtained from the transport authorities in Benin.

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4.5.2 Togo

Prospective customers in Togo are located in three main areas, namely; Lome, Kpeme and Tabligbo. A high level review of the pipeline route indicates that an optimal route (subject to a comprehensive route survey) is likely to be one taking WAGP gas from the beachhead, through Lome, along the coastline to Kpeme and finally north to Tabligbo (see *Figure 4-3* below).

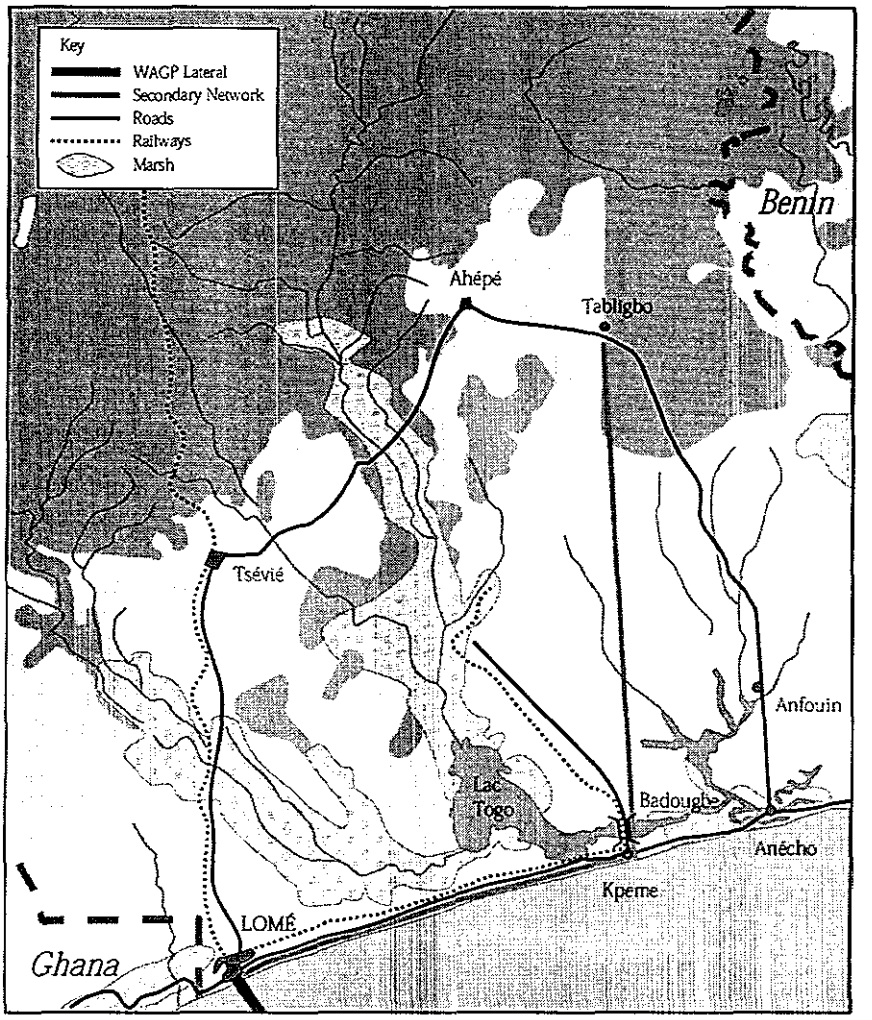

Figure 4-3 Example Togo Pipeline Route

The routing assumed for the secondary network in Togo from the WAGP lateral is for a single mains line first serving customers in Lome, then routing north-east to Kpeme, crossing Lac Togo via the existing road bridge[5] to minimise costs, and finally routing north to Tabligbo. The above route was previously assessed by the Project Implementation Committee (PIC) as their "Route D", one of four possible options evaluated. Nexant priced all four routes and the above route was the most cost effective (see *Table 4-5*).

[5] Subject to the appropriate planning consents being obtained from transport authorities in Togo.

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The table below details the estimated cost for full development of optimal Togo Network (option D)) assuming all customers qualify for gas commercially.

Section		Size	Distance	Cost
From	To	(Inches)	(km)	(US$ millions)
WAGP	CEB	10	1.2	0.23
CEB	ElectroTogo	10	1.2	0.00
ElectroTogo	OTP	8	21.8	3.78
OTP	WACEM	8	42.0	7.29
WAGP	Brasserie (Spur Line)	2	10.0	1.20
			Total	12.5*

* Based on Present Demand Scenario and all customers qualifying.

Table 4-4 Estimated Capital Expenditure Breakdown for Togo Network

The figure below gives an indication of all four routes considered in this report prior too selection of an optimal route.

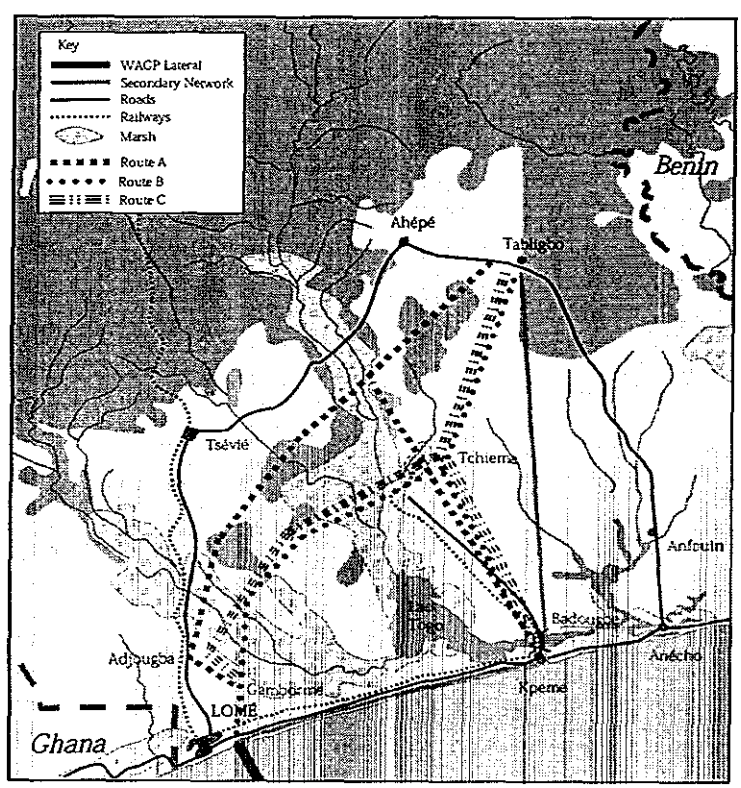

Figure 4-4 Alternative Routes Considered in Previous Studies in Togo

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Section	Cost (US$ millions)			
	Option A	Option B	Option C	Option D
Total	17.0	15.4	16.0	12.5*

* Based on Present Demand Scenario and all customers qualifying.

Table 4-5 Capital Cost Estimates for Togo Network Options

As with Bénin though, the Commercial Group has been in discussion with CEB in Togo about an alternate route and direct supply to CEB without going through the aggregator. The effect of this (i.e. the loss of CEB from the secondary network) will also be reviewed in this analysis.

4.5.3 Ghana - Tema

Prospective customers in Tema are primarily concentrated in the Tema Industrial Estate. A further tranche of customers are to be found in the Accra area, both within the city and in the industrial areas around the city. 35km of network length has been assumed in the Tema model to Accra, with a further 15km allowed for local distribution in and around Accra order to provide a cost for tariff calculation.

Nexant conducted a high level review of the likely pipeline route in Tema. A probable and reasonably cost effective route is likely to be[9] one taking WAGP gas from the Beachhead, proximal to and behind the Valco facilities, down the axis road servicing Tema Oil Refinery, and then south at the main road towards the port. Spur lines will be taken off to the north to service Nestle and Tema Steel. A future extension of the main spur from the port to consumers in Accra is also considered.

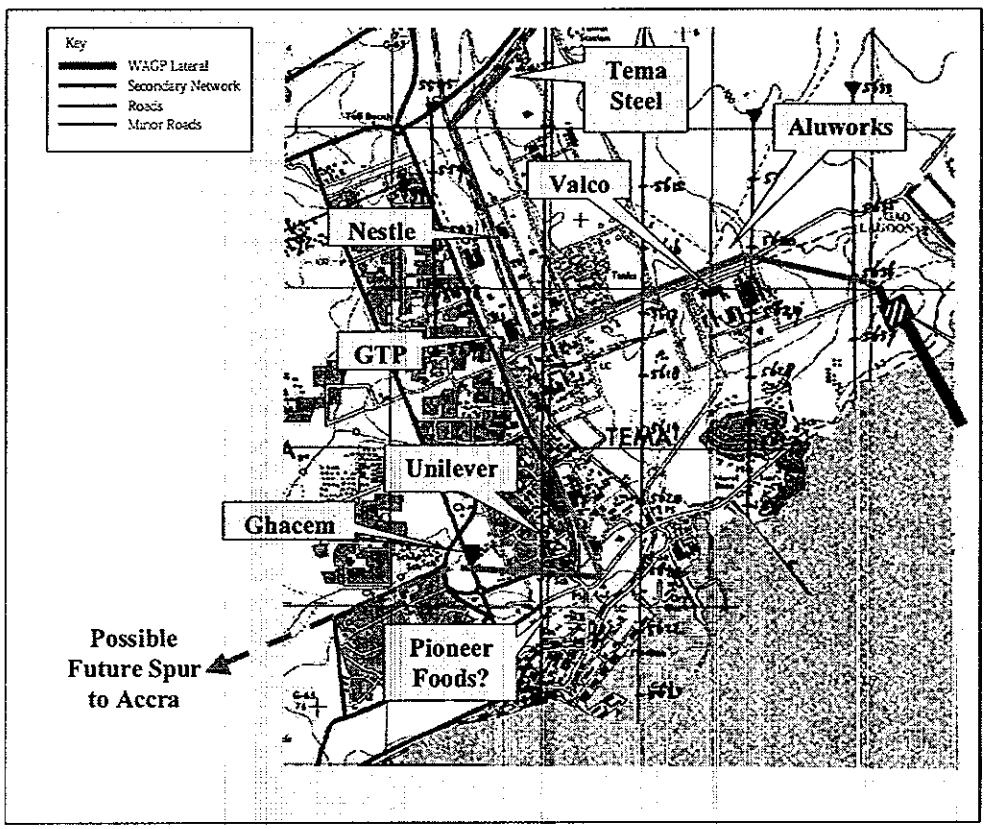

Figure 4-5 Example Tema Secondary Network

It should be noted that the route depicted above indicates a single aggregator being responsible for secondary network gas distribution in Tema, this is against certain customer preferences (notably Valco) who have a desire to be serviced with gas without an intermediary. This could be an issue for regulation or alternatively for negotiation between WAPCo and Valco. A remote possibility put forward by Valco was that they had been in discussion with a possible IPP in Tema who was interested in leasing land from them, it may therefore be possible to piggy back Valco gas consumption with that of the IPP.

[9] Subject to a comprehensive route survey.

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Section		Size	Distance	Cost
From	To	(Inches)	(km)	(US$ millions)
WAGP	Aluworks	6	1.5	0.26
Aluworks	Node 1	6	2.5	0.43
Node 1	Nestle	2	5.5	0.66
Nestle	Tema Steel	2	1.5	0.18
Node 1	GTP	6	0.2	0.03
GTP	Unilever	6	2.0	0.34
Unilever	Pioneer Foods	6	1.0	0.17
Pioneers Foods	Others'	6	4.8	0.82
Others'	Accra	4	40.0	5.64
WAGP	VALCO (spur Line)	2	1.5	0.18
			Total	8.7*

* Based on Present Demand Scenario and all customers qualifying.
\# Others includes; Tema Textiles, Cocoa Processing, GTMC, GAFCO, Ferro Fabrik & Wahome (exact locations in Tema industrial area not determined).

Table 4-6 Capital Expenditure Breakdown for Ghana (Tema) Network

4.5.4 Ghana - Takoradi

Neither volume data nor customer location data for network sizing was available for Takoradi. An assumption has been made that the Takoradi network will be 15km in total to derive a cost for tariff calculation. This does not adversely affect any potential customers in Takoradi since network tariffs are on a postage stamp basis.

Section		Size	Distance	Cost
From	To	(Inches)	(km)	(US$ millions)
WAGP	Takoradi Industries	4	15	2.07
Total				2.1

- Based on all industries qualifying.
-

Table 4-7 Capital Expenditure Breakdown for Ghana (Takoradi) Network

35'

The table below gives an indication of the size and cost of a Takoradi network, if it were to include the strategic projects. The main change being an increase in pipeline size from 4 inches to 16 inches.

Section		Size	Distance	Cost
From	**To**	(Inches)	(km)	(US$ millions)
WAGP	Takoradi Industries	16	15	4.37
Takoradi Ind	Takoradi Strategic	16	0	0.00
Takoradi Strategic	Tarkwa Strategic	16	60	17.50
Tarkwa Strategic	Nyinahin Strategic	16	180	52.50
Total				74.4

* Based on all industries qualifying.

Table 4-8 Capital Expenditure Breakdown for Ghana (Takoradi) Network with Strategic Projects

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5 Development Scenarios

Scenario Basis

It must be emphasized from the outset that the accuracy of any cost / volume figures presented by Nexant or its sub-contractors in this Report or in any other submission, written or verbal, in connection with this project is not guaranteed, and that any such figures are offered for conceptual planning purposes only. In particular, such figures may NOT be used as a basis for investment decisions. Furthermore, Nexant's economic analysis was conducted without corroboration of the WAGP Standard Tariff rate derived from the mid-market projection scenario.

Estimates of potential gas demand have been made on the basis of the responses received from the assessment visits and the complimentary surveys (see Section 3). These were derived by taking the heat output of current energy sources and calculating a gas equivalent, taking into account comparative fuel lower heating values (LHV) for each fuel.

From the base gas demand levels calculated, demand projections were made based on a chosen scenario and growth rates assumed for that scenario. These along with corresponding pipeline requirements for the secondary networks under the chosen scenario at each location were then utilised to calculate likely gas tariffs in that area.

Scenario's Considered

Broadly speaking, this study considered three scenarios for each country:

- A Present Demand scenario without expansion but with GDP growth for those entities where no perceived market demand limitation exists.
- An Expansion/Demand Growth Scenario taking account of the expansion plans stated by the potential customers and GDP growth as applicable, and
- A "Strategic Projects Scenario" taking account of strategic projects (if applicable) i.e. those projects planned but for which there is no funding or immediate implementation plan.

Scenario Assumptions (Starting Point)

Below is a list of assumptions necessary for demand estimation and tariff calculations:

- WAGP Gas assumed to be available in the consumer countries from 2006.
- Country GDP growth only applied to industries with a largely domestic based consumption profile e.g. GTP (Textiles) in Ghana, as opposed to Valco whose main market is overseas.
- GDP growths for Bénin, Ghana & Togo taken to be 3.7%, 3.2% and 2.6% respectively, in line with Purvin & Gertz's 20 year averaged GDP growth for each country.

Country GDP Data Source	Bénin	Ghana	Togo
CIA World Factbook	5.0%	3.4%	3.4%
IMF	6.2%	-	-
Commercial Group 20 Year Average	3.7%	3.2%	2.6%
GDP Used in this Report	3.7%	3.2%	2.6%

Table 5-1 Country GDP

- In all cases, Phase 1 of each secondary network is taken to have a 12% IRR to minimise initial tariffs. Phase 2 and 3 (if applicable) utilise IRRs of 14% and 15% respectively.

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- An arbitrary fuel gas price discount of 10% on present fuel cost on an equivalent heat basis (US$ / MMBTU) is applied to determine the opportunity cost (or conversion threshold) for an industry.
- Nexant pipeline specialist's pipeline costing formulae.
- All projected gas volumes are based on the respondents' own data supplied to Nexant.
- Present fuel costs are based on Nexant-ChemSystems™ netback prices of product data, corroborated where possible with customer price data supplied to Nexant.
- WAGP Gas calorific value specification is in the range 850 – 1050 MMBTU / MMSCF, average of 950 MMBTU / MMSCF taken for all calculations.
- The Commercial Group's mid-market projection standard tariff model serves as the input gas price for the models - see *Table 5-2* and *Figure 5-1* below.

Customer	Standard Tariff (ST) *US$ / MMBTU*	Foundation Tariff (FT) *US$ / MMBTU*	Industrial Development Tariff (IDT) *US$ / MMBTU*
Gas Commodity Price	0.50	0.50	0.50
Gas Delivery Charge	0.10	0.10	0.10
Others (Ins., Admin Body etc.)	0.10	0.10	0.10
ELP Transport Tariff	0.25	0.25	0.25
WAGP Capacity Charge	*1.85*	*1.75**	*1.35#*
÷ by Reserved Capacity (80%)	*0.8*	*0.8*	*0.8*
= WAGP Tariff	2.31	2.19	1.69
Total Landed Beach Price	3.25	3.13	2.64

All figures are on a real basis except the discount applied to the FT.
** Based on ST less US$0.10 discount (nominal) for 20 years.*
 # Based on ST in year 20 of WAGP operation, remains level throughout life of WAGP.

Table 5-2 WAGP Tariff Component Breakdown (2006)

The 2006 tariff table above is represented graphically over time below:

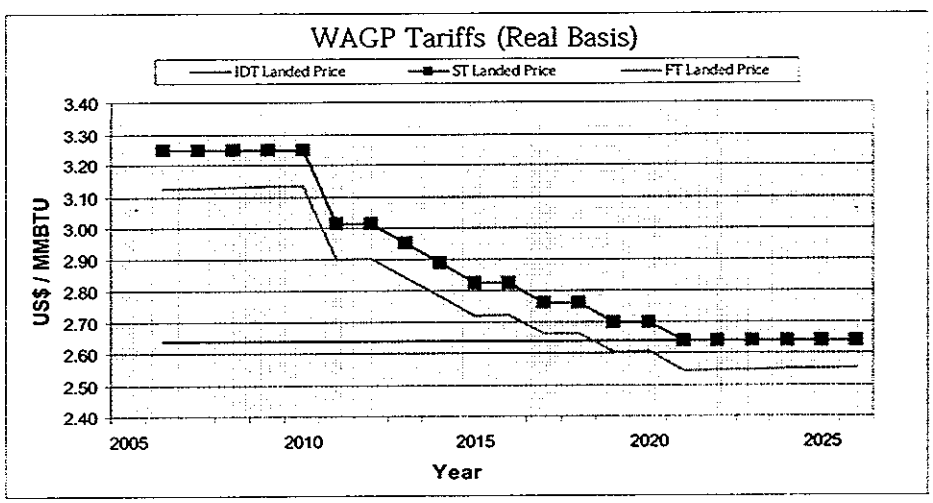

Figure 5-1 WAGP Tariff Chart

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Narrative of Secondary Network Analysis Tables

Below is a typical table used in the country analysis section to detail potential customers, their cost of fuel and the calculations leading to an assessment of the components in the delivered cost of gas to each customer. An explanation of Nexant's tables is provided below by way of introduction to the analytical sections that follow.

		a	b				c	d	e	f	g	h	j
Target Demand	Business & Location	Actual Plant Utilization	Yearly Averaged Gas Demand (Basis: 80% utilization minimum)				Present Fuel Cost	Opportunity Cost of Fuel	Secondary Network Tariff	WAPCo Discount on ST	Annualised Conversion Cost	Delivered Gas Price	PHASING*
			2006	2011	2016	2021	(US$ / MMBTU)						
Customer 1	Product 1. Somewhere	90%	7.00	7.00	7.00	7.00	3.96	3.56	0.89	0.00	0.01	4.15	1
Customer 2	Product 2. Somewhere	80%	0.50	0.50	0.50	0.50	3.69	3.32	0.80	0.63	0.40	3.82	2
Customer 3	Product 3. Somewhere	70%	2.00	2.00	2.00	2.00	3.69	3.32	0.70	0.00	0.15	4.20	3
	Demand Totals	Phase 1	7.00	7.00	7.00	7.00							
		Phase 2	-	7.50	7.50	7.50							
		Phase 3	-	-	9.50	9.50							

Table 5-3 Example Table of Potential Gas Demand

a) Actual plant utilization data for potential customer based on number of hours/days/weeks of operation. Minimum plant utilization taken to be 80% for secondary network TARIFF estimation. If actual utilization is lower, tariff is prorated upwards accordingly.

b) Yearly averaged flow calculated from daily maximum flow based on minimum 80% utilization. Used to calculated secondary network TARIFF.

c) Present fuel cost - converts price and consumption data from client into reference energy cost (US$ / MMBTU).

d) Discounts the present cost of fuel (energy) to the potential customer by an arbitrarily determined 10% to obtain an opportunity cost, or conversion threshold cost for gas, below which a potential customer is likely to change over to gas.

e) The secondary network TARIFF calculated from the life cycle cost of the network.

f) WAPCo subsidy (if any) on standard tariff as it applies to that customer (to be deducted from standard tariff).

g) Converts equipment conversion costs to an annuity (based on a 15 year equipment life and a cost of capital to the company of 15%), and then spreads this across the gas demand volume to derive an effective unit cost of conversion on the energy costs (US$ / MMBTU).

h) Effective delivered PRICE (burner tip) of gas from the secondary network – sum of: (1) Secondary Network Gas TARIFF (e) x (80% Utilization / Actual Utilization if less than 80%), (2) WAPCO. standard tariff (US$3.25 / MMBTU), (3) equipment conversion cost (g), less (4) WAPCo. discount to customer (f).

j) Checks to see if / when (h) becomes less than (d) to decide phase (year) in which customer qualifies.

Note: The blue shaded columns are those to be compared for qualification criteria.

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Secondary Network Tariff Component Breakdown

Below is a typical breakdown for an industry using less than 1 MMSCFD and therefore benefiting from the WAPCo discount of US$0.63 / MMBTU. The industry illustrated is fictitious and for explanatory purposes only.

Customer	Actual Cost US$(000)	Annuitised Cost US$(000)/Yr	Unit Cost US$ / MMBTU
Landed Gas Price (based on WAPCo. Standard Tariff)	-	-	$3.25
*Secondary Network Gas Tariff**	-	-	*$0.50*
Capacity Factor or Assumed Plant Utilization	-	-	*80%*
÷ Actual Plant Utilization	-	-	*40%*
= Tariff Escalation Factor (cannot be less than 1)	-	-	*x 2*
Effective Secondary Network Tariff to Customer	-	-	$1.00
Secondary Network Gas Price	-	-	$4.25
WAPCo. Tariff Discount	-	-	-$0.63
Conversion Costs			
Equipment	*$57.8#*	*$9.88*	*$0.049*
Training & Miscellaneous	*$28.0*	*$4.79*	*$0.020*
Metering Station	*$40.0***	*$6.84*	*$0.029*
Total Conversion Costs	$125.8	$21.51	$0.098
Delivered (Burner Tip) Gas Price	-	-	$3.72
Opportunity Cost of Fuel to Consumer	-	-	$4.04†
Customer qualifies for supply in:	-	-	Phase 1

All figures are on a real basis.
* *Based on lifecycle cost of network over 20 years at 12% IRR (for Phase 1).*
\# *Reference cost data from vendor where possible.*
** *Nexant in-house data for double metering station per Nigerian installations.*
† *Present fuel cost to customer discounted by 10%.*

Table 5-4 Example Secondary Network Tariff Components

From the above it can be seen that the tariff discount would greatly benefit industries that would otherwise not qualify for gas uptake.

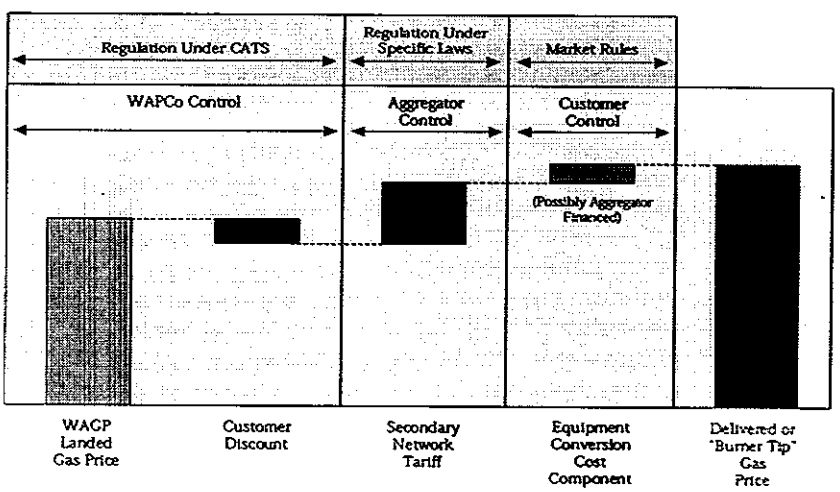

Table 5-5 Secondary Network Tariff Build-up

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Secondary Network Analysis and Modelling Methodology

The six basic steps to tariff modelling applied in this report are depicted below

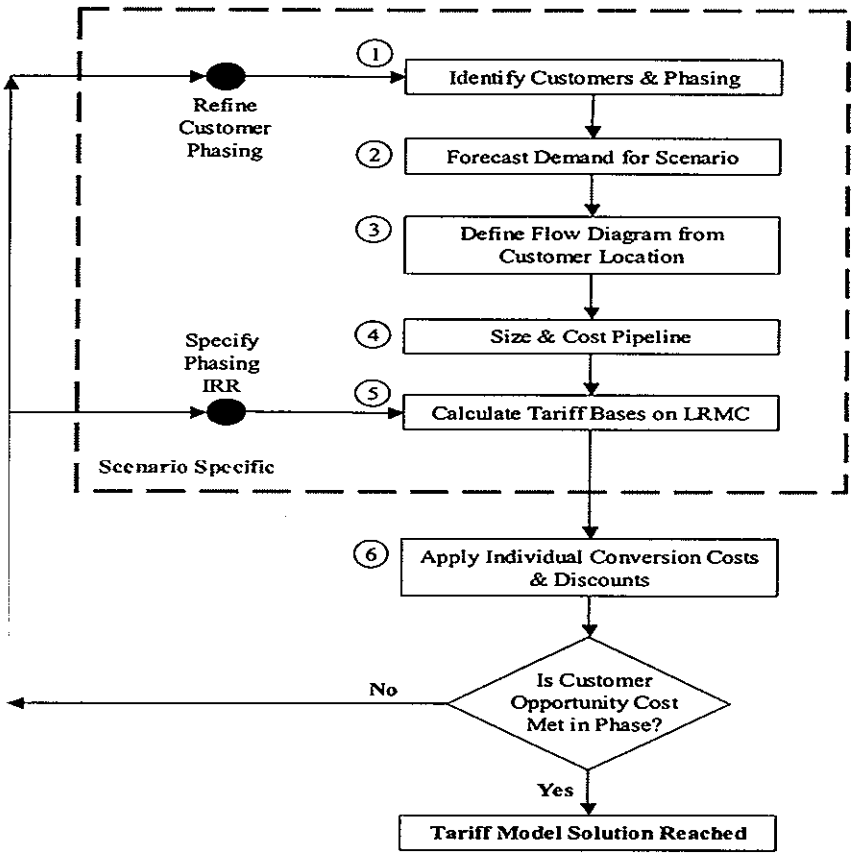

Figure 5-2 Nexant Tariff Model Methodology

The scenarios developed for each region and the estimated gas tariffs calculated now follow.

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5.1 Bénin

The potential gas demand data as calculated for Bénin based on industry supplied data is tabulated in *Table 5-6* below. The yearly averaged maximum potential demand for Bénin identified by this study stands at 8.0 MMSCFD (heat) and 4.5 MMSCFD (power) in 2006. This is unprocessed data i.e. it assumes: all customers can be converted to gas economically, a minimum plant utilization of 80% (per take-or-pay agreements), and takes no account of the specific economic conditions as they apply to each industry (present cost of fuel, cost of conversion, resistance to change etc.).

Assuming all customers qualify, the total cost of network development is estimated at US$19.7m, and the corresponding secondary network tariff calculated is US$0.89 / MMBTU based on 12% IRR.

Reader's note: For all detailed reference files and calculations relating to Benin, including demand tables and tariff calculations, see *Appendix 1 – Bénin Files.*

Target Demand	Business & Location	Actual Plant Utilization	Yearly Averaged Gas Demand (Basis: 80% utilization minimum)				Present Fuel Cost	Opportunity Cost of Fuel	Secondary Network Tariff	WAPCo Discount on ST	Annuitised Conversion Cost	Delivered Gas Price	PHASING*
			2006	2011	2016	2021	(US$ / MMBTU)						
SCO Lafarge	Clinker, Onigbolo	90%	6.87	6.87	6.87	6.87	3.96	3.56	0.89	0.00	0.01	4.15	
SoBeBra (Plant)	Brewery, Cotonou	79%	0.20	0.27	0.32	0.39	3.69	3.32	0.89	0.63	0.38	3.89	
(Fork Lifts)		79%	0.02	0.03	0.03	0.04	5.61	5.05	0.89	0.63	2.15†	5.66	
SoBeTex	Textiles, Cotonou	67%	0.22	0.27	0.32	0.38	3.69	3.32	0.89	0.63	0.40	4.08	
SBEE	Power, Akpakpa	90%	-	-	-	-	-	-	0.89	0.00	0.00	4.14	
IBCG	Cotton, Cotonou	50%	0.40	0.48	0.58	0.69	3.69	3.32	0.89	0.63	0.30	4.35	
IBCG	Cotton, Porto Novo	50%	0.24	0.29	0.35	0.42	3.77	3.39	0.89	0.63	0.46	4.51	
CEB	Power, Cotonou	80%	4.52	4.52	4.52	4.52	5.93	5.34	0.89	0.13	0.02	4.04	
	Demand Totals	Phase 1	12.5	12.7	13.0	13.3							
		Phase 2	-	-	-	-							
		Phase 3	-	-	-	-							

† Analysis includes annuitised cost of two CNG compressor stations (one as standby). This could be halved should it be possible to interchange with operation on LPG bottles.
* 1 = Phase 1, 2 = Phase 2, 3 = Phase 3, S = Strategic Project, NV = Non Viable Consumer

Table 5-6 Table of Maximum Potential Gas Demand in Bénin

The above table is a summary of the customer demand profile for Bénin. From this demand forecasting, pipeline sizing and cost estimation, and finally tariff calculations will now be conducted on a scenario by scenario basis (refer *Figure 5-2*) in order to establish what volume of gas (and at what cost) can be delivered in each period of time, and therefore who would qualify at that time (i.e. the phasing of development).

In Bénin demand projections were adapted to allow for an expressed interest in CNG from a customer (SoBeBra) looking to convert forklift trucks over to CNG use. The customer's main driver for this is a social desire to reduce workplace environmental pollution and possible health problems as their trucks currently run on diesel within enclosed spaces. The economics of this will be evaluated but the scenario planning for CNG will be based on that for the plant and the advent of gas to the site (rather than just the economics for a CNG project)

The scenario discussions now follow.

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5.1.1 Benin Present Demand Scenario

This scenario assumes gas demand in Bénin remains relatively static at present day levels, with customer own predictions of growth excluded. Some GDP growth estimates are factored in for those industries for which GDP related demand growth was deemed to be a high probability e.g. SoBeBra and SoBeTex. The overall effect of this though is negligible as it applied to industries accounting for less than 10% of projected gas consumption.

Due to the distances involved (hence network development costs), and the comparatively limited market size in Benin no permutations of the secondary network were found to economically deliver gas to consumers, with tariffs remaining above US$0.90 / MMBTU, and the delivered cost of gas being higher than the opportunity cost of fuel to the target consumers presently. Even with an unrealistically low IRR of 6%, tariffs for the secondary network remained above US$0.60 / MMBTU, which once conversion costs have been factored in still remains unattractive for consumers to convert. The only realistic consumer with a sufficiently high present cost of fuel to make conversion to gas economic is the CEB.

The calculated tariff for a network developed in Benin solely for CEB would be US$0.20 / MMBTU (refer *Table 5-7* below). However, with a single client base under this scenario, the need for an aggregator needs to be examined since CEB could effectively save on this tariff by contracting directly with WAPCo.

Target Demand	Business & Location	Actual Plant Utilization	Yearly Averaged Gas Demand (Basis: 80% utilization minimum)				Present Fuel Cost	Opportunity Cost of Fuel	Secondary Network Tariff	WAPCo Discount on ST	Annuitised Conversion Cost	Delivered Gas Price	PHASING#
			2006	2011	2016	2021	(US$ / MMBTU)						
SCO Lafarge	Clinker, Onigbolo	90%	6.87	6.87	6.87	6.87	3.96	3.56	-	0.00	0.01	-	NV
SoBeBra (Plant)	Brewery, Cotonou	79%	0.20	0.27	0.32	0.39	3.69	3.32	-	0.63	0.38	-	NV
(Fork Lifts)		79%	0.02	0.03	0.03	0.04	5.61	5.05	-	0.63	2.15	-	NV
SoBeTex	Textiles, Cotonou	67%	0.22	0.27	0.32	0.38	3.69	3.32	-	0.63	0.40	-	NV
SBEE	Power, Akpakpa	90%	-	-	-	-	-	-	-	0.00	0.00	-	NV
IBCG	Cotton, Cotonou	50%	0.40	0.48	0.58	0.69	3.69	3.32	-	0.63	0.30	-	NV
IBCG	Cotton, Porto Novo	50%	0.24	0.29	0.35	0.42	3.77	3.39	-	0.63	0.46	-	NV
CEB	Power, Cotonou	80%	4.52	4.52	4.52	4.52	5.93	5.34	0.20	0.13	0.02	3.34	1
	Demand Totals	Phase 1	4.5	4.5	4.5	4.5							
		Phase 2	-	-	-	-							
		Phase 3	-	-	-	-							

1 Analysis includes annuitised cost of two CNG compressor stations (one as standby). This could be halved should it be possible to interchange with operation on LPG bottles
1 = Phase 1, 2 = Phase 2, 3 = Phase 3, S = Strategic Project, NV = Non Viable Consumer

Table 5-7 Potential Gas Demand in Bénin – Present Demand Scenario

The profile of burner-tip gas price over time for this scenario is illustrated in *Figure 5-3* below.

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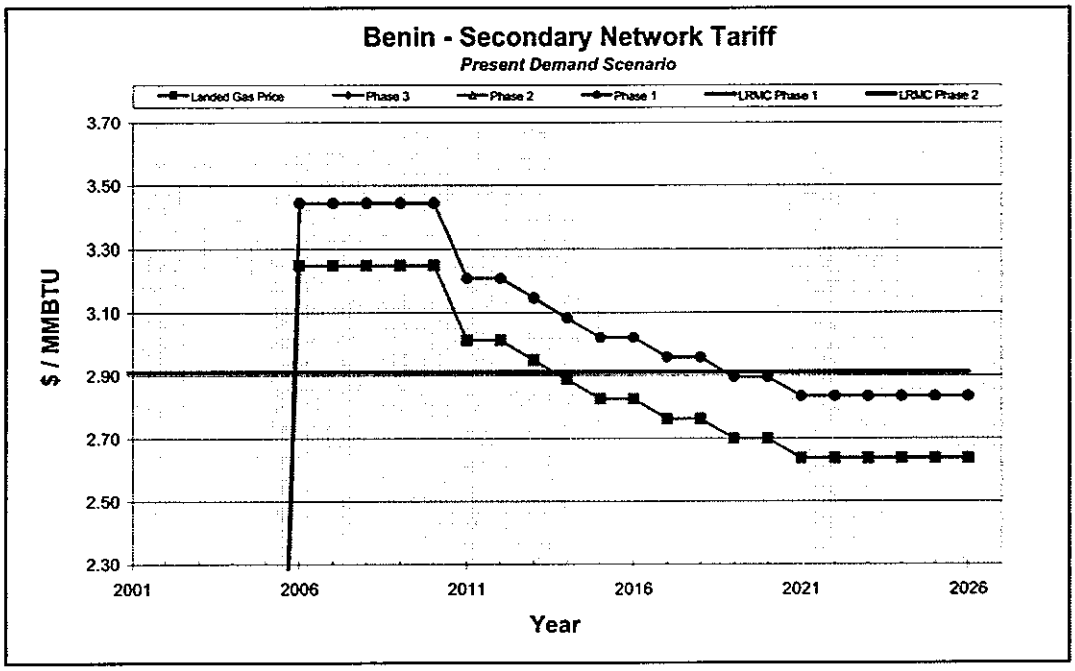

Figure 5-3 Bénin Secondary Network Tariff – Present Demand Scenario

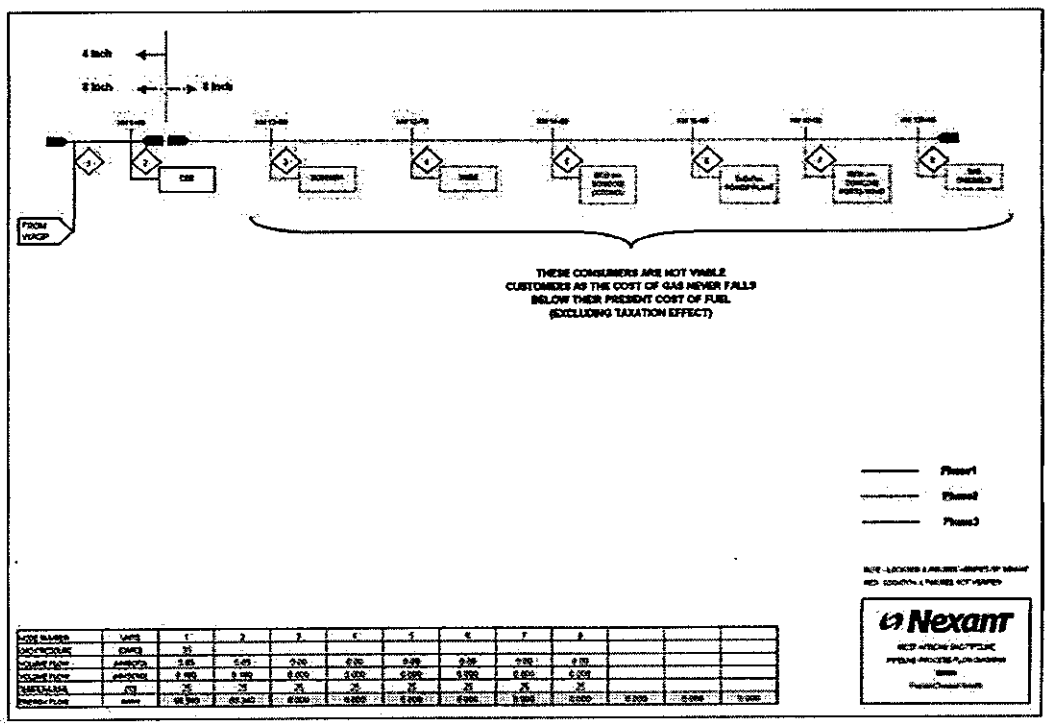

Figure 5-4 Bénin Secondary Network Schematic – Present Demand Scenario

5.1.1.1 Present Demand Scenario Without CEB

As above but with a network tariff of US$1.40 / MMBTU with all customers considered.

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5.1.2 Benin Expansion / Demand Growth Scenario

For this scenario, SCO Lafarge's projection of doubling production capacity in 5 years has been factored in and electricity demand forecasts have been made enabling a second CEB turbine to be installed in 2011, with a consequent doubling of gas demand. This leads to an increase in pipeline size requirement hence network capital expenditure, notably; 10 inch up to Porto Novo and 8 inch thereafter to Onigbolo.

Without positive intervention for this scenario, the calculated tariff for full network development would be US$0.63 / MMBTU based on a 12% IRR and the only viable consumer again would be CEB. Projected volumes are 4.5 MMSCFD initially, rising to 9.0 MMSCFD with the introduction of the second turbine. Refer to blue (Phase 1) line in *Figure 5-5* below. As CEB would be the only consumer, this option is again open to question.

With positive intervention however, i.e. a cross subsidy into the secondary network by CEB, a secondary network could be realised. This however would require an initial subsidy of US$0.37 / MMBTU by CEB to enable early amortization of the network costs, refer to orange (Phase 2) line in *Figure 5-5* below. With the early subsidy provided by CEB, Phase 2 of the network could be developed all the way to Onigbolo in 2011, with the consequent increase in demand resulting in a decline in the delivered gas price to the factory gate. However, this takes advantage of the decline in WAPCo landed gas price by this time (see pink line) with a lower pass through of the decline in the WAPCo gas price, and an effective increase in the subsidy from CEB to US$0.50 / MMBTU based on a 14% IRR to account for the increased risk to the network developer. The table below gives an indication of the gas demand volumes that could be realised with this approach.

NOTE: In the above assessment, no account has been taken of the competitiveness of CEB cost of electricity once the power pool has been realised which would impact CEB's capacity to cross subsidise industries in Benin.

Target Demand	Business & Location	Actual Plant Utilization	Yearly Averaged Gas Demand (Basis: 80% utilization minimum)				Present Fuel Cost	Opportunity Cost of Fuel	Secondary Network Tariff	WAPCo Discount on ST	Annuitised Conversion Cost	Delivered Gas Price	PHASING*
			2006	2011	2016	2021	(US$ / MMBTU)						
SCO Lafarge	Clinker, Onigbolo	90%	13.7	13.7	13.7	13.7	3.96	3.56	0.37	0.00	0.01	3.63	2
SoBeBra (Plant)	Brewery, Cotonou	79%	0.20	0.27	0.32	0.39	3.69	3.32	0.37	0.63	0.38	3.37	2
(Fork Lifts)		79%	0.02	0.03	0.03	0.04	5.61	5.05	0.37	0.63	2.15†	5.14	2
SoBeTex	Textiles, Cotonou	67%	0.22	0.27	0.32	0.38	3.69	3.32	0.37	0.63	0.40	3.46	2
SBEE	Power, Akpakpe	-	-	-	-	-	-	-	-	-	-	-	-
IBCG	Cotton, Cotonou	50%	0.40	0.48	0.58	0.69	3.69	3.32	0.37	0.63	0.30	3.52	2
IBCG	Cotton, Porto Novo	50%	0.24	0.29	0.35	0.42	3.77	3.39	0.37	0.63	0.46	3.68	2
CEB	Power, Cotonou	80%	4.52	9.03	9.03	9.03	5.93	5.34	0.37	0.13	0.02	3.52	1
	Demand Totals	Phase 1	4.5	9.0	9.0	9.0							
		Phase 2	-	24.1	24.4	24.7							
		Phase 3	-	-	-	-							

† Analysis includes annuitised cost of two CNG compressor stations (one as standby). This could be halved should it be possible to interchange with equivalent on LPG bottles.
* 1 = Phase 1, 2 = Phase 2, 3 = Phase 3, S = Strategic Project, NV = Non Viable Consumer

Table 5-8 Potential Gas Demand in Bénin – Expansion/Demand Growth Scenario

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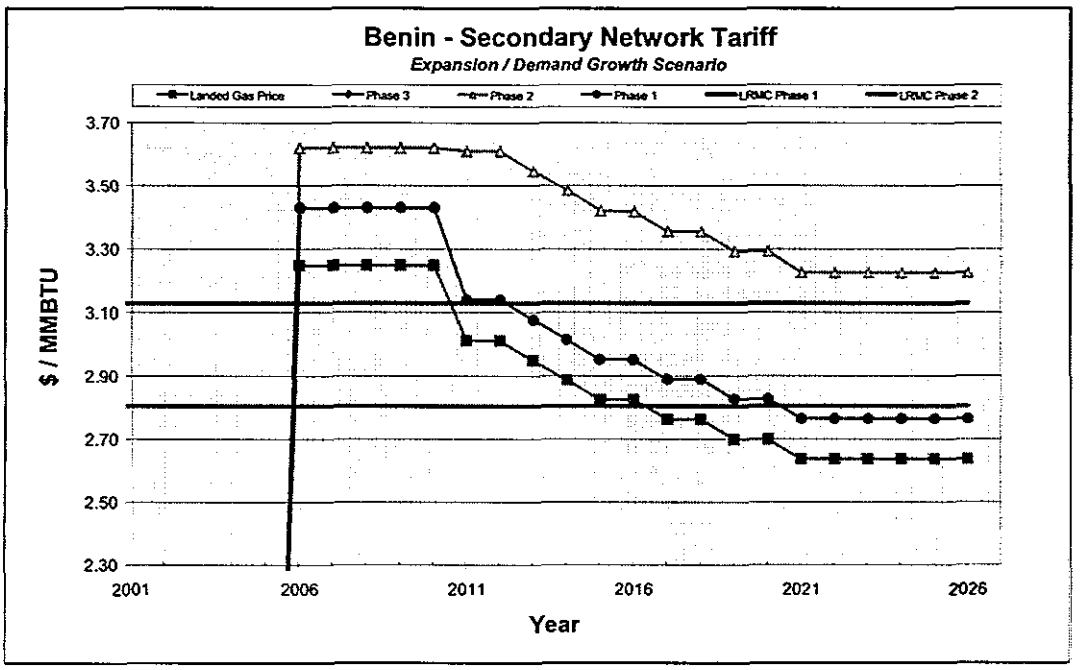

Figure 5-5 Bénin Secondary Network Tariff – Expansion/Demand Growth

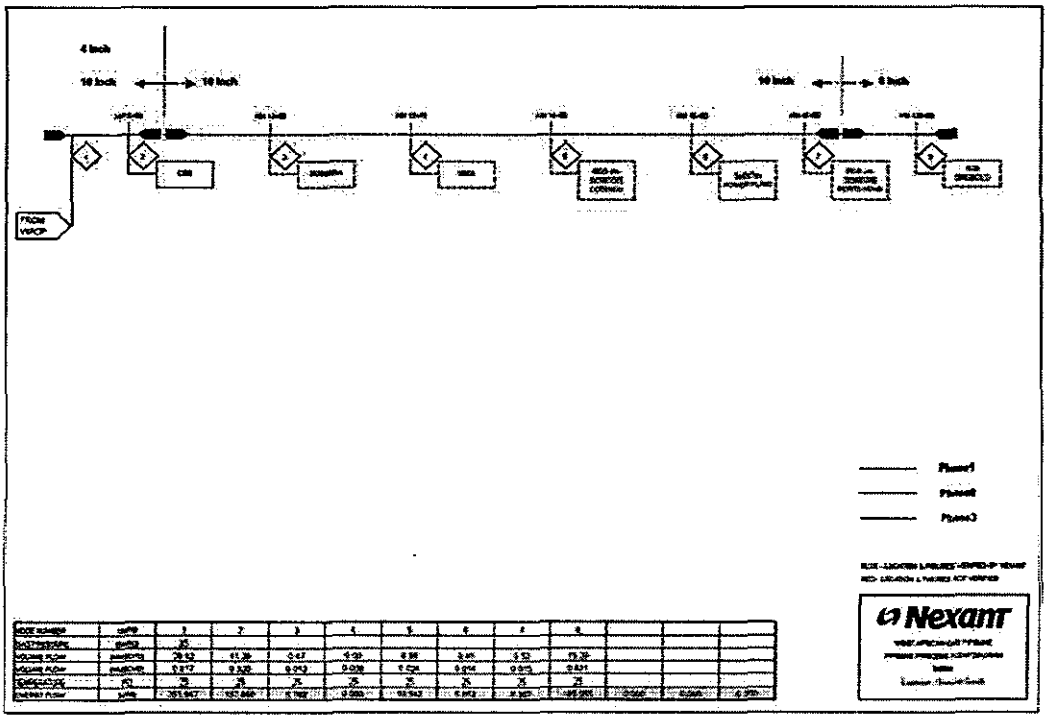

Figure 5-6 Bénin Secondary Network Schematic – Expansion / Demand Growth Scenario

5.1.2.1 Expansion / Demand Growth Scenario without CEB

Without CEB participation in the network, secondary network development in Benin could not feasibly be realised without additional volumes being found to fund development.

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5.1.3 Benin Strategic Projects Scenario

No strategic projects have been identified for Benin.

5.1.4 Discussion on CEB Direct Supply in Benin

The alternative route proposed by the commercial group is predicated on the following assumptions:

- The expansion and operation at full capacity of the gas turbine power plant in the center of Cotonou will pose an environmental problem.
- Laying and future operation of a medium pressure (30+ Barg) line through the centre of Cotonou is likely to be considered undesirable by local NGOs and the public.
- Significant cost savings may be possible in pipeline costs to the power plant if the power plant were to be relocated to a point North West of Cotonou, along the route of the power distribution grid (to minimize re-connection costs), and if the WAGP Lateral were to be extended to the alternate location.

The proposals mean that CEB can purchase gas directly from the WAGP lateral at WAPCo's foundation tariff without the additional burden of a secondary network tariff, thereby resulting in cheaper electrical power costs for Bénin, which is of benefit to the general populace and means CEB remains competitive within the power pool, but this does not result in realisation of a network in Benin[10]. However, a secondary network cannot be realised in Benin EVEN with CEB participation under the present demand scenario. For a network to be developed, SCO Lafarge's energy demand (along with that from other viable consumers) must show substantive growth (of the order of 100%), and CEB must participate in the network and grow its demand (by the addition of more generating capacity as consumer demand allows). The subsidy required from CEB, while not insignificant at US$0.37 – 0.50 /MMBTU, could be considered a necessary social cost and may be acceptable to consumers given that present energy costs to CEB would be reduced from US$5.93 / MMBTU to US$3.52 / MMBTU (refer *Table 5-8*).

Other options open to a Network developer that would limit the subsidy level from CEB would be acceptance of lower rates of return, reduced discounts on present cost of fuel from 105 down to 5% for example, and or lower tariffs from WAPCo.

[10] This is of course before CEB relocation costs have been taken into account, and the additional cost of the WAGP lateral extension north of Cotonou (approximately 5-10 km of pipeline). The latter may be less significant though due to WAGP "postage stamp" tariff basis.

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5.2 Togo

The potential gas demand calculated for Togo based on industry supplied data is tabulated in *Table 5-9* below. The yearly averaged maximum potential demand for Togo identified by this study (taking individual plant utilization into account) is 20.4 MMSCFD (heat) and 4.5 MMSCFD (power - excluding customers with no existing plans for CHP systems). This is unprocessed data i.e. it assumes all customers can be converted to gas economically, a minimum plant utilization of 80% (per take-or-pay agreements), and takes no account of specific economic conditions as they apply to each industry. It does not also take growth projections by customers into account.

Assuming all customers qualify, the total cost of network development would be US$12.5m, and the corresponding secondary network tariff calculated is US$0.29 MMBTU based on a 12% IRR. Based on this tariff, most consumers either qualify or come close to qualifying, making development of a network in Togo a possibility.

Reader's note: For all detailed reference files and calculations relating to Togo, including demand tables and tariff calculations, see *Appendix 2 – Togo Files.*

Target Demand	Business & Location	Actual Plant Utilization	Yearly Averaged Gas Demand (Basis: 80% utilization minimum)				Present Fuel Cost	Opportunity Cost of Fuel	Secondary Network Tariff	WAPCo Discount on ST	Annuitised Conversion Cost	Delivered Gas Price	PHASING*
			2006	2011	2016	2021	(US$ / MMBTU)						
OTP (Plant)	Phosphates, Kpeme	50%	4.39	4.39	4.39	4.39	3.73	3.36	0.29	0.00	0.04	3.76	
(Power)		50%											
CEB	Power, Lome	80%	4.52	4.52	4.52	4.52	5.93	5.34	0.29	0.13	0.02	3.44	
WACEM (Plant)	Cement, Tabligbo	90%	15.6	15.6	15.6	15.6	3.83	3.45	0.29	0.00	0.01	3.55	
(Power)		90%	-	-	-	-	-	-	-	-	-		-
Brasserie	Brewery, Lome	50%	0.36	0.41	0.46	0.53	5.61	5.05	0.29	0.63	0.38	3.47	
ElectroTogo	Power, Lome	90%	-	-	-	-	-	-	-	-	-	3.57	-
	Demand Totals	Phase 1	24.9	24.9	24.9	25.0							
		Phase 2	-	-	-	-							
		Phase 3	-	-	-	-							

* 1 = Phase 1, 2 = Phase 2, 3 = Phase 3, S = Strategic Project, NV = Non Viable Consumer

Table 5-9 Table of Maximum Potential Gas Demand in Togo

From the above table and for each scenario, demand projections were performed, followed by pipeline sizing and cost estimation, and finally tariff calculations based on a specified rate of return. From these the expected cost at which gas can be delivered in each period of time, and which industries qualify for supply at that time was determined.

The scenario discussions now follow.

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5.2.1 Togo Present Demand Scenario

This scenario assumes demand for energy in Togo remains relatively static, with no customer growth predictions included. Some GDP growth is factored in for customers where the industry is deemed to be sensitive to this parameter (currently only the Brasserie in Lome). ElectroTogo is excluded from the outset, as Nexant's assessment presently is that the company presently lacks the financial standing to be considered a viable customer for this scenario. They are however considered under the strategic projects scenario.

By iteration in the Togo tariff model, based on; the established present cost of energy provided by the potential customers contacted, a projected size of network, and a costing of the network, the burner tip gas price was established for the Togo network for all industries. It was found that two phases are necessary to develop the network, with only CEB and the Brasserie qualifying initially, followed by WACEM and OTP in Phase 2. The calculated secondary network tariff in Phase 1 with this outcome is US$0.25 / MMBTU based on a 12% IRR - refer to Phase 1 price profile in *Figure 5-7* below. The tariff profile for the Phase 2 development can also be seen in the same figure. Even with an increased rate of return of 14%, an appreciable tariff decline still occurs to benefit future consumers from 2011, despite the low (50%) utilization of OTP and the Brasserie.

For this scenario, the projected yearly-averaged gas demand starts at 4.9 MMSCFD in 2006, rising to 25.0 MMSCFD in 2021 (refer *Table 5-10* below).

Target Demand	Business & Location	Actual Plant Utilization	Yearly Averaged Gas Demand (Basis: 80% utilization minimum)				Present Fuel Cost	Opportunity Cost of Fuel	Secondary Network Tariff	WAPCo Discount on ST	Annuitised Conversion Cost	Delivered Gas Price	PHASING*
			2006	2011	2016	2021	(US$ / MMBTU)						
OTP (Plant)	Phosphates, Kpeme	50%	4.39	4.39	4.39	4.39	3.73	3.36	0.25	0.00	0.04	3.69	2
(Power)	-	50%	-	-	-	-	-	-	-	-	-	-	-
CEB	Power, Lome	80%	4.52	4.52	4.52	4.52	5.93	5.34	0.25	0.13	0.02	3.40	1
WACEM (Plant)	Cement, Tabligbo	90%	15.6	15.6	15.6	15.6	3.83	3.45	0.25	0.00	0.01	3.51	2
(Power)	-	90%	-	-	-	-	-	-	-	-	-	-	-
Brasserie	Brewery, Lome	50%	0.36	0.41	0.46	0.53	5.61	5.05	0.25	0.63	0.38	3.40	1
ElectroTogo	Power, Lome	90%	5.80	5.80	5.80	5.80	5.92	5.33	0.25	0.00	0.03	3.53	S
	Demand Totals	Phase 1	4.9	4.9	5.0	5.0							
		Phase 2	-	24.9	25.0	25.0							
		Phase 3	-	-	-	-							

* 1 = Phase 1, 2 = Phase 2, 3 = Phase 3, S = Strategic Project, NV = Non Viable Consumer

Table 5-10 Potential Gas Demand in Togo – Present Demand Scenario

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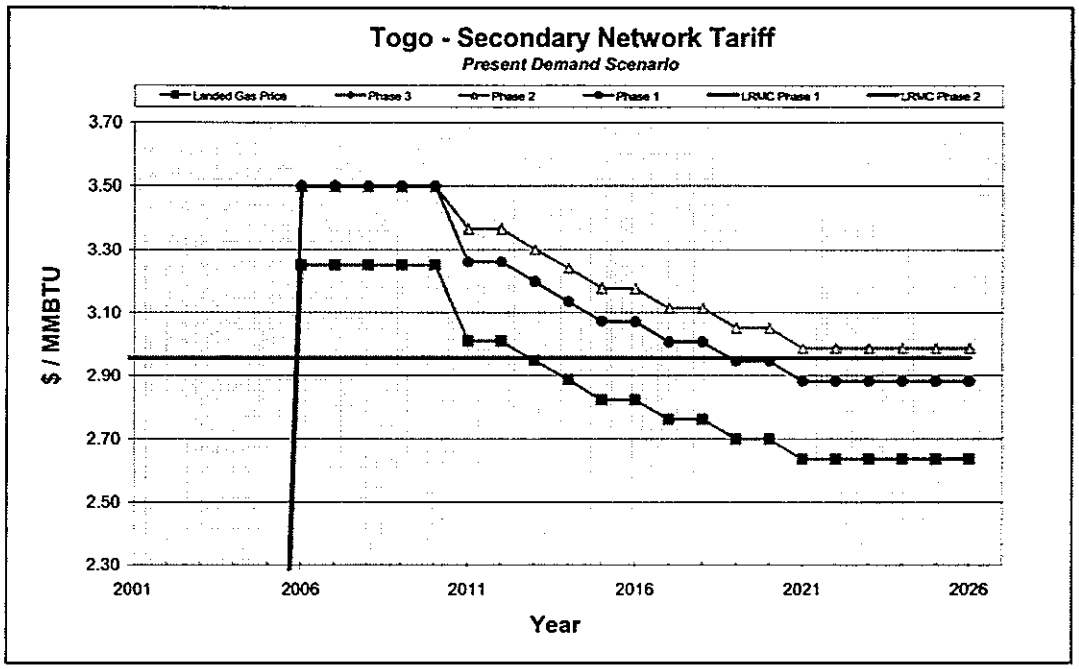

Figure 5-7 Togo Secondary Network Tariff – Present Demand Scenario

The figure below gives a diagrammatic indication of the network development under this phase.

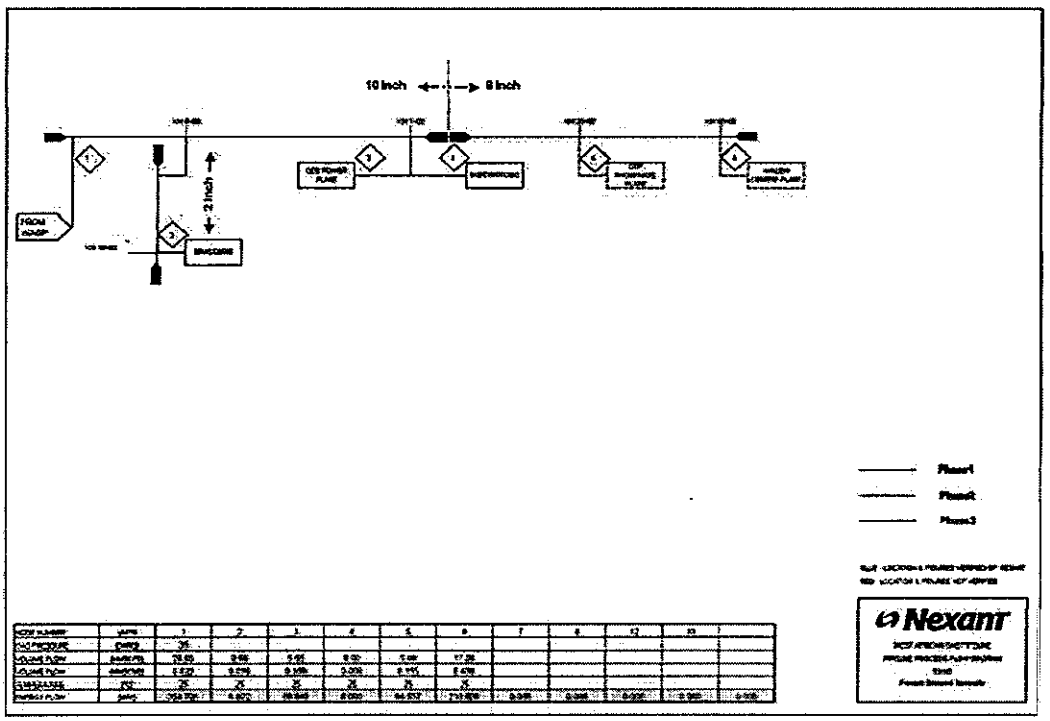

Figure 5-8 Togo Secondary Network Schematic – Present Demand Scenario

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5.2.1.1 Togo Present Demand Scenario – without CEB

Without CEB participation in the secondary network under the present demand scenario, development of the entire network will be delayed until 2011 with a starting tariff of US$0.40 / MMBTU. The only difference therefore being the delay in implementation of the Brasserie spur and a marginal increase in tariff at the start of operations.

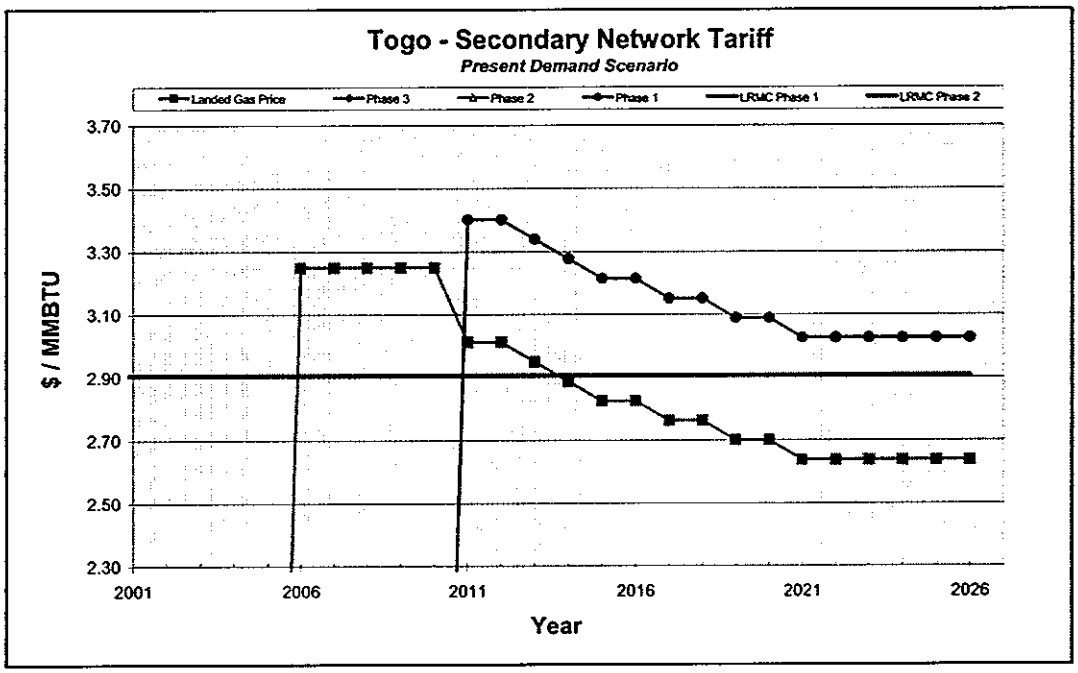

Figure 5-9 Togo Secondary Network Tariff without CEB– Present Demand Scenario

The tariff necessary to develop the entire secondary network in 2006 would be US$0.35 / MMBTU based on a 12% IRR, which once conversion costs are taken into account would be unattractive to all potential consumers. It is conceivable however, that with flexibility in the application of the US$0.63 / MMBTU IDT discount to customers such as WACEM, the secondary network in Togo could be realised. With mutual benefit to all concerned.

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5.2.2 Togo Expansion / Demand Growth Scenario

For this scenario, it is postulated that OTP would operate closer to full capacity with utilization increased to 90%, and WACEM's estimate of a 22% increase in production from 4.5 kTPD to 5.5 kTPD of cement is incorporated. Electricity demand has been projected forward, necessitating the addition of a second turbine to CEB production in 2006. Gas demand from the Brasserie is unchanged and ElectroTogo is still considered a strategic project.

The resultant effect on the pipeline is an extension of the 10 inch section of pipe from Lome to Kpeme, a distance of 22 km (refer *Figure 5-11*).

By iteration it was again determined that two phases would be necessary to develop the secondary network in Togo for this scenario, with the increase in OTP and CEB demand contributing to improving the viability of the secondary network development. The calculated tariff for Phase 1 of the network is US$0.13 / MMBTU (cf. US$0.25 / MMBTU for the present demand scenario), with CEB and the Brasserie again qualifying based on a 12% IRR. The second phase is anticipated to commence post 2011 when landed WAGP gas price would be low enough to enable extension of the network to WACEM. Projected yearly-averaged gas demand start at 9.4 MMSCFD in 2006, rising to 33.6 MMSCFD in 2021 for Phase 2 (see table below).

Target Demand	Business & Location	Actual Plant Utilization	Yearly Averaged Gas Demand (Basis: 80% utilization minimum)				Present Fuel Cost	Opportunity Cost of Fuel	Secondary Network Tariff	WAPCo Discount on ST	Annualised Conversion Cost	Delivered Gas Price	PHASING*
			2006	2011	2016	2021	(US$ / MMBTU)						
OTP (Plant)	Phosphates, Kpeme	90%	4.96	4.96	4.96	4.96	3.73	3.36	0.13	0.00	0.02	3.40	2
(Power)	-	90%					-	-	-	-	-	-	-
CEB	Power, Lome	80%	9.03	9.03	9.03	9.03	5.93	5.34	0.13	0.13	0.02	3.28	1
WACEM (Plant)	Cement, Tabligbo	90%	19.1	19.1	19.1	19.1	3.83	3.45	0.22*	0.00	0.01	3.43	2
(Power)	-	90%					-	-	-	-	-	-	-
Brasserie	Brewery, Lome	50%	0.36	0.41	0.46	0.53	5.61	5.05	0.13	0.63	0.38	3.21	1
ElectroTogo	Power, Lome	90%	5.80	11.6	11.6	11.6	5.92	5.33	0.13	0.00	0.03	3.41	S
	Demand Totals	Phase 1	9.4	9.4	9.5	9.6							
		Phase 2	-	33.5	33.5	33.6							
		Phase 3	-	-	-	-							

* 1 = Phase 1, 2 = Phase 2, 3 = Phase 3, S = Strategic Project, NV = Non Viable Consumer
* Tariff if WACEM were included in Phase 1 of the network

Table 5-11 Potential Gas Demand in Togo – Expansion/Demand Growth Scenario

The figure below illustrates tariff phasing and decline over time under this scenario.

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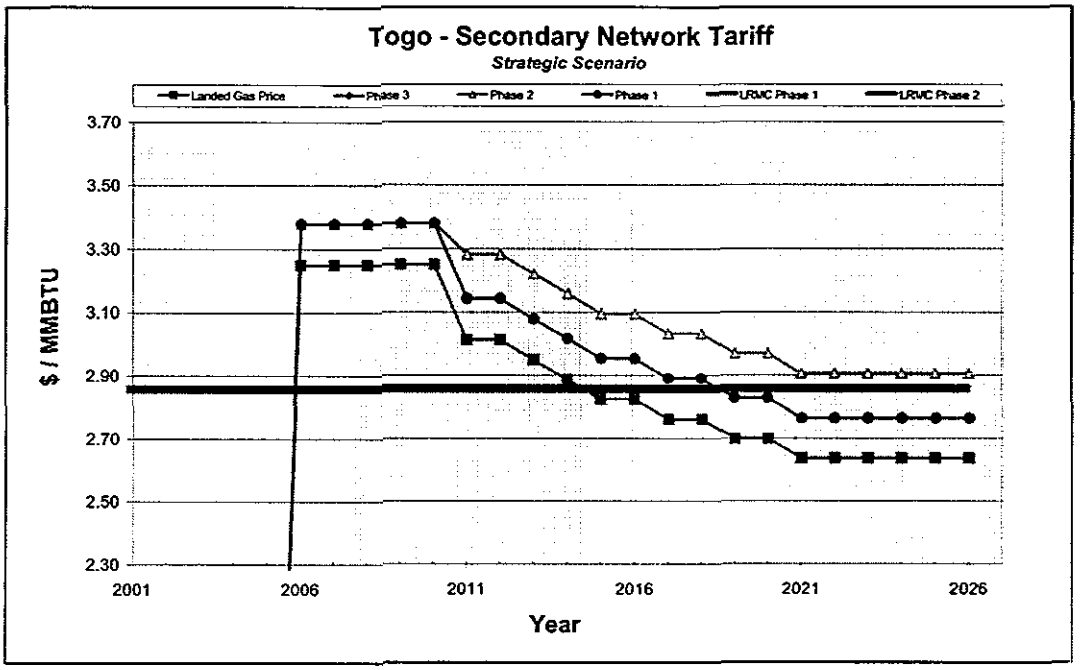

Figure 5-10 Togo Secondary Network Tariff – Expansion / Demand Growth Scenario

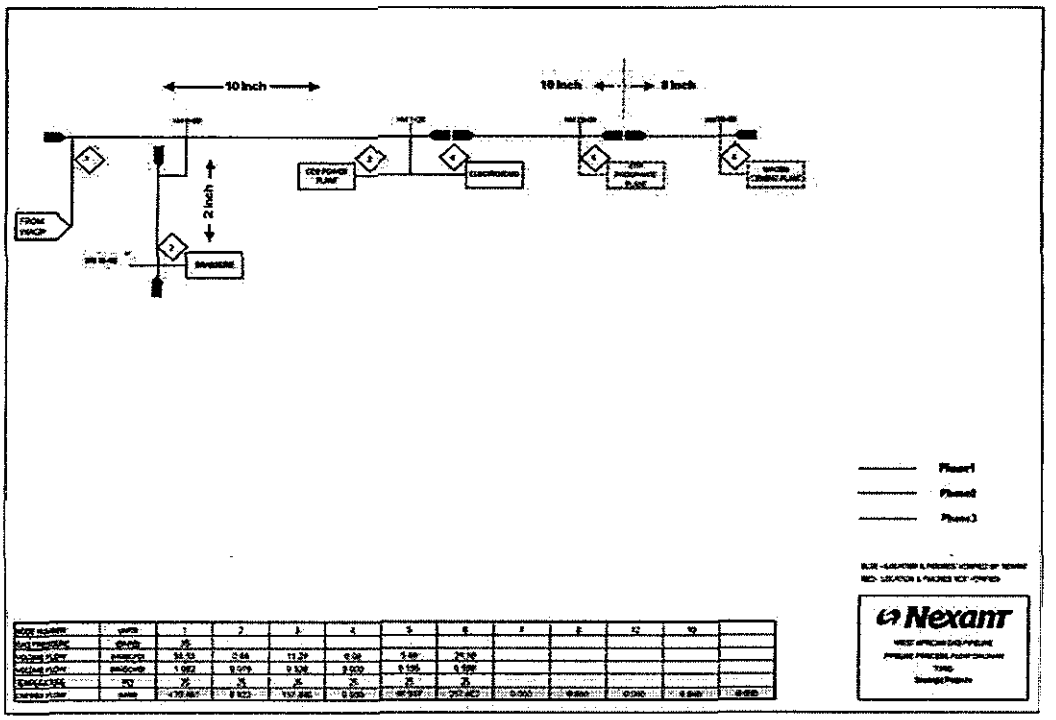

Figure 5-11 Togo Secondary Network Schematic – Expansion / Demand Growth Scenario

5.2.2.1 Togo Expansion / Demand Growth Scenario without CEB

As with the Present demand scenario case, without CEB participation Phase 1 of the network will not be realised until 2011. The tariff required to cover the cost of the entire network development in

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2006 has been calculated as US$0.30 / MMBTU (cf. US$0.35 / MMBTU – present demand scenario). Again making the case for flexible application of the IDT, and or CEB participation in the network.

5.2.3 Togo strategic Projects Scenario

The only additional consumer considered under this scenario is ElectroTogo. For this scenario, ElectroTogo, which currently operates with 4 x 10 MW generator sets, and has available a 25MW gas turbine, is assumed to have the operational and financial capacity in place to enable it produce electricity viably and in competition with CEB. ElectroTogo's gas turbine demand has therefore been factored in from 2006, with sufficient growth in electricity demand to allow commissioning of a second turbine in 2016.

No change in pipeline size from that in the Expansion Scenario is required (refer *Figure 5-11*).

Under this scenario, the tariff necessary to develop a network in Lome (CEB, ElectroTogo, and Brasserie), then Kpeme (OTP), and finally Tabligbo (WACEM), were evaluated in turn. These were determined to be US$0.08 / MMBTU, US$0.17 / MMBTU, US$0.20 / MMBTU respectively. Despite the relatively small increment in tariff required for continued development of the network, under the criteria used in Nexant analysis (10% discount on present fuel cost, no WAPCo discount to OTP or WACEM, and 12% IRR), both OTP and WACEM fail to qualify until Phase 2 of Network development. This is not to say these industries will not qualify when the actual network is developed since there is room for manoeuvre in:

- The discount applied to these industries (with 7% sufficient to gain qualification but maybe insufficient to persuade conversion by the companies concerned)
- The extension of foundation customer status to OTP and WACEM (again sufficient to attain qualification for gas supply while retaining the 10% savings on present fuel costs)
- The tax regime or the desired rate of return an aggregator can be persuaded to accept.

With any one of the above incentives, qualification by OTP and WACEM in the first phase of development can be achieved with a consequent boost in gas demand volume of 24.1 MMSCFD.

Without these actions however, there is no significant detriment to network development in Togo and the table of demand distribution would be as below for this scenario.

Target Demand	Business & Location	Actual Plant Utilization	Yearly Averaged Gas Demand (Basis: 80% utilization minimum)				Present Fuel Cost	Opportunity Cost of Fuel	Secondary Network Tariff	WAPCo Discount on ST	Annuitised Conversion Cost	Delivered Gas Price	PHASING*
			2006	2011	2016	2021	(US$ / MMBTU)						
OTP (Plant)	Phosphates, Kpeme	90%	4.96	4.96	4.96	4.96	3.73	3.36	0.20**	0.00	0.02	3.47	2
(Power)	-	90%	-	-	-	-	-	-	-	-	-	-	-
CEB	Power, Lome	80%	9.03	9.03	9.03	9.03	5.93	5.34	0.08	0.13	0.02	3.23	1
WACEM (Plant)	Cement, Tabligbo	90%	19.1	19.1	19.1	19.1	3.83	3.45	0.17*	0.00	0.01	3.46	2
(Power)	-	90%	-	-	-	-	-	-	-	-	-	-	-
Brasserie	Brewery, Lome	50%	0.36	0.41	0.46	0.53	5.61	5.05	0.08	0.63	0.38	3.13	1
ElectroTogo	Power, Lome	90%	5.80	5.80	11.6	11.6	5.92	5.33	0.08	0.00	0.03	3.36	1
	Demand Totals	Phase 1	15.2	15.2	21.1	21.2							
		Phase 2	-	39.3	45.1	45.2							
		Phase 3	-	-	-	-							

* 1 = Phase 1, 2 = Phase 2, 3 = Phase 3, S = Strategic Project, NV = Non Viable Consumer
* Tariff if WACEM were included in Phase 1 of the network
** Tariff if OTP included in Phase 1 of the network

Table 5-12 Potential Gas Demand in Togo – Strategic Projects Scenario

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The figure below illustrates the phasing and tariff decline of a Togo secondary network under this scenario. The input IRR basis for Phases 1 and 2 are 12% and 14% respectively.

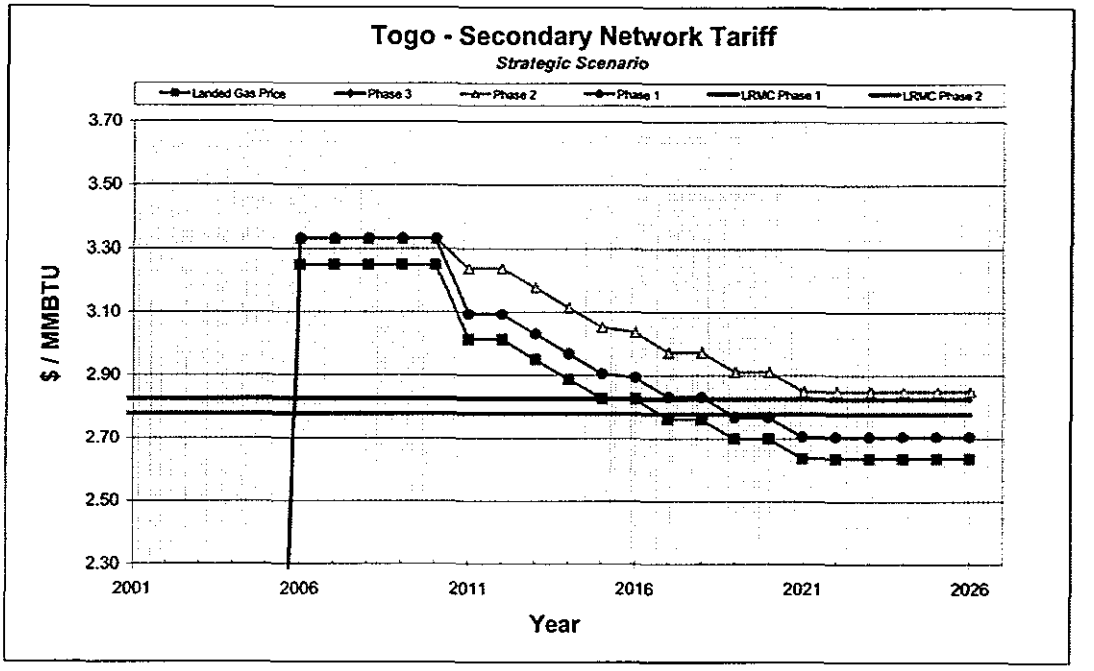

Figure 5-12 Togo Secondary Network Tariff – Strategic Projects Scenario

5.2.3.1 Togo Strategic Projects Scenario without CEB

Without CEB participation in the network for this scenario, tariffs are forecast to rise by approximately US$0.10 / MMBTU and US$0.05 / MMBTU in phases 1 and 2 respectively. No change to the timing of phase development, or phasing demand volume other than the loss of CEB demand is foreseen.

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5.3 Ghana (Tema)

The potential gas demand calculated for Tema based on industry supplied data is tabulated in *Table 5-13* below. The yearly averaged maximum potential demand for Tema identified by this study is 6.3 MMSCFD (heat) – this excludes customers in Accra and those in Tema with CHP potential but without firm plans of implementation e.g. Unilever and GTP. This is unprocessed data i.e. it assumes all customers can be converted to gas economically, a minimum plant utilization of 80% (per take-or-pay agreements), and takes no account of specific economic conditions as they apply to each industry. It does not also take growth projections by customers into account.

A nominal 1 MMSCFD has been assumed for the maximum future gas demand from Accra to enable pipe sizing and tariff calculation for gas consumed in the Tema area.

Assuming all customers qualify, the total cost of network development in Tema would be US$3.1m, and the corresponding secondary network tariff calculated is US$0.42 MMBTU. If the network were to be extended to Accra in the west, the development cost would increase to US$8.7m, while the corresponding network tariff would rise to US$0.78 MMBTU. However, the higher tariff were the network to be extended to Accra in the first Phase would discourage conversion by some industries in Accra, pushing tariff's higher still. Both calculations are based on a 12% IRR.

Reader's note: For all detailed reference files and calculations relating to Tema, including demand tables and tariff calculations, see *Appendix 3 – Ghana (Tema) Files.*

Target Demand	Business & Location	Actual Plant Utilization	Yearly Averaged Gas Demand (Basis: 80% utilization maximum)				Present Fuel Cost	Opportunity Cost of Fuel	Secondary Network Tariff	WAPCo Discount on ST	Annualized Conversion Cost	Delivered Gas Price	PHASING*
			2006	2011	2016	2021	(US$ / MMBTU)						
Valco (Plant)	Aluminium, Tema	95%	2.29	2.29	2.29	2.29	4.68	4.21	0.42	0	0.53	4.20	
(Power)		95%											†
Tema Steel (Plant)	Scrap Metal, Tema	86%	0.33	0.33	0.33	0.33	4.68	4.21	0.42	0.63	0.21	3.25	
(Power)		86%											†
Unilever (Plant)	Detergents, Tema	95%	0.75	0.88	1.03	1.21	4.68	4.21	0.42	0.63	0.08	3.13	
(Power)		95%											†
GTP	Aluminium,	93%	0.94	1.1	1.29	1.51	4.68	4.21	0.42	0.63	0.02	3.07	
	Tema	93%	0.05	0.06	0.08	0.09	5.24	4.72	0.42	0.63	0	3.05	
Pioneer Foods	Foodstuffs, Tema	74%	0.18	0.18	0.18	0.18	4.68	4.21	0.42	0.63	0.5	3.58	
Nestle	Aluminium,	74%	0.17	0.17	0.17	0.17	4.68	4.21	0.42	0.63	0.67	3.74	
	Tema	95%										3.67	
		95%	0	0	0	0	5.24	4.72	0.42	0.63	0	3.05	
Alumworks	Aluminium,	95%	0.16	0.16	0.16	0.16	5.61	5.05	0.42	0.63	0.47	3.51	
	Tema	95%											†
		95%	0	0	0	0	5.24	4.72	0.42	0.63	0	3.05	
Tema Textile	Textiles, Tema	71%**	0.3	0.3	0.3	0.3	4.68	4.21	0.42	0.63	0	3.10	
Cocoa Processing	Cocoa, Tema	71%**	0.14	0.14	0.14	0.14	4.68	4.21	0.42	0.63	0	3.10	
GTMC	Unknown, Tema	71%**	0.3	0.3	0.3	0.3	4.68	4.21	0.42	0.63	0	3.10	
GAPCO	Unknown, Tema	71%**	0.18	0.18	0.18	0.18	4.68	4.21	0.42	0.63	0	3.10	
Ferro Fabrik	Metalworks, Tema	71%**	0.25	0.25	0.25	0.25	4.68	4.21	0.42	0.63	0	3.10	
WAHOME	Unknown, Tema	71%**	0.28	0.28	0.28	0.28	4.68	4.21	0.42	0.63	0	3.10	
Accra Area	Various, Tema	17%††	0.94	1.10	1.28	1.50	4.68	4.21	0.78§	0.00	0.00	6.99	
	Demand Totals	Phase 1	6.3	6.6	7.0	7.4							
		Phase 2	-	7.7	8.3	8.9							
		Phase 3	-	-	-	-							

* 1 = Phase 1, 2 = Phase 2, 3 = Phase 3, S = Strategic Project, NV = Not Viable Consumer

§ Tariff if network extended to Accra

† Not included in analysis as these are purely power demands.

** Based on 24 hour per day, 5 day a week, 52 week a year operation assumed.

†† Based on assumed maximum 4 hourly utilization by commercial & domestic consumes.

Table 5-13 Table of Maximum Potential Gas Demand in Tema

From the above table and for each scenario, demand projections were performed, followed by pipeline sizing and cost estimation, and then tariff calculations based on a specified rate of return.

Scenario discussions now follow below.

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5.3.1 Tema Present Demand Scenario

This scenario assumes demand for energy in Tema remains relatively static, with no customer growth predictions included. Some GDP growth is factored in for customers e.g. Unilever, Ghana Textiles and Accra Area, where the industry/ customer is deemed to be sensitive to this parameter. By iteration in the Tema tariff model, based on; the established present cost of energy provided by the customers contacted, a projected size of network, network tariff, and burner tip gas price were established for the secondary network in Tema. All customers visited by Nexant were found to qualify for supply in the first phase, hence tariffs for this scenario do not change from those quoted above, i.e. US$0.42 / MMBTU for Phase 1 at 12% IRR (refer *Table 5-13*). NOTE: This is based on Valco's inclusion in the secondary network in Tema. Assuming Valco are successful in their desire for direct supply by WAPCo, then the secondary network tariff without the Valco demand would rise by US$0.20 / MMBTU. This does not adversely affect any of the other consumers, with all still remaining in Phase 1 of the development. It is Nexant's opinion however, that the substantial reduction in energy costs available to Valco with the advent of gas from the WAGP would be sufficient inducement to overcome any reservations about a gas aggregator.

NOTE: The calculated annuitised conversion cost for Valco at US$0.53 / MMBTU (refer Table 5-13), which appears high is based on data supplied by Valco.

Extension of the network to Accra in Phase entails excessive costs in comparison to the estimated demand that exists in the capital. In view of this, secondary network tariffs must remain flat, and not decline over time (refer to the yellow Phase 2 tariff profile in *Figure 5-13* below) in order to pay for the network on a 14% IRR basis, or customers in Accra must be prepared to pay a premium for the convenience of pipeline gas as opposed to bottled gas. The latter is quite feasible given the relatively high cost of bottled LPG.

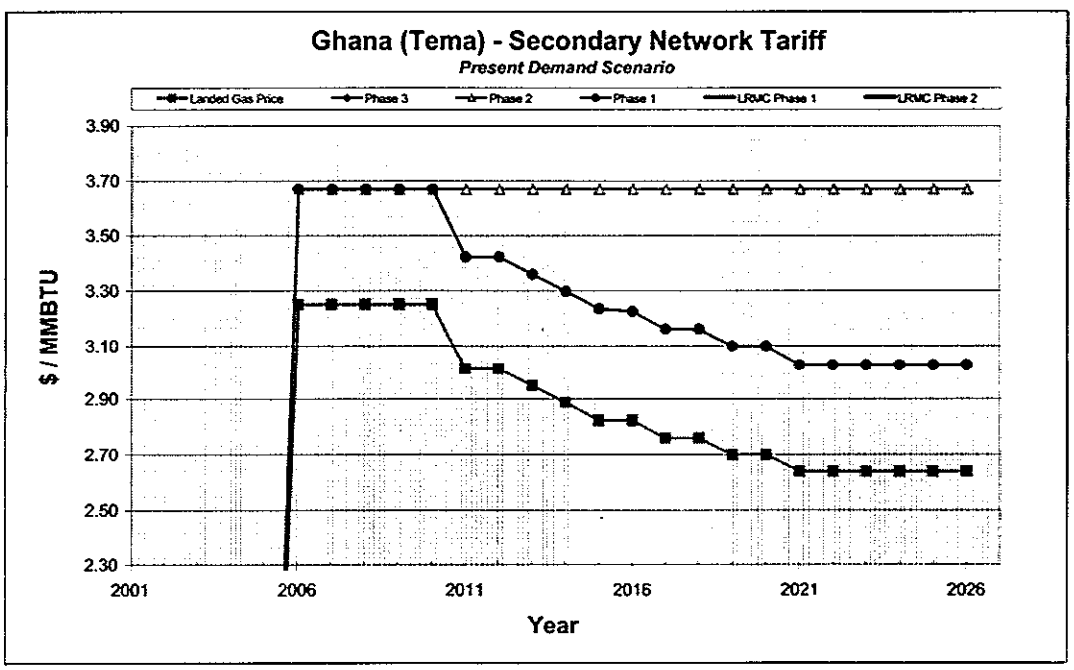

Figure 5-13 Tema Secondary Network Tariff – Present Demand Scenario

For the two phases identified the demand flows are per *Table 5-13* above i.e. 6.3 MMSCFD in 2006, rising to 8.9 MMSCFD by 2021.

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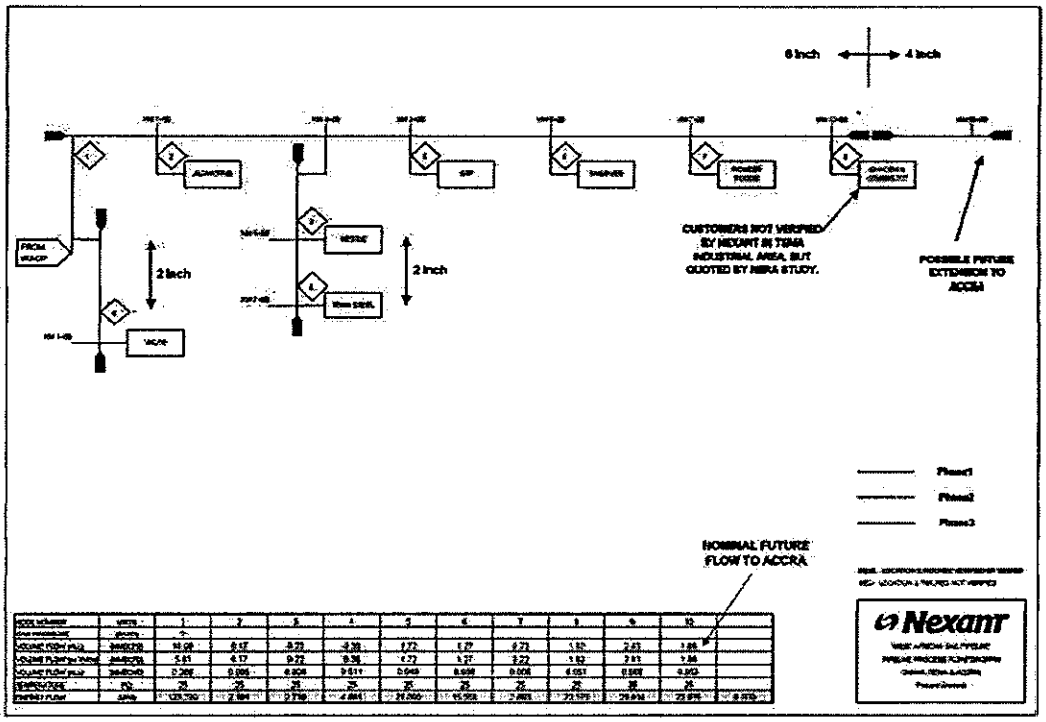

Figure 5-14 Tema Secondary Network Schematic – Present Demand Scenario

5.3.2 Tema Expansion / Demand Growth Scenario

In this scenario, a number of growth projections are made, namely:

1. Valco's 5th smelting pot is brought on-line.
2. Unilever's plans to grow production by 100% (translates to an energy demand growth of 50%) is implemented.
3. Customer own growth projections incorporated for; Pioneer Foods (5% pa), Nestle (0.5-2% pa depending on fuel type), Aluworks (2.6% pa).

Again for this scenario, two phases have been identified, with all customers in the Tema area falling into Phase 1, while Accra is included in Phase 2. Projected yearly-averaged gas demand for both phases commences at 7.4 MMSCFD in 2006 and rises to 10.6 MMSCFD by 2021 (refer *Table 5-14*).

The secondary network tariff for this scenario again remains flat in Phase 2 (albeit lower than that for the previous scenario) due to the additional cost of construction incurred to Accra (refer yellow Phase 2 tariff profile in *Figure 5-15* below). Again, customers in Accra must be prepared to pay a premium for the convenience of pipeline gas as opposed to bottled gas in order to eliminate the cross subsidy from industry, which could be detrimental to their competivity.

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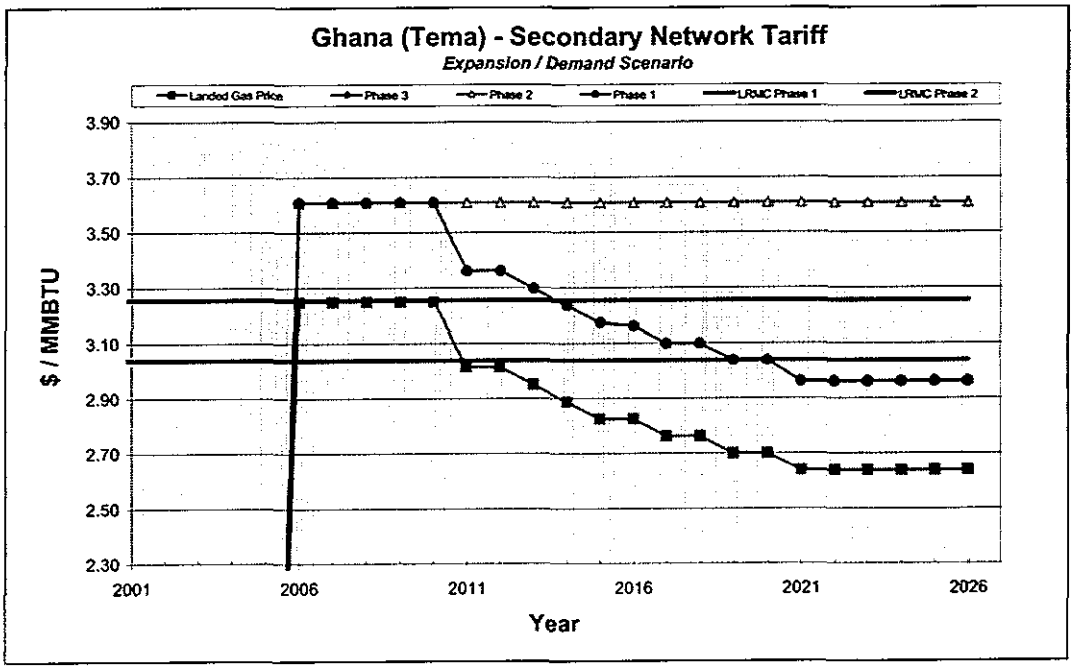

Figure 5-15 Tema Secondary Network Tariff – Expansion / Demand Growth Scenario

The net effect of the increased volumes is to drive down tariffs for Phase 1 to US$0.36 / MMBTU (cf. US$0.42 for Present Demand Scenario) based on 12 % IRR, and for Phase 2 to US$0.68 / MMBTU (cf. US$0.42 for Present Demand Scenario) based on 14% IRR – see table below.

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Target Demand	Business & Location	Actual Plant Utilization	Yearly Averaged Gas Demand (Basis: 80% utilization minimum)				Present Fuel Cost	Opportunity Cost of Fuel	Secondary Network Tariff	WAPCo Discount on ST	Annualised Conversion Cost	Delivered Gas Price	PHASING*
			2006	2011	2016	2021	(US$ / MMBTU)						
Valco (Plant)	Aluminium, Tema	95%	2.86	2.86	2.86	2.86	4.68	4.21	0.36	0.00	0.53	4.14	1
(Power)		95%											†
Tema Steel (Plant)	Scrap Metal, Tema	86%	0.33	0.33	0.33	0.33	4.68	4.21	0.36	0.63	0.21	3.19	1
(Power)		86%											†
Unilever (Plant)	Detergents, Tema	95%	1.13	1.32	1.55	1.81	4.68	4.21	0.36	0.63	0.98	3.07	1
(Power)		95%											†
GTP	Aluminium,	93%	0.94	1.10	1.29	1.51	4.68	4.21	0.36	0.63	0.02	3.01	1
	Tema	93%	0.05	0.06	0.08	0.09	5.24	4.72	0.36	0.63	0.00	2.99	1
Pioneer Foods	Foodstuffs, Tema	74%	0.23	0.29	0.37	0.47	4.68	4.21	0.36	0.63	0.50	3.52	1
Nestle	Aluminium,	74%	0.19	0.21	0.23	0.25	4.68	4.21	0.36	0.63	0.67	3.68	1
	Tema	95%	0.01	0.01	0.01	0.01	5.61	5.05	0.36	0.00	0.00	3.61	1
		95%	0.00	0.00	0.00	0.00	5.24	4.72	0.36	0.63	0.00	2.99	1
Alumworks	Aluminium,	95%	0.18	0.21	0.24	0.27	5.61	5.05	0.36	0.63	0.47	3.55	1
	Tema	95%											†
		95%	0.00	0.00	0.00	0.00	5.24	4.72	0.36	0.63	0.00	2.99	1
Tema Textile	Textiles, Tema	71%**	0.30	0.30	0.30	0.30	4.68	4.21	0.36	0.63	0.00	3.08	1
Cocoa Processing	Cocoa, Tema	71%**	0.14	0.14	0.14	0.14	4.68	4.21	0.36	0.63	0.00	3.08	1
GTMC	Unknown, Tema	71%**	0.30	0.30	0.30	0.30	4.68	4.21	0.36	0.63	0.00	3.08	1
GAPCO	Unknown, Tema	71%**	0.18	0.18	0.18	0.18	4.68	4.21	0.36	0.63	0.00	3.08	1
Ferro Fabrik	Metalworks, Tema	71%**	0.25	0.25	0.25	0.25	4.68	4.21	0.36	0.63	0.00	3.08	1
WAHOME	Unknown, Tema	71%**	0.28	0.28	0.28	0.28	4.68	4.21	0.36	0.63	0.00	3.08	1
Accra Area	Various, Tema	17%††	0.94	1.10	1.28	1.50	4.68	4.21	0.68§	0.00	0.00	6.51	2
	Demand Totals	Phase 1	7.4	7.8	8.4	9.0							
		Phase 2	-	8.9	9.7	10.6							
		Phase 3	-	-	-	-							

* 1 = Phase 1, 2 = Phase 2, 3 = Phase 3, S = Strategic Project, NV = Non Viable Consumer

§ Tariff network extended to Accra

† Not included in analysis as these are purely power demands.

** Based on 24 hour per day, 5 day a week, 52 week a year operation assumed.

†† Based on assumed maximum 4 hourly utilization by commercial & domestic consumers

Table 5-14 Potential Gas Demand in Tema – Expansion/Demand Growth Scenario

No change is necessary to the network size and configuration as shown in *Figure 5-14* for this scenario.

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5.3.3 Tema Strategic Projects Scenario

In this scenario, the following additional projects, outlined as strategic projects in Purvin & Gertz's report are included in the demand forecasting:

1. PVC & Salt Recovery Project

With the realisation of the combined PVC and salt recovery project in the Tema area, a further 4.5 MMSCFD of demand is added to the secondary network demand volume. As there is no overall change in pipeline size required from that utilised for the first two scenarios, a significant drop in secondary network tariffs arises (US$0.22 / MMBTU in Phase 1). Projected yearly-averaged gas demand for both phases commences at 11.9 MMSCFD in 2006, rising to 15.0 MMSCFD by 2021 (refer *Table 5-15*).

Target Demand	Business & Location	Actual Plant Utilization	Yearly Averaged Gas Demand (Basis: 80% utilization minimum)				Present Fuel Cost	Opportunity Cost of Fuel	Secondary Network Tariff	WAPCo Discount on ST	Annualised Conversion Cost	Delivered Gas Price	PHASING#
			2006	2011	2016	2021	(US$ / MMBTU)						
Valco (Plant)	Aluminium, Tema	95%	2.86	2.86	2.86	2.86	4.68	4.21	0.22	0.00	0.53	4.00	1
(Power)		95%											†
Tema Steel (Plant)	Scrap Metal, Tema	86%	0.33	0.33	0.33	0.33	4.68	4.21	0.22	0.63	0.21	3.06	1
(Power)		86%											†
Unilever (Plant)	Detergents, Tema	95%	1.13	1.32	1.55	1.81	4.68	4.21	0.22	0.63	0.08	2.93	1
(Power)		95%											†
GTP	Aluminium,	93%	0.94	1.10	1.29	1.51	4.68	4.21	0.22	0.63	0.02	2.87	1
	Tema	93%	0.05	0.06	0.08	0.09	5.24	4.72	0.22	0.63	0.00	2.85	1
Pioneer Foods	Foodstuffs, Tema	74%	0.23	0.29	0.37	0.47	4.68	4.21	0.22	0.63	0.50	3.37	1
Nestle	Aluminium,	74%	0.19	0.21	0.23	0.25	4.68	4.21	0.22	0.63	0.67	3.53	1
	Tema	95%	0.01	0.01	0.01	0.01	5.61	5.05	0.22	0.00	0.00	3.47	1
		95%	0.00	0.00	0.00	0.00	5.24	4.72	0.22	0.63	0.00	2.85	1
Alumworks	Aluminium,	95%	0.18	0.21	0.24	0.27	5.61	5.05	0.22	0.63	0.47	3.31	1
	Tema	95%											†
		95%	0.00	0.00	0.00	0.00	5.24	4.72	0.22	0.63	0.00	2.85	1
Tema Textile	Textiles, Tema	71%##	0.30	0.30	0.30	0.30	4.68	4.21	0.22	0.63	0.00	2.87	1
Cocoa Processing	Cocoa, Tema	71%##	0.14	0.14	0.14	0.14	4.68	4.21	0.22	0.63	0.00	2.87	1
GTMC	Unknown, Tema	71%##	0.30	0.30	0.30	0.30	4.68	4.21	0.22	0.63	0.00	2.87	1
GAPCO	Unknown, Tema	71%##	0.18	0.18	0.18	0.18	4.68	4.21	0.22	0.63	0.00	2.87	1
Ferro Fabrik	Metalworks, Tema	71%##	0.25	0.25	0.25	0.25	4.68	4.21	0.22	0.63	0.00	2.87	1
WAHOME	Unknown, Tema	71%##	0.28	0.28	0.28	0.28	4.68	4.21	0.22	0.63	0.00	2.87	1
PVC & Salt	PVC, Tema	90%	4.50	4.50	4.50	4.50	4.68	4.21	0.22	0.00	0.00	3.60	1
Accra Area	Various, Tema	17%††	0.94	1.10	1.28	1.50	4.68	4.21	0.44§	0.00	0.00	5.36	2
	Demand Totals	Phase 1	11.9	12.3	12.9	13.5							
		Phase 2	-	13.4	14.2	15.0							
		Phase 3	-	-	-	-							

1 = Phase 1, 2 = Phase 2, 3 = Phase 3, S = Strategic Project, NV = Non Viable Consumer

§ Tariff if network extended to Accra

† Not included in analysis as these are purely power demands.

Based on 24 hour per day, 5 day a week, 52 week a year operation assumed.

†† Based on assumed maximum 4 hourly utilization by commercial & domestic consumers

Table 5-15 Potential Gas Demand in Tema – Strategic Projects Scenario

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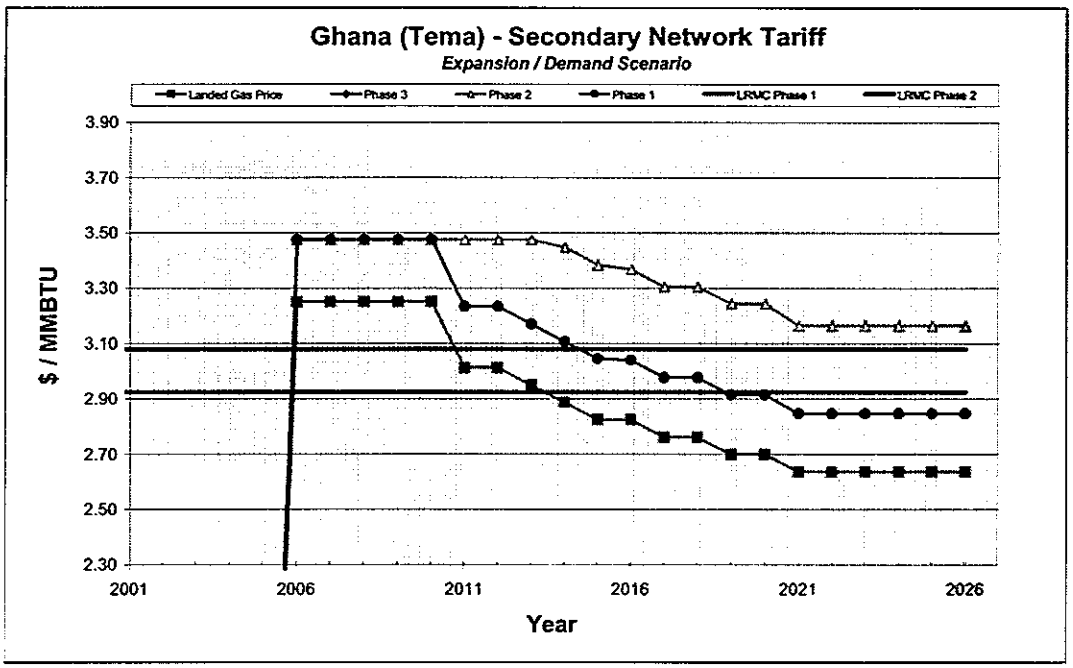

Figure 5-16 Tema Secondary Network Tariff – Strategic Projects Scenario

With the increased demand post realisation of the PVC & Salt Recovery, a "postage stamp" tariff-pricing basis could be maintained even with the extension of the network to Accra (the area between the yellow Phase 2 line and the blue Phase 1 in the figure above represents the level of industry cross subsidy). However, it is Nexant's opinion that commercial & residential customers are able to and should pay a premium for their gas. This would improve the long term competitiveness of industry in Tema as a whole.

5.3.4 Tema-Buipe Strategic Projects Scenario

The Another Strategic project considered under the Tema area is the supply of gas for Limestone Clinkerization in Buipe as identified in the Purvin & Gertz report. This project has a stated gas demand of 16 MMSCFD and is located 400km to the North of Tema. The calculated pipeline size required to deliver this volume of gas is 12 iches, and the construction cost is estimated at US$114m. The calculated network tariff is US$6.00 / MMBTU, giving a delivered gas price of US$9.25 / MMBTU, compared with a delivered liquid fuels cost of US$5.60 / MMBTU. It is therefore not considered viable to supply the clinker project in Buipe via the WAGP.

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5.4 Ghana (Takoradi)

Nexant obtained relatively limited data through the supplementary survey conducted on industries in Takoradi with just two respondents to questionnaires sent out. However, data from the two respondents was compared against that in the NERA report and found to agree closely. Data in the NERA report regarding the market size in Takoradi was therefore taken to have a reason degree of accuracy and incorporated in this report.

For the purposes of this section, the analysis of market demand in the Takoradi area will be broken down as follows:

- Takoradi Present demand Scenario
- Takoradi Strategic Projects Scenario
- Takoradi-Tarkwa Startegic Projects Scenatio
- Takoradi-Nyinahin Strategic Projects Scenario

Reader's note: For all detailed reference files and calculations relating to Tema, including demand tables and tariff calculations, see *Appendix 4 – Ghana (Takoradi) Files.*

5.4.1 Takoradi Present Demand Scenario

The potential gas demand calculated for Takoradi has been assessed at 1.5 MMSCFD in 2002 terms and projected forward to 2006 at 1.8 MMSCFD based on Ghana 20 year average GDP growth of 3.7%. Nexant has assumed a network of no more than 15km in length (i.e. similar to Tema), and a pipeline size of 4 inches has been calculated with an estimated construction cost of US$2.1m. The tariff applicable to industries in Takoradi based on this and a 12% IRR was determined to be US$0.78 / MMBTU – (refer *Table 5-16* below) based on a gas demand of 1.88 MMSCFD in 2006, rising to 3.1 MMSCFD in 2021. Note: It has been assumed all industries in Takoradi qualify for the industrial development tariff from WAPCo (IDT), but even without this, gas is still competitive against fuel oil.

Target Demand	Business & Location	Actual Plant Utilization	Yearly Averaged Gas Demand (Basis 80% utilization minimum)				Present Fuel Cost	Opportunity Cost of Fuel	Secondary Network Tariff	WAPCo Discount on ST	Annualised Connection Cost	Delivered Gas Price	PHASING*
			2006	2011	2016	2021	(US$ / MMBTU)						
Takoradi, Present Industries	Various, Takoradi	80%†	1.80	2.16	2.59	3.11	4.68	4.21	0.78	0.63	0.00	3.40	1
Takoradi, Strategic Industries	Iron & Steel, Takoradi	80%†	7.44	7.44	7.44	7.44	4.64	4.18	0.78	0.00	0.00	4.08	S
Tarkwa, Strategic Industries	Manganese Ore, Tarkwa	80%†	7.20	7.20	7.20	7.20	4.81	4.32	0.78	0.00	0.00	4.08	S
Nyinahin, Strategic Industries	Bauxite, Nyinahin	80%†	29.44	29.44	29.44	29.44	5.22	4.70	0.78	0.00	0.00	4.08	S
	Demand Totals	Phase 1	1.8	2.2	2.6	3.1							
		Phase 2	-	-	-	-							
		Phase 3	-	-	-	-							

* 1 = Phase 1, 2 = Phase 2, 3 = Phase 3, S = Strategic Project, NV = Non Viable Consumer

† Assumed operation.

Table 5-16 Potential Gas Demand in Takoradi – Present Demand Scenario

5.4.2 *Takoradi Strategic Projects Scenario*

Purvin & Gertz state an Iron & Steel plant in Takoradi under strategic projects. This introduces an additional demand volume of 7.4 MMSCFD to the Takoradi network and increases the line size to 6 inches (from 4 inches). No increase in network length is foreseen as the location of the plant is assumed to be in the Takoradi industrial area. The estimated construction costs are US$2.3m. The tariff applicable to industries in Takoradi based on this and a 12% IRR determined to be US$0.18 / MMBTU – (refer *Table 5-17* below), a reduction of US$0.60 / MMBTU over the present scenario tariff. The gas demand volumes are estimated at 9.2 MMSCFD in 2006, rising to 10.6 MMSCFD in 2021.

Target Demand	Business & Location	Actual Plant Utilization	Yearly Averaged Gas Demand (Basis: 80% utilization minimum)				Present Fuel Cost	Opportunity Cost of Fuel	Secondary Network Tariff	WAPCo Discount on ST	Annualised Conversion Cost	Delivered Gas Price	PHASING*
			2006	2011	2016	2021	(US$ / MMBTU)						
Takoradi, Present Industries	Various, Takoradi	80%†	1.80	2.16	2.59	3.11	4.68	4.21	0.18	0.63	0.00	2.80	1
Takoradi, Strategic Industries	Iron & Steel, Takoradi	80%†	7.44	7.44	7.44	7.44	4.64	4.18	0.18	0.00	0.00	3.43	1
Tarkwa, Strategic Industries	Manganese Ore, Tarkwa	80%†	7.20	7.20	7.20	7.20	4.81	4.32	0.18	0.00	0.00	3.43	S
Nyinahin, Strategic Industries	Bauxite, Nyinahin	80%†	29.44	29.44	29.44	29.44	5.22	4.70	0.18	0.00	0.00	3.43	S
	Demand Totals	Phase 1	9.2	9.6	10.0	10.6							
		Phase 2	-	-	-	-							
		Phase 3	-	-	-	-							

* 1 = Phase 1, 2 = Phase 2, 3 = Phase 3, S = Strategic Project, NV = Non Viable Consumer

† Assumed operation

Table 5-17 Potential Gas Demand in Takoradi – Strategic Projects Scenario

5.4.3 *Takoradi-Tarkwa Strategic Projects Scenario*

If the network were then to be extended to Tarkwa, 60 km north West of Takoradi, the additional demand volume of 7.2 MMSCFD attributable to the proposed Manganese Ore Processing plant and the extra distance would necessitate a larger pipeline at 8 inches, and cost an estimated US$21.9m. The network tariff calculated for these conditions and using a 12% IRR is US$0.78 / MMBTU, and on this basis all industries would still qualify for supply with no phasing necessary in network construction. The gas demand volumes are estimated at 16.4 MMSCFD in 2006, rising to 17.8 MMSCFD in 2021.

5.4.4 *Takoradi-Nyinahin Strategic Projects Scenario*

If the network were further extended to Nyinahin to cover the Bauxite Processing plant, and capture their additional demand volume of 29.4 MMSCFD, though no line size increase would be required, the network cost would rise to an estimated US$74.4m. The network tariff calculated for these conditions and using a 12% IRR is US$0.88 / MMBTU. Again, on this basis all industries would still qualify for supply with no phasing necessary in network construction. The gas demand volumes are estimated at 45.9 MMSCFD in 2006, rising to 47.2 MMSCFD in 2021 under this scenario.

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5.5 Scenario Analysis Summary

Note; the preceding anaysis have

Tangible factors: cost, transport, etc

Intangible factors: potential benefits of working capital released from not having to hold liquid inventory, combustion efficiency improvements in using gas as opposed to liquid fuels could be as much as 5%), lower maintenance costs with cleaner burning properties of gas, reduced risk of spillage and fire

5.6 Making Secondary Networks a Reality

For Benin and Togo, the realisation of a secondary network is marginal based in certain low demand scenarios, which may make it imperative for additional means to be found for stimulating growth in these markets. To illustrate the necessity for these further steps, Togo will be taken as a case in point.

The collected data as indicated in Chapter 3 and the analysis made in the present Chapter, show that the current cost of energy available to the main potential customers is too low to make WAGP gas a really competitive alternate (refer Section *5.2*). Although a number of variables affects this outcome, by far and away the most significant is landed gas price in the Primary Network, as posted in the CATS Tariff Methodology. However, this does not mean that the possibility of enabling economic conditions necessary to develop a Secondary Network in Togo in the near future does not exist. It is Nexant's believe in fact that, provided the players in the narrow market of supplying energy to WACEM and OTP act rationally, those conditions may potentially exist.

In order to allow marketability of WAGP gas to these two companies, two main conditions must be fulfilled:

1. That the WAGP Developers / WAGP Gas Sellers agree to lower their gas price under the current levels of the Standard or Foundation Customer rates that result from the CATS Tariff Methodology.

2. That the current suppliers of Fuel Oil to the Togo market do not use dumping practices which will prevent any long term deal between WACEM / IFG and the gas sellers

5.6.1 WAGP CATS Tariff Methodology

WAGP gas competes with various alternate sources of energy (Fuel Oil Heavy Fuel, Crude Oil, Diesel Oil, Jet Fuel, LPG etc.) that are available on the market at different prices and for different applications, it is difficult for this to occur with Fuel Oil under the current conditions of the CATS Tariff Methodology (TM).

CATS TM stipulates that there are three Tariffs for WAGP gas delivered "on the beach" (refer *Figure 5-1* also):

- The Standard Tariff: $3.25 / MMBTU in the currently projected conditions; decreasing with WAGP contracted capacity; available to customers who are not eligible for another Tariff.

- The Foundation Tariff: $3.12 / MMBTU, decreasing with WAGP contracted capacity; available to customers who sign their purchase contract before final investment decision (FID), and

- The Industrial Development Tariff (IDT): $2.64 / MMBTU; low-level Industrial Development Tariff (IDT), independent of overall contracted capacity; not declining with time and available to industries provided that; it is not used for power generation, it is limited to 1 MMSCFD per customer, and it is limited to an overall maximum of 10% of WAGP contracted capacity

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Study results indicate that the estimated current cost of delivered fuel Oil is $3.83 / MMBTU to WACEM and $3.73 / MMBTU to OTP/IFG. On the basis of a 10% "incentive" discount, "opportunity costs" for these two customers would come down to $3.45 and $3.36 / MMBTU respectively.

The cost of delivered gas (including conversion cost) in the Present Demand Scenario (WACEM 15.6 MMSCFD, OTP/IFG 4.4 MMSCFD, CEB 4.5 MMSCFD, Brasserie 0.4 MMSCFD) based on the CATS TM (Standard Tariff) and a calculated secondary network tariff of US$0.25 / MMBTU would be as follows:

	Full Network* Including CEB	Full Network Excluding CEB	Reduced Network* Including CEB	Reduced Network Excluding CEB	Present Discounted Cost of Fuel
OTP/IFG	3.76	3.85	3.71	3.80	3.36
WACEM	3.55	3.61	3.50	3.56	3.45
Brasserie	2.86	2.95	N/A	N/A	N/A
CEB	3.42	3.13	3.37	3.13	3.13

* Full Network includes a spur to the Lomé north industrial area, delivering to Brasserie. The reduced Network doesn't.
** All figures are in US$ / MMBTU

Table 5-18 Delivered Gas Costs to WACEM & OTP/IFG

The above table shows that none of the delivered costs of gas is low enough to attract OTP/IFG or WACEM, which prevents realisation of the secondary network for several years. Actually, it is important to note that any defection among these potential users will increase the cost to the others, so there is a need for a collective adherence to gas delivery, therefore gas price, and the Aggregator could play a key role in this regard.

Now, should a discount up to or equivalent to that of the CATS Industrial Development Tariff (IDT) be available to industries without restriction for instance, the delivered cost of WAGP gas to WACEM and OTP/IFG would be up to $0.63per MMBTU lower and gas would be definitely attractive to these industries.

There are several reasons why the CATS TM rules could be loosened when drafting the Concession Agreement:

a) Any additional sale of gas would bring additional cash flow, the benefits of which would be shared between all WAGP customers and WAGP owners, contributing to both a lowering of gas prices and increasing investors' return.

b) The above is true as long as there is available capacity in the pipeline. But according to all projections, an 18" Pipeline will not be filled for about 15 years, during which opportunity exists to derive substantial cash flow from additional marginal markets such as these two in Togo. Diagram below refers.

c) The Developers need to be realistic and consider that there is not one single market, but several two of which are the gas-fired power market and the gas-to-heat industrial market. These markets can only be reached with appropriately targeted and relevant market prices.

The figure below illustrates the main components of the WAGP pipeline capacity in two hypotheses:

1. Customer base with Takoradi and CEB as Foundation Customers

2. The same plus WACEM and OTP/IFG as "Foundation" Industrial Customers paying IDT.

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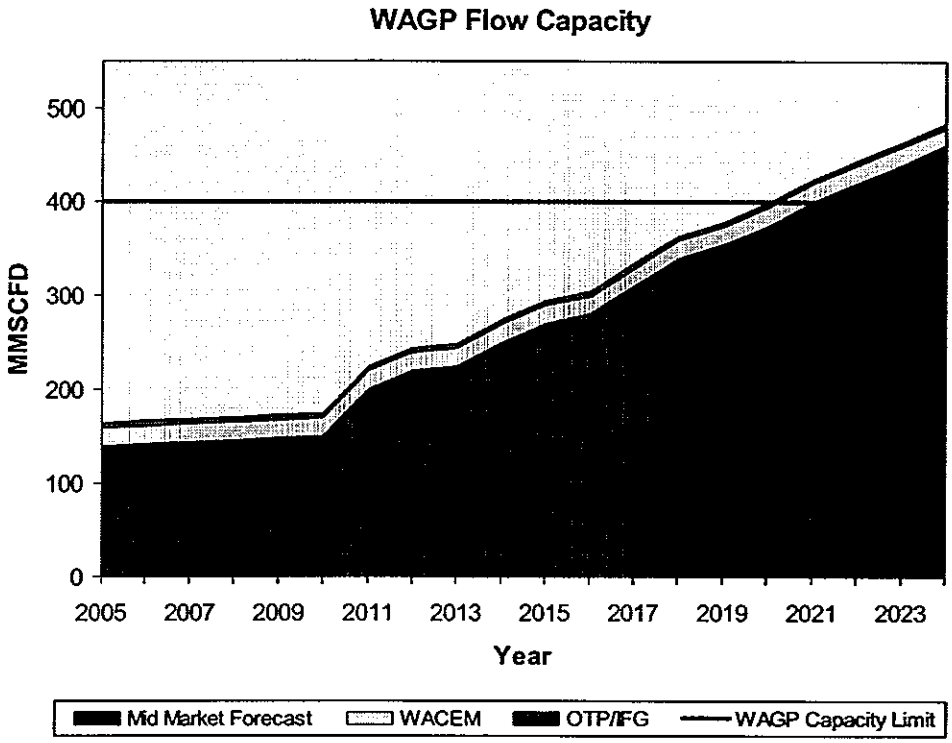

Figure 5-17 WAGP Pipeline Capacity (Mid-Market Forecast)

Based on the additional volumes that could be generated if flexibility was introduced to the tariff model, the present value of additional revenue to the Primary Network (based on the IDT) from WACEM and OTP/IFG alone is US$124.3m (refer table below). Expressed differently, this represents an additional US$19.8m of revenue annually.

	Additional Demand Volume based on 90% Plant Utilization	Additional Yearly Revenue from WACEM & OTP/IFG	Additional Revenue PV at 15% IRR
	(MMSCFD)	(US$ millions)	(US$ millions)
OTP/IFG	5.00	$15.70	$98.50
WACEM	19.1	$4.10	$25.80
Total	24.1	$19.8	$124.3

Table 5-19 PV of Additional Revenue from OTP & WACEM at 15% Real IRR

As can be seen, there is sufficient to the financial incentive to the developers if WACEM and OTP/IFG were to convert to gas.

Though the Fuel Oil market is limited in the purchasing countries, there is little doubt WACEM and IFG are very attractive customers to the local refineries and their distributors. Therefore, to maintain them as clients, Fuel Oil suppliers and marketers would certainly consider lowering their prices as low and as long as possible to compete with gas, thus preventing or delaying any initiative to build a secondary network delivering gas to these two industries as well as other similar entities.

Fuel oil being a residual "product" from refineries has a cost that could vary substantial depending on market demand. Fuel Oil in West Africa could be considered a product that is marginally in surplus

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in the region based on refinery output and product consumption data (Source: Energy Information Administration Website 1998-1999 figures). As refinery complexity is likely to increase (refer Ghana Tema Oil Refinery RFCC project), and based on regional energy demand growth, it is feasible that the market may even become marginally in deficit. This limits the capacity of the suppliers and marketers of fuel oil from product "dumping" i.e. selling below market or cost price. Though the West Africa Fuel Oil market may be limited, the nearest surplus market is the Mediterranean market, which therefore provides price regulation for the region. In fact, the Fuel Oil prices in West Africa should vary between two levels:

- Maximum level: Med price + cost of shipment. Above that price, customers would purchase from the Med market

- Minimum level: Med price – cost of shipment. Below that price, suppliers would sell to the Med market

Therefore, there is a limit below which local suppliers cannot go. Nevertheless, this minimum level was not considered in the above chapter, as it is Nexant's opinion that it is not sustainable for prolonged periods given he marginal supply nature of the West African region and the poor performance of a number of regional refineries.

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5.7 Conclusion

The present study cannot predict with full accuracy the result of the commercial negotiations that will take place between the gas Sellers and the industrial potential customers. Firstly, Nexant did not have access to the actual cost of energy currently incurred by these potential customers, since most considered this information to be commercially sensitive, hence fuel costs utilized in this study are based on net back pricing calculations from the Mediterranean market. Secondly, there will remain an element of subjectivity in each potential users appraisal of the advantages of gas, as compared to the alternate sources of energy. Thirdly, the response of the suppliers of the alternate energy sources cannot be fully anticipated, and this could impact the competitiveness of gas.

Nevertheless, it is the Consultant's belief that the present study brings new elements to the Parties to the Concession Agreement, to the extent that they consideration should be given to reconsider the CATS Tariff Methodology with a view to enlarging the access to Industrial Development Tariff to large Fuel Oil consumers who might not otherwise convert to gas. Therefore, it is recommended that the States approach the Commercial Group in that sense, for the benefit of all WAGP stakeholders.

6 Government Policies & Strategies

6.1 Introduction

Chapter 3 set forth the market data in each Purchasing Country; identification of the users, their demand and their "opportunity cost", i.e. the cost of gas at which users would select to use WAGP gas instead of their current fuel.

Chapter 4 indicates how delivery networks could be physically developed, i.e. their design and cost.

Chapter 5 defines whether the various potential users could be eligible for the delivery of gas at their gate at some point in time in the development of the WAGP system and the secondary network, based on both the Concession Agreement Term Sheet (CATS) Tariff Methodology and the Secondary Network Tariff Methodology. The Chapter also proposes a basis for reconsideration of the CATS Tariff Methodology in the interest of all Project stakeholders.

This Chapter will focus on what the governments of the Purchasing Countries can and should do to allow and promote the development of the Secondary Networks and the establishment of local gas markets. The chapter will review successively:

- National Regulations; why and how each national market has to be regulated.
- Market Management Options; how to organise the framework in which Stakeholders are to operate. The Stakeholders are:
  - The Primary Network Operator (WAPCo.)
  - The gas sellers (N-Gas).
  - The potential gas users (CE, WACEM, OTP, VALCO, etc.)
  - The Secondary Network Operators (or Aggregators)
  - The National Governments
  - Regulatory Authorities
- Market Promotion Strategies; what particular policies the governments should develop to favour market creation and further growth.

6.2 National Regulations

6.2.1 The Need for National Regulations

Opportunities for availability of natural gas to the member countries and their economies through the WAGP urges purchasing governments to implement all necessary measures for regulating the natural gas industry, protecting consumer rights and promoting investments in the sector for the successful development of national gas markets. WAGP natural gas purchasing countries have to develop secondary networks. Therefore it is essential for the governments to establish appropriate fiscal, technical and legal framework that will govern the all-possible activities in the sector during development of Secondary Network. During the course of establishing such frameworks, governments of purchasing countries have to take into account the principles set for the Primary Network, so that the two are compatible with each other and can coexist and operate on similar basis. It will also be beneficial for the purchasing countries economies if governments consider granting certain fiscal incentives in order to attract sufficient investments and ease project financing and

implementation burdens. In the view of this it is essential for governments to take into account the private investors desires while developing the secondary network.

6.2.2 Outline of Project Developers Needs

In order to build and operate the appropriate infrastructure for a secondary network, investors will look for transparent technical, fiscal, legal and regulatory frameworks, necessary for project financing and recovery of project costs. While developing Secondary Networks, it is reasonable to assume that Aggregators will look at similar Rates of Return as for the Primary Network, set in the WAGP Access Code (i.e. minimum 12% real rate of return after tax on initial Capital investment; and after tax real rate of return of 15% on total capital invested for the entire project). For further detail refer to Tariff Methodology below.

Similar experiences of developing national gas networks worldwide, have shown that project developers need:

- To know all of the criteria they must satisfy in order to receive a license or authorization to construct and operate natural gas infrastructure projects.
- The assurance that these criteria will be applied equally to all applicants for such licenses or authorizations, including domestic (whether private or government-owned) companies.
- To know that their request for government approval and other relief will receive prompt and efficient attention.
- The assurance that, if they comply with all requirements, they will receive all necessary authorization to construct and operate their projects without further holdup.
- The ability to obtain land to construct facilities, subject to the project requirements (a crucial issue in countries where foreign land ownership is discouraged by law).
- The ability of sellers of natural gas to work/negotiate directly with customers
- The ability to recover the costs of the project, with a reasonable rate of return, which requires a clear and transparent tariff setting structure set forth by or agreed with the regulatory bodies.

The mechanisms and institutions through which governments enforce their laws also are important to reducing risks and costs to investors, especially when it concerns the regulatory aspect of the industry. These mechanisms and institutions should be independent from politics and other influence in order to assure investors that they will be treated fairly and impartially.

6.2.3 Outline of Government Objectives

In order to facilitate the natural gas market development and the establishment of Secondary Networks, it is desirable that governments of purchasing countries:

- Permit recovery of and return on investment in developing Secondary Network, that reflects the similar principles of the Prime Network.
- Establish transparent and non-discriminatory procedures for project sponsors to obtain appropriate eminent domain (expropriation of land), siting and right-of-way approvals.
- Establish health and safety standards for the construction and operation of natural gas infrastructure consistent with highest international standards.

- Clarify the environmental standards, appropriate to the conditions of the project, applicable to gas infrastructure projects and enforce such standards on a non-discriminatory basis.
- Permit buyers and sellers of natural gas to negotiate directly with each other, consistent with sanctity of contract.
- Establish clear rules for all prospective activities, so that the developers are aware of the requirements
- Avoid changing applicable legislation frequently, in order to secure constructive investment climate, and
- Establish transparent and non-discriminatory procedures for obtaining licenses/authorizations to construct and operate distribution networks and other natural gas infrastructure projects.

Therefore governments shall consider establishing stable, transparent, independently administered, predictable and non-discriminatory legal, fiscal, regulatory and trade regimes that will consider the interests of all participants in the natural gas sector. These regimes shall (1) allow participants to understand what the government expects them to do; (2) allow participants to understand what they can expect the government to do, and (3) provide participants comfort that, once established, these regimes will not be changed arbitrarily, thus protecting the investment and the viability of the businesses initiated under these regimes. Such regimes increase certainty for investors, thereby reducing perceived risk.

6.2.4 Regulatory Framework

At present there are no such regulatory institutions present in Togo and Benin, however Ghana, under the Energy Commission Act of 1997, has already established the Independent Energy Commission whose functions does include the regulation of the natural gas sector. Similar institutions will be required to be established in the other countries.

Regulations for the secondary transmission network should be developed and implemented in the view of the primary transmission network. It is desirable that those regulations for the secondary network complement the Access Code, regulating the primary network.

Independent regulatory framework needs to be established in each country in order to determine the main principles and set of regulations for the secondary network that includes transmission lines starting from the beachheads, where the gas is landed from the offshore line. National Regulatory Bodies shall standardize relations and activities of the secondary network operator - Aggregator and the consumers - companies working in the areas of natural gas supply, transportation and distribution.

Main functions of the National Regulatory Bodies have to be setting tariffs for gas transportation and issuing licenses to cover all activities in natural gas sector in all three purchasing countries. Such licenses will be limited to the: transportation, supply and distribution of WAGP natural gas. To set the tariff methodology and principles for issuing transportation and supply and distribution licenses will be the primary objective of the National Regulatory Body. Tariffs for residential customers and accordingly regulations for distribution license can come into effect later, when the appropriate local distribution networks are established in the purchasing countries.

The National Regulatory body shall establish procedures, which shall specify the information required to obtain a License, including information regarding financial strength, credit rating, experience, and compliance with all domestic Laws and regulations approved by the National Regulatory Body, as well as any application fee for the License established by the National Regulatory Body.

Such independent National Regulatory Bodies shall:

- Establish and enforce standards of performance for companies engaged in natural gas supply, transportation and distribution.
- Establish rules and requirements for granting supply, transportation and distribution licenses
- Set rules for license application, application procedure and requirements, qualification criteria's for granting the license, and license conditions
- Receive and administer license applications and granting of licenses
- Promote and ensure uniform rules of practice for natural gas supply, transportation and distribution
- Set the tariff methodology and regulations/procedures for approving/revising tariffs for transportation as well as for the end users
- Establish and enforce standards of performance, including but not limited to:
  - Gas pressure
  - Number of scheduled and unscheduled interruptions in supply
  - Gas quality
  - Metering, and
  - Safety and emergency procedures
- Promote and incentivize expansion of Secondary Networks
- Maintain register of companies engaged in natural gas supply, transportation and distribution
- Pursue and ensure strict compliance with domestic legislation and National Regulatory Body regulations
- Define the procedure for dispute resolution and arbitration
- Monitor fulfillment of the License requirements by the Licensees

Construction and operation of natural gas facilities raise land-use, environmental and health and safety issues that will require that project developers obtain a license or other authorization from relevant government agencies to construct and operate such facilities. National Regulatory Bodies shall make sure that they will liase with other governmental institutions and oversee the timing issuance of all required permits and licenses.

The construction of natural gas pipelines requires access to land. Such land can either be held privately or is controlled by local authorities or institutions, or often is held through local "squatters rights", and thus almost impossible to definitively provide ownership or title. Developers must have means under the law to acquire the rights to use such lands in the public interest.

Regulations setting out the technical, health and safety standards to which natural gas projects will be subject reduces uncertainty for investors, and also serves to protect the public. These standards should be applied equally to all participants in the gas sector, including domestic (private or government-owned) projects.

Regulated companies also desire the right to appeal decisions of the regulatory authority to higher independent authorities, such as arbitration courts, that will review such decisions under standards set out in law.

6.2.5 National Access Code and Tariff Methodology

These general principles have been derived from the West Africa Gas Pipeline Term Sheet, but have been edited and modified as appropriate to make them applicable to the secondary networks.

6.2.5.1 Access Code Principles

Applying to the Secondary Networks in Ghana, Benin, Togo and any other country later linked to the West Africa Gas Pipeline System (Secondary Networks)

I. Unbundling of Gas Sales and Transportation

A. The local Aggregator may be established as both a transportation provider, and a gas seller. In the longer term (suggested to be more than ten years), once a gas market is well developed, local regulatory bodies may require that these roles are unbundled.

B. Affiliates or Shareholders of Aggregator who are engaged in gas sales activities and who enter into gas transportation agreements with Aggregator will be required to do so on an arm's length basis

II. Firm Transportation Capacity Rights

A. Aggregator will ensure that any "spare" transportation capacity (available transportation capacity which Aggregator is not required under Gas Transportation Agreements to reserve for existing Shippers) is made available to all qualified users on a firm basis, with full rights to the use or re-marketing of the associated transportation capacity. 'Qualified users' requires any prospective Shipper to meet certain fundamental criteria, including creditworthiness, a bona fide transportation requirement, the requirement to ship only gas meeting certain quality specifications and a requirement to ship some nominal minimum volume.

B. Transportation capacity rights under an existing contract will at all times be respected. "Spare" transportation capacity rights include rights that become available as contracts expire. Allocation of rights should be non-discriminatory and existing rights holders should not receive preferential treatment, except for contract renewal "rights of first refusal" provisions in existing contracts.

C. Initially, Aggregator will allocate spare firm transportation capacity among potential Shippers on a first-come, first-served basis.

III. Firm Capacity Rights Trading

A. Prior to the time when Aggregator has firm contracts for all of its available transportation capacity, firm transportation capacity rights should be tradable with no requirements for advance notification or consent from Aggregator, except to ensure that new Shippers meet financial credit requirements of Aggregator and otherwise comply with all requirements of the Access Code. When transportation capacity rights are traded, the original party contracting for the transportation capacity will remain a contracting party and thus liable to Aggregator. The new (replacement) party receiving use of the transportation capacity rights must execute a replacement contract with Aggregator. Aggregator will collect transportation

revenues from the replacement Shipper, and use those revenues to reimburse the original Shipper in the subsequent accounting month. Aggregator may set a minimum time period for trading of transportation capacity, but not greater than 1 year.

B. Aggregator will be required to publish timely information on the existing and projected availability of spare firm capacity on its system.

IV. Interruptible Service

A. The Aggregator may offer a short-term interruptible ("on-demand") service at any time at its discretion, but, after the pipeline system has firm contracts for all of its available capacity, it will be required to offer such a service.

B. Aggregator will publish timely and detailed information about the use of the system and its capacity.

V. Pricing of Services

A. Aggregator's transportation services will be priced in accordance with the Tariff Methodology. No change to the pricing or methodology will occur unless approved by the National Authority responsible for energy regulation. If the relevant National Authority does approve, Aggregator may amend the Tariff Methodology and vary its pricing accordingly.

B. Aggregator will publish a tariff of transportation charges for its services, including all terms of service and credit requirements for Shippers.

C. Tariff price structures for firm transportation service will be structured as a two-part rate, involving both a capacity charge and a usage charge. The fixed costs of the transportation system will be allocated to the capacity charge, while variable costs will be allocated to the usage charge. In addition, Aggregator will charge Shippers the charge imposed on it by the National energy regulatory Authority and pro-rated in proportion to the customer's reserved capacity.

D. Interruptible service can be priced above short-term variable cost. The price for interruptible service will be capped at the price of firm service on a 100% load-factor basis.

VI. Requirement for Pro-Forma Service Contracts

A. Aggregator will publish Pro-Forma gas transportation contracts for all types of services it offers as an obligation of the Access Code. The Pro-Forma contract will make clear to any potential Shipper the terms under which Aggregator will offer a specific type of service.

B. Pro-Forma contracts should be published for firm transportation capacity service, interruptible service (at the time it is initially offered), and any other services offered by Aggregator.

C. Pro-Forma contracts should include at least the following information:

i. Creditworthiness requirements

ii. Current cost for the particular service

iii. Provisions for any line-pack and compressor fuel

iv. Nomination procedures

v. Gas quality specification

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vi. Billing and payment procedures

vii. Definition of limitation of Aggregator liability for gas losses in transit if the Aggregator operates solely as transporter.

viii. Dispute resolution procedure

D. Aggregator will develop and publish a procedure on how prospective Shippers can request transportation services.

VII. Obligation to Expand the Capacity of the Pipeline System using Commercial Criteria

A. Aggregator will have an obligation to expand the transportation capacity of the Pipeline System up to the ultimate transportation capacity specified in the Approved Aggregator Master Plan to meet the requests of qualified Shippers, provided that the following commercial investment criteria are met:

i. Requests from qualified prospective Shippers must be for firm transportation capacity, for a term of at least 5 years, with a binding contractual commitment to pay for the service under a valid gas transportation contract if Aggregator undertakes the expansion to create the capacity.

ii. Aggregator must have, in the aggregate, enough commitments for the expanded capacity to ensure a minimum acceptable return on the incremental investment necessary to facilitate the expansion.

VIII. Balancing Rules and Imbalance Charges

A. There should be consistency between the stringency of the balancing tolerances required, and the size of any imbalance penalties imposed on Shippers.

B. Unless it can be demonstrated otherwise as necessary by the Aggregator, balancing on a less than monthly basis should not be imposed.

C. Shippers will be allowed to aggregate and/or trade their imbalance positions. Aggregator will provide regular and timely information to each Shipper as to the size of its imbalance position and the coincident imbalance status of the system.

IX. Standardisation

A. Where it is required as the extent of the gas infrastructure grows, standardisation should be promoted via cooperative industry action rather than regulatory or legislative fiat.

B. As an essential safeguard against discrimination, any industry authority involved in proposing standardisation measures should reflect the views of all classes of market participants, including regulatory authorities and potential third party entrants.

C. Standardisation is required in a number of areas, including: the definition of firm transportation capacity rights; nomination procedures, gas allocation procedures and settlement mechanisms and balancing rules and protocols.

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6.2.6 Secondary Networks Tariff Methodology

For the purpose of the Secondary Network Tariff Methodology, Tariff(s) shall mean the portion of the unit price of WAGP gas covering the transportation through the Secondary Network.

6.2.6.1 General Tariff Principles

The following principles are used to derive the Tariffs:

- Whether the Shipper into the Secondary Network is the gas Seller (initially N-Gas), the Aggregator or the end gas user, Prices paid by the Secondary Networks end gas users shall be the addition of:
  - The "landed price" of gas ex-West Africa Gas Pipeline as supplied initially by N-Gas and based on the tariff for the West Africa Gas Pipeline system. This landed price will reflect the various tariff classes defined in the WAPCo Concession Agreement, and should be a pass through. Any reference, information, calculation method regarding the "landed price" shall be looked upon in the Concession Agreement.
  - The tariff pertaining to the transportation through the Secondary Network (the Tariff), which is subject to the present Secondary Networks Tariff methodology.
- The Tariffs are set to recover the anticipated costs of constructing and operating the Secondary Network, as at the time of Aggregator's Final Investment Decision, based on estimated construction costs including the results of Approved Competitive Bidding Procedures for major cost items
- The Tariffs are set to provide Aggregator with:
  - A minimum, after-tax, real (in US dollar terms) rate of return on initial capital invested of 12%, and
  - An after-tax, real (in US dollar terms) rate of return of 15% on total capital invested for the entire project (except that the reduction in corporate income tax from the allowance for tax purposes of any interest in respect of debt shall be brought to account)
  - A non-distance sensitive Tariff design having only one single transportation rate regardless of distance that gas is transported along the pipeline route
  - A pass through by Aggregator, as a Regulatory Authority Charge add-on Tariff component, of the costs of any National Energy Regulatory Authority set up by the State to administer Aggregator
  - Reduction in Tariffs charged as throughput increases, starting when volumes grow beyond the level of initial or "Foundation" volume commitments
  - Tariffs quoted, and payment made, in local currency, but with charges indexed in US dollars.

The Tariffs will be structured in a two-part rate with one part fixed and the other part varying according to the volume of gas actually transported:

- Fixed costs are recovered through a reservation charge assessed on the quantity of pipeline capacity contracted by the consumer
- The cost of fuel gas (if any) for Aggregator's compressors is recovered through a variable or usage charge, assessed on actual gas transported.

- The exact usage charge will be adjusted annually to account for actual fuel usage and contracted capacity on the pipeline. All consumers will pay the same usage charge per unit of gas transported.

6.2.6.2 Classes of Customers

Rights derived from the Primary System

Every customer shall keep its class as derived from the application of the Concession Agreement, and shall be billed accordingly for the portion of the gas price corresponding to the transportation in the Primary System, unless the following sub-paragraph applies.

If several customers are grouping their purchases through the Aggregator and therefore allow the Aggregator to benefit from the WAGP Concession Agreement Foundation Customer tariff conditions, then these conditions shall be passed through to the said customers.

Rights derived from the Secondary Network

Customers executing contracts before the Aggregator's Final Investment Decision will be called "Secondary Networks Foundation Customers" and will benefit from Tariffs based on the minimum, after-tax, real rate of return on initial capital. Other Secondary Network customers will be called Standard Secondary Network Customers.

Rules pertaining to the respective calculations of the Tariffs applicable to Foundation and Standard Secondary Network Customers will be defined at the Study Implementation stage.

6.2.6.3 Specific Tariff Principles

Specific Tariff principles, where applicable, will be inspired from the CATS Tariff Methodology.

Calculation of Tariffs

Detailed calculation of Tariffs will be performed during the Study Implementation. The Tariffs used in Chapter 5 of this Study are the result of simplified formula, although they give a close approximation of what should be the definite Tariffs.

6.3 Market Management Options

6.3.1 Organizing the Market: the Institutional Framework

The term "institutional framework" is used to describe the set of contractual and/or regulatory arrangements to be established between the above listed Stakeholders in order to initiate and promote the development of the market.

For the sake of simplification, the present study will assume that N-Gas is the sole Seller of gas at WAGP Points of Delivery (POD). Actually, according to the Concession Agreement Term Sheet, this situation will prevail during the first ten years or until the WAGP sold capacity reaches 200,000 MMSCFD, whichever occurs first. Thereafter, other sellers will be authorized to offer their own gas and the WAGP will become an "Open Access" facility.

6.3.1.1 Objectives

To ensure that sustainable gas markets support the Secondary Networks, it is necessary to organize the chain between N-Gas and the identified gas users, in a way that the chain cost and efficiency are optimised to serve the following:

- Attracting and maintaining as many users as possible, essentially by allowing a cost of delivered gas as low as possible

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- Attracting investors into the Secondary Networks
- Allowing governments to play their role, essentially through technical and economical regulation
- Securing the sustainability of the market institutional framework

6.3.1.2 Primary and Secondary Networks Similarities

In the present context, there will be many similarities between the "Primary Network" (the WAGP System) and the four Secondary Networks:

- Gas delivery will be a natural monopoly: once the Secondary Network is established, no competing network is likely to be built to offer an alternative to the gas users
- Economic behaviour of the Stakeholders will be subject to access codes, expansion rules and price regulation
- Gas sellers will seek long-term agreements, at least at the beginning of the Secondary Networks development
- Investors are likely to require secured rates of return
- In the case of Benin and Togo, distributors ("the Aggregators") have already been nominated, in the same way as the Commercial Group was given exclusivity on the Primary Network

6.3.1.3 Aggregators

So far as; (a) the primary Network Developer has not showed interest in being the Secondary Networks developer, (b) there will be more than one gas user in any Secondary Network, and (c) the Project aim remains to develop gradually gas utilization, then it appears that a third party, "the Aggregator", would be required to fill the gap between the gas Sellers and each of the "secondary markets", in each secondary market. The role of such "Aggregator" should extend to:

- Aggregating and consolidating gas demands from the various users. The Aggregator will benefit from lower prices and allow delivery to small consumers, as N-Gas might not be motivated to mobilize its resources to negotiate and manage too small volumes.
- Coordinating and balancing gas demand
- Investing in the Network
- Transferring technology and know-how to the users

Obviously, the introduction of an Aggregator at any WAGP System delivery point will have a cost, and the overall balance of the Aggregator added value against such cost should remain positive at all times.

6.3.2 Aggregator Profile and Selection

It will be up to each country to select its aggregator. Ghana may actually select two, one for Tema and one for Takoradi, or only one, if there is an advantage to do so.

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6.3.2.1 Aggregator Profile

There are specific conditions that an Aggregator should fulfil:

Know-How:

There is a new industry to create in the purchasing countries, and the aspect of know-how in the gas network industry will be fundamental[11]. This know-how extends both to the technical and commercial aspect of the profession. Therefore, it is recommended that any Aggregator candidate must possess or acquire such know-how through hiring or being in association with a certified gas network operator of another country, at least during the first few years, until the know-how is passed to the selected Aggregator.

Knowledge of local industry environment

The Aggregator must include a significant national content, as the coordination with local authorities will be essential for the harmonious development of its network construction and operation.

Financial strength

It is essential that the Aggregator be strong financially. Significant investments will have to be made with long periods of pay back and with an element of risk associated to them. Once the contracts are signed, time will be of essence to implement the development, and any failure will have drastic consequences for the users and the market. Therefore, only candidates demonstrating the requisite financial strength to execute the project in its entirety should be accepted.

Responsibility and Motivation

The Aggregator should be, and should feel, responsible for the task of public service allocated to him in its role within the market. Many industries, many jobs, many financial results will be dependent upon the Aggregator's performance in delivering gas in a reliable manner.

While the regulatory framework will be there and will impose constraints on the Aggregator, it is essential that the Aggregator be motivated to react properly to situations that may hinder gas delivery, whether through the existing network or through network expansions that the development of the market would require and the regulation would impose.

To this extent, the participation of the gas sellers and the key gas purchasers in the capital of the Aggregator would be an assurance that the proper motivation will be there.

6.3.2.2 Aggregator Selection

On the basis of criteria that would include the conditions described above, each country, at the time the market conditions will make the development of a Secondary Network feasible, should initiate a procedure aimed at selecting the Aggregator(s).

Normally, one would expect the Aggregators to be selected through a fair and transparent competitive process. Nevertheless, two of the three countries have already selected an Aggregator to develop their national networks. Hence, Sobegaz and Sotogaz are the pre-selected candidates for the tasks and responsibilities of Aggregator in Benin and Togo respectively.

Knowing that Sobegaz and Sotogaz are already potential investors in the Primary network, it makes sense that they also be assigned the Aggregator role, provided that they comply with the conditions described above, and provided that their activity are subject to control under national regulations and by a gas regulatory authority without hindrance or favour.

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[11] An LPG distributor cannot be considered a priori as a gas network operator. The two industries are too different in many aspects.

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Furthermore, the States concerned are advised not to grant a license to the pre-selected Aggregators, until; a) the Aggregator-candidates submit a thorough Business / Master Plan, and b) such Business Plan is duly verified and accepted by the State Regulatory Authorities. In addition, to the same extent that the Commercial Group was appointed as the Developer of the Primary System (WAGP) and benefited from exclusive rights to negotiate the Concession Agreement during a certain period (two years initially, later extended), the Aggregator should be given a reasonable period of exclusivity to prepare their Business / Master Plan and have it reviewed and accepted by the regulatory authority.

6.3.3 Regulatory Model

Based on successful examples of gas regulation around the world, the Study recommends that the Secondary Network transportation price be calculated on the basis of a postage stamp price applicable to all customers, based on a rate of return on the Network-invested capital.

Postage stamp price means that every customer on the Network will have access to gas in equal conditions of price, generally based on volume and load factor. Other parameters may intervene that would make the paid price vary depending on the customer profile, but it remains that the price is posted and not discretionary.

The present Study recommends that the Aggregators be remunerated in the same conditions as the Developer of the Primary Network, i.e. that the Rate of Return on the Secondary Network investment be as follows:

- "Foundation" Rate of Return: 12%
- Overall Rate of Return calculated on the mid-market projection –to be determined (but approximates to the Expansion / Demand growth Scenario) over the duration of the Concession Agreement: 15%

"Investment" means the capital invested in the engineering, procurement, construction and commissioning of the Secondary Network, plus the cost of development above mentioned Business / Master Plan. The remuneration will be based on the capacity contracted by the customers, and will start when the first gas is delivered.

6.3.4 Case of Benin and Togo: CEB, Sobegaz, Sotogaz

The case of Benin and Togo is particular, not only because the Aggregators have already been pre-empted, but also because the CEB is itself a particular gas user. In fact, under current expectations of the Project:

1. CEB would be a Foundation Customer, which implies that contractual, financial, institutional and regulatory gas delivery conditions be satisfied before the Project FID, i.e. within 21 months from PCE, and that the initial secondary network be commissioned 18 months thereafter, unless the gas is delivered by the WAGP System at the very location of CEB.
2. If the WAGP point of delivery in Togo, and may be also in Benin, is planned to be located at the CEB plant, then there is no need for an important investment in a secondary network, or even no further investment at all, for CEB to access gas.
3. The cost differential of the gas at CEB gate is significant, whether CEB buys its gas from the Aggregator (and therefore participates in the cost of the secondary network) or whether CEB buys the gas directly from N-Gas (and does not contribute to the financing of the secondary network.
4. CEB is a power producer, not a gas-to-heat consumer. A differential in the gas cost affects CEB cost structure in larger proportions than it does to the industrial users.

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The specific conditions relating to CEB, led to the consideration of two alternates in this study for Benin and Togo, namely:

Alternate 1: CEB buys gas from the Aggregator;

Alternate 2: CEB buys gas directly from N-Gas.

The benefits of Alternate 1, which are listed below, are the disadvantages of Alternate 2, and vice-versa. It should be noted that this analysis is based on the assumption that there will actually be other consumers than CEB when the network is developed. Otherwise, the role of an Aggregator becomes redundant and would not add any value to the gas market.

Benefits of Alternate 1, "CEB Buy from Aggregator":

- Lower access cost for industrial users
- More users will therefore have access, or they will have access earlier in the development of the WAGP System
- Faster development of the local market in the mid term, provided initial additional complexities are overcome in a timely manner
- Single rule, postage stamp prices
- Greater latitude in gas balancing for the Aggregator

Disadvantages of Alternate 1:

- Lower access cost for industrial customers is a "zero-sum" game and balanced by an increase to CEB
- Greater complexity of the contractual scheme: three entities to combine (N-Gas, the Aggregator, CEB), making negotiations longer and costlier
- Greater complexity of the Guarantee chain
- Necessity to have the national regulatory framework in place earlier (Aggregator's licence, market regulation)
- Currently selected Aggregators have no experience, no guarantee of being able to raise the necessary funding & security packages to enter contracts with N-gas and CEB
- Currently selected Aggregators have many shareholders. This may jeopardize the dynamic decision-making that is required by the development of the commercial deals
- A real risk of missing the target date for Sobegaz and Sotogaz to become Foundation Customers, or to delay the WAGP system implementation in its entirety (particularly the laterals).
- "Consent & Support Agreement" / "Security Package" by governments more likely awarded to CEB, being a parastatal company, than for the Aggregators, which are private companies
- Duplication of custody transfer tasks (metering, billing) – requires transfer from N-Gas to Aggregator and then Aggregator to CEB.

On the basis of the above paragraphs, recommendations are presented in the sub-chapters below, assuming that the price of gas to be delivered to customers will actually lead to the conclusion of Gas Purchase and Sale contracts for the volumes anticipated in Chapter 5 above.

6.3.5 Service Lines (Benin and Togo): Incorporation in WAGP or in the Secondary Networks

The Service Lines are the portions of pipelines to be installed in between the beach and the points of delivery to CEB, in the original design of the WAGP System. These lines are short sections, particularly in the case of Togo. Their cost is estimated to be between US$0.5 and 1.0 million (Togo), and US$2.5 to 4.0 million in Benin.

Nexant is aware of the discussions currently taking place between the Commercial Group, the potential WAGP Foundation Customers and the States of Benin and Togo in order to modify the WAGP System design and incorporate the Service Lines into the WAGP System, instead of having the Service Lines as a portion of the secondary networks.

In order to help stakeholders making a decision, the following aspects were considered:

Cost Issue

The incorporation of the Service Lines would result in having their cost supported by all WAGP customers, instead of having it supported by the Togo and Benin secondary network clients respectively.

This option would result into significant savings for the latter. In the case of Togo, this would represent between 0.5% and 2% of the delivered gas cost, depending on whether CEB is alone in the market or is sharing the network with the other identified potential customers. In the case of Benin, the saving is even more significant: between 2% and 4% respectively.

One conclusion of above Chapter 6 "Demand Scenarios" was that no secondary network would be built for several years in either country, unless the current Tariff Methodology is modified to extend the applicability of the Industrial Development Tariff, as WAGP Gas would not be competitive with the current source of energy (RFO) available to the major potential industrial customers. On the basis of this conclusion, any opportunity to reduce the cost of delivered gas is worth seizing, to preserve the possibility to have a secondary network at all.

Learning Curve Issue

There may be an interest in allocating the Service Lines as the first asset of the Aggregators, in the sense that it would help Sobegaz and Sotogaz to start in the business with a small investment.

Clearly, the initiation of a business like gas transportation and distribution needs prior know-how. It requires knowledge and experience in the following areas, in particular:

- Technical and operational: handling of an inflammable product under pressure; gas balancing.
- Commercial: gas business, gas contracts.
- Financial: Take or Pay, project finance, guarantees.

Establishing the Aggregator on the basis of an early limited asset is one way to acquire such know-how. However, as underlined in the paragraph "selection of the Aggregator", it is required that the technical and operational know-how, at least, exists within the company at the inception of the business.

Additional Revenue

The Service Lines would not represent an investment that would generate a sufficiently large return as to make the aggregators viable companies, covering the fixed costs of operating a business unit. Actually, considering the Aggregators economics as indicated above:

- Connecting Line, Benin: US$2.5 to US$3.0 M Dollars
- Connecting Line, Togo: US$0.5 to US$1.0 M Dollars
- Rate of Return: 12% to15%

The annual revenue of the Aggregator would be approximately $100,000 per year (or 70 million CFA) for Togo and $400,000 per year (or 280 million CFA) for Benin. That would not be enough to cover financing costs as well as Aggregator fixed and operating costs, let alone remunerate shareholders.

As a consequence of the above, we would recommend that the extended WAGP design, including the Service Lines, be adopted. Moreover, we suggest that other options should be considered in order to help the Aggregators start their business and motivate them to further develop the secondary networks. Such options include:

a) The incorporation of WAPCo, N-Gas and the major potential customers in the Aggregators' capital, and / or

b) The optimisation of the contractual arrangements, lowering the risks to the Aggregator, and / or

c) The coupling of the ownership in WAGP and the Aggregator's licence

6.3.6 Improving the Pre-selected Aggregators Profiles (Togo and Benin)

The Study recommends that the Aggregator profile include:

1. Technical and commercial know-how
2. Financial strength
3. National content
4. Motivation to develop the secondary network.

As far as the Consultant is aware, the pre-selected aggregators in Benin and Togo, in their current profile:

1. Lack required know-how
2. Lack strong balance sheet
3. Have the required national content
4. Could be tempted to limit themselves to the management of their share in WAGP and be less motivated by the development of the secondary network.

Therefore, the Consultant hereby makes the following recommendations in order to improve the pre-selected Aggregators' profiles.

6.3.6.1 Improve the Aggregators Know How

An easy way to transfer the appropriate know-how to Sobegaz and Sotogaz is to open their capital to WAPCo and N-gas. The presence of the Developer / future owner of the Primary System and the Sellers would bring a unique combined experience from their past operations in West Africa (Nigeria), as well as their experience of developing the Primary System. With WAPCo and N-gas onboard, the technical and commercial know-how of the Aggregators is secured.

To be significant, the involvement of WAPCo / N-Gas in Sobegaz and Sotogaz should be in the range of 20%.

The opening of the aggregator capital to WAPCo / N-gas would be preferable to a simple technical assistance agreement. Firstly, WAPCo may not be as interested in a pure operating or assistance agreement. Secondly, having invested in the Aggregator will enhance the Developer's commitment to promote the local gas markets. Thirdly, it will help Sobegaz and Sotogaz find the financial resources necessary to invest in the secondary networks.

6.3.6.2 Improve the Aggregators Balance Sheet

Aggregators will have to provide for the following financial resources (estimated amounts)

1. To invest into the Primary Network: 2% of $500M, i.e. $10M
2. To invest into the Secondary Network: $4M (Togo) and $7M (Benin), based on a 30% equity / 70% debt project financing
3. Operating facilities: $2M to $5M
4. Guarantees: depending on negotiations, but at this stage it is thought that the company assets could be brought as guarantee.

These are large sums for start up companies. However, there are two possibilities to help them meet their financial requirements: a) improve their financial strength and b) reduce their financial exposure.

Improve Aggregators' Financial Strength

It is recommended above that WAPCo have equity in the Aggregators capital. In addition to WAPCo, the major gas purchasers could be significantly present in the capital of Sobegaz and Sotogaz, as stakeholders in these markets characterized by a limited number of players. In the present situation, the parties concerned would be CEB, WACEM and IFG for Sotogaz, and CEB and SCO Lafarge for Sobegaz. A participation of between 10 and 20% each would be advised.

All together, WAPCo and the major gas purchasers may not have less than 50% of the Aggregators capital, as there role in the success of the secondary network is pivotal, being the real players of the markets.

Actually, some – if not all – of these major potential customers expressed the desire, not to say the requirement, during the Assessment Visits, to build themselves the pipelines that would deliver the gas to their facilities. Having them sharing the ownership and control of the management of the secondary network would satisfy their expectations in that regard. In addition, they would receive in return a portion of the cost of transport in the secondary network they would have paid, corresponding to the rate of return on their investment.

Actually, this model would more or less reproduce the scheme already existing in the Primary System, which proved successful as having reached the stage of the PCE.

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Reduce Aggregators Financial Exposure: Optimising the Contractual Arrangements

There are two contractual ways to involve Sobegaz and Sotogaz in the delivery of gas through the secondary networks: as merchants or as carriers.

Merchants would mean that they purchase the gas from N-Gas at WAGP "beach price" and re-sell it to the local customers at WAGP "beach price" plus secondary network price.

Carriers would mean that they only transport the gas without ever being the owner of it. N-Gas would sell the gas directly to the final customer, and subcontract the transport through the secondary network to the Aggregator.

In the first case, the money flow through their accounts would be based on the full price of delivered gas, i.e. about $3.30 to $4.50 / MMBTU. In the second case, it would be based on the cost of transport through the secondary network only, i.e. $0.4 to $1.65 MMBTU. Since the guarantee required by the WAGP gas Sellers, as well as the one required by the local Purchasers will be based on the volume of money flow, it will be substantially lower in the case of the Aggregators being carriers only, easing up the burden on the Aggregators balance sheet.

However, since the WAGP gas Sellers have made known their policy not to sell directly to small buyers, the above "carrier scheme" could be limited to customers purchasing at least 4 to 5 MMSCFD, i.e. the above referred major customers.

The schemes below explain how contractual arrangements would be made. One should note that in both cases, the profit of the Aggregator is the same, as it is based on the regulated Rate of Return.

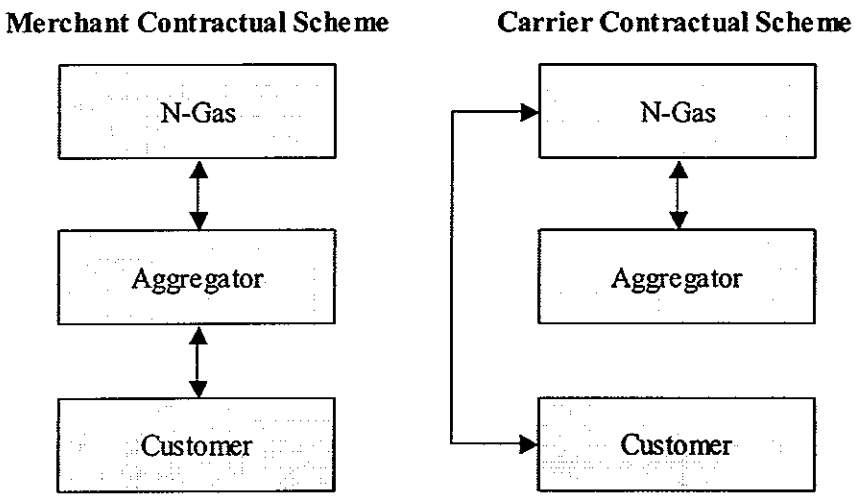

Figure 6-1 Different contractual Schemes for Aggregator Gas Sales

6.3.6.3 Improve the Aggregators Commitment to Network Development

The previous two paragraphs addressed the participation of the gas Sellers, the Primary Network Transporters, and the major industrial gas Purchasers, in the capital of the Aggregators as facilitating the successful development of the Secondary Networks. It is underlined that such arrangement would make sense not only because of the expected transfer of know-how and the availability of financial resources, but also because it will enhance the motivation of the Aggregators.

Another way of enhancing the commitment of the Aggregators to develop the Secondary Network would be to create a conditional link between the access to ownership in WAGP and the regulatory commitment to develop the Secondary Networks. In other words, the Aggregators license would include the right to purchase WAPCo shares at preferential price (i.e. the current expected price

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based on WAGP Capex) if and only the obligation of developing the Secondary Network, provided economical conditions for the development are there, in the opinion of the National Regulator, are accepted. The rules defining the commitment to develop the Secondary Networks would be similar to the rules pertaining to any expansion of the network in the Primary System.

6.3.7 Case of Togo: Secure early Development of the Secondary Network

Should Electrotogo acquire the status of Foundation Customer and buy gas in Lome at the same delivery point as CEB (NOTE: read "CEB and Electrotogo" everywhere we read "CEB" below, except where the status of CEB as a parastatal company is addressed).

The Study recommends that the activity pursued by the Aggregators through the Secondary Networks be regulated on the basis of a posted stamp price based on a Rate of Return assessed on the Capex of the Secondary Network. This means in particular that, until the Secondary Network is build and commissioned, and gas flows in the Network, the Aggregators would not derive any revenue.

Whether the Aggregators are carriers only, or the Aggregators are gas Merchants, the following scenario is anticipated:

6.3.7.1 Delivered Gas Price

A section of Chapter 6 of the Study is dedicated to the possibility of an early initiation of the Secondary Network in Togo. Delivered gas prices are indicated in two Alternates, (i.e. Alternate 1: CEB participating in the cost of the secondary Network; and Alternate 2: CEB not participating)

The Study shows that CEB current cost of energy is higher that the delivered cost of gas in all cases, so CEB should welcome gas.

For WACEM and IFG, their current cost of energy would be lower than the delivered cost of gas, if the WAGP "beach" price retained is the Standard Tariff. So, in the present conditions of the CATS TM, gas would not be attractive to them and there would not be any Secondary Network for several years.

On the basis of the WAGP IDT beach price though, the economical conditions for the creation of a Secondary Network would be there, for the benefit of all stakeholders. Therefore, the Study suggests that the CATS TM be reconsidered.

6.3.7.2 National Regulation

Should there be a consensus to reconsider the CATS TM, the government of Togo should initiate the following steps:

- Establish a Gas Regulatory Authority
- Draft a Gas Regulation
- Invite the Aggregator to submit a Master Plan in order to be awarded its license

6.3.7.3 Contractual Arrangements

In order to find a solution that would both:

- Preserve the timely completion of the "Foundation" arrangements pertaining to the Primary System
- Preserve the future development of the Secondary Market according to the recommended National Regulations

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The following actions should be undertaken:

- CEB and N-Gas Pursue their negotiations with a view to concluding their gas sale and transport contract in the WAGP system.
- The Aggregators initiate and conduct their marketing and funding plans (the Master Plan)
- CEB, N-Gas and the Aggregator should execute a Memorandum of Understanding by which the Aggregator will have an option to take place in the contractual arrangements (as Carrier or Merchant).
- When the Aggregators will have contracted additional customers, secured the financing of the initial secondary network, and acquired its license, then the Aggregator will have the right to exercise its option.
- In the meantime, the Aggregator should be entitled to attend the negotiations between CEB and N-Gas, to become familiarized with industry requirements
- As suggested above, the Aggregator shareholding may be re-engineered so as to give more ownership to CEB, in particular, in the business generated by the Secondary Network. In this way, CEB will recuperate as a profit a portion of the additional cost it would have paid in contributing to the development of the Secondary Network.

6.3.8 Case of Benin

6.3.8.1 Delivered Gas Price

Referring to the Alternates 1 and 2 above (CEB participating and CEB not participating), the delivered costs of gas to local customers would be as follows (Present Demand Scenario):

	Network Including CEB	Network Excluding CEB	Present Discounted Cost of Fuel
Standard Tariff Based	4.16	4.66	3.56
Industrial Development Tariff Based	3.53	4.03	3.56

All figures are in US$ / MMBTU

Table 6-1 Delivered Gas Costs to SCO Lafarge

The Study shows that SCO Lafarge, with a current cost of energy at $3.96/MMBTU, would only be attracted to WAGP gas if a) CEB participates in the network and paid a tariff proportional to its consumption, and b) if the IDT was granted to SCO Lafarge without restriction.

Otherwise, the Secondary Network would not be developed unless the gas demand grows substantially, which the Study does not anticipate. The key would be the development of the activity of the SC Onigbolo clinker factory, and/or the creation of new industries.

Besides, the government of Benin will have to take position on the location of the WAGP delivery point (East or West of Cotonou). The Consultant is aware of the plans to develop an industrial "Free Zone" near the Nigerian border. Without prejudice as to the legitimacy of such initiative, the Consultant noted that no firm gas consuming projects was yet under construction in the area. Moreover, moving the delivery point to the Free Zone would create the need for substantial additional investments in the Benin electrical grid, in case CEB has to move in the Free Zone to receive WAGP gas.

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Therefore, the Consultant believes that the delivery point should be maintain West of Cotonou, mainly to preserve the timely access of CEB as a Foundation Customer. When the Free Zone will develop, the Secondary Network, should its construction be justified, could be extended to the East, and supply the small industries in the existing industrial zone

6.3.9 Case of Ghana

6.3.9.1 Delivered Gas Price

The delivered costs of gas to local customers would be as follows (Present Demand Scenario):

	Network Including Valco	Network Excluding Valco	Present Discounted Cost of Fuel
Standard Tariff Based	3.67	3.87	3.56
Industrial Development Tariff Based	3.06	3.26	3.56

All figures are in US$ / MMBTU

Table 6-2 Delivered Gas Costs to Tema Area

On the basis of the Standard Tariff landed price, the majority of the Ghanaian industries would be attracted by gas. On the basis of the IDT, a potentially larger market could be gained.

Regarding the market and its required institutional framework, the case of Ghana is rather standard. There is a clear separation of the power market from the industrial market, whereby the power market – at least the Foundation power market, but also probably the Tema IPP project – will buy gas directly from the Sellers.

The industrial market shows a larger number of potential customers than those of Benin and Togo, without clear existing leader(s) such as WACEM and IFG in Togo or SCO in Benin. This reinforces the standard status of a) the industrial gas market in Ghana and b) the response to the need for gas development strategies.

The Aggregator has not been pre-selected and the recommendation is to proceed with a competitive bidding, with two areas concerned, Tema and Takoradi.

The issue is that while the Takoradi zone has firm commitment already from WAGP Foundation Customers and Tema has not, the initial bid might be limited to Takoradi, unless the Tema "lateral" Pipeline is built without waiting for an IPP project in Tema. Specific calculations should be undertaken with the Commercial Group to check the merits of installing the Tema lateral ahead of any power contract.

Finally, the Study gave privilege to the short-term issues and did not enter into detail regarding the "Strategic Projects" in Ghana. Nevertheless, the Study contains general appreciations of the categories of project that would accept WAGP gas, as well as elements to calculate the cost of gas transport through secondary networks. Therefore, the Developers of these Strategic Projects will also find their interest in the Study.

6.4 Market Promotion Strategies

6.4.1 Gas Market Drivers

Existing studies have already clearly defined the Power markets as the driver for the growth of the West Africa Gas Pipeline activity.

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The present study supplements that:

1. The gas-to-heat industrial market can also be a driver for the growth of the WAGP contracted capacity, although to a lesser extent, provided arrangements are found to reach this "secondary" market at the appropriate price level.

2. The gas-to-heat industrial market will remain for a long time the unique driver for the development of the secondary networks.

6.4.2 Promoting the Industrial Development Tariff

In the light of the above, the Consultant again recommends that the States undertake negotiations with the Commercial Group on the WAGP Tariff Methodology, in order to agree on a Tariff to be made available to the gas-to-heat industries – while preventing them to use such low-cost gas to produce electricity. Such Tariff would allow delivering WAGP gas these "secondary" markets wherever possible, in the interest of all stakeholders and the national economies.

6.4.3 Promotion Initiatives

Furthermore, contact should be initiated – or pursued – with the potential industrial users with a view to familiarise them with the possibilities of WAGP gas for their industries. Such contact will find in the proposed country Roundtables appropriate forums, in which technical, operational and economical information on the development of the Secondary Networks will be made available. Moreover, the Study should be used by the appropriate country agencies for the necessary follow up towards the potential users.

6.4.4 Promotion through the Media

Diffusion of accurate information about what to expect from the WAGP Project will take place in the context of the EIA development. It should be an opportunity for the diffusion of accurate information through the media on what can be expected from the WAGP project and the Secondary Networks.

6.4.5 Fiscal Incentives

The Consultant recommends that Fiscal Incentives similar to those granted to the Developers of the Primary Network be granted to the Developers of the Secondary Networks, such as:

- Corporate Income Tax of 35%
- Income Tax Holiday of 5 years
- Capital Allowances of 25% of capital account balance, to begin at the end of the holiday period

The other applicable rules would be found in the CATS Fiscal Regime

6.4.6 Financial Incentives

In the absence of clear definition of the expected "WAGP Development Fund" in the CATS, the Study cannot give detail of how this Fund could be used for the development of the WAGP Gas Market.

However, when such fund will be defined, the Consultant recommends that the fund be used in priority to help industrial customers meet their costs of conversion to WAGP gas.

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6.4.7 Energy Policy Consistency

The development of a gas industry in the Purchasing Countries will be the opportunity for each country to harmonise their Energy policies. Currently, competing energy sources may have different regimes – fiscal or otherwise. The Governments will have to define their priorities regarding energy sources and apply the appropriate policies to serve them.

6.4.8 Intra-Regional Aspects

When defining their policies, the Governments may have a consideration to Energy laws, regimes and practices in the neighbouring ECOWAS countries. There will be an opportunity to harmonise Energy policies between countries. Different regimes granted to competing companies – some of them potential users of the same WAGP gas – could create distortions and potentially harm some of the WAGP gas customers.

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7 Study Follow Up and Implementation Plan

7.1 Study Follow Up: Presentation of the Study Report to the PIC and the Stakeholders

7.1.1 Presentation to the PIC and the Steering Committee

The GMPS Study Report will be presented to the Project Implementation Committee at the earliest opportunity.

Although the Consultant believes that the Study, in its present condition, answers the expectations of the PIC as expressed in the Terms of Reference, the Consultant is ready to receive comments from the PIC and, if necessary, amend or clarify the Study to make it fully beneficial to the Governments and the market stakeholders

After review of the Study by the PIC, the Study will be presented to the Steering Committee, and thereafter to the Commercial Group.

7.1.2 Organisation of Country Roundtables

The Consultant recommends that Roundtables be organised in each of the Purchasing Countries where the Consultant would present and explain the various aspects of the Gas Market Promotion Strategies Study to the Country stakeholders.

The Study revealed that issues to be discussed at the roundtable are particular to each country. Moreover, each government remains the final decider of the model of Institutional Framework it wishes to create. For instance, some government may wish to privilege low cost gas delivery to power industry, while some other may wish differently. Also, some of the stakeholders in different countries being competitors with each other, the open discussion that is expected to take place in the Roundtables may not occur if they attend together.

Therefore, it is advised that three separate roundtables be held, one in each country (Cotonou, Lome and Accra) instead of one general Roundtable. Each Roundtable will focus on the concerned country particular issues.

Participants to these Roundtables would be:

1. The Minister of Energy of the Country
2. Other concerned Ministers
3. Members of Country Parliaments
4. The Country PIC Members
5. The ECOWAS Representative
6. The Country WAGP Team members
7. Other Country Agencies concerned
8. The Country identified potential gas users
9. Commercial Group representatives
10. USAID representatives
11. Nexant Experts

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The Roundtables will also offer an opportunity to confirm and/or update the Study findings. A report will be issued at the end of the Roundtable by the Consultant and thereafter submitted to the PIC and to the Roundtables country participants.

7.2 Study Implementation Plan: Assisting Governments in the Creation of the Country Institutional Frameworks

The Consultant is willing, subject to availability of USAID funds, to assist the Purchasing Countries during the Implementation Stage of the Study.

Two successive steps could be envisaged: help countries establish National Gas Regulations; and assist Governments in the initiation of the Secondary Network

7.2.1 Help Countries Establish National Gas Regulations

On the basis of the elements pertaining to National Regulations including in this Study, the Consultant may:

- Help defining the scope of work of the National Gas Regulatory Authority (NGRA)
- Assist in capacity building and training of the NGRA staff
- Help drafting the National Regulations
- Help defining the Secondary Network Mid-Market projection
- Help calculating the Tariffs

7.2.2 Assist Governments in the Initiation of the Secondary Network

For the countries in which the government and the stakeholders would come to a consensus that a secondary network is to be buitd, the Consultant may:

- Assist the Government in the selection of the Aggregator
- Assist in reviewing the Aggregator Master Plan
- Help drafting the Service Contract

Addendum – Gas Paper

A1 Overview of Gas Usage

A1.1 Preamble

This paper forms part of the Gas Market Promotion Strategy (GMPS) study undertaken by Nexant at the request of the WAGP Project Implementation Committee, in the framework of the USAID-funded technical assistance coordinated by the ECOWAS Secretariat. The GMPS study aims at assessing the potential gas usages in the WAGP gas Purchasing Countries, including the analysis of the estimated cost of access to gas as well as at developing gas market promotion strategies.

Within this context, the present document is an assessment of all gas usages developed to date in the world and in Africa, to serve the purpose of informing the PIC and the WAGP Sponsor States stakeholders of what WAGP gas is and what can be done with it. It is structured as an overview analysis of the main usages of gas and their relevance to the economic conditions existing in Ghana, Togo and Bénin.

A1.1.1 Objectives of the Overview of Gas Usage

The key objectives of the present document are:

- Prepare a world-wide overview of the gas usage and highlight the market drivers for the main industries using gas as feedstock or fuel;
- Develop a world-wide and regional summary of the supply and demand for the main gas usages;
- Highlight the key success factors of the specific industries using gas and their competitive strategies;
- Present the basic economics of the gas industries analysed, with a view to assessing the feasibility of the various gas usages in the WAGP Purchasing Countries.

A1.1.2 Information and Data Sources

The Overview of the Gas Usages is an inventory of the existing gas usages in the world, to help determine which of these usages can apply to the Purchasing Countries. The main sources used in developing the Overview of the Gas Usages are the following:

- In-house data and analysis on the worldwide gas industry
- Field data on the Nigerian experience of gas usage, through site assessment
- Findings of the field data gathered in the Nexant Assessment Visits in Ghana, Togo and Bénin
- Information presented in existing reports on regional gas:
  - Energy Strategy Study for Bénin - Tractebel, 1996
  - Ghana Natural Gas Market Assessment – NERA – May 1997
  - Bénin Gas Market Study – Beicip-Franlab – December 1997
  - Market Study for the Supply of Natural Gas to Togo – Tractebel – April 1998
  - West African Gas Pipeline Project – Market Report – Purvin & Gertz – March 2001.

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A2 Definition of Natural Gas and WAGP Gas

In order to understand what can be done with WAGP gas, and also to better assess the potential developments of various gas usages in Bénin, Togo and Ghana, especially non-power generation ones, it is important to answer the following questions:

- What is Gas?
- What is WAGP Gas?

A2.1.1.1 What is Gas?

The term gas is most often applied to a whole range of naturally occurring flammable gases, which have a myriad of industrial applications and the principal chemical constituents of which are the elements Carbon and Hydrogen, hence the other generic name "hydrocarbon gases". In general though, the term is more often than not applied to the most common of these; the light saturated hydrocarbon chains or paraffinic compounds chemically defined as $C_nH_{(2n+2)}$ where C represents a Carbon Atom, H represents a Hydrogen Atom and "n" refers to the number of Carbon atoms present in that specific gas molecule.

A2.1.1.2 What is WAGP Gas?

We shall limit our discussion to the four constituents we are concerned with in the WAGP project, listing them in order of molecular weight starting with the lightest:

- Methane CH_4
- Ethane C_2H_6
- Propane C_3H_8
- Butane C_4H_{10}

The heavier gases, Propane and Butane, are more commonly referred to as Liquefied Petroleum Gases (LPG), a loosely defined product that can be any combination mix (0-100%) of these two constituent gases. In fact it is probably true to say that historically, the term gas in Africa is more often used to refer to LPG. WAGP gas contains only trace amounts of LPG, around 2%, as these have been separated out prior to injection into the pipeline since it is not technically feasible to transport these in gaseous form via the WAGP. The presence of these two gases, combined with the high pressure the pipeline operates under and the cold seabed temperature would otherwise encourage liquid to form in the line, with potentially disastrous consequences for compressor systems and all other downstream equipment associated with pipelines. These will therefore not be discussed further in this document. A further 2% of the WAGP gas represents various constituents with no value to the WAGP project.

Ethane, constituting some 6% of the WAGP Gas by volume, is the most valuable of the constituents due to its versatility. A significant proportion of modern day plastics and petrochemicals are based on ethane derivatives and it can truly be said that this material more than any other has revolutionised every aspect of modern civilization. Its value is such that it is often cost effective to separate it out (an energy intensive operation) from amongst the other gases for utilization as feedstock to petrochemical facilities. The limited quantity of ethane present in WAGP gas negates the recovery of this material for commercial use in the consumer countries. Further discussion of this material in the Nexant report will also therefore not be undertaken.

We are therefore left with Methane, commonly though inaccurately referred to as Natural Gas, since it is the largest single constituent of most natural gas reserves. It is by far the most abundant of the

naturally occurring hydrocarbon gases, and is also the primary constituent of the WAGP Gas, accounting for almost 90% of the total gas volume transported.

Methane, as will be seen later in this section is utilised in the manufacture of many common petrochemical commodities, e.g. Fertilizer, Methanol, MTBE (a motor gasoline additive etc.). However, experience shows that these primary industries are only ever commercially viable when located close to the gas source. Methane use as bottled gas (i.e. compressed natural gas or CNG) in tropical climates such as West Africa is possible but not always feasible economically due to the high pressures involved (200Bar+ cf. 20 Bar for LPG).

The technical specifications of the WAGP gas are as follows (with possible minor variations due to upstream operations):

Constituents/Data	Est. Values (%)
Methane	88-90
Ethane	6
Propane	1.3
Butanes	0.7
Others (Inerts etc.)	2-4
Net Heat Value (BTU/SCF)	963
Gross Heat Value (BTU/SCF)	1061

Source: Commercial Group Technical Data

Table A2-1 WAGP Gas Composition

A3 Worldwide Gas Markets

A3.1 Gas Supply

Global natural gas reserves have doubled over the last twenty years. The evolution of proved gas reserves has been dynamic in several regions, where significant increases have been recorded: in the Former Soviet Union (FSU) gas reserves increased by more than 50%, those in Africa registered an increase of 87% and the gas reserves of the Middle East rose by more than 100%[12]. Two African countries are among the first ten countries in terms of the largest gas reserves: Algeria and Nigeria. However, in terms of marketed production, only Algeria is ranked amongst the first ten. The breakdown of marketed production of natural gas by region is shown in the figure 1-1 below. Out of the total production of almost 2,400 BCM per year, Africa represents 5%. This share is expected to grow as significant efforts are put into developing new reserves (e.g. Egypt, Ethiopia) and into increasing exports. Gas exports rose significantly over the last few years reflecting the Algerian pipeline exports to Europe and Nigerian LNG exports to Europe.

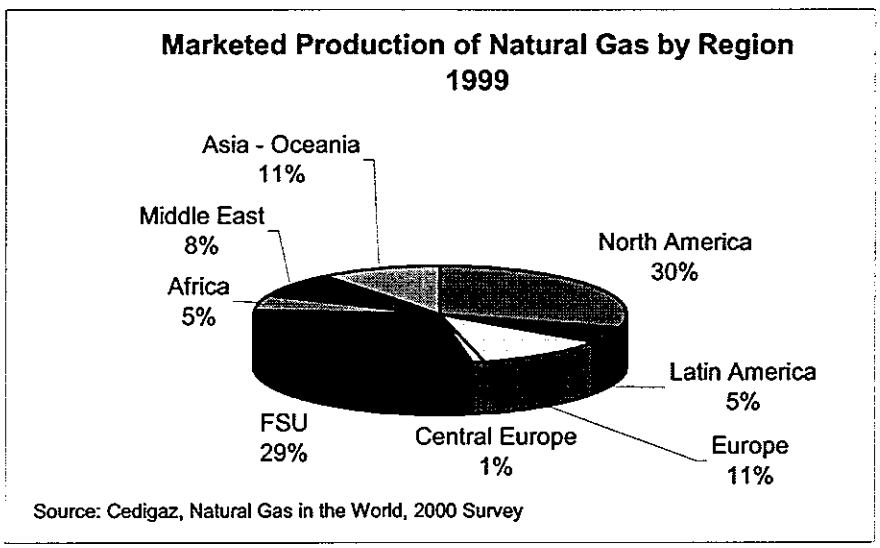

Figure A3-1 Marketed Production of Natural Gas by Region

The supply of gas via trading routes, LNG or pipeline, reached a volume of more than 580 BCM in 1999 according to Cedigaz 2000 Survey. The world gas trade represented 24% of the total gas marketed. The LNG trade represented more than 20% of the total volume traded worldwide. The major LNG importing countries in 1999 were: Japan 56%, South Korea 14%, France 8%, Spain 5.7% and Taiwan 4.3%.

The major pipeline gas importers in 1999 were: USA 21%, France 7%, Italy 10%, Ukraine 13% and Germany 16.5%.

It is important to note that there is a significant contrast between production areas and the reserves areas. In particular, North America is producing way above its relative reserves. However, even at present consumption rates, there are sufficient reserves for more than sixty years of consumption. This figure (which varies significantly from one region to another) ignores new findings of gas in the future or improved supply chain technology.

[12] Cedigaz, Natural Gas in the World, 2000 Survey

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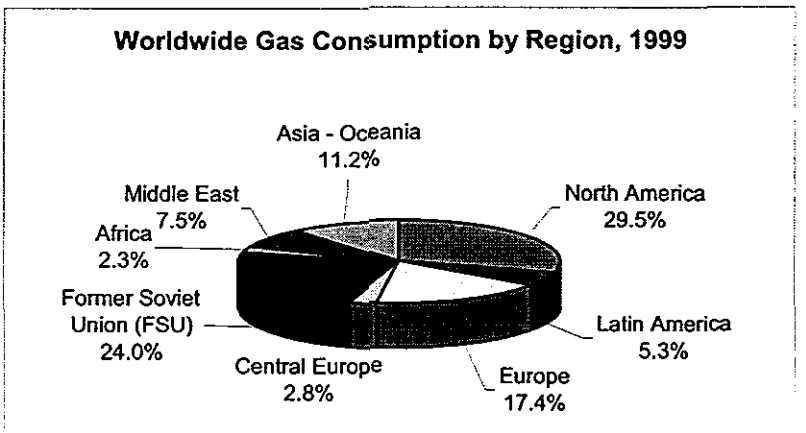
A3.2 Gas Consumption

The total volume of gas traded globally represents only 24% of the gas used in 1999 according to the International Energy Outlook 2001, due to remote locations of the supply centres, high transportation costs and investments associated with moving gas to the demand markets. Lack of infrastructure is the major barrier to increased worldwide gas consumption. This problem is particularly true of Africa, which accounts for only 1%[13] of the worldwide transportation and distribution network.

In the context of the global gas consumption, Africa represents the smallest share at only 2.3%, similar to the consumption in Central Europe of 2.8%. The distribution of gas consumption by region is shown in figure 3-2 below.



Source: Cedigaz, Natural Gas in the World, 2000 Survey

Figure A3-2 Worldwide Gas Consumption by Region, year 1999

A more detailed breakdown of gas consumption by sector in the various regions, as recorded in 1998 is shown in *Figure A3-3*. Compared to other areas, gas consumption in African countries is biased towards electricity generation. This is largely due to very low consumption in the residential and commercial sectors, and low industrial capacity in most African countries.

Generally, per capita consumption is affected by availability of cheap gas and economic development.

[13] Cedigaz, Natural Gas in the World, 2000 Survey

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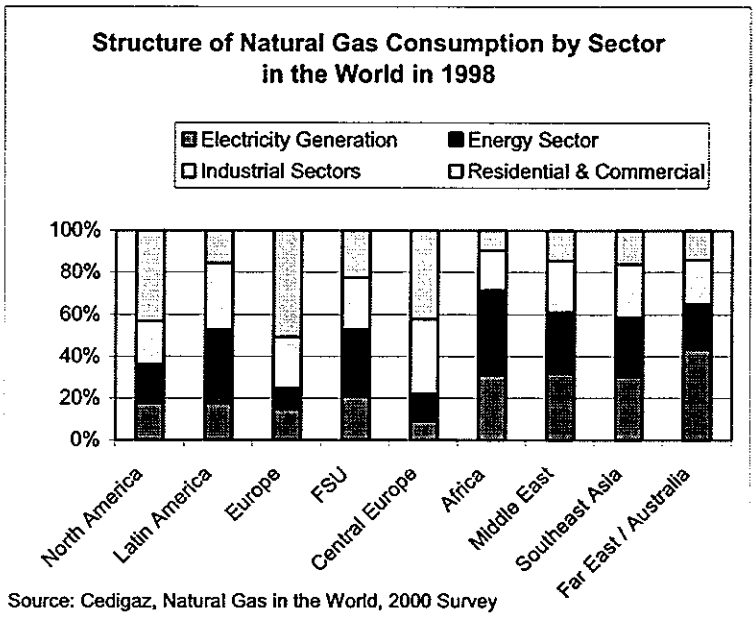


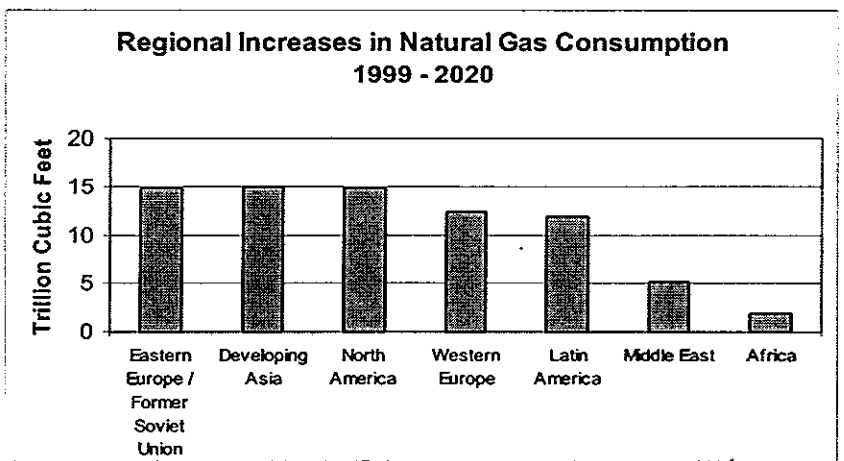
Source: Cedigaz, Natural Gas in the World, 2000 Survey

Note: Energy sector refers to production, treatment, processing and transportation of hydrocarbons and consumption of district heating plants

Figure A3-3 Breakdown of Gas Consumption by Region and by Sector, year 1998

A3.3 Demand Projections

Natural gas is the fastest growing primary energy source. Natural gas consumption for the next 20 years is projected to double, from 84 TCF in 1999 to 164 TCF in 2020[14]. The largest share of this growth is due to increasing demand for gas in the power sector in industrialised countries with gas fuelling 25% of the electricity generation in these countries by 2020. Similar trends are projected for developing countries where an estimated 3% annual demand growth is expected.



Source: Energy Information Administration (EIA), International Energy Outlook, March 2001

Figure A3-4 Projected Natural Gas Consumption Growth to 2020

[14] Forecast according to Energy Information Administration, International Energy Outlook 2001

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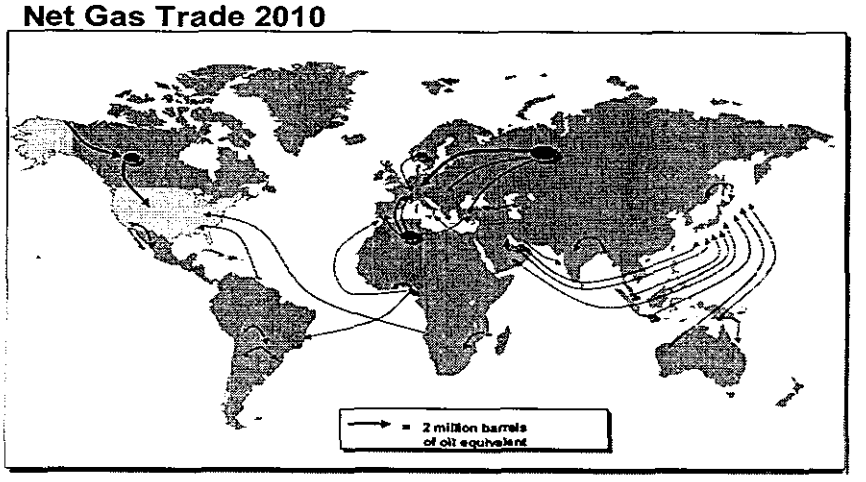

Figure A3-5 Natural Gas Flows Worldwide, projections to year 2010

Natural gas represents, as already indicated above, the growing component of the primary world energy consumption. Whilst oil share is projected to remain in the 40% range, worldwide gas consumption is expected to increase from 23% in 1999 to 28% in 2020 as a consequence of increased usage in power generation and industry.

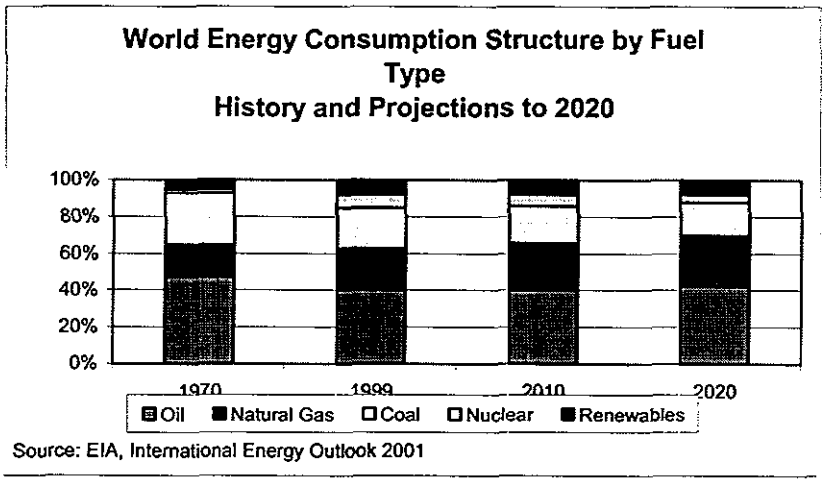

Figure A3-6 Historic and Projected World Energy Consumption by Fuel Type to 2020

Looking closer at the primary fuel source for power generation worldwide, illustrated in figure 3-6, the gas share has been increasing since 1995 from 17% to almost 19% in 1999. This trend is expected to continue over the next twenty years to a reach a share of 28%. Most of this increase is expected to take place in Western Europe, provided gas prices remain competitive.

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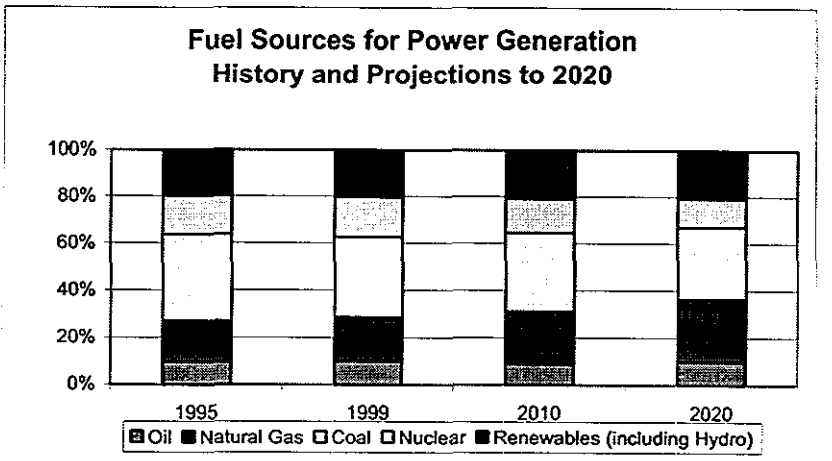

Source: EIA, International Energy Outlook

Figure A3-7 Historic and Projected Fuel Sources for Power Generation by 2020

The power generation and gas sectors are becoming increasingly interconnected in Western Europe and USA due to increased availability of gas supply, improved gas turbine technologies and the environmental regulation. However, regardless of the region, gas consumption growth is driven by a combination of economic factors:

- The price of competing fuels and relationship between the gas price and other fuel prices
- Incentives stipulated by the environmental regulation favouring fuels low in sulphur
- Strong policies on carbon emission, reinforcing the advantages of gas
- Diversification of energy sources

Growth can also be triggered by a governments' interests in developing gas projects, as is the case in several countries, including Algeria and more recently Nigeria.

A3.4 Critical Issues in Developing Gas Markets

The critical issues in developing gas consumption can be summarised as follows:

- Gas resources are far away from the markets.

  As has been demonstrated, gas reserves worldwide are abundant. However, since export markets are distant, high transport costs hinder the development of gas usage. This commercial problem is compound by transit issues, i.e. a pipeline must cross several countries, raising issues such as security of supply, ownership and operation of infrastructure, and transit fees levied. These factors can make new technologies such as Gas-to-Liquids (GTL) attractive.

- Financial resources needed to develop infrastructure.

  Besides the fact that capital investments are significant, the nature of the sponsors is sometimes critical to the availability of funds. Availability of foreign capital is in most cases connected with the liberalization of the energy sector. Also key to the development of gas infrastructure is the contract period. The current wisdom is that in order to develop capital-intensive facilities, long-term (20 years +) take-or-pay contracts are needed. This wisdom has started to be challenged and the observed trend is for shorter contracts: from 15-25 years to 8-15 years.

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- Gas price and its relationship to the oil price.

  This is particularly relevant to the power sector. During 2000 – 2001, the European border gas price levels were high – linked to the then oil price. However during the same period, electricity prices, impacted by regional liberalization, were low. This combination low price-high cost prevents further development of gas-fired power plants. In the future, gas sector players are expecting gas-to-gas competition, which would provide a downward pressure on gas prices, even though the dynamics are still unknown. Scenarios have been developed by International Energy Association (IEA) and the Royal Institute of International Affairs in the UK, whereby it was assumed that a realistic scenario for the delivered gas price in Europe during the period 2000 – 2010 would be in the range US$2 – 3 / MMBTU.

- Privatization and liberalization of the gas markets.

  This was largely triggered by the need to reduce fuel prices to industry and resolve environmental problems associated with the use of fossil fuels. For example, regulatory restructuring in the USA has resulted in the removal of gas price regulation, open access to infrastructure, expansion of short term or spot trading as opposed to long-term contracts. In the UK, the privatization of the gas and electricity utilities has triggered gas-to-gas competition. This approach is fundamentally tailored to suit markets with strong demand and established gas delivery systems, as the focus has been to establish conditions for the development of a competitive gas market. In less developed markets, lacking adequate infrastructure and demand, this approach may not be entirely adequate.

The main reasons for the increase in gas consumption in various regions are in summary:

- USA: environmental protection concerns and the expected decline of nuclear power generation together with the deregulation in the electricity and gas markets. This has meant the removal of the price controls, with an emphasis of gas trading and distribution at a regional level.

- Europe: deregulation of the electricity markets, new environmental regulations, the decrease of indigenous coal production and lack of growth of nuclear power.

- Developing countries such as Bolivia and Brazil: a major driving force in gas developments has been the privatization of the gas utilities and the attraction of foreign investments as a consequence of the liberalization of the energy sector.

A3.5 Major Gas Usages

A3.5.1 Power Generation

A3.5.1.1 Industry overview

The demand for gas in power generation is crucial to any future projection of overall gas demand. Between 50% and 70% of the increase in European gas demand up to 2020 is expected to be in the power sector. Such significant increases in gas consumption are dependant on price levels and the relationships between gas price and other competing fuel prices.

In this context, the biggest change the gas industry has experienced in the last twenty years is probably the development of the high efficiency combined cycle gas turbine (CCGT) power generation plant. This has revolutionised the economics of gas in countries with a large power demand. The value of gas for power generation in CCGT's is so much higher than for producing for example urea, that urea plants can no longer afford to purchase gas feedstock and are therefore shutting down in the USA and in Europe and in some cases re-selling gas from long-term gas contracts.

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At gas costs of around US$5 / MMBTU, CCGT operators are still highly competitive with alternative fuels. This order of gas cost is found in many of the gas markets – such as the USA and Europe and is the true cost of importing gas into gas deficient markets such as India.

A3.5.1.2 Key Industry Parameters

During 2000/01, European border gas prices – linked to oil prices – were at the highest levels for a decade, whilst European electricity prices, impacted by liberalization, were at relatively low levels. These are commercial conditions that can prevent any significant building of new gas-fired power generation. To realise the large forecast increases in consumption of 50% to 70%, the price levels have to become more competitive. For example, the IEA gas price scenario for the period 2000 – 2010 assumes gas price in the range of US$4-5 / MMBTU and lower, in the range of US$3-4 / MMBTU for the subsequent ten years. Since LNG can be distributed to Europe at around US$2.5 / MMBTU, pressure to reduce gas prices exists. The border price itself does not represent the only key element in driving the growth of the gas sector. The taxation imposed in several Western European countries can reduce gas demand even if gas is at an advantage against other fuels as end-users invest in energy conservation.

Should the traditional link between gas and oil prices be broken, then gas prices could become more competitive, particularly in the power generation sector.

A3.5.1.3 Economics

Various studies and analyses undertaken in OECD Member countries relating to the electricity generation costs for gas-fired CCGT power plants have highlighted the basic economics as follows:

- Average CCGT plant size: 600 MW
- Gas fired CCGT capital costs are lower than US$800/kWe in both OECD and non-OECD countries
- Gas-fired plants are more sensitive to fuel prices since fuel accounts for a larger proportion (around 60%) of total costs than in coal plants
- The projected costs of generating electricity in 2005 is based on the price expectations of the players in the power sector

Gas Price Data for Electricity Generation
Historic and Projections
US$ per GJ

	1998	1999	2005
Mexico	1.944	2.108	N/A
USA	2.200	2.398	1.58
Hungary	2.984	3.210	3.42
Spain	3.063	2.863	5.17
UK	3.017	2.742	N/A
Japan	5.056	5.056	4.95

Sources:
Historic: IEA Statistics, Natural gas Information 2000
Projections: Proceedings of International Power Generation Conference, Aug. 98, Baltimore, USA

Table A3-1 Cost of Gas for Electricity Generation, Historic Data and Projections

- The projected levelised generation costs demonstrate that in the majority of cases, gas –fired plants are cheaper that coal-fired plants. Also, at higher discount rates, gas-fired CCGT have an advantage compared to the more capital-intensive alternatives.

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Projected Levelised Generation Costs for Gas-Fired Plants	
US cents / kW	
	Discount rate
	10%
France	5.3
Hungary	4
Italy	5.1
Japan	8.4
Spain	5.4
Turkey	3.4
USA	2.7

Source:
Projections: Proceedings of International Power Generation Conference, Aug. 98, Baltimore, USA

Table A3-2 Projections of Levelised Generation Costs for Gas-Fired CCGT Plants for year 2005

In may countries the gas –fired plants are the least expensive option compared to coal or nuclear plants, due mainly to lower cost construction, and maintenance, lower fuel prices and low cost of compliance with emission regulations compared to other fossil-fuelled technologies.

A3.5.2 Gas as Feedstock

A3.5.2.1 Fertilizer Production

Industry Overview

Ammonia is consumed primarily in fertilizer manufacture as shown in the figure below, although a significant amount of ammonia is used to produce other chemicals (nylons and artificial fibres).

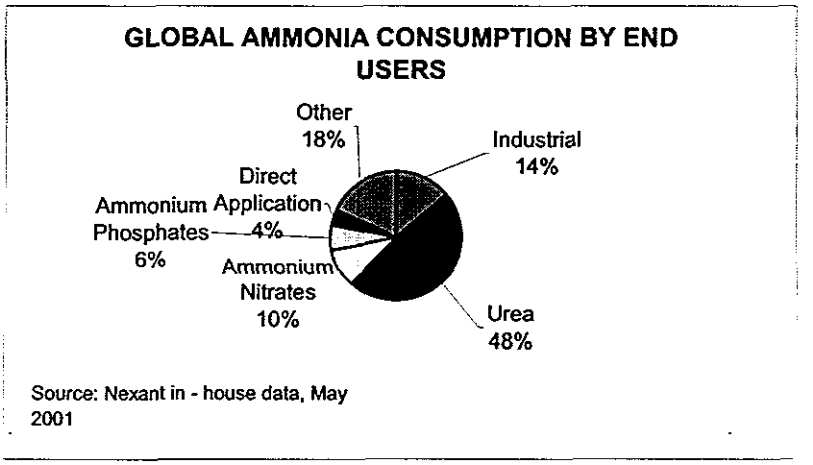

Figure A3-8 Global Ammonia Consumption, year 2001

Around 90% of current global production of ammonia is based on natural gas feedstock. Access to low price gas feedstock has led to the concentration of new ammonia plants in Latin America, the Former Soviet Union (FSU), the Middle East and some parts of Asia.

Urea can be supplied to the customer in two main forms: prilled (the traditional form) and granular (a more recent development). Granular material costs more to produce and normally commands a premium price on the market. Almost all of the market in the USA and other developed countries is for granular urea. In price sensitive markets, that place no value on mechanical handling, prilled product still finds a market. However, almost all new plants are built with granulation plants, rather

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than prilling towers and in the future, the ammonia market will gradually transition to granular, as prilled plants cease production.

Supply Demand Balance

The ammonia market reached 180 million tons per year worldwide in 2000. An annual growth of 2.5% is estimated for the medium term. The growth has been primarily driven by government policies that have encouraged the use and manufacture of fertilizers. Consequently, new capacity is planned or considered, especially in the Middle East and North Africa and their products will substitute the higher cost production in Europe or USA.

Global demand for urea is expected to grow at 2.5% for the next twenty years, in line with projections for ammonia, with global capacity reaching around 147 million tons per year of urea by 2005. Capacity will continue to build in the Middle East, supplying growing demand in Pakistan, India and Thailand. As major markets such as India, Europe and North America rationalise their own high cost production in favour of lower cost imports, global trade in urea is expected to increase at around 4% according to Nexant's research and analysis. African countries rich in gas would be well placed to tap this market providing the right economic climate exists.

Economics

The cost drivers for a fertilizer manufacturer are:

- Capital cost recovery. The fertilizer industry is a relatively low risk industry. An average cost of capital for a fertilizer manufacturer based in the USA or Western Europe is 7.5% in nominal terms. For other locations, investors would normally seek a risk premium based on the perceived additional risk for investing in a country.

- Gas cost. Difference in gas costs is the long-term advantage that gas rich countries have over other countries in this industry. A low gas cost is key to developing a fertilizer plant and countries such as India who intend to develop the domestic fertilizer industry are doing so based on gas prices in the region of US$0.75 / MMBTU.

- Capacity utilization. Capacity utilization is also a major factor affecting the economics, as it is the case for all high capital cost industries. Efficient utilization of capacity has become the norm in the fertilizer industry and therefore does not represent an important competitive advantage.

- Shipping costs. Shipping costs are the major constraint that inhibits the supply of fertilizers from low cost gas countries. Urea and ammonia are low cost commodities, where shipping costs can add significantly to the price of product delivered to the farmer.

As an example, a typical cost structure of delivering ammonia to a location (from a Middle Eastern supplier to India) is illustrated below.

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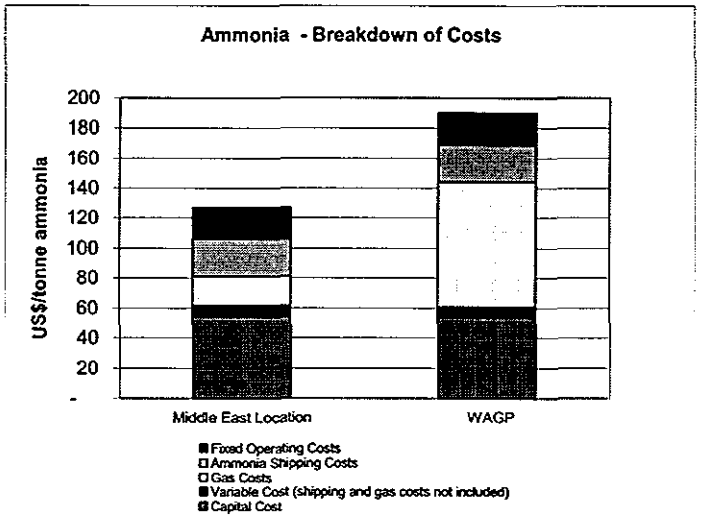


Source: Nexant in-house data, 2001

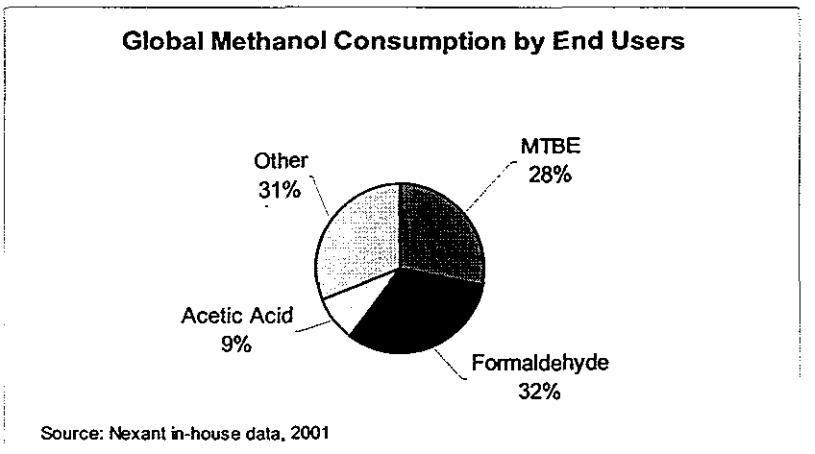
Figure A3-9 Typical Cost Structure for Delivering Ammonia from a Middle Eastern Producer to India

The optimal size of an ammonia plant, i.e. a world scale plant, is in excess of 1,750 TPD. Gas consumption for a world-scale plant is 33GJ/tonne (31 MMBTU/tonne) if gas is used only as feedstock. If gas is used for utilities, then the consumption rises to 43 GJ/tonne (41 MMBTU/tonne).

A3.5.2.2 Methanol Production

Industry Overview

Methanol consumption has continued to grow steadily over the last few years. Typical applications of methanol are in motor fuel additives, adhesives, solvents and aerosols. Part of the growth has came form traditional end-uses such as formaldehyde (used in adhesives and laminates) and some from newer end-uses such as MTBE. The outlook for MTBE, hence to a lesser extent, methanol, is presently uncertain following the Californian State Government's decision to ban the use of MTBE as an automotive fuel additive, it's main market. The structure of methanol consumption by end-user is shown in *Figure A3-10* below.



Source: Nexant in-house data, 2001

Figure A3-10 Global Methanol Consumption, year 2001

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Formaldehyde is predominantly used in producing adhesives destined for construction sectors. Their growth is linked to general economic growth. This is valid for most of the methanol based chemical products for which GDP growth represents a good indicator for methanol forecasts.

Supply Demand Balance

The methanol market worldwide reached 30 million tonnes per year and is estimated to have an annual growth of 2.6% per year in the medium term. An overview of the current supply – demand balance and supply and demand projections are shown in *Figure A3-11*.

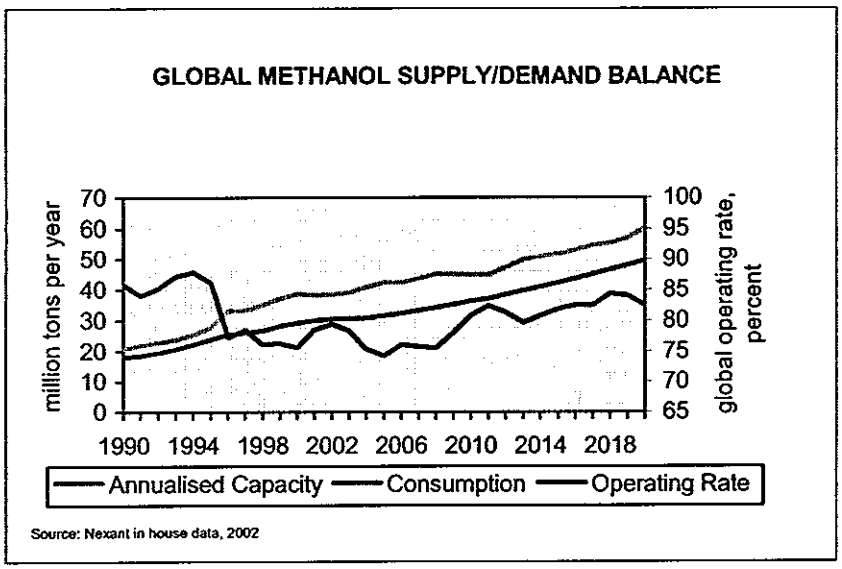

Figure A3-11 Historic and Projected Methanol Supply / Demand Balance

Overall methanol consumption, split by region, is shown in *Figure A3-12* below.

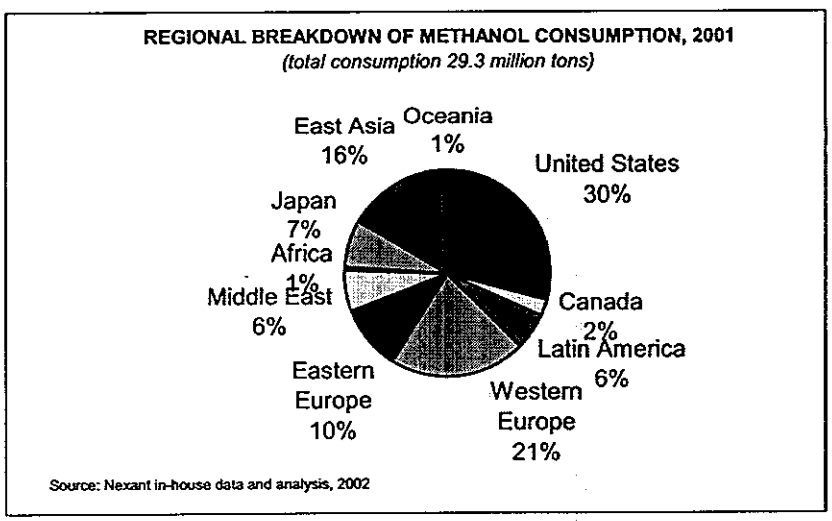

Figure A3-12 Breakdown of Methanol Consumption by Region, year 2001

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The USA is the largest single methanol consumer followed by Western Europe and East Asia. Whereas the USA market is set to decline over the next few years due to the restrictions imposed on the use of MTBE, the East Asia is estimated as a growing market.

Economics

The size of a world-scale methanol plant is 3,000 tonnes / day with a gas consumption of 33-35 GJ/tonne (31-33 MMBTU/tonne) of methanol.

Given that the cost of shipping methanol can represent a significant share of the delivered cost, the markets' location is determined in most cases by geographical considerations.

The existing trading pattern is expected to continue into the future, reflecting the fact that low cost gas producers are located in areas with low domestic consumption, whereas in the major consuming regions there is an alternative value for natural gas that makes local production less economically attractive.

The export production in Africa is located in Libya and Algeria and the target market is Southern Europe where the product is shipped. The new plant in Equatorial Guinea will target Western Europe and the United States.

The key factors in methanol production are the gas price and shipping costs. Other elements such as utilities costs, labour and maintenance play a minimal role in the overall costs.

- Gas cost. The gas costs vary from producer to producer and typical figures are:

Country	US$ / GJ (2001)	US$ / MMBTU (2001)
Bahrain	0.49	0.47
Iran	0.49	0.47
Trinidad	1.15	1.09
Saudi Arabia	0.73	0.69

Source: Nexant, in-house data, 2002

Table A3-3 Gas Cost for Main Methanol Producers, year 2002

- Shipping cost. When shipping methanol from a remote location, the cost of shipping can be significant. The cost of shipping is also volatile and depends not only on the size of the cargo but also on the demand for shipping. One way to overcome this hurdle is for the producer to enter into long-term contracts rather than use the spot or short-term contracts available on the shipping market.

A typical structure of the overall cash cost of delivered methanol is shown in *Figure A3-13.*

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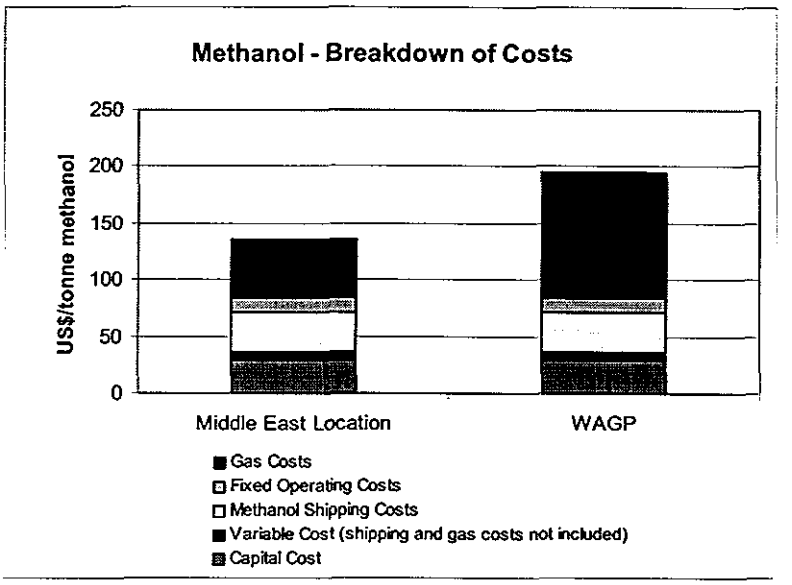

Figure A3-13 Typical Cost Breakdown for a Middle Eastern Producer Delivering Methanol to India

A3.5.2.3 GTL (Gas to Liquids)

Industry Overview

The technology of converting gas to liquids is receiving a lot of attention presently. The liquid fuels produced by this technology are premium products with very high specifications such as zero sulphur content. However, the technology essentially starts from the same point as ammonia i.e. synthesis gas which is then converted to a mixture of paraffinic hydrocarbons which are then hydrogenated and isomerised to give primarily high quality transport fuel.

Supply and Demand

At present, GTL plants are small scale and demonstration units as the economics of this sector are still uncertain. Licensors are claiming that increase in scale will reduce capital investment below US$25,000 / BBL[15] (from approximately US$30,000 per BBL presently), while efficiency will be improved from the current 9,000 - 13,500 SCF/BBL of transport fuel over the next ten years. Current high oil prices and the demand for higher specification fuels will encourage new plant developments, examples of which are the proposed plants in South Africa, Qatar and Nigeria that are in various stages of engineering design. The drivers for these projects bearing in mind the high capital cost is primarily the availability of large volumes of stranded gas at a relatively low price. This is obviously not the case for end of line WAGP customers.

Economics

A small-scale unit GTL plant of 200,000 TPA production (or 5,000BPD) consumes 50-70 MMSCFD[2]. This is equivalent to the gas consumption required by a 350MWe combined-cycle power plant. Recent feasibility studies looking into the viability of GTL plants showed that the following are the estimated economics of a small-scale viable plant (appropriate for the African market):

- Plant output capacity: 5,000 BPD
- Capital expenditure: US$30,000 / BBL of capacity

[15] By comparison, a typical refinery cost will be in the region of US$6-12,000 / BBL, depending on complexity

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- Product price: US$30 / BBL
- Gas price: US$1 / MMBTU
- Discount Rate 12% (real terms)

Very broadly, the cost of producing GTL products is evenly divided between operating costs, investment costs and natural gas feedstock costs as shown in *Figure A3-14*.

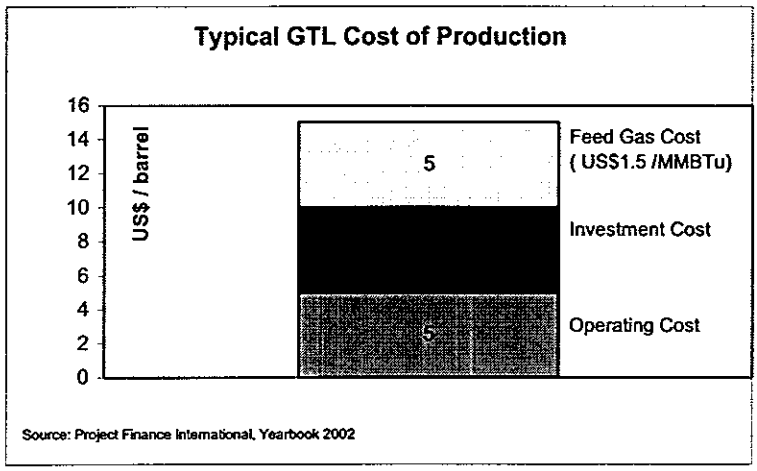

Figure A3-14 Breakdown of Costs for GTL Production, year 2002

Based on industry data, a GTL plant would be economic when the crude oil price is at least US$20 / BBL if gas is available at US$1.00 / MMBTU[16]. In the case of a GTL plant located proximal to a gas field, the plant become viable at a lower crude oil price, at around US$18 / BBL.

A viable GTL project depends on a multitude of factors, some mentioned in this section and some not discussed in this paper such as taxation, royalty treatment, financing approach and construction. However, internal rate of return proves to be an acceptable measure over a range of assumptions, as shown in *Table A3-4*. The assumptions refer to various levels of investment per 1,000 BPD capacity and for various gas prices between US$0.50 & US$2.00 / MMBTU. Under these assumptions, the equivalent crude oil price (US$ / BBL) required for an IRR of 15% is shown (see table below).

Investment US$ / 1,000 BPSD		**$15m**	**$20m**	**$25m**	**$30m**
Feed gas price scenario (US$ / MMBTU)	0.50		11	14	16
	1.00	13	16	18	21
	1.50	18	21	23	26
	2.00	23	25	28	31

Source: Project Finance International, Yearbook 2002

Table A3-4 Crude Oil Price Required for 15% Internal Rate of Return (IRR)

[16] Africa Gas Initiative Main Report, February 2001, UNDP / World Bank Energy Sector Management Assistance Programme (ESMAP).

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Since most GTL projects target ultra low sulphur diesel fuels, the potential premium for GTL diesel compared to refinery diesel is a critical consideration in any economic calculation.

Currently Shell operates a GTL project in Bintulu, Malaysia, with a capacity of 12,500 BPD of middle distillates using some 100 MMSCFD of natural gas.

Another planned project is based in Qatar and aimed at producing about 35 kBPSD of distillates and naphtha. The project will consume between 350 MMSCFD of gas. The capital investment is estimated at about US$1.0 billion. Future expansion of the plant could take overall capacity to 120 kBPSD.

In Qatar and Oman, due to the co-production of large quantities of condensate, the revenues obtained from condensate sale can improve the economics of the GTL projects – they can be equivalent to a reduction in the price of crude oil of up to US$10 / BBL.

A3.5.3 Gas as Heating Source

Note: *Sections A3.5.3.4* to *A3.5.3.8* deal specifically with Purvin & Gertz strategic projects identified in Ghana.

A3.5.3.1 Industrial Sector

The industrial sector structure in Africa is concentrated in small or medium size industries, mainly in the following fields: food processing, ceramic and tiles, glass, clinker and metal industries.

At present, industrial demand for gas in Africa represent around 27% of the total energy demand in the Sub-Saharan countries[17]. The majority of industrial demand is met by electricity and fuel oil, whereas gas represents a higher proportion in Nigeria only.

The economics of these sectors are dependant on the price of energy and therefore, the increase of gas usage in the industrials sectors mentioned depends on the fuel mix an their price attractiveness. Pre-feasibility studies demonstrated that the potential industrial gas market ranges from 80,000 toe (tons of oil equivalent) for larger industrial markets such as Abidjan to 4,000 toe for small markets such as Congo (Pointe Noire)[6]. In addition to the size of the market, the potential for an increased gas industrial usage depends on the cost of conversion from fuel oil to gas. It is expected that in time, gas equipment will replace conventional and more energy intensive ones.

As noted in the Purvin & Gertz report, there are some potential Strategic Projects that have been identified for Ghana. Several of these have significant gas demand. These projects are generally larger in scale and represent significant investments. We have included below some information on the conventional, *world-scale* new plants for each of these potential projects too.

A3.5.3.2 The Glass and Ceramics Industry

Gas is used in the glass and ceramics industry to fire furnaces. An alternative fuel for the furnaces is LPG. The conversion costs to switch a furnace from LPG to natural gas are negligible and therefore, the affordable gas price in the glass industry is equivalent to the LPG price. For new glass plants modern electric heating technology is preferable to gas firing as it is less capital intensive.

The demand from the glass industry is relatively low – a typical glass plant would consume no more than 3.5 MMSCFD. The glass industry alone cannot provide the quantity of demand necessary to support a gas infrastructure project.

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[17] Africa Gas Initiative Main Report, February 2001, UNDP / World Bank Energy Sector Management Assistance Programme (ESMAP).

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A3.5.3.3 The Cement Industry

Cement industries are a large energy consumer with the greatest proportion of their energy bill arising from drying and curing processes. The presence of these in almost all the consumer countries offers an opportunity for fuel substitution for gas from the WAGP. However, there are provisos in that:

1. The cement process is a highly alkaline process and as such it is more tolerant of lower quality (high sulphur) fuels than most other industries. **Fuel in cement manufacture is burnt in an open flame in direct contact with the limestone. High sulphur content fuels can easily be accommodated and the sulphur dioxide produced by the combustion of the fuel reacts with alkaline cement, removing the sulphur dioxide from the flue gas. Cement manufacture can therefore utilize fuels that would normally be highly unattractive due to the cost of cleaning the flue gases. These high sulphur fuels are normally sold in the world market at a large discount.** However, and fortunately most fuel oils sold in West Africa are of the low sulphur variety (LSFO).

2. Most clinker manufacturers assert that fuel oil has a "hard sting", a short concentrated flame, which transforms limestone to clinker faster than the long flame obtained from gas.

The main driver therefore for market penetration into this segment has to be fuel price as opposed to the cleaner burning properties of natural gas.

A3.5.3.4 Iron and Steel Manufacture

Traditional iron and steel manufacture has been through the major blast furnace / basic oxygen process in integrated major steel mills. Steel is in structural surplus in the world and to survive in this competitive environment any new project needs to have highly favourable economics. Key factors for a viable traditional steel mill are:

- Capacity 2 to 5 million tonnes per year of liquid steel
- Access to a market that can absorb the bulk of the output
- Direct access to deep water (water more than 25 metres deep at the jetty) for importation of low cost coking coal and iron ore from very large bulk carriers.
- Integration with rolling mills / specialist coating mills to absorb the output from the plant. Traditional steel mills still dominate the world supply of flat products and heavy sections due to the large volumes of steel required to make the rolling mill viable.

In the past ten years, new Greenfield, large steel mills have been relatively unusual. Gas is not normally the major fuel used in this industry, as most energy is provided by the coking coal, which also provides the chemical reducing agent to convert the iron ore (oxide) to iron.

Most new capacity in the industry has been installed in recent years using the newer, more flexible process found in the so-called *Market Mills*. These use electric arc furnaces to melt scrap steel and some iron ore pellets to produce steel. Typically key factors for this type of mill are:

- Close proximity to the target market able to absorb around 1 million tonnes of product – often either a simple product, such as rebar or wire or a very specialist steel grade produced in small quantities, such as stainless steel.
- Scrap and iron pellets readily available.
- Reasonable electricity prices.

Gas is not a major fuel requirement for electric arc furnaces – the electric arc provides most of the energy. Gas can be used for preheating furnaces and for use in the reheat ovens to prepare the steel billets for rolling into product.

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To feed iron for these *market mills* a new process for converting iron ore to iron was developed. This used natural gas as the reducing agent to convert pellets of iron ore into pellets of sponge iron. In regions of the world with gas resources, a significant number of these sponge iron plants (DRI – Direct Reduction of Iron) plants have been built. The key factors for a DRI plant are:

- Low cost gas supply – typically less than $1.50 per MMBTU
- Direct access to a jetty for import of iron pellets (15metre plus depth) and export of product.
- Local market for iron pellet product

A typical size of a DRI plant of economic scale is around one million tonnes of iron production per year. This would have the following parameters:

Materials	Consumption
Iron Oxide (pellets/lump ore)	1.7 mn t/y
Natural Gas	2.8 million GCAL/year (11 MMMSCFD)
Power	15 MW
Water	1.7 million m^3/year
Iron Oxide Storage (pellets/lump ore)[1]	190,000 m^3
Core Plant[2]	5.0 hectares
Iron Oxide Storage & Support Facilities[2]	4.5 hectares

[1] Allowance for 30 days' supply of raw materials, for a 1.0 million t/y integrated steel production facility.

[2] Area required for a 1.0-million t/y capacity integrated steel production facility. Does not include space for expansion, dockside loading facilities, service buildings or third party processing activities.

Table A3-5 World Scale DRI Plant Data

Natural gas is the only viable feedstock to use for the DRI process. Whilst other sources of reducing gases, such as coke / coal have been tried, these have not been either financially viable or technically without problems. In the context of the WAGP project, it would require a special tariff for the gas to create conditions for a viable DRI project.

A3.5.3.5 Manganese Ore Processing

Manganese ore is found in Ghana. Manganese ore is smelted in an electric arc furnace together with reductants to produce various manganese rich products. These are then used in the steel industry to produce manganese alloy steel. Total electricity consumption in the smelting process amounts to about 32 GJ/tonne of product. Gas would be only a minor requirement for a smelter; electricity would be the main energy source. Nexant would suggest that if this project was pursued it would be a major gas consumer only indirectly through its electricity consumption. The electricity requirement would best be met from one of the major generation plants, rather than from captive power generation on site.

A3.5.3.6 Bauxite Processing

Bauxite is the ore for the production of aluminium. The first stage in the manufacture of aluminium is the conversion of bauxite ore into alumina in an *Alumina Refinery*. Typically, Alumina Refineries are located close to the bauxite deposit and twice the scale of a typical Aluminium Smelter that converts the alumina to metal.

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Materials	Consumption per year
Dry Bauxite	2.0 - 2.5 million tonne
Caustic soda (100 %)	110,000 tonne
Lime	45,000 tonne
Power	30 - 45 MW
Water	1.5 million m3
Flocculant	600 tonne
Natural Gas	7.0 million MMBTU (19 MMSCFD)

- *Material quantities will vary with the bauxite characteristics.*
- Storage capacities will vary with the location of bauxite supply and alumina shipping requirements.
- A fenced area of 800 meter by 1000-meter area including 200,000-ton bauxite storage and 80,000 will be required.
- Size of Red Mud disposal area will depend on the bauxite refined. Approximately one kilometre square area is required for 3 -5 years storage of the dried solids accounting for 70 - 75 % of plant throughput.

Table A3-6 Alumina Refinery, Optimum Size Refinery 0.6-1.0 Million TPA (Metric)

The fuel requirement for an Alumina Refinery is largely for steam raising boilers. A variety of fuels can therefore be used. The data given above assumes that natural gas is available at a price competitive with alternative fuels. Gas consumption for this world scale project is 19 MMSCFD.

An Alumina Refinery may be dependent on the availability of a local resource of bauxite. Although there are plants elsewhere in the world that import bauxite and site the refinery close to a deep water bulk terminal. Alumina Refineries have a large effluent stream (red mud) that has to be stored and dried in large shallow lakes. This makes them environmentally unattractive features.

The Alumina Refinery has a useful link with another project on the Purvin & Gertz Market Report strategic list – a Chlor-Alkalis plant. This plant produces chlorine and sodium hydroxide by electrolysis from salt. The sodium hydroxide is often difficult to sell for a viable price. Alumina refineries are major consumers of sodium hydroxide and there would be significant synergy in co-location if possible.

A3.5.3.7 PVC Manufacture

PVC is manufactured from Vinyl Chloride Monomer (VCM). This is a carcinogenic liquid and transportation is now avoided. VCM is manufactured from Ethylene Dichloride (EDC). This in turn is manufactured from ethylene and chlorine gas. Ethylene is the most important building block in the organic chemical industry and is the feedstock for many plastics. Ethylene is manufactured in crackers on a very large scale (600,000 to several million tonnes per year). Nexant assumes that any PVC plant considered as part of the Strategic Projects would be based on importing ethylene and utilising locally produced chlorine to manufacture EDC and on to VCM and PVC.

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Natural gas or any fuel requirement for PVC manufacture is neither a critical requirement nor a major factor in the economics of a plant. Inputs required for the PVC plant are:

Materials	Consumption per year
Ethylene	Tonnes (assumed imported)
Chlorine	Tonnes (from chlor-alkali plant)
Fuel	21,300 tonne FOE (heating basis) or 2.7 MMSCFD of gas
Electricity	0.15 MWh per tonne PVC
Ethylene	77,050 tonnes (assumed imported)
Chlorine	100,000 tones (from chlor-alkhali plnat)
Medium Pressure Steam	63,000 tonnes or 0.5 MMSCFD of gas

Table A3-7 Typical PVC Manufacture Material requirement

The plant illustrated above would produce 163,000 tonnes per year of PVC.

A3.5.3.8 Salt Recovery and Allied Processes

A major building block of the chemical industry is sodium chloride – common salt. Salt can be produced either from rock salt deposits or from seawater by solar evaporation. Salt is refined in a simple vacuum crystalliser for use in the Chlor-Alkalis industry. Salt refining uses very little energy, and fuel choice for the steam required is not an important factor in the economics of the industry. The Chlor-Alkalis plant uses purified sodium chloride to manufacture chlorine and sodium hydroxide by electrolysis.

Chlorine is a highly poisonous gas that can be stored in liquid form. Chlorine production is closely linked to the downstream uses. The major use for chlorine is in the production of PVC (polyvinyl chloride) plastic and other chlorinated hydrocarbon products. Chlorine is also used in water sterilization, mainly in form of sodium hypochlorite, which safer to handle than liquid chlorine. Any Chlor-Alkalis project will only proceed as a strategic project if there is an immediate use for the chlorine that will be produced. This would mean in the context of the identified Strategic Projects, the simultaneous implementation of the PVC project.

The sodium hydroxide produced by the Chlor-Alkalis plant also needs a market. Sodium hydroxide is highly caustic and a relatively hazardous material to transport. It can be shipped either in solid form in bags or semi-bulk containers, sealed from moisture or as a concentrated 49% solution in water.

The economics of Chlor-Alkalis plants is dependant on three factors:

- Immediate market for the bulk of the chlorine produced, such as an adjacent PVC plant.
- Good market for the bulk of the sodium hydroxide with a reasonable transport distance. This market could be Alumina Refineries or glass plants (if naturally occurring soda ash is not immediately available.
- Low price of the large quantity of electricity for the electrolysis of the sodium chloride

The basic plant unit is an electrolytic cell and different sized plants are designed simply by varying the number of cells used. Fuel choice for steam-raising is not a critical economic parameter in the industry and any small natural gas supply would have to be competitively priced with alternative fuels.

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If the strategic project is selected to align with the Bauxite processing, which requires 110,000 tonnes per year of sodium hydroxide, then the inputs required for the Chlor-alkalis plant are:

Materials	Consumption per year
Salt (Sodium Chloride)	170,000 tonnes (as brine)
Low pressure steam	66,000 tonnes (0.5 MMSCFD of gas)
Electricity	2.5 MWh per tonne caustic

Table A3-8 Typical Chlorine Plant Material Requirement

The plant illustrated above would produce 100,000 tonnes per year of chlorine to feed the PVC plant.

A3.5.3.9 Residential and Commercial Sectors

In temperate climates (Europe, North America etc.) well-established town gas networks are commonplace. The development of these was facilitated in large part by the requirement for space heating, which accounts for approximately 80% of domestic demand in these climates, and is a relatively stable load (particularly in winter months). The resulting high utilization of the networks, coupled with the environmental pressure for fuel substitution to replace coal (the previous energy source) in order to eliminate smog from cities provided governments with sufficient incentive to develop these local networks.

Urban gas networks dedicated to residential or commercial use are not well developed in Africa mainly because of poor economics of such projects. Lacking a requirement for space heating, any urban gas network must be designed to cater for domestic cooking and hot water needs only. South Africa and Cote d'Ivoire have developed urban gas networks but they suffered from poor maintenance, increasing operating costs and payment arrears. The residential LPG pipeline network developed in Abidjan in 1970s faced a similar situation. At the peak, this network serviced 12,000 residential and commercial clients[18].

The main obstacle in developing residential and commercial gas networks in Africa (and other tropical climates) resides in the limited demand. Cooking and water heating, the main uses, are much less stable loads than space heating and have very pronounced peaks occurring 2-3 times a day, with negligible utilization at other times. A typical household demand for gas is in the region of 30-40 SCFD, which is equivalent to approximately US$120-150 per year[19]. The capital expenditure required to develop a secondary gas network per customer is in the range US$500-1,000[20]. Therefore, the potential revenues are insufficient for supporting the capital expenditure, unless the customers are willing to pay a premium for the increased availability.

Another potential use for gas in African countries is in absorption cycle air conditioning, especially in the commercial sectors (hospitals, hotels). However, the gas based air conditioning devices are expensive and not well known in Africa, making their penetration even more difficult.

A3.5.4 Compressed Natural Gas (CNG) in Transportation

A3.5.4.1 Industry Overview

The worldwide experience with compressed natural gas (CNG) vehicles is limited. The countries with a significant experience in developing and running CNG vehicles are New Zeeland, which had an extensive programme in the 80's which declined significantly since then and Argentina, which has

[18] Africa Gas Initiative Main Report, February 2001, UNDP / World Bank Energy Sector Management Assistance Programme (ESMAP).
[19] Africa Gas Initiative Main Report, February 2001, UNDP / World Bank Energy Sector Management Assistance Programme (ESMAP).
[20] Ditto 8

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a more recent experience. The main driver in developing the usage of gas in transportation is the availability of significant natural gas resources that has no clear use.

The latest international CNG vehicles statistics published by the International Association for natural gas vehicles shows that in 2001 more than 1,700,000 vehicles ran on CNG worldwide fuelling at more than 4,500 refuelling stations. By far the majority are gasoline vehicles converted to CNG. The USA is the world leader with CNG bus operation experience, with a market penetration of 7%.

Country	Vehicles converted	Refuelling stations
Argentina	721,830	950
Italy	380,000	369
Pakistan	200,000	200
Brazil	120,000	131
USA	102,430	1,250
Venezuela	40,962	170
China	36,000	70
Egypt	34,754	60
Russia	31,000	205
India	25,000	6

Table A3-9 Top Ten CNG Vehicles Markets, year 2001

The driving forces behind the CNG developments in transportation are the utilization of available gas resources that have no other clear use, the need to reduce imports of diesel and to reduce emissions in large cities. In Western Europe and USA the development of CNG vehicles is also triggered by the need to meet increasing fuel quality specifications.

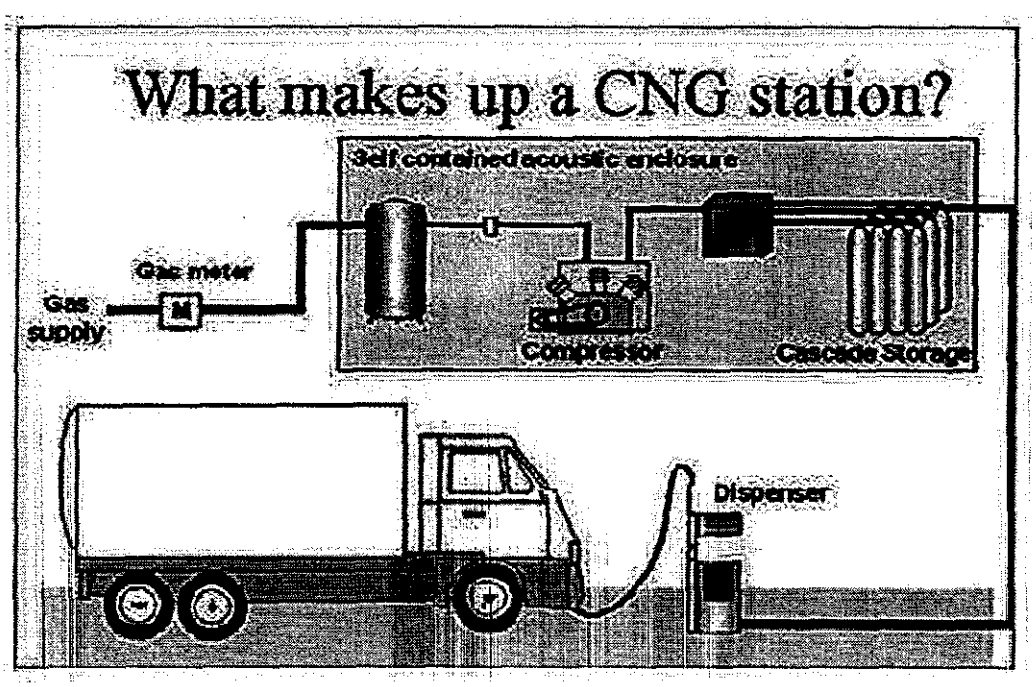

Figure A3-15 Typical CNG Compressor Station

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The critical success factors in developing CNG vehicle programmes are:

- Achieve a critical mass of vehicles and refuelling stations. Their numbers need to be balanced though as to avoid refuelling queues or under-utilization of refuelling stations;
- The existence or development of a natural gas distribution pipeline;
- Regulatory framework in place;
- Inter-fuel taxation policy favourable to natural gas;
- Quality of conversion and training of staff.

CNG demand is typically determined by the incentives in place that make the CNG attractive compared to diesel. The markets in developing countries are usually segmented due to no /limited natural gas pipeline infrastructure. These factors make the assessment of demand difficult as the demand ultimately depends on the conditions created in the market place for the developing of CNG programmes.

Typical conditions enabling CNG vehicles sustainable programmes are:

- Environmental concerns drive the majority of CNG programmes today. This is the case in some developing countries too, such as India.
- Regulatory framework needs to establish appropriate pricing policies and structures to encourage the use of CNG. It also needs to include standards of quality, codes of practice and the establishment of regulation and regulatory bodies for the functioning of the CNG industry.
- Adequate safety and performance standards need to be in place and enforces. This need has been demonstrated by recent cases of CNG vehicle fires in Delhi.
- Inter-fuels taxation policy favourable to natural gas over other fuels that CNG can replace should be adopted. As a rule of thumb, the retail price of natural gas should be about half of the liquid fuel. In developing countries, diesel is seen as a social fuel and is taxed little or even subsidised, making it more difficult to justify conversion to natural gas on commercial grounds.
- Fleet size needs to achieve economies of scale in order to economically justify the necessary infrastructure. Examples in France and USA showed that a fleet size of 50 buses appears to lead to significantly better results than smaller fleets. CNG infrastructure costs are five to eight times that for diesel.

Another important reason for developing CNG vehicles is the diversification of energy sources. This can be easily achieved by targeting gasoline vehicles because of inter-fuels pricing.

The main obstacles encountered in the development of CNG programmes and in running CNG fleets are related to:

- Adequate conversions have to be performed to satisfactory level of technical competence in order to achieve vehicle performance and fuel economy.
- The weight and space needed to store the gas.
- Expensive distribution and storage;
- Higher vehicles costs;

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- Performance and operational problems compared to liquid fuels vehicles.

A3.5.4.2 Country Experience

The experience accumulated in the countries that have developed CNG programmes highlighted that they encountered a common range of issues:

- Fuel delivery issues are related to the large gas compression systems at the refuelling stations and the refuelling time (typically long 2 to 6 hours, though fast fills exist too);

- Conversions issues generated by poor conversion or conversions of vehicles in poor condition. It is estimated that 50% to 70% of CNG vehicles in developing co8ntries may fail a conversions test.

Two opposite experiences in developing CNG vehicles programmes are presented below.

Argentina

Argentina launched its CNG vehicle programme in 1984 when an extensive network of gas pipeline reached most cities. The government was not involved in the programme, i.e. did not offer subsidies. The incentive for fuel switching stemmed from the high tax on gasoline. The pricing overview in Argentina in 1999 was:

- Gasoline: US$1.04 per litre;

- Diesel: US$0.50 per litre;

- Natural gas: US$0.33 per cm.

At these prices, the payback period for CNG converted vehicles was a matter of months depending on the number of km travelled.

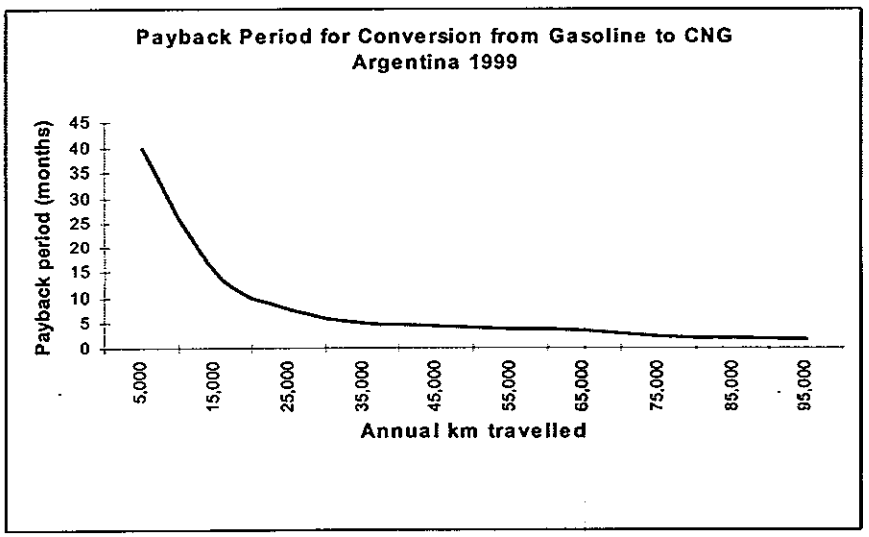

Figure A3-16 Payback Period for Conversion from Gasoline to CNG in Argentine, 1999 fuel prices

There has been limited conversion from diesel to CNG because the price difference between diesel and CNG has not been sufficient to recover the incremental cost of conversion and operation of the CNG vehicle. Argentina has the largest number of CNG vehicles, but in fact they are not in regular operation. Diesel is actively competing with CNG to capture the taxi market away from CNG.

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New Zealand

In contrast to Argentina, the government of New Zealand was heavily involved in the CNG programme and provided significant financial incentives for conversion and developing fuelling stations. The main driver in the growth of the CNG industry in New Zeeland was the cheaper prices of CNG compared to the gasoline. Once the economy has been deregulated and the financial incentives withdrawn, the CNG market declined significantly.

A3.5.4.3 Economics

Conversions Costs

The costs of converting vehicles to CNG operation vary with the size of the vehicle and the technology used. Typical conversion costs for US and European conversions are presented in table 1-5 below. Costs in other countries, where local equipment and local labour can be used, are significantly lower. For example, conversion of a gasoline car in Pakistan costs about US$300 compared to around US$1,500 in Europe.

	Car	Transit Van	Fork Lift Trucks	Light Truck	Heavy Truck	Bus
Gasoline vehicles	1,200 – 1,400	1,400 – 1,500	No Data	2,300	7,500	7,500
Gasoline cars and modern larger diesel engines with electric controls	3,0000	4,500	1,600 – 3,000	5,300	18,000	38,000

Table A3-10 Conversions Costs, year 2001

Figure A3-17 Aboso Glass Forklift Truck Operating on CNG (Nigeria)

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Figure A3-18 Shell Pet. Dev. Co. (SPDC) Estate Car Operating on CNG (Nigeria)

Fuel Cost

Worldwide the CNG pricing has been set at about 50% of the gasoline price and it is in direct competition with diesel. At this level of pricing, the conversion of gasoline vehicles can be economic if the critical factors related to the operation and infrastructure development are manageable. Countries such as USA, Italy, Argentina or China have priced the natural gas for transportation purposes below the diesel price. The consumer countries within the WAGP project framework have relatively low diesel prices compared with CNG implementing countries and therefore the economics of CNG vehicles is not clear.

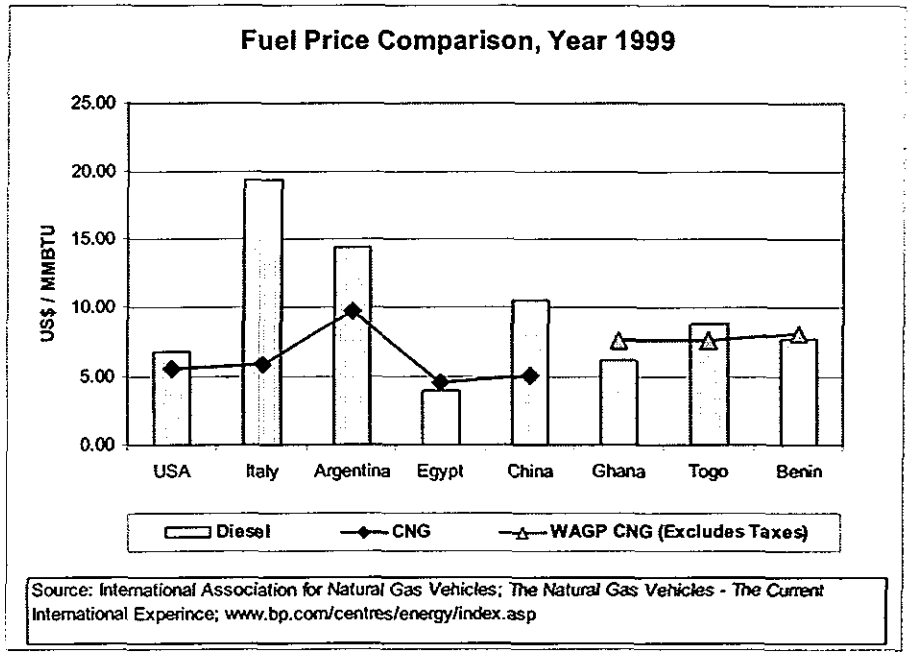

Figure A3-19 Diesel vs. CNG Fuel Price Comparison in Countries with CNG Programmes

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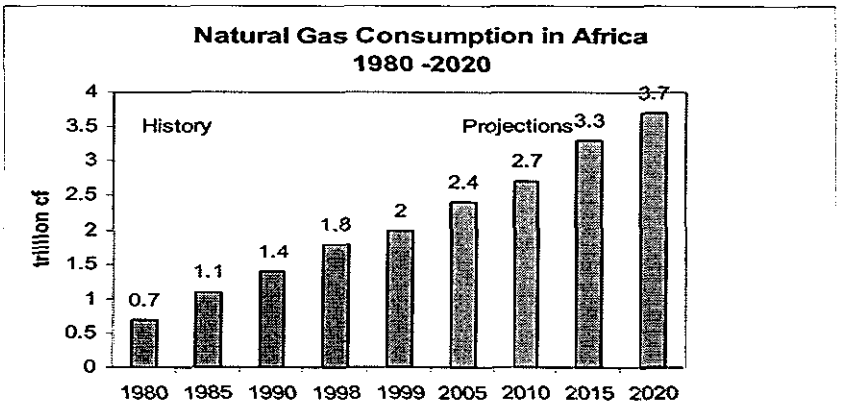
The operational costs are typically 30% higher than those for diesel vehicles. They depend on the utilization rates, the reliability of the vehicles as well as the labour costs. The later are a function of location and therefore developing countries usually have low labour costs.

It is generally recognised that US$30 per barrel of oil is the point where CNG can stand without support, i.e. subsidies.

A3.6 Overview of the African Gas Usages

A3.6.1 Overview

The gas reserves in Africa represent almost 8% of global reserves and are currently estimated at 394 TCF, according to the International Energy Outlook prepared by EIA in March 2001. The vast majority of these reserves, around 80%, are concentrated in Algeria and Nigeria. Considering the concentration of the production in North and West Africa, several export projects and development plans for gas usage are being considered in these areas. The International Energy Outlook 2001 projects an increase in natural gas consummation in Africa by 3.5% per year from now until 2020.



Source: Energy Information Administration (EIA), International Energy Outlook, March 2001

Figure A3-20 Historic and Projected Gas Consumption in Africa to 2020

Overall, Africa is a major net energy exporter. According to the US Department of Energy, in 1997 Africa produced 26.5 quadrillion BTUs (quads) of commercial energy and consumed only 11.4 quads. The vast majority of the energy consumption, around 80% is in North and Southern Africa. Five countries (South Africa, Egypt, Algeria, Nigeria and Libya) were the largest consumers of commercial energy in 1997, around 78%. They were also responsible for 84% of energy production.

According to the Africa Gas Initiative Report[21] the oil demand in the Sub-Saharan region amounted to 35 million tons in 1997. The use of oil is split between a few sectors, with a high dominance of the transportation sector as shown below.

Africa is a heavy user of non-commercial fuels, primarily biomass. This consumption is concentrated in Central and East Africa. Energy demand in other African countries is also generally met by non-commercial fuels such as wood fuels and biomass, especially in the domestic and commercial sectors.

Country	Gross Production	Vented / Flared	Re-injected	Marketed Production	% Marketed Production

[21] Africa Gas Initiative, February 2001, UNDP / World Bank Energy Sector Management Assistance Programme (ESMAP)

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Algeria	5,299	245	2,259	2,796	53%
Angola	233	145	62	26	11%
Cameroon	73	73	0	0	0%
Congo	134	57	77	0	0%
Cote d'Ivoire	28	0	0	28	100%
Egypt	645	32	32	580	90%
Gabon	91	63	21	7	8%
Nigeria	1,121	738	148	235	21%

Source: Energy Information Administration, International Energy Annual 1999

Table A3-11 Natural Gas Production in the Main African Producing Countries, 1998 (BCF)

Country profiles incorporating a gas sector overview and the main usage of the gas, current or planned in each country follow. Countries selected are those with significant gas reserves and production as indicated in the above table. From this it can be seen that countries in the Sub-Saharan region are not efficiently utilising their gas reserves, the proportion of marketed production to total production being very poor in most cases.

A4 Gas Usages in Africa

A4.1 Algeria

Algeria, the world's second largest exporter of liquefied natural gas (LNG) in 1998, exported 22% of the world's total LNG to Western Europe and the USA. Gas is also exported from Algeria via the Trans-Mediterranean (Transmed) pipeline (847 BCF per year) and the Magreb-Europe (MEG) pipeline (300 BCF/year).

Algeria recorded a marketed production of 82 TCM (2900 TCF) of natural gas in 1999[22], out of which almost 60 TCM (2110 TCF) was exported.

The structure of gas consumption in the country is biased towards the energy sector, as reflected in figure below.

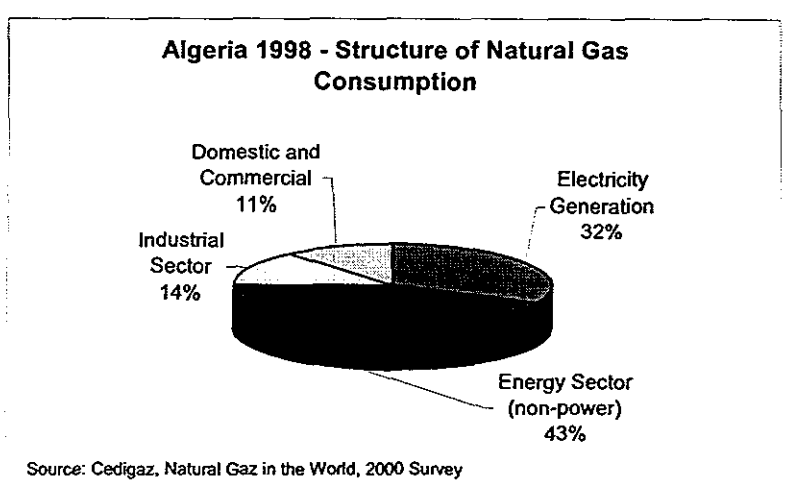

Figure A 4-1 Breakdown of Gas Consumption by Sector in Algeria, year 1998

[22] Cedigaz, Natural Gas in the World, 2000 Survey

Most of the power generation in Algeria runs on gas and has been increasing modestly over the last few years. In absolute terms, the gas consumption declined at the end of the 90s, mainly because decrease in gas consumption in the industrial sectors. In 1999 the total volume of gas delivered to the domestic market was 22.2 TCM (780 TCF).

Power Generation

Approximately 95% of the country's electricity is generated by natural gas. The electricity demand is growing at 5% annual rate and will require, according to Algeria's state power utility Sonelgaz, additional capacity which, together with the transmission and distribution infrastructure will require considerable financing. The source for the necessary funds would probably be largely foreign capital. New legislation pending in parliament would end the monopoly of Sonelgaz in the power generation and allow the development of independent power projects (IPPs).

Petrochemicals

Algeria's principal petrochemical plants are:

- A 550,000 TPA ammonium phosphate fertiliser plant and an ammonium and nitric acid complex, both at Annaba
- 365,000 TPA ammonia, 146,000 TPA urea and 182,500 TPA ammonium nitrate at Arzew
- 130,000 TPA high-density polyethylene unit, 120,000 TPA ethylene cracker and aromatics complex at Skikda.
- Sonatrach has undertaken a number of petrochemical and fertiliser expansion projects, including a new MTBE complex and polyester resin complex.

Domestic and Residential

Algeria planned during the last five years to connect 134 cities and town to the gas network, i.e. 237,000 households. Almost 50% of these had been commissioned by the end of year 2000. The overall estimated cost was US$150 million against which SONELGAZ will contribute 30%, the beneficiaries another 12 % with the balance being provided by the government and local authorities.

Transportation

Following the objective of diversification of the energy sources, Algeria is putting in place a regulatory framework that will allow the introduction of compressed natural gas in transportation (CNG). SONELGAZ is planning to launch (as of 2001) a CNG pilot programme including 50 converted buses. The CNG programmes will run in large cities to cater for environmental concerns.

A4.2 Angola

Angola's natural gas reserves amount to 1.6 TCF. Gas production was around 280 BCF in 1998[23], of which almost 70% was flared. The gas usage in Angola is suffering from the lack of gas pipeline infrastructure, very limited domestic markets and lack of financial resources. Consequently, only 10% or 28 BCF of gas is utilised for commercial purposes.

[23] Africa Gas Initiative, February 2001, UNDP / World Bank Energy Sector Management Assistance Programme (ESMAP)

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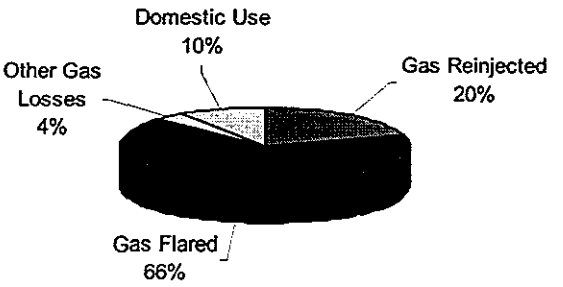

Source: Africa Gas Initiative Report, February 2001, Joint UNDP / World Bank Energy Sector Management Assistance Programme (ESMAP)

Figure A 4-2 Gas Utilization in Angola

The Angolan government is implementing strategies to reduce flaring and to increase the commercial and domestic use of gas. Thus, the Futila Industrial Park located in the Cabinda province is planed to make use of the flared gas in energy intensive industries. Other gas usages are considered too, including LPG separation for domestic consumption, developing of Gas-to-Liquids (GTL) projects and power generation. The potential usage of gas in Angola is discussed below by the main sectors.

Power Generation

Hydropower units dominate electricity supply in Angola. At present, a few feasibility studies demonstrated the economics of developing gas fired power plants, by converting the two 60 MWe oil-fired power plants in Luanda and adding a new gas turbine in Luanda[24]. These would be cost efficient and cheaper than hydroelectric schemes. The calculated price of gas for power generation for these projects is around US$3.3 /MMBTU. This is an attractive price for developing further new gas -based power generation schemes. However, further assessment is needed to determine the possibility to supply gas at an economic cost to the power generation sector.

Petrochemicals

The use of gas in large-scale petrochemical projects is driven by its cost and the size of the facility. The main potential use for gas outside power generation is in the fertilizer industry. Given the economics of a fertilizer (ammonia / urea) plant, the total production of nitrogen fertilizer from a world -scale plant needs a very large market. The domestic demand for nitrogen fertilizer is very limited, even if it is expected to grow and could only cover around 25%-40% of a typical plant production of 450,000 TPA. The key factors to developing a fertilizer plant in Angola are the price of gas, normalization of the agricultural production and identification of export markets.

Industrial Sector

The use of gas in the industrial sector is heavily constrained by the overall economic and political situation in the country. The industries are confronted with severe raw material, labour, water and electricity shortages. Overall, the industrial activity in Angola is at 10% of its capacity. Provided the countries enjoys some economic recovery, potential usages of gas are in the following industries:

- Scrap metal processing: The current scrap metal processing capacity based in Luanda is 31,000 tonnes. The gas consumption is however small and even if plans to developed a second facility at Lobito materialises with UNDP help, this sector will only represent a small percentage of demand.

[24] Africa Gas Initiative, February 2001, UNDP / World Bank Energy Sector Management Assistance Programme (ESMAP)

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- Luanda cement factory is a potential gas user as the gas can be delivered at a very low cost. At present, the factory produces annually 720,000 tonnes clinker requiring around 2 million CM of fuel oil[24]. However, the fuel oil cost to the factory is only US$1.8 / MMBTU. Considering that there are no technological advantages in burning gas in a cement factory, the very low fuel oil price would be a major obstacle in converting to gas.

- Luanda refinery utilises fuel oil, which comes at no cost to it, consuming some 1.1 million CM per annum. The Government of Angola has plans to expand the refining capacity from the current 38,000 BPSD with another 200,000 BPSD facility in Lobito. This refinery could utilise natural gas, with potential gas consumption estimates of 7.1 BCF per annum, according to the African Gas Initiative Report. However, as with Tema Oil Refinery in Ghana, it would be extremely unusual (and uneconomical) for a refinery to import fuel gas to substitute for fuel oil, which is essentially a waste product, unless a ready market for the fuel oil exists.

- Other industries currently represent 20% of the fuel consumed in boilers in the country. It is estimated that this is equivalent to 0.7-1.8 BCF per year[25]. However, gas usage will depend on the cost of gas, which will have to incorporate the development of a transmission and distribution network, especially for locations outside Luanda.

Overall Angola represents an important potential user of gas whose development depends on a significant degree of economic recovery but also on the development of gas transport and distribution network.

A4.3 Congo

Congo has the fourth largest gas reserves in Sub-Saharan Africa, after Nigeria, Angola and Cameroon, estimated at around 5.2 TCF. The proven reserves amount to 4.2 TCF, out of which 1.9 TCF is associated gas and the rest non-associated gas. The associated gas production in Congo varies between 64 and 71 MMSCFD, the majority of which – more than 80% - is currently being flared.

The country's reserves are in excess of the domestic demand which is very limited and fragmented, being concentrated in two areas: Brazzaville and Pointe Noire.

Power Generation

Congo is a country with plenty of hydropower potential capacity. Some of this is being built in phases at Sounda. Should this hydropower scheme having a total planned installed power of 1,000 MW be completed, the electricity needs of the country will be fully met, according to the Africa Gas Initiative Report 2001. This report also highlights that the cost of a gas based power generation alternative would be cheaper. However, a gas-based power plant could only be considered if Sounda project does not materialise due to lack of financial resources. The least cost option determined by this report refers to a 3 x 50 MWe gas –fired turbines scheme using gas delivered at US$1.6 / MMBTU.

The potential for gas based power generation in Congo depends also on the competition with imported electricity from the Democratic Republic of Congo, which is overall, the cheapest source for Congo [2]. An incentive to develop gas based power generation schemes would be if Congo decides to rely solely on internal supply sources. However, even if the electricity price generated by a gas fired power plant would be the cheapest option in the medium to long term, in addition Congo would have to develop gas sources that can be made available to power generation. One option would be the development of the Litchendjili gas field.

[25] Ditto 17

Petrochemicals

There are some incipient studies related to the development of an ammonia plant that would require 71 MMSCFD. This study dates back to early 1990s and has never been pursued.

Industrial Sectors

The demand of gas for industrial purposes is very fragmented and it is located in three areas: Brazzaville, Dolosie and Pointe Noire, with and estimated potential consumption of 494 MMSCF per year, 388 MMSCF per year and 353 MMSCF per year according to the Africa Gas Imitative Report published in 2001. Besides the limited demand and its geographic fragmentation, two of these locations are situated relatively far from Pointe Noire, the oil and gas centre of the country. The capital investments needed to build a gas pipeline can negatively influence the economics of such a pipeline. Another potential location for industrial gas development could be Kinshasa.

Congo is developing studies on the potential of utilising natural gas for power generation and mining projects.

Residential and Commercial

The demand for gas in the residential and commercial sectors to produce hot water for cooking and for air conditioning is limited and there is no infrastructure available to serve these at present. The development of a gas secondary network will largely depend on the development of major power generation project, the most likely area being the Pointe Noire. This could trigger the development of industrial gas usage in Pointe Noire and at an additional marginal cost a few commercial facilities.

A4.4 Cote d'Ivoire

Cote d'Ivoire is one of the few Sub-Saharan countries, together with Nigeria, Gabon, Senegal and South Africa, using natural gas on the domestic market for electricity generation and industrial purposes. The country has also prepared a review of overall potential for gas usage.

The natural gas reserves are estimated at 1.1 TCF and they are located at the main gas fields Foxtrot, Kudu and Panthere. At present, the gas produced from the Panthere filed is transported by pipeline to Abidjan and is used to generate electricity. Future industrial usage is planned though. To this extent, the Cote d'Ivoire is building a gas pipeline in Abidjan, which will deliver gas to the industries based in the capital.

Power Generation

The power generation schemes based on gas are located in Abidjan where gas is delivered by pipeline. The country has some 1,200 MWe[26] of installed generating capacity. Around 50% of this is hydro and the rest is provided by thermal generating facilities. The gas-fired schemes amount to a total installed capacity of 460MWe with further enhancement at the Azito power plant, which will increase the output by another 100MWe. Azito power plant burns natural gas supplied from Foxtrot and Ocean Energy gas fields, having signed a 10-year take-or-pay contract for 170 BCF in total.

Petrochemicals

Cote d'Ivoire's refining facilities are composed of the 65,200 BPSD SIR refinery and an adjacent 10,000BPSD asphalt plant (Societe Multinationale des Bitumes-SMB) in Abidjan[27]. Gas consumption is around 20 MMSCFD.

Industrial Sector

Small and medium facilities that can use gas as fuel are located in Abidjan, close to the gas terminals. The size of the industrial market was assessed at 6 MMSCFD in 1997 according to the African Gas

[26] EIA Country Profile, January 2002, http://www.eia.doe.gov/cabs/cdivoire.html
[27] Africa Gas Initiative, February 2001, UNDP / World Bank Energy Sector Management Assistance Programme (ESMAP)

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Initiative Report. This represents the need for gas as fuel in small and medium size plants that could serve the four industrial zones near Abidjan. Two of these are located nearby the gas terminal. In addition to this, other potential users can be considered in traditional industries concentrated in the Abidjan area such as food processing, oil mils and soap making. These industries would need steam generators and the total market for gas to be used in co-generation units is around 2-4 MMSCFD.

Petroci (Societe Nationale d'Operations Petrolieres de Cote d'Ivoire) is building a gas network in the harbour area of Abidjan. This is limited at the moment to a 4km network. The plan is however to expend this gas network to reach additional industrial areas such as Yopougon and Koumassi.

Cote d'Ivoire is also planning to develop the processing of mineral resources, i.e. nickel and iron, located some 600km west of Abidjan. If developed, these projects could use around 20 MMSCFD / tonne of product. The project is planned to become operational by 2003 with the involvement of Falconbridge, a Canadian operator.

Petrochemical

Cote d'Ivoire is also considering the development of a fertilizer plant, an integrated ammonia and urea facility. This would consume around 80 MMSCFD. As in other countries, the cost of the fertilizer production and hence its attractiveness to the market, is strongly influenced by economies of scale. This project has been considered for a while and according to the African Gas Initiative report of 2001, partners and financing are being sought.

Overall, the potential development of gas usages in Cote-d'Ivoire is a function of its price to the consumer. The mostly used fuel is fuel oil, whose price is according to the African Gas Initiative Report of February 2001 US$6.7 / MMBTU. Gas will have to compete with this and in addition to add in to the economics of projects the cost of conversions to gas.

A4.5 Egypt

Egypt is the third largest gas market in the Mediterranean after Italy and France and growing rapidly. The gas reserves are estimated at 1600 TCF, with a current gas production of 580 BCF. The rapid increase in Egypt's natural gas reserves and production has encouraged plans for gas exports, either by pipeline or LNG tanker, but Egypt is currently consuming all the gas it produces. Natural gas discoveries in the Nile Delta could generate export revenues in the region of US$550 million. Several countries in the region are targeted: Turkey, Libya, Israel, Jordan and Libya and Palestine. A small export pipeline to Jordan is to be commissioned in 2003.

Egypt has been active in pursing the development of gas sector in terms of regulation, exploration, new technologies, infrastructure development and regional cooperation. Therefore, the gas contribution in primary energy resources in Egypt has surpassed 34% while remaining about 23% worldwide.

Gas consumption is biased towards power generation, which consumes 57% of total gas produced.

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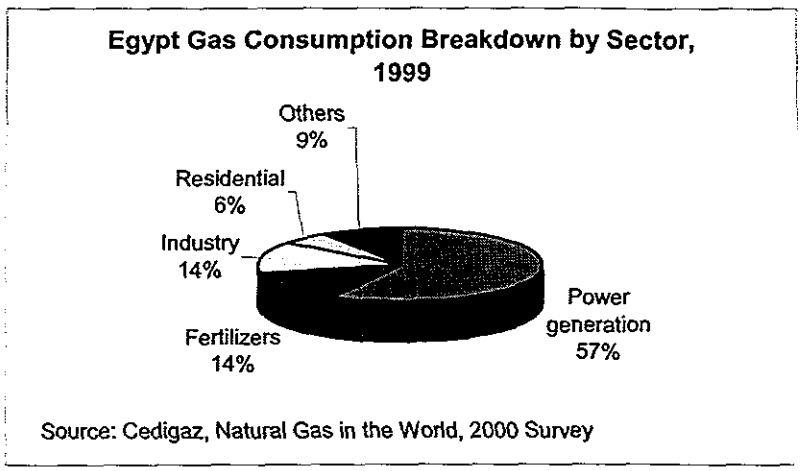

Figure A4-21 Gas Consumption by Sector in Egypt, year 1999

Industry was the second major consumer together with the fertilizer sector representing 28% of total gas consumption. Natural gas used as a fuel in the transport sector reached 81,000 tonnes in 1999/2000, representing about 24% of the household consumption. This is expected to increase over the coming period as a result of the state's petroleum use strategy.

Power Generation

Gas based power generation has increased over the last few years, the gas consumed representing 65% of the total gas consumption in the country. The installed capacity of 13.3 GW will be extended with another 9.3 GW mainly gas-fired by 2010. The new power generation will come almost exclusively from privately funded projects that will sell electricity to the Egyptian Electric Holding Company. There are current reform plans that are looking at the separation of the generation, transmission and distribution to facilitate the participation of the private sector.

Electricity in Egypt can be available at very competitive prices. For example, a newly commissioned gas-fired steam power plant at Sidi Kerir on the Golf of Suez is delivering electricity at 2.54 cents / kWh because of availability of very cheap gas supplied by Gasco. Another planned gas-fired plant to be built by Electricite de France under a Built Own Operate Transfer (BOOT) scheme, which reached financial closure in 2001, will deliver electricity at 2.4 cents / kWh.

Petrochemicals

Egypt is planning the expansion of the petrochemical sector. A local private venture is planning to build a polypropylene plant in Alexandria that will utilise natural gas from the Western Dessert fields as feedstock. The investment is estimated at US$80million for the production of 120,000 TPA of polypropylene. The Egyptian Petrochemical Company is also planning two new petrochemical plants: an ethylene plant with a capacity of 310,000 TPA and a polyethylene plant with a capacity of 220,000 TPA. Another polypropylene plant is planned for Suez, having a capacity of 400,000 Tpa.

Residential and Commercial

In terms of gas usage in domestic residences, Egypt connected gas to more than 150,000 residences in Cairo and Alexandria on the Mediterranean Sea. This number will increase to more than 1.5 million residences according to the country's 5-year plan (1997/2002) which includes connecting gas lines to houses in many villages and the cities' different districts.

Several private distributors serve domestic gas consumers. One of them, an international consortium (British Gas, Orascom of Egypt and Edison of Italy) is developing distribution infrastructure in Asyut, where no piped natural gas has been previously available. This first phase, estimated at US$220

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million, could be followed by a second phase whereby the natural gas grid could be extended to Aswan.

Transportation

The use of CNG as transportation fuel is an example of the success of the gas-production-consumption strategy in Egypt. Many companies were established to convert cars from using gasoline to the double use of gas and gasoline. The low gas price helped this process - gas price represents about 50% only of gasoline price. Today thousands of vehicles run on CNG, preserving the country's balance of petroleum and helping to protect the environment from pollution.

A4.6 Nigeria & The Nigerian Experience

Nigeria is the repository of the largest known reserves of natural gas in Sub-Saharan Africa, and the 10th largest worldwide, amounting to 104 TCF. Much of this is associated gas with little dedicated exploration for gas presently being undertaken, as the gas produced is presently under-utilised. Nigeria's record on gas utilization to date has been poor with approximately 65% of production (2 BCF / day) is flared, 15% re-injected and 30% marketed. The reasons for these have been myriad, ranging from an unstable political environment, to lack of an environmental or commercial incentive. The lack of a ready market (petrochemicals, power etc.) for the gas, and the huge spread of the associated oil fields from which the gas originates (an estimated 600 onshore and offshore), previously made commercialization of the gas reserves a low priority to both producers and government.

However, the present administration has made it incumbent upon the producers to utilise this resource (an estimated US$2.5 billion is lost annually as a result of flaring) through the establishment of a National Gas Policy. These in broad terms amounted to:

- Increased fines on the producer per cubic foot of gas flared;
- Inclusion of a gas utilization clause in new production sharing contracts with the oil companies, essentially making no new development of associated oil fields possible without a market being found for the associated gas;
- Transfer of responsibility for development of natural gas networks to the private;
- Nil rates of VAT on gas equipment;
- Nil import duties on gas equipment;
- A 5-year tax holiday for gas investors (plus a further 2 years if that company is considered a pioneer).

These policies have begun to reap rewards, and the administrations stated objective of zero flaring by 2008 might well be realised. The dividends from the policies implemented are also evidenced by the upsurge in private sector investments in gas developments.

Nexant conducted a fact-finding visit to Nigeria to evaluate developments in gas commercialization. The current and potential gas consuming industries in Nigeria are discussed below by the main sectors:

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Power Generation

Thermal power plants in recent years overtook hydropower as the dominant electricity supply source in Nigeria, accounting for some 67% of capacity and 53% of production in 1999[23]. The lower production percentage for thermal power plants reflects problems associated with inadequate revenues from tariffs that were set too low, resulting in insufficient revenue being available to fund maintenance, and the ultimate demise through lack of maintenance and large-scale mismanagement of these facilities. The net result of which was a dramatic 60% drop in production capacity over a 3-year period.

With the initiatives outlined in the National Gas Policy and recent electricity price rises of 50-100%, a number of Independent Power Projects have materialised. These include:

- AES's rehabilitate-operate-and-transfer (ROT) project for the 1000 MWe plant at Sapele.
- Shell's recently acquired ROT contract on the 1000 MWe Afam power plant.
- AGIP's 450 MWe power station in Delta State.
- Mobil's 350 MWe proposal for a power station in Bonny.
- Shell's proposed 1000 MWe power station in Abuja, requiring construction of a 250 km pipeline to the facility
- A further 3 x 1000 Mwe power stations under consideration.

Though the Nigerian power supply situation remains critical, the above demonstrate the impetus that can be provided by a co-ordinated government policy.

Petrochemicals

Again the use of gas as a feedstock in any industry is driven by the cost of gas and the size of facility proposed (i.e. is it a world scale plant, large enough to compete with the economies of scale achievable by existing competitors?). Though some progress has been made, by and large the petrochemical industry in Nigeria has failed to grow despite the abundance of low cost gas and the proximity to markets of potential industries. By comparison, the Middle Eastern experience, particularly that of Saudi Arabia, demonstrates how; government policy, plus adequate provision for private capital participation, can be used to stimulate growth in this sector. From a standing start in the 1970's, Saudi Arabia now accounts for 6-10% of worldwide petrochemical output. However, it is worthy of note that while gas is available in Saudi Arabia and Nigeria at a cost of approximately US$0.5-0.7 / MMBTU, gas at the consumer end of the WAGP lines would be available at over US$3 / MMBTU, making large scale petrochemical facilities with product destined for an export market less feasible.

GTL

A Nigerian GTL plant, a joint venture project between ChevronTexaco and Sasol of South Africa, is in the front-end engineering design phase. In spite of the high capital cost of GTL projects (can be between 2-4 times that required for a typical refinery), the Nigerian GTL project has been spurred on by; the abundance of stranded natural gas reserves, the drive to reduce flaring, and the penalties imposed on producers for every cubic foot of gas flared. Current high oil prices and the demand for higher specification fuels in Europe and North America make this project and other similar projects around the world more economically attractive. The investment in the Nigerian project is expected to total $800m. Plant production of 23,000 BBL of synthetic diesel and 10,000 BBL of synthetic naphtha is targeted, and natural gas consumption is expected to be 310 MMSCFD.

[23] CIA World Factbook

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LNG

The liquefied natural gas (LNG) project is currently the largest construction and investment program in Nigeria. Following incorporation of the Nigerian LNG (NLNG) Company in 1989, Trains 1 & 2 of the NLNG plants have been completed with a total investment of US$4b (including acquisition of 7 dedicated LNG vessels). Train 3 (investment cost US$2b) is nearing completion and incorporates LPG separation facilities, and the final investment decision for Train 4 & 5 is pending, with a possible 6th train being discussed. Estimated gas consumption on completion of train 3 would be 800 MMSCFD, with a similar volume destined for the next 3 phases if implemented. Total investments cost if all facilities are developed is estimated at over US$9b.

As can be seen from the above, development of LNG is a capital-intensive business and relies on the availability of an abundant stranded gas source at low cost and, more importantly, long-term contracts (20 year plus) for gas delivery. Building an LNG plant in the consumer countries is not viable as these conditions are not present in the consumer countries of WAGP gas. It is also not feasible to import gas into the consumer countries as an alternative to pipeline delivery as construction costs for an LNG receiving terminal stands at approximately $500m. even if only two were built (one dedicated to Ghana and a combined facility for Togo & Bénin with cross-border transportation by pipeline), the economics of this option are already unattractive compared to the WAGP alternative, particularly as operating costs for LNG are higher (i.e. allowing for LNG ship transport, maintenance of facilities etc.).

Industrial Sector

As with Angola, the use of natural gas in the industrial sector has been constrained by the economics, lack of infrastructure and the political situations in country. Following establishment of the National Gas Policy, more rapid growth has been experienced in demand for natural gas. Nexant conducted a fact-finding trip to Nigeria (the sumarised notes of meeting are attached to this report – see Apendix 5, Sumary of Inetrview Notes). Examples of Industries converting to gas in Nigeria (and their supplier in brackets) are:

- Tyre manufacturing - Dunlop Nigeria Limited, Lagos (Gaslink Limited). Gas is used in firing steam boilers with no plans to convert their generators. Gas consumption is about 1 MMSCFD.
- Confectionery – Cadbury Nigeria Limited, Lagos (Gaslink Limited). Gas is used for boiler firing, and Cadbury are in the process of soliciting tenders for BOOT contract on a tri-generation system to handle their substantial heating, power and refrigeration energy requirements (currently 3.6 MWe power, 18-21 MWt steam, and 1-3 MWt refrigeration).
- Aluminium – Robicon Aluminium, Lagos (Gaslink Limited).
- Glass Manufacturing – Beta Glass, Warri (Shell Nigeria Gas). Used for furnace firing, gas turbine power generation (1 MWe) and as CNG for forklift trucks (see *Figure A3-17*). Two of their forklift trucks were converted units, while three were purchased with gas engines.
- Textiles – Reliance Textiles, Lagos (Gaslink Limited).
- Metal works – Pioneer metal Products, Lagos (Gaslink Limited).
- Brewery – Nigerian Breweries, Warri (Shell Nigeria Gas). Gas is used for boiler firing.
- Brewery – Guinness Nigeria, Lagos, (Gaslink Limited). Used for boiler firing.

Overall the Nigerian gas consumption potential for the future look more promising now than ever.

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A5 Conclusion – Possibilities for the Purchasing Countries

A5.1 Key Features of the Industries Analysed

The overview of the gas usages in the world demonstrated that the use of gas is a fragmented market, both in terms of application and geographically. The main characteristics of the industries using gas as feedstock or fuel are summarised in the following table.

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	Power	Petrochemicals			CNG	Industrial Sectors	Residential	Commercial
		Ammonia & Urea	Methanol	GTL				
Gas Consumption	4.5-11.3 MMBTU/ MWh depending on efficiency	31 MMBTU / tonne	31-33 MMBTU / tonne	71-96 MMBTU / tonne of synthetic fuels	N/A	Varies (industry size & type dependent)	Household demand 0.03-0.04 MMBTU / day	Varies
Economic Size	Any, but typically 100to 1000MWe	Plant size: 1,750 TPD (~60 MMSCFD)	Plant size: 3,000 TPD (~105 MMSCFD)	Plant output: 5,000 BPD (50-70 MMSCFD)	Very much dependent on local motor fuel prices and fuel tax regimes in the country and fiscal policies available to aid investment in gas. Generally only vehicles operating on fixed routes are rational target markets – due to the high capital cost of filling stations. Compressor size and required fill rate also factor into the economics. A typical compressor has a throughput of 320 N/m³.	Dependent on proximity to site of gas supply and potential demand at site.	High population density (e.g. apartment blocks) Significant gas demand for space heating – e.g. cold or temperate climate. Low cost and availability of network pipe material in country. Low labour costs. Opportunities for pipeline laying cost savings by laying with other services at the same time, such as telecoms.	Sizeable commercial institutions e.g. Large Hotels, Shopping Centres, Hospitals etc. with steady heat, power and / or refrigeration loads. In some tropical countries hotel cogeneration schemes have proved viable based on packaged units around 1 MW in size.

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	Power	Petrochemicals			CNG	Industrial Sectors	Residential	Commercial
		Ammonia & Urea	Methanol	GTL				
Gas Price	US$3.00-5.00 / MMBTU Gas turbines have a competitive advantage over other thermal stations due to the increased efficiency achievable with CCGT units (up to 80% compared with about 30% for coal).	US$0.5 – US$1 / MMBTU Plants using low cost gas dominate the World supply of nitrogenous fertilisers and no other feedstock is competitive today.	US$0.5 – US$1.00 Plants using very low cost gas dominate the World supply of methanol and no other feedstock is competitive today.	US$1 / MMBTU This technology has been developed for converting surplus gas into valuable premium automotive fuels.	Almost all examples of the use of CNG have been where it has been adopted as an urban pollution prevention measure. Consequently CNG has received favourable fiscal incentives. Without these tax advantages, it has often not been competitive with gasoline and diesel even at very low gas prices.	Delivered price to customer must compete with alternative fuels. Pipeline transportation of gas (long distance & local networks) dominates the gas cost structure. Competes with LPG in clean fuels industries (e.g. glass & ceramics), which can be bulk delivered/stored – hence lower infrastructure cost. Competes with FO for other uses. In some cases (e.g. cement), competes with cheap HSFO, high sulphur coke and/or coal. Both FO and LPG prices are linked to crude oil prices. FO oil typically being around 70% of crude price while LPG is 150-250%.	Typical household expenditure US$120-150 per year (based on LPG prices) i.e. ~ US$10 / MMBTU. Competes with bottled LPG.	Competes with electricity prices for air conditioning and fuel oil (often gas oil) for heating.

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	Power	Petrochemicals			CNG	Industrial Sectors	Residential	Commercial
		Ammonia & Urea	Methanol	GTL				
Key Enabling Factors	Abundant and constant sources of gas. Relatively low cost gas compared to other fuels. Environmental concerns. High plant capacity utilization.	Low cost source of delivered gas Proximity to the gas source Proximity to markets (local / international) Achieve high utilization rates of the plant	Low cost source of delivered gas Proximity to the gas source Proximity to markets (local / international) Achieve high utilization rates of the plant	Technology is still developing and a credible technical partner willing to underwrite the project is required. Low cost source of gas. Achieve high utilization rate. High crude price. Utilization of stranded gas deposits too small for LNG. Demand for zero sulphur diesel AND proximity to markets.	Low cost source of gas Government support: inter-fuel pricing favouring CNG, regulation and promotion. Environmental concerns. Large vehicle fleet to spread cost of compressor investment. Vehicles operating fixed routes.	Identify clusters of industrial consumers located close to an existing gas pipeline or a power plant that could be a potential anchor customer for gas. Industrial zones with fiscal policies beneficial to energy consumers and with opportunities for energy savings through CHP applications.	Relatively affluent population willing to pay a premium for increased availability & convenience of piped gas to justify capital expenditure to develop gas network (estimated at US$500-US$1,000 per customer). To a lesser extent a cluster of customers in large residential blocks.	Existence of a lead customer e.g. power plant to secure sizable gas demand and high load factor. Large heating, electric and / or refrigeration loads on single site.

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	Power	Petrochemicals			CNG	Industrial Sectors	Residential	Commercial
		Ammonia & Urea	Methanol	GTL				
Constraints	Regulated power market, especially price. Insufficient plant utilization making take-or-pay contracts uncompetitive.	Limited domestic markets Shipping costs Large capital investments	Large capital investments. Shipping costs. High gas cost. Negligible domestic markets in region. Uncertain international market outlook.	Large capital investment Markets and economics are relatively unproven. Novel technology.	Limited fleet size – no economies of scale Limited range of vehicles. Conversion costs Lack of regulatory support Lack of inter-fuels taxation policy favourable to CNG Reliable electricity supply required to run compressors at filling station.	Limited penetration due to lack of networks Low demand Conversion costs Non-competitive gas price with respect to other fuels. Limited availability of funds to finance gas network development	Lack of gas network. High cost of gas-fired appliances for the residential sector. Pronounced peaks in demand leading to oversized / under-utilised networks.	Lack of gas network. Conversion costs. Lack of BOOT type contract service providers. Lack of the larger commercial customer such as large hotels and complexes.

Table A5-1 Features of the Industries Using Gas as Fuel or Feedstock

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A5.2 Possibilities for the Purchasing Countries

A5.2.1 Benefits from the Nigerian Experience

A common thread amongst the users of gas in Nigeria was scepticism concerning the gas network project schedules and the future availability of gas, due to past promises that were not fulfilled, in a couple of cases, the potential gas consumers made substantial investments in gas conversion kits only then to suffer a 2-3 year delay in the availability of gas. Not only had these entities purchased additional equipment therefore, but also their energy base remained the more costly liquid fuels they sort to replace, resulting in an effective increase in energy costs as opposed to the decrease envisaged. Gas was eventually made available when development and control of the gas network was passed from the state owned NGC, to private companies through BOOT contracts.

A further complication for one customer was the fact that though gas equipment purchases are zero rated for VAT and excise duties, Customs & Excise were at the time unaware of the required procedure, resulting in a levy that effectively cost the industry an additional NGN3 million in import duties ($30,000). It can be said that the procedure for taking advantage of this particular fiscal incentive could itself be streamlined. It presently requires; (1) an application to the Minister of Finance (with equipment invoices attached), (2) issuance of approval notice from the minister, (3) notification of Customs Service by the ministers office, and (4) complimentary notification of the Customs Service by the purchaser.

A regulatory body was established early to handle licensing applications for industries wishing to convert to gas, and the licensing process appears to function smoothly.

Post conversion, most consumers' experiences were largely positive, but with a strong belief that government policy is key to stimulating market growth.

Key success criteria for any government policy should therefore be:

- Implementation of a clear policy on fiscal incentives for gas promotion such as the National Gas Policy in Nigeria (preferably through legislation).
- Of equal importance, dissemination of the implications of these incentives down through the affected branches of the state administrative machinery to ensure the minimum amount of bureaucracy is retained, this to include education of the various arms of government (regulators, customs, internal revenue services etc.).
- Regulatory bodies empowered to monitor, and control developments in the gas industry, both for sellers and consumers alike.
- Selection of an aggregator with the financial muscle to implement the planned development phases of distribution networks to schedule and on budget so as to meet customer expectations of delivery dates and price.
- Capacity building of the aggregator(s) in gas network management, operation and maintenance and customer demand forecasting/supply planning to ensure that once the system is up and running, it remains in good operational order.
- The minimum of government intervention and involvement should be maintained, other than in a regulatory and monitoring capacity.

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A5.2.2 Benefits of Worldwide Gas Usage Experience to the WAGP Projects

The overview of the gas usages worldwide has highlighted the main drivers for the development of the economic sectors using gas as fuel or feedstock. The relevance of these usages to the commercial and economic conditions in Ghana, Togo and Bénin can be summarised as follows:

- Large scale projects such as world-scale petrochemicals e.g. ammonia, urea and methanol require large up-front capital expenditure and face severe competition in a commodities market. These types of projects are generally only viable close to the gas supply to minimise the cost of transporting gas

- The conventional gas markets – residential, commercial and industry are limited in Africa. Whereas the residential and commercial sectors are limited due to climate to a largely cooking and water heating based demand, the demand in the conventional industrial sectors are limited by lack of infrastructure and availability of gas. While the residential and commercial sectors can only be developed if the end consumer is willing and able to pay a premium for energy from gas, the industrial is much more promising, and not negligible in terms of projected gas demand. Here, WAGP gas, not committed to power generation, can bring value to industries with potentially greater benefits for clusters of industries and/or industries located nearby power generation facilities operating on gas.

- The potential demand of the industrial sectors is relatively significant and in theory should grow. However, this demand is concentrated in a limited number of cities where the size of the industrial market has reached a critical mass that could trigger distribution projects, often with vast distances between these cities. Proper planning and execution of gas distribution networks is therefore critical. Phased development of these networks is paramount to ensure a good balance of revenue stream to capital expenditure outlay, so as to ensure that the distributor (aggregator) retains liquidity for long-term development.

- GTL is not viable for these markets as there is no local demand for high specification fuels and the export market is better served by the Nigerian GTL project due its lower feedstock cost. Furthermore, the high capital cost of such projects precludes any GTL projects based on WAGP gas.

- Gas demand and usage by many industries will occur only if the cost of gas delivered by the distribution systems is competitive with the cheap fuel oil from Nigeria. To this extent there needs to be a fine balance in the rate of return the network investor expects and needs, it is however expected that this issue will be naturally regulated by market forces, but the presence of a regulatory body is also mandatory.

- The use of CNG in transportation merits consideration, especially where environmental and health issues can occur. A specific case in this respect is the use of CNG in handling equipments.

- Liberalization of the gas market is desirable, with little or no state involvement in the management and operation of the gas distributor.

- The usages of natural gas (methane) described in this addendum do not represent substitutes for wood fuel and in this respect; the WAGP gas does not serve directly the objectives of wood fuel substitution set by the Nigerian government. This substitution can be achieved with bottled LPG. However, in order to achieve this, LPG produced by the separation of the associated gas. In the case of the WAGP project, the cost of the separation is only economic if both products obtained (LPG and Methane) are commercialized. Hence, by allowing commercialization of Methane, WAGP contribute to producing LPG and therefore substituting wood fuel for LPG

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[29] Asia Pacific Economic Cooperation

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List of Companies / Organisations Visited

BENIN

- Ministère des Mines, de l'Energie et de l'Hydraulique
- Ministère du Commerce, de l'Artisanat et du Tourisme
- Caisse Autonome d'Amortissement
- Administrateur des Banques
- Ministère de l'Industrie, du Commerce et de la Promotion de l'Emploi – Direction du Commerce Extérieur
- Ministère de l'Industrie, du Commerce et de la Promotion de l'Emploi – Direction du Commerce Intérieur
- CEB (Communauté Electrique du Bénin)
- CimBénin
- IBCG (Industrie Béninoise des Corps Gras, ex- SONICOG)
- SoBeBra (Société Béninoise de Brasserie)
- SBEE (Société Béninoise d'Electricité et d'Eau)
- SoBeGaz (Société Béninoise de Gaz) – Proposed Aggregator
- SoBeTex
- SCO (Société des Ciments du Bénin)
- *SCO Lafarge (Société des Ciments d'Onigbolo)*

TOGO

- Ministre des Mines, de l'Energie et des Postes et Télécommunications et ses fonctionnaires
- Ministère du Commerce, de l'Industrie, des Transports et du Dévelopement de la Zone Franche
- Autorité de Réglementation de l'Electricité
- MIGA (Multilateral Investment Guarantee Agency, a member of the World Bank Group)
- GARI (Guarantee Fund for Private Investments in West Africa)
- Brasserie BB Lomé
- CEB (Communauté Electrique du Bénin)
- ElectroTogo
- OTP (Office Togolais des Phosphates)
- SoToGaz (Société Togolaise de Gaz) – Proposed Aggregator
- TogoElectricité
- WACEM (West African Cement)

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GHANA

- Energy Commission
- Energy Foundation
- Ministry of Energy
- PEF (Private Enterprise Foundation)
- PURC (Public Utilities Regulatory Commission)
- BOST (Bulk Oil Storage and Transportation Company)
- Inter-Afrique Holdings
- GTP (Ghana Textile Printing Company)
- TOR (Tema Oil Refinery)
- VALCO (Volta Aluminium Company)
- Tema Steel Company
- Unilever

NIGERIA

- Triple E
- Chevron
- NETCo.
- Shell Petroleum Development Company / Shell Nigeria Gas
- Gaslink
- Dunlop
- Cadbury

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Appendices

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Appendix 1 – Bénin Files

Appendix 2 – Togo Files

Appendix 3 – Ghana (Tema) Files

Appendix 4 – Ghana (Takoradi) Files

Appendix 5 – Net Back Fuel Prices

ABBREVIATIONS AND ACRONYMS

CapEx	Capital Expenditure
CATS	Concession Agreement Term Sheet
CIF	Cost, Insurance, Freight
CNG	Compressed Natural Gas
CG	Commercial Group
EIA	Energy Information Administration (US DoE)
FOB	Free on Board
F-T	Fischer-Tropsch (GTL technology)
GDP	Gross Domestic Product
GTL	Gas-to-Liquids
GTP	Gas-to-Power
HSFO	High Sulphur Fuel Oil
LSFO	Low Sulphur Fuel Oil
IEA	International Energy Agency
IPP	Independent Power Producer
LHV	Lower Heating Value
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
LSFO	Low Sulphur Fuel Oil
NGL	Natural Gas Liquids
OpEx	Operating Expenditure
RFO	Residual Fuel Oil
US$	US Dollar

UNITS OF MEASURE

Barg	Bar Gauge (Pressure measurement)
BCF	Billion Cubic Feet
BCM	Billion Cubic Metres
BBL	Barrels
BOE	Barrels Oil Equivalent
CF, CFD	Cubic Feet, Cubic Feet Per Day
GJ	Gigajoule
GW, GWh	Gigawatt, Gigawatt-hours
kCAL	Kilocalorie
kW, kWh	Kilowatt, Kilowatt-hour
MMBOE	Million Barrels Oil Equivalent
MCAL	Megacalorie
MMBTU	Million British Thermal Units
MMSCFD	Million Standard Cubic Feet Per Day
MMCM	Million Cubic Metres
TOE	Tons Oil Equivalent
TPA	Tons Per Annum
kTPA	Thousand Tons Per Annum
MW, MWh	Megawatt, Megawatt-hour
psi	Pounds per Square Inch (Pressure measurement)
TCF	Trillion Cubic Feet
TJ	Terajoule
TCM	Trillion Cubic Metres
T, k	Thousand Kilo (10^3)
MM, M	Million, Mega (10^6)
B, G	Billion, Giga (10^9)
T, T	Trillion, Tera (10^12)

CONVERSION AND EQUIVALENCES

Volume

1 CM	35.315 CF
1 000 CF	28.32 CM
1 BBL	159 litres; 0.159 CM
1 CM	6.29 BBL

Energy Content (LHV)	kcal/kg	BTU/kg
Fuel oil/Oil equivalent	10 000	39 700
Heavy / Residual fuel oil	9 800	38 900
Gas oil, diesel oil	10 100	40 100
Jet fuel	10 470	41 520
Kerosene	10 390	41 230
LPG	10 810	42 900
Fuelwood	3 000	11 940
Charcoal	7 000	27 860

Energy Equivalences

1 kWh = 0.86 Mcal = 3.6 MJ

1 MMBTU= 252 Mcal = 293 kWh = 1 055 MJ

1 GWh = 3412 MMBTU

1 000 cm natural gas = 0.85 TOE

1 000 kWh electricity = 0.11 TOE (final consumption)

1 ton wood = 0.30 TOE

1 ton charcoal = 0.70 TOE

Rules of Thumb

Natural gas:	1 MCF ~ 0.95 MMBTU
Natural gas:	1 MMSCFD ~ 10 MMCM/Y
Oil:	1 BPD ~ 50 TPA
Natural gas:	US$1.0 / MMBTU ~ US$0.95 / 1000 CF