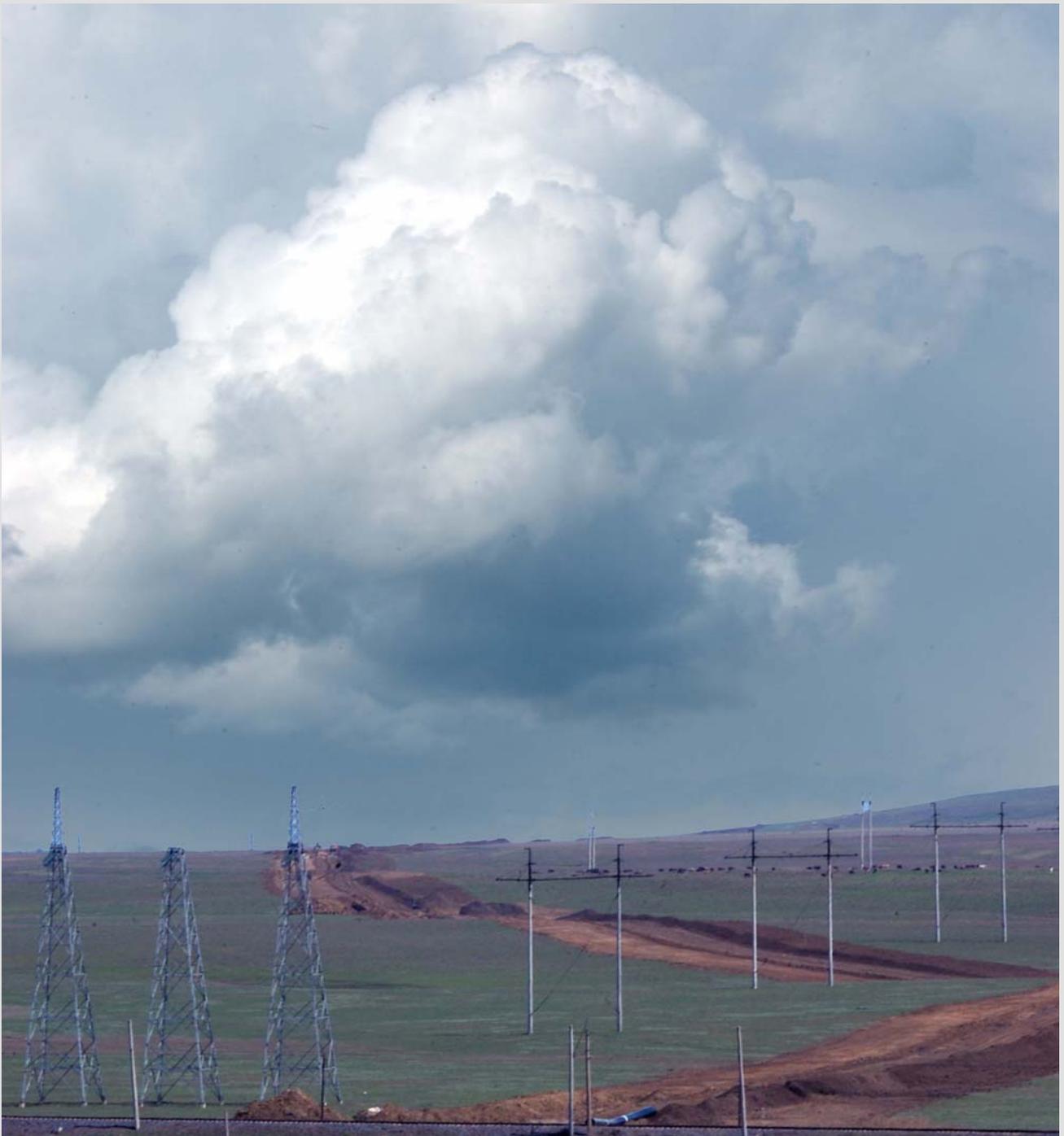




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**Advisory Assistance to the Ministry of Energy of Georgia**  
P.E.D. IQC – Contract No. DOT-I-00-04-00020-00 Task Order #800

# **NATURAL GAS STRATEGY FOR GEORGIA: PART 1. ANALYSIS AND PROPOSALS**



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Advisory Assistance to the Ministry of Energy of Georgia

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# **NATURAL GAS STRATEGY FOR GEORGIA:**

## **PART 1. ANALYSIS AND PROPOSALS**

### **Disclaimer**

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

# NATURAL GAS STRATEGY FOR GEORGIA: PART 1: ANALYSIS AND PROPOSALS<sup>1</sup>

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<sup>1</sup> All views expressed herein are those of the authors, and may not reflect the views of the United States Agency for International Development. The Study "Natural Gas Strategy For Georgia: Analysis And Proposals" was prepared by Chief of Party Paul Ballonoff. Annex 2 was prepared by staff attorney Ana Uchaneishvili. The analysis of Part III.D rests on a model of operation of the Georgian power system prepared by project engineer Bidzina Kekelia.

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## **EXECUTIVE SUMMARY**

The Ministry of Energy of Georgia has requested that the USAID supported project Advisory Assistance to the Ministry of Energy of Georgia<sup>2</sup> offer its vision of energy strategy concepts for Georgia. This document is therefore the first part of a multipart reply to that request. The two major segments are the present study, which concentrates on natural gas issues and certain inter-fuel comparisons of natural gas and hydro-power for Georgia. The second major segment will cover more general issues, including a more complete analysis of power system strategic issues.

The immediate study “Natural Gas Strategy for Georgia” in turn consists of two major sub parts. The immediate document is entitled “Part 1: Analysis And Proposals”. Part 1 deals with certain broader proposals and the inter-fuel comparisons. Part 1 recommends considering certain wholly commercial solutions for development of gas trading markets in Georgia. Bound separately is “Part 2: Economic and Geopolitical Context”. Part 2 contains a detailed documentation of gas supply sources and price, transit routes, storage, and other infrastructure and basic economic and geopolitical issues affecting gas supply to Georgia. Part 2 is intentionally done as an independent separate study, to provide additional insights. But the two studies reinforce each other by providing a much broader and deeper analysis than if only one were undertaken.

The present study proposes recommendations related to gas policy for Georgia. It does not claim to be a complete “gas strategy”, nor an analysis or particular trading partners or contract terms. We concentrate in this Part 1 on two principal issues. One, the relationships of power markets of Georgia to natural gas policy. We separate this analysis of the “internal” market, for service of energy demands within Georgia; from our second discussion, of the “external” or international commercial relationships, for energy supply and transport. In analysis of the external markets, we especially discuss a proposal for making Georgia a commercial trading center, serving international energy markets. That is, our inter fuel comparisons result in recommendations for management of Georgian domestic energy supply requirements. But our external analysis results in recommendations of how Georgia can become a center for important international market services, especially by creation of a Georgian based futures (financial trading) market for natural gas contracts. Such market in turn would also support development of a more reliable and diverse source of supply for Georgian domestic consumption. However, we do not advise transforming the Georgian domestic market into a futures market. Georgian distributors, industrial

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<sup>2</sup> The contractor for this project is CORE International, Inc. This study was prepared by the staff of the project, under the direction of Chief of Party Paul Ballonoff, with the close support of CORE International principal staff. **DISCLAIMER:** All opinions in either study are those of the authors or the project alone, and do not necessarily reflect any viewpoint or opinion of USAID nor the US Government.

users or producers might also choose to use the proposed futures market for supply or other uses. But the purpose of the proposal is to show how Georgia can offer additional valuable services to world markets, not to transform the domestic markets.

In Georgia's domestic markets, natural gas offers a source of supply for electrical generation, a fuel and feed stock for industry, and a fuel for residential consumption. By comparing total capital and energy costs per kwh consumed under a range of assumptions, we show that in most circumstances, Georgia should prefer use of hydro power, rather than natural gas as a source of electric generation. Preliminary analysis of hydrological conditions show this can be a feasible solution, even in low water conditions. Reliance on hydro would minimize domestic requirements for external sources of natural gas, and thus increase energy security for the country. Hydro power may have high capital costs. But Georgia also has potentially high capital costs for service of its domestic gas distribution loads. Thus, the study also recommends that the Government of Georgia concentrate its borrowing capacities on assuring power industry resources, and allow natural gas services to sustain by wholly market based actions, or from Donor grants if available.

Also related to domestic markets, the pricing policies generally presently applied by the sector regulator, the GNERC, are easily seen to be themselves a cause of energy shortages and unreliable delivery systems. Therefore, the report recommends that the Ministry of Energy include requirements for more competent energy pricing policies, in the energy policy for Georgia the Ministry is required to submit to the Parliament.

We do not discuss, since we have no reliable information, the prospects for developing new natural gas production from fields within Georgia. If the hoped for finds are proven to exist, that is an obvious benefit which can affect many conclusions, not simply those of this study.

New major discoveries aside, an immediate problem is that the domestic energy markets of Georgia, taken alone, are not sufficiently large to sustain the capital investments required to assure diverse and reliable natural gas supply for Georgia. In contrast, in international markets, large volumes can and increasingly will, transit the country. Georgia is a quite small consumer in that transit, but is a major provider of transit services. Often it is paid for those services in form of commodity-in-kind. This "transit gas" provides at best a small fraction of the volume consumed in Georgia, and is self-evidently not a means to assure supply, since it necessarily depends on economic choices made by others. The Georgian demand alone does not sustain exploration and development of major new fields nor construction of major pipeline projects. Therefore some other solution is required.

This study thus recommends that Georgia take advantage of its position as a favored transit route, which is a service industry to international markets, to also become a major international commercial center for natural gas trading. The burgeoning markets for Central Asian energy production as yet have no international trading center. Relying on Georgia's already developing international transit corridor, we therefore suggest that the Ministry of Energy encourage creation of a Georgian commodities exchange (futures market) for natural gas, for use by international gas traders. Presence of such market could induce not only the important financial industry represented by that trading. Such market could induce international industry to invest for assurance of reliability of that market, and to take advantage of trading opportunities by improving network capital services. Parties might do so by placing new transit routes through Georgia, by inter-tie of regional transit routes to the Georgian system to maximize trading opportunities, and by other projects such as natural gas storage that may also maximize trading opportunities. By this indirect means, Georgia may also assure that its domestic markets may have access to a large and diverse set of supplies, and thus reduce its dependence on any single source of natural gas supply. Though lacking capital to do so, directly, Georgia may still assure its energy security by vigorously encouraging commercial opportunities through international trading markets.

## ***I. PURPOSE, PHILOSOPHY AND TECHNIQUE OF THIS ANALYSIS:***

### **1.A. SCOPE OF THE PRESENT DOCUMENT**

The present document is part of a set of related studies on energy strategic planning issues for Georgia, to be created by CORE International in the scope of its work under the USAID project “Advisory Assistance to the Ministry of Energy of Georgia”. This task has two principal origins, and thus, two principal components. In June 2005 the Ministry of Energy requested that the project provide assistance in documenting energy statistics related to Georgian energy supply and demand analysis; asked that the project prepare its own vision of an “energy balance” for Georgia that can assure energy security<sup>3</sup> for the country; and asked the project to train the staff of the Ministry in the techniques used in that analysis. In December 2005 the Ministry also requested that the project provide analysis of alternatives related to the supply of natural gas to Georgia. This second study is inherently part of the first, but was also requested as a separate document, and with greater urgency.

CORE International is responding to those Ministry requests as follows. The immediate two part study focuses on gas policy, but must also consider interactions with other energy sources, as gas is both affected by these other policies, and is an alternative means for some of them. The companion documents include an independently written discussion of economic and geopolitical issues affecting Georgian natural gas supply, including data on Georgian and other relevant country gas markets. Also attached, as Annex 2, and in support of our proposals for creating regional commercial markets in Georgia, is an overview of the treaties and international agreements that affect energy supply to, and energy transport to and within Georgia. The major component of our work, to follow in June, will expand the concepts presented here, to electricity markets, and to deeper inter-relationships of the natural gas and electricity markets not covered in the present study.

### **1.B. UNDERLYING PHILOSOPHY OF THIS STUDY**

The concepts of Government “policy” and of “planning” have very different meanings in different contexts. Their use especially in a market system differs importantly from that

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<sup>3</sup> The Ministry did not define “security”. For purpose of this study, we take “security” to mean the ability to assure that internal supply requirements are met with minimal opportunity for complete interruption. We treat the issue by analysis related to diversity of supply. We specifically do not attempt to analyze a more technical version of this concept: the ability to assure that at least a minimal supply is available under all circumstance for some selected purposes for some minimum of time. Analysis of that concept is a much more physical analysis, related to design and operation of all of consumption, production, transmission and storage. It would also involve complex and in many cases, political judgments, about what are “priority” needs. In the first instance, the project has not sufficient data to attempt this question, whether on particular industries, nor the operations; nor, on details of operation of delivery facilities. But also, the judgment that Government can assure “security” in this more physical sense, often leads to efforts by Government to allocate supply by other than market means. In general however the author believes that market are also the best manager of supply, even in extreme conditions. Thus, the best thing that the Government could so to assure physical supply security in this sense, is to promote pure commercial operation of all facets of the gas supply system, in as free and open a market as can be made possible. (This should not be taken as a recommendation nor comment of any form on policies for local distribution infrastructure systems).

of a centrally controlled system. Under the law and current practice of Georgia, energy sector operating companies are all either wholly private, or are corporatized. These state owned corporate entities are also expected to become self-sufficient in conformance with corporate accounting and responsibility standards. In the future, most Georgian energy operating companies are expected to become wholly private. The role of Government in setting policy and doing planning in that environment is thus very different than when the Government owns and operates all economic institutions.

This distinction shows up even in the language used to describe the activities. In the former Soviet system, “planning” was often a directive exercise, stating quantitative requirements for output to conform to some broader objective that might be called a “policy”. This led to doing energy “planning” by the method of computing energy “balances”. In doing “balances” purely quantitative measures of production and consumption were shown to “balance” each other in some period of time, in a “plan” that would be implemented by direction of the government. Conduct of this kind of planning requires that the Government have complete control of all parts of the production and consumption chain, including to determine prices, and to allocate rights to consumption. But because the pricing and other decisions in such system do not reflect the real costs of resources, the actual outcome of the system was typically not the intended “planned” result. Instead, the common practical result was creation either of large shortages compared to the actual amounts desired to be consumed at the enforced prices, or, creation of massive over-production, for which there was no economic need. Attempting similar actions in a market system will produce similar results, exacerbated by the perception of undue attempts at exercise of Government control.

In a market system therefore, the role of Government in setting policy and conducting planning in implementation of that policy, must be very different. In a market economy, in which the principal operational actors are independent of government, the role of Government becomes one or both of two principal activities. One, to set the rules by which the operating entities may interact; this in essence means setting of “law”, or “administrative rules”, in various forms. Second, the Government may still have specific powers that allow it to directly intervene in markets, by doing specific constructions itself, by subsidizing others, and by using other powers of government to facilitate or disincentive certain kinds of activities. In Georgia, the law is of course set by Parliament. But also, by law, the Ministry of Energy may establish certain kinds of policies by administrative documents, such as Market Rules for natural gas or electricity markets, and may create or subsidize particular projects. As well the Government as a whole, by its actions such as to take Donor loans or grants, and by other especially financial actions, can facilitate or inhibit, certain projects or activities.

The art of Government policy in a market economy is to conduct these activities as may be required for broader objectives (whether social, political, security or economic) while still allowing market institutions to function so that shortages or overproduction are avoided. The ability of Government to do so rests on a combination of extensive amounts of data collection and analysis, supporting well documented analysis and reasoning about possible future conditions. Thus, by way of advising the Government in suggesting policies related to natural gas in Georgia, this study rests heavily first on data collection and analysis. While some of this data may appear in forms that look like quantitative balances (as used in Soviet planning) the principal

uses of data in market oriented planning are to point out possible areas of problems, or to find opportunities, to test concepts for future action, and to estimate the likely costs or possible outcomes of those courses of action.

Strategic planning by a market oriented government therefore in large part means to anticipate in advance what may be the likely costs and effects of particular policy choices for future action by government. Because a government may still have extensive powers that can affect those outcomes, the principal uses of this analysis are to help focus government action in a way that most effectively achieves a desired result. It may also support the decision of what result may be desired, based on a better understanding of relative benefits, always constrained by a respect for the proper discretion of the independent operators. But it does not involve Government direction of specific results, especially, it does not involve Government mandates of specific quantities to be produced, shipped, or purchased, by any party..

The problem of energy security for Georgia, as discussed in this study, is nominally is to assure that internal supply requirements are met. On that nominal criterion, the principal international component is the existence of sufficient supply contracts and transit routes to assure those domestic supply requirements. But the two realms of internal and external policy are also closely linked – for example, by following a suitable external policy, the internal requirements might be met at lower direct capital cost to Georgia, and with higher reliability.

Thus this study recognizes that energy supply policy for Georgia has two different administrative components, which may be governed by different policies and rules: internal and external. Policy applied internally may affect ownership and operation of the distribution and transmission systems serving needs within the country, rights of access to distribution and transmission for domestic needs, tariffs for transmission, distribution, and domestic supply, perhaps other services delivered domestically, and rights to engage in trades or contracts for domestic supply purposes. While there are some treaty based constraints on how these powers may be exercised when international parties are also affected (see Annex 2), these are principally matters of domestic policy for Georgia. Responsibility for domestic natural gas policy in Georgia is divided principally between the Ministry of Energy, and the regulator (GNERC). The GNERC sets tariffs, while the Ministry of Energy proposes policy to the Parliament, assures the enforcement of policy approved by Parliament, and determines Natural Gas Market Rules.

External natural gas policy for Georgia may affect import and export of commodity, transmission through (and to or from) Georgia, and trading of commodity within Georgia or on international markets linked to Georgia. This external policy is determined by several institutions. One, it is affected by pre-existing supply contracts and financial commitments for supply to Georgia. Second, it is affected by international agreements, including treaties, contracts or protocols of lesser legal standing than treaties. Third, it may be affected by the Georgia Natural Gas Market Rules, if and to the degree those affect import or export of energy, or if otherwise affect commercial transactions within Georgia that interact with international trade are subject to those Rules. The Ministry of Energy can also use its role as advocate, such as by proposing policies to the Parliament of Georgia. Finally, international trade or transit may be affected by other laws or institutions of Georgia. Because a principal outcome of our

analysis is the ability to secure increased reliability at lower cost by international trading, we also discuss the external side of the market.

## **II. MINISTRY OF ENERGY OF GEORGIA POLICY AUTHORITY**

### **II.A. LEGAL FOUNDATIONS OF MINISTRY OF ENERGY POLICY AUTHORITY**

The Ministry of Energy of Georgia is the State institution implementing executive authority and state policy in the Georgian energy sector. The Ministry of Energy exists in accordance with the Law of Georgia on “The Structure of the Government of Georgia” (11.02.04). The Ministry’s activities are governed by the Georgian Constitution, International Agreements, other Standard Acts and the ‘Charter of the Ministry of Energy of Georgia’ most recently approved by the Government of Georgia in March 17, 2005. The Ministry with its entire system ensures implementation of State policy in the energy sector. Under the law on “Electricity and Natural Gas” the Ministry of Energy relinquishes ownership, and operational rights in the electricity and natural gas sectors, and has only specified regulatory rights. That is, the Ministry is not an operational body that delivers energy commodity and services to the population. It is a policy body.

Thus, as we outline in more detail below, a principal tool of the Ministry is its ability to propose energy policy to the Parliament (and thus its ability for leadership even when it has no direct authority). Similarly the Ministry has the ability to approve Natural Gas Market Rules, subject to public hearings, which govern commercial relations for trade of natural gas within Georgia for the Georgian market; and its ability to set Market Rules for electricity (also subject to public hearing), which thus strongly affect a principal market for natural gas, as a fuel for electric generation. Closely related to the Market Rules for electricity, is the ability to approve the “energy balance” for expected dispatch of electric generation in a coming period. One reason we elsewhere in this Part 1 discuss concepts of “planning” including of energy balance, is because the form of exercise of that authority has a very strong impact on the efficiency and structure of operations of both the natural gas and power markets. Within the general ability to propose policy, the Ministry can also propose tariff policy for internal markets (retail and wholesale tariff policies for natural gas and electricity) which would be followed by the regulator if approved by Parliament. As discussed below (Part III.E and Annex 1), such tariff policies affect not only price per se, but also requirements for capital. Thus, it is appropriate that this study discuss both issues of pricing policy. and also, concepts for the market structures affecting trade in natural gas in and through Georgia.

The detailed authorities of the Ministry of Energy are described in Tables II-1, II-2 and II-3 below. The Law on ‘Electricity and Natural Gas’ (June 27, 1997, as amended) give the Ministry of Energy the function of establishing main directions of state policy in the electricity and natural gas sector, securing their implementation and creating and adopting the legal framework for the sector. The Ministry “sets” those policies by proposing a state energy policy to the Parliament; if approved, then the Ministry secures their implementation.

Although the Ministry can only “set policy” with approval of the Parliament, there are certain critical normative-administrative legal acts which have policy content, which the Ministry can approve (indeed, must issue) on its own authority, under the Law on Electricity and Natural Gas. These are:

1. Electricity (Capacity) Balance;
2. Natural Gas Balance;
3. Electricity (Capacity) Market Rules;
4. Natural Gas Market Rules;
5. The Rules of Installation and Operation of Energy Facilities and other Technical Equipment

Also, the Ministry of Energy is authorized to make decisions on deregulation, based on state energy policy.

Apart from the words of the Law on Electricity and Natural gas itself, there is no legal policy guide for how the Ministry should exercise its authority, substantively. No legal act defines the terms: "monitor", "promote", or prepare "indicative forecasts". There is also no other specific provision of other laws that guide direction of policy of the Ministry of Energy. However, procedurally, the Ministry of Energy must apply the General Administrative Code of Georgia. Particularly, the Ministry shall prepare, issue, or enforce administrative-legal acts (individual and normative) or solve administrative complaints in accordance with the procedures established by that Code, including, by use of public hearings. However the Ministry is generally required by the Law on Electricity and Natural Gas to promote efficient uses of energy, and to promote competitive markets. Thus, this report recommends the Ministry rely on its capacity as an analyst of energy security and energy markets, and its required role as an advocate of policy, to propose policies that achieve those objectives.

**Table II-1**  
**Functions of the Ministry of Energy**  
**Under the Law on Electricity and Natural Gas**

- (a) Elaborate programs in energy sector including electricity and natural gas sectors based on the short, medium, and long-term strategy and priorities and to coordinate their implementation;
- (b) Promote attraction of short, medium, and long-term investments and credit resources, also implementation of state investments for rehabilitation and development of the energy sector;
- (c) Promotion of efficient restructuring and privatization of state owned enterprises in the energy sector, also support of competition development in electricity and natural gas sectors; development of rules and strategy for conservation and liquidation of energy facilities;
- (d) Participate in elaboration and development of legal and regulatory framework, monitor the technical and economic condition of the energy sector;
- (e) Develop and coordinate implementation of uniform State program targeted to increase efficiency in the areas of electricity generation, transmission, dispatch, distribution, import, export and consumption, as well as in the areas of natural gas supply, import, export, transportation, distribution and consumption;
- (f) Promote development of scientific research, design-construction and education spheres in the energy sector, also promote attraction of investments and credit resources and implement subsidies.
- (g) Promote environmental protection in the energy sector, and optimal reflection of ecological aspects in energy programs during their development and implementation;
- (h) Promote cooperation between Licensees, Importers and Exporters, suppliers and electricity and natural sector entities in foreign countries, and support transit and import/export relationships in the electricity and natural gas sectors.
- (i) Develop state strategies for energy sector emergencies;
- (j) Determine strategy for the insurance of the security in the energy sector, elaboration of recommendations as well as studying the emergency situations and technical imperfections and preparation of the conclusions about them.
- (k) Promote increase of energy resource production, prevalent utilization of the renewable (alternative) energy resources and support energy efficient measures related to the increase of the effectiveness of the production.

**Table II-2**  
**Ministry of Energy's 31 Specific Authorities As to Policy**  
**Under the Law on Electricity and Natural Gas:**

1. Elaborate the legal bases for the functioning, restructuring and developing the energy sector;  
 Coordinate legal relations with the Parliament, President's Administration and other State organizations;
2. Conduct negotiations with investors and donors organizations, prepare and examine the draft agreements and monitor the implementation of the concluded agreements;
3. Coordinate the activities of the legal departments of the organizations subordinated to the Ministry;
4. Implement the legal relations with the foreign countries, international financial institutions and private investors; in accordance with the Acting Legislation
5. Ensure representation of the Ministry in Court and Arbitrage in accordance with the rules established by Acting Legislation;
6. Prepare the draft legal documents and ensure their compliance with the Acting Legislation;

7. Promote the competition in the Georgian energy resources market within the scope of its competences and in compliance with the implementation of the energy sector restructuring and main economic reforms;
8. Participate in the elaboration of the State and Budget financing policy in the energy sector and promote its implementation;
9. Participate, within its competence, in the negotiations with the donors and investors and financial monitoring of contract implementation;
10. Within its competence, implement and monitor the procurements made by funds allocated for the energy sector rehabilitation;
11. Develop the state indicative programs and forecast plans in the energy sector;
12. Monitor and prepare information reflecting the State budget relations and financial statuses of the Legal persons of the public law under the Ministry governance;
13. Coordinate and cooperate with the organizations operating within the energy sector; Monitor over the technical condition of equipment belonging to power generation, transmission/dispatch, distribution enterprises and production enterprises (coal, crude oil, natural gas etc.);
14. Supervise over safe utilization of electric equipment and devices (within its competence);
15. Develop the proposals regarding energy sector management, improve technological processes, reduction of energy and thermal losses; develop the projects targeted to modernize technical and technological processes; prepare programs and technical data for rehabilitation of generation, transmission and distribution facilities;
16. Develop the energy balances; forecasts the country's increased demand for energy resources, taking into consideration the household basket and national economic parameters; Monitor over their implementation in order to guarantee reliable operation of the Georgian electric system and energy distribution companies.
17. Monitor over production and sale of energy resources, also import/export volumes of energy resources;
18. Prepare the proposals and recommendations on efficient utilization parameters of fuel resources and their effectiveness.
19. Forecast energy resource volumes and analysis of current expenditure;
20. Elaborate methodological recommendations technical maintenance rules and other Standard Acts on energy producing spheres within the scope of its competence and in accordance with the Acting Legislation
21. Develop the uniform policy and strategy in the energy sector and promote its implementation;
22. Develop short term, medium and long term programs; develop the country's energy security policy and promote its implementation;
23. Define directions for the utilization of the renewable sources of energy; develop the uniform State policy and strategy in this regard;
24. Participate in elaboration of the energy sector privatization plans, within the Ministry's competence, and prepare the list of the facilities for privatization
25. Participate in energy efficiency and energy saving, as well as environmental policy development in energy sector and promotion of their implementation within the scope of its competence;
26. Coordinate the sector and inter-sector scientific research and testing/construction projects;
27. Prepare the relevant documents needed to issue permissions and conclusions regarding the proposed location of the energy sector facilities to be constructed;
28. Develop and coordinate international relations;
29. Coordinate planned activity and programs targeted to integrate the country into the Euro-Atlantic structures (within the Ministry's sphere of competence);
30. Coordinate the work of international donor organizations within current and planned projects and relations with international investors (within its sphere of competence), develop attractive projects for promoting investments in the energy sector and presents these projects at international forums;
31. Develop the current and future prospects for transportation and transit of energy resources (within its sphere of competence);

**Table II-3**  
**Administrative Acts Required of the Ministry of Energy**  
**Under the Law on Electricity and Natural Gas**

- Order on Electricity (capacity) balance,
- Order on Natural Gas balance,
- Order on Electricity (Capacity) Market Rules,
- Order on Natural Gas Market Rules,
- Order on the Rules of Installation and Operation of Energy Facilities and other Technical Equipment through a public administrative proceeding prescribed by Chapter 9 of the “General Administrative Code of Georgia”, including participation of the Commission and other interested parties”.

## **II.B. PRINCIPAL POLICY TOOLS OF THE MINISTRY OF ENERGY**

The Ministry of Energy has available many tools to both set and effect policy for the energy sector of Georgia. These can affect both internal and external policy. The “biggest” of these, but which is also in some ways the most difficult to use, is the power to set policy by proposing “policies” and laws for Parliamentary approval. It is “biggest” since it is potentially the most general, but for the same reason, that it requires Parliamentary approval, is also a rather difficult tool. Therefore, while a major tool it is also one that can be used as a practical instrument only on infrequent occasions. This however may be the principal tool required to propose the policies discussed in Part IV of this study, related to creating international trading markets for natural gas contracts, in Georgia. Because those markets would be principally serving the internal trade, not domestic trade, the Ministry power to set Natural Gas Market Rules is thus probably not adequate to establish this position for Georgia. As well, establishing a futures market, as discussed in Part IV, may also required some new legislation. Thus, the Ministry power on proposing policy may be a key tool to carry out the recommendations o this study.

A second tool, which is rather easier to use though also requires Parliamentary approval, is to create projects funded by the state budget via the Ministry. That tool is relatively easier to use since to do so requires approval only of a specific task, justified on its own merits, and may not affect general principles of behavior nor duties, as would a new law for example. But because state resources are always limited, as a general principle, effecting projects via the state budget is a necessarily limited possibility, which therefore must be used in a highly targeted manner. Thus, this study makes recommendations, summarized in Part III.F, on directions of priority for use of state resources, including, use of state power to borrow funds at low rates from international financial institutions and related Donorbodies.

The remaining direct tools of the Ministry are the administrative instruments it is required to issue, principally the Market Rules for each of the gas and electric markets, and the discretion to exercise a decision on deregulation (provided such policy has been provided for in a state policy approved by Parliament.) Because the Ministry has

direct authority to issue these documents, they are “easiest” to use, in an administrative sense. But because they are administratively “easy”, they therefore carry with them a higher degree of direct risk to the Ministry, including irresponsibility for their success, and public exposure to criticism if they are not well understood by the public. The Ministry powers on approval of market rules (for both the domestic natural gas market, and for the power markets generally), and to approve energy balances, are all critical and would be affected by the recommendations of this study.

The “Natural Gas Market Rules” are most apparently related to the present study. The definition of Natural Gas Market Rules under the Law on Electricity and Natural Gas includes that it is “a document regulating the commercial, financial and technical relations arising from natural gas purchase-sale and transportation...”. The internal natural gas market structure of Georgia is to a very large degree determined by the Law on Electricity and Natural Gas, and by the ownership structure of the gas operating companies (and therefore not in the direct control of the Ministry of Energy). But the relationships of market participants of the internal market are fully within the control of the Ministry of Energy via the Natural Gas Market Rules.

As well, the commercial relationships of external market participants engaged in such transactions within Georgia, are therefore also potentially affected by the Natural Gas Market Rules (except when also regulated by government by some other body of law, as we shall discuss later as regards commodity markets). This is a critical realization, since many of the authorities of the Ministry noted in Table II-1 affect international commerce, especially item 4 of that table “Implement legal relations with foreign countries, international financial institutions and private investors, in accordance with existing legislation”; and 8 “participate, within its competence in the negotiations with donors and investors and financial monitoring of contract implementation”; and 17 “monitor over production and sale of energy resources, and also import/export volumes of energy resources”; and 22 “Develop short term, medium and long term programs; develop the country’s energy security policy and promote its implementation”. As is discussed in Part 1B above, a principal tool for assuring Georgian energy security can be the manner in which markets and transit routes for energy consumed external to Georgia, are managed within Georgia. This in turn may tie to domestic tariff policies for facilities used for both domestic and international trade (and thus affected by treaty obligations as noted in Annex 2). Thus, the Ministry of Energy has an important role to play in determining that policy.

Finally, we note that one of the “restrictions” on Ministry action, that it must conduct a public hearing to carry out an administrative act such as these, is not a restriction, but a tool for managing policy by the Ministry. As the Ministry experience with media actions demonstrates to date, media and the public can always find ways to criticize an action, and will do so more fiercely when adequate explanations are not provided. While the public hearing is indeed a forum in which criticism (or other comments) might be expressed, it is also one in which the Ministry can control the process, and the outcome. The Ministry is required only to hold the hearings, and consider what is then expressed. Having done so, the Ministry action can then be less subject to subsequent criticisms, and the Ministry be less surprised by opposition, if indeed there is such, of a proposed action. The public hearing also allows to correct possible errors if discovered by the participants of the hearing, in a way that shows the Ministry as responding to the public. Thus, while this analysis of strategy will not dwell

further on the procedural aspects of hearings, it notes that if the Ministry were to adopt any policy suggested here, that use of a public hearing as part of the process of adoption is a strong positive tool that the Ministry should use in a constructive, well managed and previously thought through manner.

### **III. DOMESTIC ENERGY AND CAPACITY REQUIREMENTS FOR GAS SUPPLY TO GEORGIA**

#### **III.A. FORECASTED QUANTITY REQUIREMENTS**

We begin the analysis of options for natural gas supply within Georgia by an assessment of domestic demand. Forecasting demand in a market environment can be difficult, since the forecast must reflect that consumers (including industry and power generation consumers) will make decisions for use of natural gas based in large part on the economics of use of gas. But as gas prices fluctuate in markets, and as especially in Georgia there is little history of making energy use decisions in a market environment, forecasting use of gas is difficult. In particular, the “simple” choice of forecast, to claim that demand will eventually return to Soviet consumption levels is certainly an incorrect forecast, since the conditions at that time did not reflect economic choices either for price of gas nor for location and kinds of industry.

Thus, we consider several forecasts. The companion study has a detailed analysis of potential demand within Georgia, using different techniques, including “bottom up” (from the detailed analysis of industry to the total), and “top down” (from the aggregate down to detail). For purposes of the present summary and comparison, we use the estimated demands as reported by the MCC/MCG assumptions of April, 2005, for flows on the North-South pipeline, including transit to Armenia. We use this here primarily because it has been the basis of other recent analysis of the sector, and thus may make it easier for some users to draw comparisons from the numbers in the present study.

This forecast is given in Table III-1 below. Within Georgia, the forecast separates demand (consumption) by electric generation, industry, and residential. Note, that because these demand forecasts are not based on a condition of market prices, we do not know the real economic basis of demand. But we the forecast avoids the common error of many previous studies, to simply assume “restoration” of demand to Soviet levels.

Because we will want to compare possible alternative sources of energy on a capital and energy cost basis, we also show an estimated MW equivalent of electric generation capacity required to provide a similar quantity of energy, using very general assumptions on typical capacities and operation characteristics of a gas fired generation unit. Because we do not, in this analysis, consider the actual daily equivalent hourly load shapes, the total electric generation capacity required to in fact provide the same amount of energy, when considering reliability, might be somewhat higher. A system must always be designed for reliability, but the current Georgian power system is also not yet designed to a known reliability standard. Thus, by our assumptions we do not introduce new forms of error. As a rough comparison, the MW

equivalent of capacity of natural gas based generation from Table III-1 for 2005 is approximately the amount actually available in that period, and the increment for capacity after that year corresponds approximately to the amounts of planned new or rehabilitated gas fired generation capacity also anticipated, at the time of this forecast, for that same period. Thus, we may take the equivalent capacity estimates in the table as being reasonable.

**Table III-1 FORECASTED GEORGIAN NATURAL GAS CONSUMPTION  
2005 - 2008**

<u>Analysis of Georgian Current and Projected Gas Usage</u>						
Gas Flow Forecasts, per MCC April 1 2005 Projections						
On North South Pipeline						
Sources of Consumption - Cubic Meters						
Year	Electricity Generation	Industry	Households	Transit to Armenia	Total	Georgia Only
2005	528,144,000	430,000,000	500,000,000	1,700,000,000	3,158,144,000	1,458,144,000
2006	942,000,000	518,000,000	540,000,000	1,750,000,000	3,750,000,000	2,000,000,000
2007	1,042,000,000	1,200,000,000	600,000,000	1,800,000,000	4,642,000,000	2,842,000,000
2008	1,100,000,000	1,450,000,000	650,000,000	2,000,000,000	5,200,000,000	3,200,000,000
Forecasted Annual Changes in Consumption and Throughput						
Year	Electricity Generation	Industry	Households	Transit to Armenia	Total	Georgia Only
2005						
2006	413,856,000	88,000,000	40,000,000	50,000,000	591,856,000	541,856,000
2007	100,000,000	682,000,000	60,000,000	50,000,000	892,000,000	842,000,000
2008	58,000,000	250,000,000	50,000,000	200,000,000	558,000,000	358,000,000
<b>Total</b>						
<b>Change</b>	571,856,000	1,020,000,000	150,000,000	300,000,000	2,041,856,000	1,741,856,000
<b>Total Use</b>	1,100,000,000	1,450,000,000	650,000,000	2,000,000,000	5,200,000,000	3,200,000,000
MW Equivalent Current Consumption Capacity At Ratios Assumed						
Year	Electricity Generation	Industry	Households	Transit to Armenia	Total	Georgia Only
2005	338.1	275.2	320.1	1,088.2	2,021.5	933
2006	603.0	331.6	345.7	1,120.2	2,400.4	1,280
2007	667.0	768.1	384.1	1,152.2	2,971.4	1,819
2008	704.1	928.1	416.1	1,280.2	3,328.5	2,048
MW Equivalent Consumption Incremental Capacity At Ratios Assumed						
Year	Electricity Generation	Industry	Households	Transit to Armenia	Total	Georgia Only
2005						
2006	264.9	56.3	25.6	32.0	378.8	347
2007	64.0	436.5	38.4	32.0	571.0	539
2008	37.1	160.0	32.0	128.0	357.2	229
<b>Total</b>						
<b>Change</b>	366.0	652.9	96.0	192.0	1,307.0	1,115
<b>Total Use</b>	704.1	928.1	416.1	1,280.2	3,328.5	2,048
<u>Ratios Assumed</u>						
	Heat Rate	10,000				
	Plant Factor	50%				

In Table III-2 we show the cost of the natural gas used at the estimated volumes given in Table III-1. Table III-2 also shows a comparison of the relative impact by class and by year of the increase of gas cost by \$55/bcm experienced in January 2006.

**Table III-2. DOLLAR COSTS OF ENERGY AT \$110 per 1000 CM**

<b>Dollar Impact of Projected Gas Cost Changes</b>						
Based on Gas Flow Forecasts, per MCC April 1 2005 Projections On North South Pipeline						
<b>At Projected Price</b>		<b>New Price pe 1000 cu meters:</b>				
<b>Cost of Consumption</b>		\$ 110.00				
Year	Electricity Generation	Industry	Households	Transit to Armenia	Total	Georgia Only
2005	\$ 58,095,840	\$ 47,300,000	\$ 55,000,000	\$ 187,000,000	\$ 347,395,840	\$ 160,395,840
2006	\$ 103,620,000	\$ 56,980,000	\$ 59,400,000	\$ 192,500,000	\$ 412,500,000	\$ 220,000,000
2007	\$ 114,620,000	\$ 132,000,000	\$ 66,000,000	\$ 198,000,000	\$ 510,620,000	\$ 312,620,000
2008	\$ 121,000,000	\$ 159,500,000	\$ 71,500,000	\$ 220,000,000	\$ 572,000,000	\$ 352,000,000
<b>Forecasted Annual Changes in Cost of Consumption and Throughput</b>						
Year	Electricity Generation	Industry	Households	Transit to Armenia	Total	Georgia Only
2005						
2006	\$ 45,524,160	\$ 9,680,000	\$ 4,400,000	\$ 5,500,000	\$ 65,104,160	\$ 59,604,160
2007	\$ 11,000,000	\$ 75,020,000	\$ 6,600,000	\$ 5,500,000	\$ 98,120,000	\$ 92,620,000
2008	\$ 6,380,000	\$ 27,500,000	\$ 5,500,000	\$ 22,000,000	\$ 61,380,000	\$ 39,380,000
<b>At Previous Price</b>		<b>Old Price pe 1000 cu meters:</b>				
<b>Total Cost of Consumption</b>		\$ 65.00				
Year	Electricity Generation	Industry	Households	Transit to Armenia	Total	Georgia Only
2005	\$ 34,329,360	\$ 27,950,000	\$ 32,500,000	\$ 110,500,000	\$ 205,279,360	\$ 94,779,360
2006	\$ 61,230,000	\$ 33,670,000	\$ 35,100,000	\$ 113,750,000	\$ 243,750,000	\$ 130,000,000
2007	\$ 67,730,000	\$ 78,000,000	\$ 39,000,000	\$ 117,000,000	\$ 301,730,000	\$ 184,730,000
2008	\$ 71,500,000	\$ 94,250,000	\$ 42,250,000	\$ 130,000,000	\$ 338,000,000	\$ 208,000,000
<b>Impact of Annual Changes in Throughput on Cost of Consumption</b>						
Year	Electricity Generation	Industry	Households	Transit to Armenia	Total	Georgia Only
2005						
2006	\$ 26,900,640	\$ 5,720,000	\$ 2,600,000	\$ 3,250,000	\$ 38,470,640	\$ 35,220,640
2007	\$ 6,500,000	\$ 44,330,000	\$ 3,900,000	\$ 3,250,000	\$ 57,980,000	\$ 54,730,000
2008	\$ 3,770,000	\$ 16,250,000	\$ 3,250,000	\$ 13,000,000	\$ 36,270,000	\$ 23,270,000
<b>Increment in Cost of Consumption Due to Increased Volume and Increased Price</b>						
<b>New Vs Previous Price</b>		<b>Increment in Price pe 1000 cu. m.:</b>				
		\$ 45.00				
Year	Electricity Generation	Industry	Households	Transit to Armenia	Total	Georgia Only
2005	\$ 23,766,480	\$ 19,350,000	\$ 22,500,000	\$ 76,500,000	\$ 142,116,480	\$ 65,616,480
2006	\$ 42,390,000	\$ 23,310,000	\$ 24,300,000	\$ 78,750,000	\$ 168,750,000	\$ 90,000,000
2007	\$ 46,890,000	\$ 54,000,000	\$ 27,000,000	\$ 81,000,000	\$ 208,890,000	\$ 127,890,000
2008	\$ 49,500,000	\$ 65,250,000	\$ 29,250,000	\$ 90,000,000	\$ 234,000,000	\$ 144,000,000
<b>Increment in Cost over Initial Period Due to Price Effects Only on Incremental Volume</b>						
Year	Electricity Generation	Industry	Households	Transit to Armenia	Total	Georgia Only
2005						
2006	\$ 18,623,520	\$ 3,960,000	\$ 1,800,000	\$ 2,250,000	\$ 26,633,520	\$ 24,383,520
2007	\$ 4,500,000	\$ 30,690,000	\$ 2,700,000	\$ 2,250,000	\$ 40,140,000	\$ 37,890,000
2008	\$ 2,610,000	\$ 11,250,000	\$ 2,250,000	\$ 9,000,000	\$ 25,110,000	\$ 16,110,000

**III.B. FORECASTED CAPITAL REQUIREMENTS**

The companion study gives detailed estimates of capital projects for restoration and expansion of the Georgian natural gas distribution, and of pipeline projects that additionally would enhance transit route capabilities of Georgia. We summarize those in Table III-3, separating the capital required for the internal Georgian market, from those for external or international projects.

**Table III-3  
SUMMARY OF POTENTIAL CAPITAL REQUIREMENTS FOR  
NATURAL GAS TRANSPORT INFRASTRUCTURE PROJECTS**

Purpose of Capital Expenditure	Estimated Maximum Capital Requirement \$ Millions
<b>International Commerce:</b>	
Full Rehabilitation and Improvement of Georgian Mains System to be suitable for a Transit Route to Turkey and Beyond	\$ 650
Construction of New Pipelines for Export of Central Asian Gas to Turkey and Europe, Via Routes through Georgia (Maximum Estimate)	\$6,000
<b>Total</b>	<b>\$6,650.00</b>
<b>Domestic Commerce:</b>	
Georgian System Generally (Except Tbilgaz, and Other Local Distribution Systems)	
Minimal Rehabilitation to Provide Supply To All Previously Served Customers	\$ 60
Additional Medium Term Rehabilitation to Serve Existing Customers	\$ 40
Additional Capital Cost To Expand System to Serve All Customers in Georgia :	\$ 131
Tbilgaz Restoration to Design Standards (thus, does not include additional cost of individual customer metering)	\$ 80
Other Local Distribution System Rehabilitation (estimated at equal to Tbilgaz rehabilitation cost)	\$ 80
<b>Total</b>	<b>\$391.00</b>

In addition to the above, there is an estimated capital cost of about \$45 million for development of the Rustavi Gas Condensate Field for gas storage, and of Euro 93 million (about \$120 million) for development of the Ninotsminda Oil Field for gas storage, to create natural gas storage operations within Georgia. These could support domestic operations, provide a degree of energy reliability in the event of short term interruptions, and potentially serve the international markets as discussed in Part IV.

Thus apart from Tbilgazi, the minimum cost to restore and expand the Georgian mains systems to serve all consumers is \$231 million, plus another estimated \$80 million for local system operations apart from metering. The total for these actions, which as a practical matter is an expansion of service compared to the present status, is thus \$311 million, plus the costs of metering. For the purpose of this study, we shall assume that is or will be a wholly private entity, thus not on the state capital budgets. But if that is not true, then we must add at least another approximately \$80 million for a total of \$391 million. Note that this is apart from the estimated \$6,650 million on the top half of Table III-3, for creating capital improvements related to international transit. By listing the full maximum estimated \$6 billion cost of the Central Asia export line, we do not imply that Georgia would fund that amount, or directly fund even part of it. It does however show the relative scale of capital required for that option.

By way of comparison, Table III-4 below shows the total capital requirements forecasted for the power sector, believed as of June 2005, for projects that may require Government responsibility. Table III-4 shows that total investment capital requirements for the power sector are about \$1,700 million for the period covered by the estimate (until 2008). Of this, not shown in Table III-4, about \$160 million might be self-generated and reinvested by UEDC if their collection rates continue to improve sufficiently. Thus the actual net requirement of capital may be \$1.54 billion. In that period, Donor credits of about \$301 million are expected. This does not include the Khudoni unit construction, nor the South Georgia 500 kv transmission line construction. While estimates remain uncertain as feasibility studies are still in progress, the combined full capital cost of those could easily be over \$1.4 billion. Thus for present purposes we assume \$700 million for Khudoni and \$300 million for the transmission line. Thus, if the state financed only half by Donor credits, the increment would be at least \$500 million in state capital commitments, but it could require the full amount by credit if not undertaken by private operators. Table III-4 follows the example of Table III-3 for natural gas projects, placing the full potential amounts into the table.

**Table III-4  
ASSESSMENT OF POTENTIAL CAPITAL REQUIREMENTS FOR  
POWER SECTOR INFRASTRUCTURE PROJECTS<sup>4</sup>**

Purpose of Capital Expenditure	Estimated Maximum Capital Requirement  \$ Millions
<b>Domestic Commerce:</b>	
Projects Identified in the 2005-2008 Action Plan	\$ 700
Khudoni Full Construction Cost	\$ 700
South Georgia Line	\$ 300
<b>Total</b>	<b>\$1,700.00</b>

An important comparison is now apparent. Consider the condition from the viewpoint of 2008 as shown by these tables. Put aside the major projects not yet evaluated or committed either for gas or electric. For natural gas to simply “restore” and expand the system for maximal coverage internal to Georgia, requires (from Table III-3) at least \$391 million. If this is done, then the cost of gas consumed domestically may expand (Table III-2), from about \$160.4 million annually to about \$352 million annually, an increase in annual energy costs of about \$251.7 million. Of this, \$123 million in increased annual gas cost would come from electricity generation, \$16.5 million from residential uses, and \$112.2 million from industrial uses.

Consider now only the power generation increment of natural gas consumption. If we put aside discounting<sup>5</sup> (time value of money) and just make a comparison of total cash costs, for simply the first 10 years of operation in that mode, the increased gas cost for power generation alone will amount to \$1.23 billion. This does not consider the

<sup>4</sup> From the Ministry of Energy “Georgia Energy Sector Action Plan 2005- 2008” of August 19, 2005, Table 9-18.

<sup>5</sup> That is justified in the present case. Creating such a model is possible, but given the additional uncertainty of not knowing the actual construction costs, would add little to understanding the problem, and may indeed distract from it, by giving the appearance, via complexity of the model, of a more accurate result than the modeling could assure. To do a detailed discounted present value computation would also require many assumptions, whose combined accuracy may be no better than the total cash cost comparison. Those include, the time periods of forecast, periods of recovery of capital costs (which may differ for hydro and for gas fired units), depreciation methods applied, borrowing costs, equity costs (required return to equity), relative discount rates for the perspectives of consumers and producers, and many other factors. For example, the recovery of capital costs for the hydro units might be recovered over a different time period than for thermal units, so even the length of discounting period is not a fixed parameter external to the model. Critical parts of such analysis however, are incorporated into the computations of Parts III.C and III.D below.

capital cost of the gas generation units, nor the capital cost of improvements to the gas systems. From Table III-1, this increase in gas consumption arises from an equivalent expansion of effective generation capacity from about 331 MW to about 704 MW or by about 372.9 MW. In comparison, the total cost of the 630 MW Khudoni HPP would be about \$700 million. But even if that plant cost \$1 billion (or alternatively an additional about 270 MW were needed to assure equivalent output to the increment of gas generation forecasted), the total energy cost alone (at \$110/1000cm), for just the first 10 years of operation of the gas units, exceeds the capital cost of equivalent hydro capacity by hundreds of millions of dollars.

Similarly, to achieve “restoration” of the gas plant to previous design standards and expanding it to serve only domestic demand in the full territory of Georgia, requires at least \$331 million in capital costs, and implies an expanded annual increment in fuel costs of \$251.7 million annually. This total, of capital costs plus incremental annual energy costs for just one year, is thus \$582.7 million. The total incremental energy cost (natural gas cost) from that for 10 years is \$2,517 Billion. The total capital requirement of the 2005-2008 Action Plan for the power sector is about \$700 million, of which about \$160 million might be generated from internal operations of UEDC alone, for a net requirement of \$540 million. That is, the amount of capital cost to expand the gas system plus just one year of energy cost increment resulting from that expansion is more than the total capital cost required for the power sector by 2008. If we remove the power sector fuel requirements from this comparison, it still only requires only two years of operation of the gas sector under the expanded conditions, to more than equal the capital requirement of the power sector.

Thus, the use of Government resources to expand the gas sector in this condition should be strongly questioned. Doing so especially requires that we must make a more careful evaluation of the possible costs and operational implications of substitution of expanded hydro power, rather than expanded use of natural gas fired generation. We thus do so in two parts below.

### **III.C. COMPARISON OF CAPITAL AND ENERGY COSTS OF HYDRO VS GAS GENERATION**

Comparison of the relative costs of natural gas fired generation and hydro power generation requires comparison of many factors. But these may be reduced to a simple comparison of relevant ranges of per unit costs, as is done in this section.

To do that comparison, for each of hydro and natural gas, we first compute an illustrative total cost, summarizing all of the main factors which can affect each. For each kind of unit, we then give a table showing what happens when two of those factors, for each kind of unit, are varied over a likely range of values.

For natural gas units we look at the implication on total cost of possible variations in energy cost (cost per 1000 m<sup>3</sup> of natural gas), and of the percentage of the total capacity of the unit that is actually dispatched. The former is affected by market factors not in the control of the Government. The last is affected by market and operational choices which in a properly functioning system, should reflect operation of the units primarily when they are the least cost method of meeting demand. Therefore these also should not be controlled by Government in a market system. (In the event the gas units are used for system stability regulation, then for that fraction of use, cost is a lesser consideration in immediate decision to dispatch the units, but that portion of their output would normally be expected to represent a small fraction of their total possible annual capacity. Thus, the cost of that use is implicitly contained in the range of values studied, at the lines for a smaller fraction of total output used.)

For the hydro plants, since the marginal cost of operation of a hydro unit per kwh is nearly zero, we may assume that the full available output will be used, at some point in the year. We thus assume a capacity factor representative of the expected annual output of the unit. Thus the parameters whose ranges are studied in our table are those which affect capital cost: choice of depreciation rate, and of degree of leveraged capital cost from Donor loans taken to support the project. These are also factors whose values are by affected in very significant part, by policy choices of the Government. Thus the choice of the levels of these parameters are policy instruments that the Government can use to help encourage private market operators to construct this form of capacity.

#### **III.C.1 NATURAL GAS GENERATION UNIT COST COMPUTATION**

The total cost per kwh of a gas fired unit is estimated as the sum of the energy cost per kwh, plus the average capital cost at the assumed annual plant factor. Table III-5 gives illustrative detail of how this computation can be done, per 100 MW of capacity, assuming a gas cost of \$110/1000m<sup>3</sup>, a plant factor of 50% of the annual theoretical maximum energy output, and other details as given in that table. The result is an average unit cost of energy generated of 12.97 tetri per kwh. Table III-5 assumes a "heat rate" of 7,000 mmbtu/kwh produced. Older units may have a less efficient heat rate. Thus, Tables III-6.A and III-6.B compare effects of different levels of efficiency of units.

**Table III-5  
ILLUSTRATIVE CAPITAL PLUS ENERGY COST PER KWH  
OF NEW GAS FIRED POWER GENERATION**

<b>Cost Per kwh of New Thermal Generation Gas @ \$110</b>	
<b>Equivalent Fuel Cost Per kwh</b>	
price per 1000 cm	\$ 110.00
cost for 1 BCM	\$ 110,000,000
fuel cost for generation per 100 MW at :	\$ 12,029,327
Plant Factor Of Annual Use	50%
kwh output per 100 MW capacity	438,000,000
fuel cost per kwh of energy	\$ 0.0275
Lari/\$ exchange rate	1.8
fuel cost in Lari/KWH	<u>0.0494</u>
<b>Average Annual Capital Cost/kwh</b>	
Capital Cost/100 MW	\$ 100,000,000
Depreciation term	20
Average Annual Depreciation	\$ 5,000,000
Rate of Return, post tax	15%
Average Annual Equity	\$ 50,000,000
Average Annual Return	\$ 7,500,000
Income Tax Rate	20%
Tax Due	\$ 1,875,000
Average Total Annual Capital Cost	\$ 14,375,000
Average Capital Cost \$/KWH	\$ 0.0328
Average Capital Cost Lari/KHW	<u>0.0591</u>
<b>Total Cost Tetri/kwh</b>	<b>0.1085</b>
<b>Total Cost S/kwh</b>	<b>\$ 0.0603</b>

**Table III-6.A  
RANGE OF PER UNIT GAS GENERATION COSTS  
GIVEN VARIATIONS IN GAS COST AND PLANT USAGE FACTORS  
REHABILITATED OLDER UNITS (Heat Rate = 10,000 btu/kwh)**

<u>Avg. Cost for CC Unit/kwh Given Plant Factors and Gas Costs</u>			
15.00% Wt. Avg. Capital Cost Average			
20 Years Depreciation			
Results Given in Lari/kwh			
Usage Factor	Gas Cost, \$/1000 cm		
	65	110	160
10%	0.3371	0.3660	0.3981
25%	0.1599	0.1888	0.2209
50%	0.1008	0.1297	0.1618
75%	0.0811	0.1100	0.1421
100%	0.0713	0.1002	0.1323

**Table III-6.B  
RANGE OF PER UNIT GAS GENERATION COSTS  
GIVEN VARIATIONS IN GAS COST AND PLANT USAGE FACTORS  
NEW CC UNITS (Heat Rate = 7,000 btu/kwh)**

<u>Avg. Cost for CC Unit/kwh Given Plant Factors and Gas Costs</u>			
15.00% Wt. Avg. Capital Cost Average			
20 Years Depreciation			
Results Given in Lari/kwh			
Usage Factor	Gas Cost, \$/1000 cm		
	65	110	160
10%	0.3246	0.3448	0.3673
25%	0.1474	0.1676	0.1901
50%	0.0883	0.1085	0.1310
75%	0.0686	0.0888	0.1113
100%	0.0587	0.0790	0.1014

Tables III-6.A and III-6.B then show the range of costs for units with efficiencies of 100,000 and 7,000 mmbtu/kwh produced, when plant factor may vary between 10% and 100%, and gas cost between \$65 to \$160 per 1000 cm. The lowest value would occur in the somewhat unrealistic extreme, of 100% output of the plant (no outage nor maintenance time), of 0.0713 Lari per kwh in Table III-6.A for a 10,000 heat rate unit (a refurbished existing unit for example), and about \$0.0587 in Table III-6.B for a newer unit.

Note that in Table III-5, we are estimating effects of variables that are not within government control, while in the similar table III-8 below for hydro, we are estimating impacts of policy instruments under the control of government. That is, we are constructing a comparison of things the Government can control by way of decisions encouraging construction of hydro units, against the risks of uncontrollable factors in

natural gas generation. The comparison shows how the Government may use comparative analysis of possible outcomes of actions, to determine policies that influence results. The result of this analysis is not, therefore, simply a recommendation that hydro is preferred to natural gas fired generation. It is also, that by varying certain conditions under its control, it may induce more hydro than may have been otherwise used. The Government does not therefore, “plan” and construct a specific quantity of certain capacity. Rather Government uses indirect incentives to allow the market to reach that result by its own decisions. This analysis shows what and how to control to gain that result, indirectly. In this case, the result may be to associate use of onward lending of low cost loans (such as from Donor sources) coupled to longer depreciation times, to encourage hydro development with lower average costs, despite the high capital cost of the units.

### **III.C.2 HYDRO UNIT COST COMPUTATION**

The total cost per kwh of a unit is estimated as the average capital cost per kwh given an assumed annual plant use factor. Table III-7 gives the detail of this computation, assuming the cost structure of Khudoni HPP used in the Prefeasibility Study prepared for the Ministry of Energy by CORE International, a plant factor of 30% of annual theoretical capacity, and other details as given in that table. (Use of this value is made for the convenience that it is an available number. This usage does not imply that this report recommends the Khudoni project, in preference to other potential hydro power projects in Georgia.) The result is an average unit cost of energy generated of 0.0729 Lari per kwh. Table III-8.1 assumes a capital cost for Khudoni of about \$700 million, and Table III-8.2 assumes a capital cost for Khudoni of \$1 billion. (That is, we estimate a capital cost range from about \$1.1 million to \$1.6 million per MW of new hydro). The Tables III-8.1 and III-8.2 then show the range of costs when depreciation may vary between 20 to 40 years, and the percent of debt leveraged to the capital structure, from 0% (wholly private) to 100% (wholly financed by Donor provided debt). The lowest value would occur in the somewhat unrealistic extreme, of 100% output of the plant (no outage nor maintenance time), of 0.0428 Lari per kwh, up to a maximum of 0.15.63 Lari per kwh at the extreme high capital cost.

**Table III-7  
ILLUSTRATIVE CAPITAL PLUS ENERGY COST PER KWH  
OF NEW HYDRO POWER GENERATION**

<u><b>New Hydro Relative Cost Illustration</b></u>	
Capital Cost per kwh of new hydro	
Khudoni MW	630
Annual Plant Factor	30%
Khudoni Annual KWH Output	1,655,640,000
KWH Output/100 MW Capacity	262,800,000
Khudoni Life, years	40
Projected Cost, total	\$ 700,000,000
Cost/100 MW	\$ 111,111,111
Depreciation term	30
Average Annual Depreciation	\$ 3,703,704
Rate of Return, post tax	10%
Average Annual Equity	\$ 55,555,556
Average Annual Return	\$ 5,555,556
Income Tax Rate	20%
Tax Due	\$ 1,388,889
Average Total Annual Capital Cost	\$ 10,648,148
Average Capital Cost \$/KWH	\$ 0.0405
Average Capital Cost Lari/KHW	0.0729

The inescapable conclusion from comparing Tables III-6 and III-8 is that in most scenarios, hydro-generated electricity is cheaper than natural gas generation. Gas units are only likely to be lower cost than hydro, if all of: the gas cost is very low, the annual capacity factors for use of gas units is quite high, and the cost of the Khudoni plant or similar construction is at the upper end of the estimated range. Thus for most scenarios, hydro is the least costly (or equivalent cost) choice. But hydro may also be subject to weather variability. Thus, in the next section III.D we consider whether hydro flow variability would allow substitution of hydro for natural gas in practical operation of the Georgian power system.

**Table III-8.1  
RANGE OF PER UNIT HYDRO GENERATION COSTS  
GIVEN VARIATIONS IN DEPRECIATION AND LEVERAGED EQUITY COSTS  
IF KHUDONI TOTAL COST IS \$700,000,000**

Average Cost of Hydro/kwh Given Weighted Cost of Capital Of			
Weighted Range from 5% to 15 %			
Debt %	Depreciation Period, Years		
	20	30	40
0%	0.1094	0.0967	0.0904
25%	0.0975	0.0848	0.0785
50%	0.0856	0.0729	0.0666
75%	0.0737	0.0610	0.0547
100%	0.0618	0.0492	0.0428

Example Weighted Average Cost of Capital:			
	%	Rate	Wt. Average
Equity	50%	15.0%	7.500%
Debt	50%	5.0%	2.500%
Total	100%		10.000%

**Table III-8.2  
RANGE OF PER UNIT HYDRO GENERATION COSTS  
GIVEN VARIATIONS IN DEPRECIATION AND LEVERAGED EQUITY COSTS  
IF TOTAL COST OF KHUDONI IS \$1,000,000,000**

Average Cost of Hydro/kwh Given Weighted Cost of Capital Of			
Weighted Range from 5% to 15 %			
Debt %	Depreciation Period, Years		
	20	30	40
0%	0.1563	0.1382	0.1291
25%	0.1393	0.1212	0.1121
50%	0.1223	0.1042	0.0951
75%	0.1053	0.0872	0.0781
100%	0.0883	0.0702	0.0612

Example Weighted Average Cost of Capital:			
	%	Rate	Wt. Average
Equity	50%	15.0%	7.500%
Debt	50%	5.0%	2.500%
Total	100%		10.000%

### III.D. EFFECT OF LOW HYDRO OPERATING CONDITIONS

The previous analysis implies that on a purely financial analysis, in almost all scenarios of combinations of cost parameters, it is cheaper to rely on hydro power (plus imports) than to use natural gas. The practical ability to implement such recommendation

however depends on three more technical factors. One is the ability to physically dispatch units in a manner compatible with meeting voltage and frequency stability conditions. A second, is the geographic location of the units in relation to the locations of the loads and the design and operation of the transmission system. The third, is whether hydrological conditions would permit dispatch of the Georgian grid, even in low hydrological periods. The successor study, to come by the end of June 2006, will example all of those issues in much greater depth. However, the principal argument made by supporters of natural gas as a principal generation source for energy requirements of Georgia, is the third, that hydro could not meet Georgian load in low water conditions.

This section thus discusses that the above assertion is almost certainly false. Even in low water conditions (assuming proper transmission conditions), the Georgian power system could meet the entire domestic load from a combination of domestic hydro, and some level of imports. Using efficient dispatch, thermal generation is never dispatched for Georgian load, even in low water conditions. We reach this conclusion by use of the project's Georgian Generation Dispatch Model (GDM), which simulates dispatch of daily hourly load shapes against available generation. The detailed assumptions and operations of the GDM will also be explained in the June 2006 study. However, in essence GDM solves this problem by assuming that the least cost available units in any hour, are dispatched first to meet load, and that units are taken in increasing order of cost until the hourly load is met. This thus gives a least-cost ("merit order") dispatch. The GDM does this for typical daily (hourly) load shapes for each month, and for the single peak day (December 31). The model assumes "must run" conditions on units which require it for operational purposes, and dispatches principal hydro units to constrain them to the available capacity of hydro conditions. Thus for, strategic planning purposes, this model shows a reasonable expectation of least cost operations, for delivery of energy against expected demand shapes.

For the present study, we thus ran the GDM under two conditions. First, we looked at current operational conditions, and load shapes. Thus, we assume current hydrological conditions, which are reasonably good. To simulate low water conditions, we assume that the Enguri unit has only 50% of its available capacity. We then compare whether and if so, how much, natural gas generation is dispatched under each scenario. This is thus a simple "reality check" on the earlier advice to rely on hydro, not natural gas.

The June study will be based on a 50 year history of hydrology, and will run our dispatch model under current conditions, under historical extreme low conditions based on hydrological expectations, and with various scenarios of how much additional hydro capacity is built. The GDM will then also advise whether and if so how much added hydro would be needed to additionally cover the amount of gas (or imports) dispatched in those conditions. In the later study, due end of June, we will also then estimate added export revenues possible from the various levels of hydro under similar variations of conditions. The revenue for export analysis is properly part of that study, but the basic physical possible replacement analysis is necessary for this study.

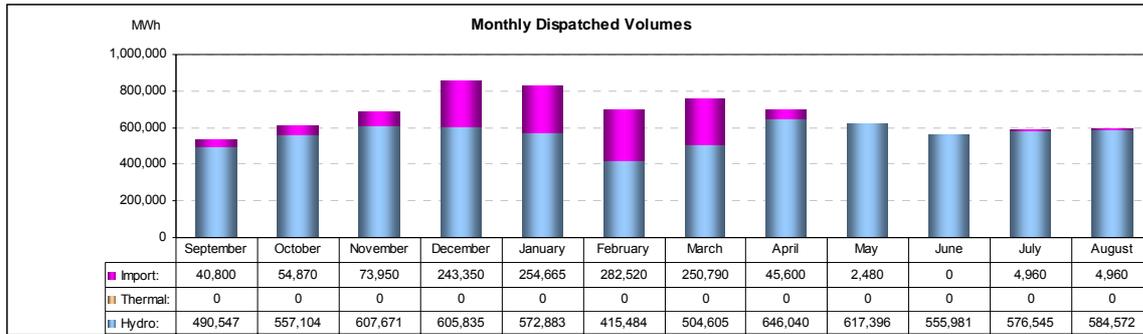
The essential result of the GDM is presented on the following two pages, in Tables III-9 for current conditions, and Table III-10 for low water conditions. The most striking part of both tables is that under no conditions, in no hours, in no periods, is

thermal generation ever dispatched on a least cost analysis. When demand exceeds domestic supply, then imports are in every case cheaper than domestic thermal to meet the load. This is true both in current, and in low water, conditions.

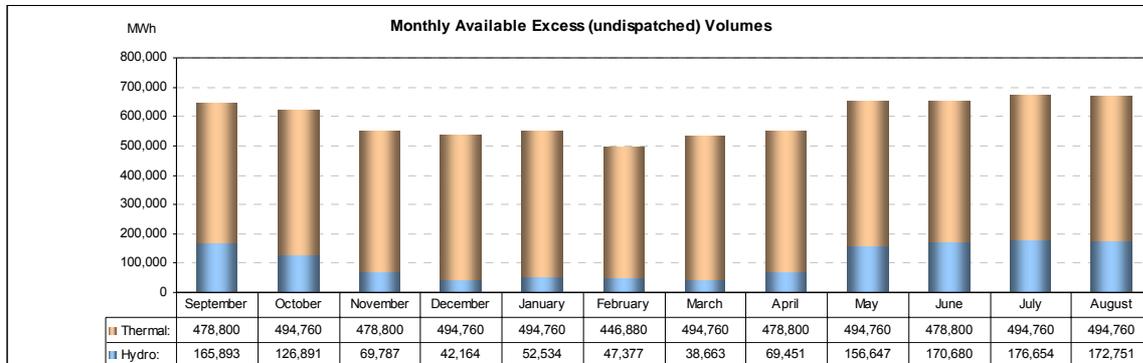
This does not imply that no natural gas fired generation is required in Georgia. Natural gas currently serves several important needs of the system. It provides reliability against transmission outages. It provides reliability against other generation unit outages. It provides reliability against unavailability of imports. And it provides ability for technical regulation of voltage and frequency stability. It does all of these things however at very high unit costs, since all of these uses imply low percentage use of the thermal plants, and thus, the highest average unit cost portions of Tables III-6.A and III-6.B (that is, the top row or top two rows of those table). The June study will therefore also analyze the possibility for and amount of, hydro generation within Georgia, to offset each of those reliability needs.

We thus conclude that the claim that the risk of low hydro condition requires expansion of thermal generation capacity, is not a valid argument against a strategy that relies principally on hydro power, and thus avoids expansion or use of thermal capacity.

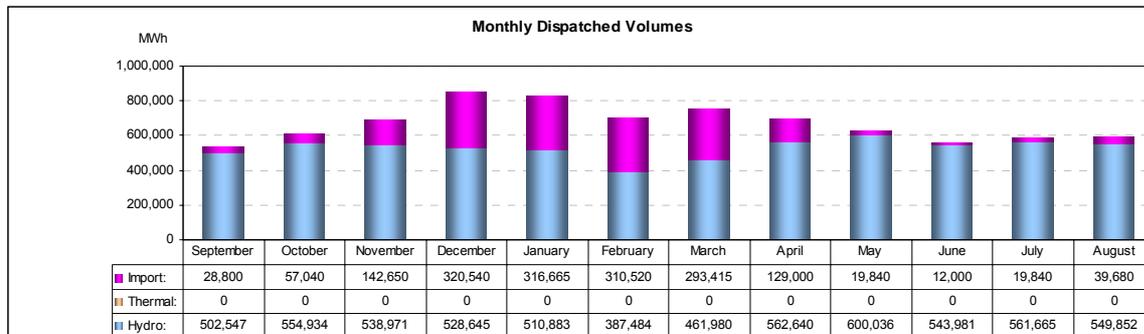
**TABLE III-9.1  
CURRENT WATER CONDITIONS:  
ANNUAL DISPATCH FOR GEORGIAN DOMESTIC LOAD,  
WITH EXISTING CAPACITY**



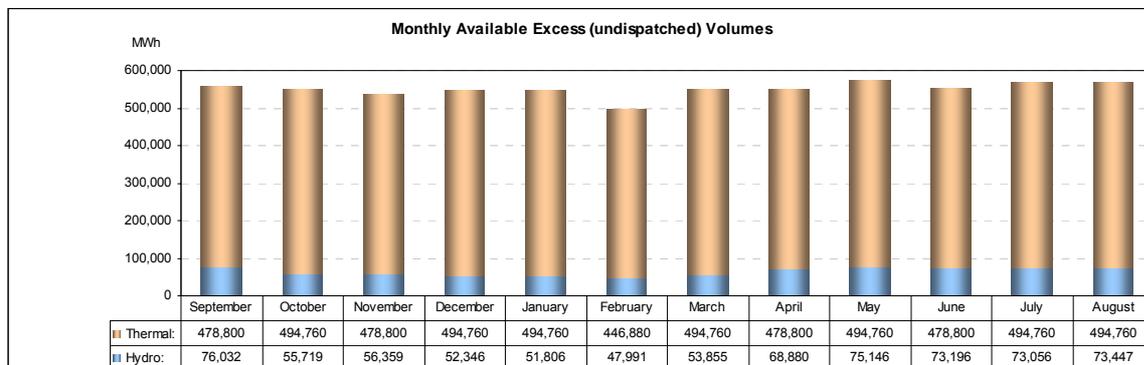
**TABLE III-9.2  
CURRENT WATER CONDITIONS:  
ANNUAL SURPLUS CAPACITY OVER GEORGIAN DOMESTIC LOAD,  
WITH EXISTING CAPACITY**



**TABLE III-10.1  
LOW WATER CONDITIONS:  
ANNUAL DISPATCH FOR GEORGIAN DOMESTIC LOAD,  
WITH EXISTING CAPACITY**



**TABLE III-10.2  
LOW WATER CONDITIONS:  
ANNUAL SURPLUS CAPACITY OVER GEORGIAN DOMESTIC LOAD,  
WITH EXISTING CAPACITY**



## **III.E. STRATEGIC CONSIDERATIONS**

### **III.E.1 GENERAL CONCLUSIONS FROM PART III**

The previous analysis demonstrates that there can be a substantial benefit to Georgia from use of hydro power over gas generation when substitution is possible, and that this is true even considering variability of hydrological conditions. Thus this Part III.E deals with the problems of minimizing investments in natural gas facilities, and gaining maximum benefits from what is invested or transacted. But this analysis has different and in some ways contradictory implications. The demand for gas in Georgia is already rather small, and does not therefore lead to negotiating leverage in typical gas supply transactions. The implication of the previous argument is that growth of the gas market in Georgia be limited by policy, which therefore would not solve the distinct problem of supply reliability nor cost for such supplies as are necessarily used, especially in industry or domestic heating. Part IV therefore will deal with that issue of “energy security”, in a rather unique way, consistent with the recommendations given here.

The most obvious conclusion from the analysis above is that Government policy should be to minimize the consumption of natural gas in Georgia. Since there is in any event a market demand for that gas in industrial uses, residential heating demand, and despite the cost comparisons some operational need for gas in the electric generation industry (such as for voltage and frequency stability regulation, and at least at present, for compensating against lower transmission system reliability), the demand for gas consumption within Georgia can not be reduced to zero.

This implies two forms of action, or better stated in part, inaction, by the Government. First, Government subsidies implied by taking Donor loans for projects, are better directed to the power sector. Especially, as there may be large capital requirements for expanded hydro generation, use of Government backed Donor loans to achieve lower interest costs, may be a critical factor to allow the fuel substitution to occur at all. That conclusion results from the effect of policy demonstrated by Table III-8. It is clear there, that the portion of financing taken from (low cost) donor lending is a critical factor in assuring hydro development is economic. As Government borrowing capabilities are certainly limited, directing the application of those in a focused way would thus assure that the policy proposed here can be best carried out.

Second, there remains a likely demand for natural gas supplies. Provision of those supplies, or gas based services (such as certain form of gas fired generation) should be encouraged to the degree it can be done by market oriented means, in essence, by private capital. However, use of Donor grants (but not loans) for gas sector projects would similarly not limit Government borrowing capacity.

This does not imply a complete hands-off attitude from Government towards the domestic gas supply and distribution industry. For one, there remains a strong role for

regulation of domestic distribution tariffs, and for domestic supply tariffs in some instances, as discussed in Part III.E.2. Government also has a contractual role in some transactions already in place, and a forward looking role toward future capital projects. For example, on existing gas transit lines, there may be an option for receipt of the fee as an in-kind payment, rather than as cash. In turn, this has led some analysts, and a current practice, to treat this gas as a “free” resource and allocate its consumption for particular uses. In fact however, that volume of gas represents a revenue to the State or to the operating company. The most efficient use of that in a market economy is to monetize the in-kind payment at its market value, or to take the fee as cash (whichever yields the greatest net revenue). In that way as well, the volumes of gas equivalents as transit fees do not become viewed as a normal supply for domestic uses.

Similarly, substitution of hydro for gas for the purpose of serving expected internal electricity needs of Georgia does not necessarily imply that the cost for electricity would be lower than the market rate for electric energy in Georgia or in the region (though it will almost certainly be much cheaper than electricity generated from natural gas). There are two reasons for this. One, as shown by separate studies and reflected in Tables III-6 through III-8, it requires a price roughly equal to the current import price, simply to be able to pay the capital cost for a new hydro power plant. Second, if Georgia trades on a regional energy market in electricity, and certainly if Georgia intends to export hydro power for revenue purposes, then the market value for hydro power would become equal to the market price for electric energy in that broader market. Economics will then require that to “reserve” hydro output for domestic use, means paying the regional market price, even for internally produced energy consumed domestically. This price however is still lower than the unit costs of gas generation.

Besides price, what is significantly different by emphasizing hydro development over use of natural gas, is that Georgian dependence on foreign produced natural gas would be very significantly reduced. Thus the ability of any single foreign entity or single fault in the gas supply systems, to undermine stability of the Georgian energy systems, would be greatly reduced.

### **III.E.2 USE OF PRICING TO CREATE CAPACITY**

It is apparent from Part III.B that there are large capital costs associated with operation of a natural gas, or indeed, any, energy system. We noted in Part I.B that central planning was often quantity oriented, with the result that because planning ignored the real economics of choices and production decisions, the result was not the planned amount, but either large shortages or surpluses. When pricing also ignores the real economics of energy systems, it has the same effect.

That is, improper pricing itself creates shortages. More specifically, purely volumetric pricing, in a system in which unit capacity costs vary greatly by load shape, (illustrated by Table III-6) and in which energy costs vary greatly by time of use (including season), necessarily creates shortages. Therefore, one of the principal causes both of energy shortages in Georgia today, and of capacity shortages to deliver energy (that is, unreliable supply), is the average unit cost pricing policy applied by the GNERC.

In summary, poor pricing in connection with wholly physical planning induces shortages, even if there are no payment problems in an energy system. In Georgia, this occurs because the prices are simply set too low, in many respects, compared to actual costs. Because people will want to consume more at lower prices, this induces excess demand for consumption. In the case of energy commodity, that means people want to consume more energy than for which they are willing to pay the real cost. In trying to service that supply, when prices are set below costs, debts are necessarily incurred, even if payment rates are 100%. In terms of capacity, pricing too low means consumers may want to require services from more capacity than they are willing to pay for. Physically, this appears as unreliability of the transmission and distribution systems, which can not meet the desired demand. This has the effect of creating engineering based “requirements” for capital investments, which however, may not all be needed if only the real economic demand is met. Poor pricing thus may create not only shortage of capacity (which shows up in practice as lower reliability of the physical system), it also may create false and excessive demands for capital.

Alternatively stated, competent pricing “creates” capital, by reducing the demand for unnecessary investment while improving reliability from the plant actually in service. This is the basis for the recommendation of this report, that the Ministry of Energy seek a national energy policy which requires the GNERC to apply professionally competent pricing policies. The Ministry of Energy should apply its authority to recommend national energy policy, to require both that the GNERC apply capacity based pricing for both the gas and electric systems transmission and distribution plant, as well as, to require that energy commodity prices reflect critical time of use based commodity price differences.

An alternative way to state this phenomenon is to say that pricing can also be used for shaping loads. Consumers may respond to higher hourly or seasonal prices by consuming less in those periods, but they may also simply shift the consumption to some period when the prices are lower. Thus, time of seasonal pricing might induce the shift of loads from peak heating use periods into other seasons, for manufacturing that can be varied independently of seasonal demands. Or, lower cost pricing in summer for natural gas might induce greater consumption in summer for gas-based industrial processes. Seasonal pricing should thus anticipate the potential for not simply reducing capital costs, but shifting the structure of demand and thus also the basis on which capital costs might be incurred.

We do not here discuss details of that pricing, which would be a very large undertaking. But we do discuss why that conclusion is necessary, from the viewpoint of economic analysis. As a preliminary view of what may be needed, in Annex 1 we discuss principles of alternative methods of pricing.

Because it is such a clear example of very poor pricing, leading to all of the above problems, we use the example of GNERC pricing as applied to the wholesale electricity market prices. That is also a problem for natural gas supply, since if incompetent pricing of the wholesale price induces false demands for both energy and capacity, it induces excessive demands for natural gas commodity to generate that electricity, and for natural gas generation plant capacity. Thus, as with other aspects of

the present study, we see that natural gas and electric markets are closely linked in Georgia.

The logic of this analysis is very simple. First, GNERC in theory applies a concept of “average annual total cost” pricing, both for individual generation units and for the market as a whole. That is, GNERC adds up the purported costs of the operating company, for some period of time, and divides by the volumes of expected sales in that period. The first problem with this method as practiced by GNERC is that it does not use actual costs such as for fuels. Thus, the actual cost of natural gas used in generation are not even included to the “cost” structure used by GNERC in computing the allowed costs of the generating company. Simple common sense demonstrates that the generator will not be able to pay for the fuel required under that practice.

Second, it is also well know that commodity prices, especially for natural gas, may greatly vary by season. In winter, when demand is high, prices can be much higher. But the GNERC uses annual total cost, and annual total volumes. Therefore, the GNERC is averaging higher winter costs with lower summer costs, and applying those averages in both seasons. This has several .effects. First, by setting price too low in winter, GNERC creates more demand for energy than the price can allow to be paid. Thus, GNERC creates shortages in winter by creating too low a price. Notice especially, this is in addition to the problem of the above paragraph, that GNERC does not even use the actual prices in its computations. By this same bad pricing, GNERC also creates generation capacity shortages in winter, by forcing the demand for electricity in winter to be greater than the capacity available to provide it.

At the same time, GNERC has created the opposite problems in the summer. In the summer, cost of generation is much lower; in Georgia this occurs since most summer generation comes from hydro capacity. But in the annual average cost method, to obtain a lower winter price, requires that the summer price be set too high. Thus, since price is higher, people will want to consume less. But, since the price is set high relative to actual costs, producers want to produce more. Thus, we see that commonly in Georgia, hydro plants generate more than they are needed to generate (thus damaging system operational stability), or even just spill water, thus wasting energy, since at the required prices, there are no customers.

As well, because electricity as such can not be stored, the energy over-produced in summer can not be “saved” for winter. But the presence of hydro storage ponds in Georgia provides the country a unique opportunity to store electricity indirectly, by reserving hydro use for periods in which marginal costs (from other sources of production) may be high. But average annual cost pricing provides no incentives for storage pond operators to seek to reserve their power production for high cost periods. This also induces economic waste.

The GNERC price-averaging therefore does not correspond to any physical acts which could make the actual costs correspond to the average prices thus computed.

Therefore, the GNERC policies are a direct cause of energy shortages in winter, energy capacity failures in winter, wasting of energy in summer, and the continual increases of debts by operating companies. Even 100% payment would not resolve

those problems. The pricing policies of GNERC are a fundamental cause of all of the basic energy supply, energy capacity and energy reliability problems within Georgia.

### **III.F SUMMARY OF POLICY CONCLUSIONS FROM PART III**

Several conclusions are expressed or implied by the discussion thus far. We summarize those here.

1. It is possible to analyze strategic problems by comparison of the range of outcomes from factors that can not be controlled (such as effects of weather variation or international prices), to the range of outcomes from factors that can be controlled by government actions, such as use of Government borrowing powers and depreciation rate policies. These controllable factors may be called “policy instruments”. Policy instruments in a market oriented system include not only general statements of “policy”, but prescriptions of behavior such as in forms of market rules. They also include setting legally or administratively determined parameters that affect decisions of private parties subject to those laws or regulations. This technique of affecting incentives by subtle means differs substantially from “policy” that mandates actions of specific parties, such as to create some predetermined “balance” in a wholly physical sense.
2. The total cost (capital cost and especially energy cost) of expanded use of natural gas is so great relative to the cost of deriving a similar amount of energy from hydro, that the government should direct first any available discretionary budget, or borrowing, resources toward encouragement of hydro development. Use of international financial institution (Donor) low cost lending might also be on-lent to hydro development at low interest rates
3. Government should leave the natural gas markets to support themselves by wholly market oriented means, or when available, by Donor grants for natural gas projects that do not detract from application of funds to hydro uses. (Part IV discusses policies that follow this prescription, and could lead to a wholly or predominantly commercial natural gas sector.)
4. Because of their comparatively higher capital costs, depreciation rates are a key factor in lowering average unit costs to make hydro plants relatively more competitive. While entrepreneurs may state preference for faster depreciation, lower cost also helps assure sales of product. Thus, as a policy choice, borrowers who accept lower cost government backed loans might also be required to use longer depreciation rate terms. This not only helps assure sales to the entrepreneur, it for the same reason, inherently passes to the public, by relatively lower prices based on costs, the benefit of the government policy.

The present study does not address regulatory policies generally, but does also address a specific conclusion, stated next.

5. The high total capital costs of anticipated gas consumption, and of hydropower production to obviate the need for natural gas, can be reduced through better

pricing policies. Proper pricing is a non-capital intensive way to “create” capacity by reducing or restructuring demand for energy. Improper pricing is a direct cause of shortages. Thus energy tariffs within Georgia should be restated to properly relate capital costs to requirements for capacity. Thus should include, assuring proper recognition of capacity fees for use of peak capacity. Storage field operators should have separately stated fees that reflect their true capital costs.

## **IV. GEORGIA AS A REGIONAL CENTER OF ENERGY COMMERCE**

### **IV.A GEORGIA AS A COMMERCIAL, NOT JUST TRANSIT, CENTER**

Georgia finds itself in an unusual condition as to energy supplies and especially natural gas, for several well recognized and some less discussed reasons. The physical dependence on neighboring states for gas supply, as a result of both geography and history of the networks, is well known, and documented in our companion study *Part 2: Economic and Geopolitical Context*. The consequent desire for a more diverse supply base is also documented in that study. However the ability to achieve those objectives is limited, not only by the physical conditions of the region and of history, but also by the relatively small size of the Georgian energy market. That market surely can not support the infrastructure development required to diversify supply, if the investment is intended just to support the Georgian market. Some other solution is required. We discuss one such solution here.

#### **IV.A.1. TRANSIT VS. MARKETS**

Many previous studies of regional energy “markets” (for natural gas and especially for electricity) have demonstrated the obvious fact that trade creates economic and technical efficiency benefits. Such studies often therefore conclude that regional governments should “cooperate” in administrative actions to effect such “markets”. But markets are not agreements among governments nor physical infrastructure, or not alone. While intergovernmental agreements facilitate or even require certain transit relations (see Annex 2), they do not themselves create a “market”.

Markets are a set of commercial activities in which diverse and primarily private parties conduct trades for their own purposes. Though markets may require physical infrastructure to operate, a market is not the physical structure, it is the conceptual framework for transactions. Thus, this section of our main report focuses on “commerce”. The more traditional and more physical topics of “region” and “transit” are discussed in the companion study.

In oblique understanding of the above analysis, the presence of Georgia as a transit route is often analyzed as providing a source of energy supply to Georgia in form of a transit fee paid for use of pipeline across the territory of Georgia. The wide currency of that analysis emphasizes that the Georgian market taken alone can not support the investment in infrastructure needed to serve that market. Transit fees are based on the provision of, operation of, and maintenance of, a pipeline. But transit in that condition is purely on the whim of the transiting entities, and has no necessary relation to the supply needs of Georgia. The fee value is related to the quantity used of services and facilities. But transit is not assured to occur in the design volumes of the pipeline, nor even at originally intended transit volumes reflected in contracts. (This fact is demonstrated by the existing uncertainties of whether Turkey will require the full originally intended flow of the Shah Deniz pipeline).

Thus the “transit fee” analysis of provision of gas supply to Georgia can not even solve short term energy needs, and offers no foundation for assuring longer term “security” of supply. As well, if the fee is commoditized, and consumed as commodity, then that value is not put to maintain or operate the systems, or support their physical security such as through resources from the state budget. Thus transit fees as a source of supply can not assure Georgian supply needs. Therefore, neither can the problem of lack of infrastructure nor the lack of diverse supply for the Georgian market be solved by the economic value of energy requirements of the Georgian market alone.

#### **IV.A.2. GEORGIA AS A PROVIDER OF ENERGY SERVICES**

Therefore, reliable and diverse gas supply to Georgia, at reasonable costs, must rest on some other solution. This study is directed to identifying and describing mechanisms to achieve such solution. Part of the answer is implied by the classical analysis. Georgia receives transit fees at all, for three well understood reasons. First, there are large supplies of energy to the interior of Georgia, in Central Asia and in the Caspian regions, which must be transported by some route to reach a market. Second, there are large actual or potential markets for those supplies in diverse places, of which Turkey and Europe are the most often mentioned, but not the only possibilities - southern Russia and northern Iran, and are other possibilities. Third, Georgia is a desired pipeline transit route for the same reason it has for millennia been a trade route: it is the shortest route with the relatively most favorable terrain between the Caspian Sea (and thus Central Asia), and the Black Sea or Anatolia (and thus, to Turkey, Europe and indeed to the rest of the world).

At present, however, these facts exist simply as a result of the accidents of geography. That is why “supply” to Georgia by way of transit fees is merely incident to the intentions, investments and actions of other parties. The key to using these facts to assure stable and diverse supply to Georgia itself, lies therefore in encouraging such actions by others. Since the energy demand within Georgia is hardly significant relative to the flows across its territory, Georgia as a buyer of supply is nearly irrelevant to those flows.

What is relevant, is that Georgia is or could become, a provider of market services. Provision of transit routes for a fee is simply an example of an energy service Georgia may provide. If sufficient interest is generated by Georgia in providing those services, then buyers of services may also provide the capital investments needed to develop them. We see evidence of this already in the fact that transporters will pay Georgia a fee for the right to use Georgian territory for transit, and will also themselves, invest the capital needed to build those transit lines.

The essential question is therefore: what other services can Georgia provide for the trade in energy, for which value will be paid and investments (in Georgia) made. If Georgia can induce enough such investments for the infrastructure of market services to others, then as a by-product, Georgia may also receive more diverse supplies for itself. Georgia would be able to take advantage of the capital investments made by others, for their much larger loads, in assuring reliable and cost effective infrastructure for Georgia.

### **IV.A.3. NEED FOR AND IMPLICATION OF INTERNATIONAL ENERGY TRADE BASED IN GEORGIA**

The potential need for such a market is easily identified. Not only does the Caucasus region lack established energy trade centers (as opposed to supply management centers such as Baku), the Caucasus region and indeed world trade, lacks established futures markets for natural gas. There are none, outside of North America (the NYMEX gas futures contract), or the UK (the IPE futures contract). The world oil trade in contrast has four futures markets: in North America (the NYMEX), Western Europe (IPE), Australia (Sydney), and East Asia (Singapore). No oil nor natural gas futures markets yet exist that specifically serve the Central Asian export markets, and no organized trading market for natural gas exists on the EurAsian continent at all.<sup>6</sup>

Notice that none of these commercial trading markets is located in the producing center for the commodity traded; certainly none of New York, London, Singapore nor Sydney are noted as energy production centers. As well, though each trading market location may consume some volume of the commodity traded, the great bulk of contract volume is traded by and consumed by, interests not physically located in the trading center. Indeed, there is no necessary relationship between the presence of a trading center, and the provision of physical supply of that commodity to the geographic place of location of that center. The contracts traded must necessarily define a delivery point, thus imply a transit route, and for legal reasons it is best or necessary that the legal system of the contract also encompass the legal system governing the nominal point of delivery, thus they would normally be in the same country. Because they are a feature of transit routes, once a contract market is established, then to take advantage of it, additional and more reliable transit routes may be induced, that directly or indirectly attach to the transit system that underlines the trading market. Since Georgia is, or can become, a center of transit routes, Georgia is also a natural place where commercial trade in energy contracts might be located, both by defining contract nominal delivery points and by physical location of the financial market.

Though the system of the contract and the delivery point would normally fall in the same legal jurisdiction (country), the influence of the price set is not limited nationally. A good example is that in the North American markets, prices for delivery points of natural gas in Canada, might be stated as derivatives of the NYMEX (New York based) futures market prices. Thus gas which never physically goes near Henry Hub Louisiana, indeed, never leaves Canada, might be priced on a value derived from trading against physical deliveries to the nominal point in Louisiana, in the southern

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<sup>6</sup> It is true however that these centers are themselves all established financial centers. A large part of the challenge to Georgia in creating a place for trading in contracts for energy, will be establishing a sufficiently transparent banking and finance system, that can support such trading. However, the Report also recognizes that the act of making Georgia a regional market center would necessarily also reflect the political decisions by major trading partners, to assure Georgia this status. Those same parties therefore should also take an interest in strengthening the Georgian banking systems. In deed, the same interests that may lead to a decision to support Georgia as an energy trading center, should want to support strengthening Georgia as an economically stable nation generally. Just as developing diversity of source of supply assists energy stability for Georgia, assuring diversity of economic base would support economic stability generally. In this case, the two are mutually reinforcing objectives.

United States. The efficiency of the NYMEX market in determining commodity price, means that transit based price differentials can be used to determine prices over a much larger region – indeed an entire continent -- than that served simply by the physical gas traded to the nominal contract delivery point. Thus, a price determined in a futures market in Tbilisi, with nominal delivery point at say, Gardabani, could be used as the basis for pricing of any natural gas contract delivered to any geographic location directly or indirectly connected to Gardabani by any transit route. Thus, as demonstrated by the NYMEX and its derivative pricing, the Georgian futures market could be used as a reference price for trading natural gas throughout the Caucasus, Turkey, central Asia including the Caspian littoral states, including even southern Russian (north Caucasus), and -- given especially the proposed new transit routes -- continental Europe.

#### **IV.A.4. FINANCIAL FOUNDATIONS FOR A GEORGIAN ENERGY MARKET**

In short, Georgia must become to the trade in energy what Switzerland is to the trade in banking and financial services: a secure and desirable place where people will want to transact business. The supporting physical infrastructure of this may be pipelines and storage fields. But the reasons for placing those in Georgia, and not elsewhere, and in larger volumes, not simply for incidental transit needs, must be not only the physical systems but financial ones.

The infrastructure for Georgia to take advantage of its unique position in transit routes therefore also lies in the financial aspect of the energy markets: trading energy contracts. They may include commodity contracts (spot markets), futures contracts, and perhaps other instruments. If Georgia were to become an established center for such financial trades, then at least some important part of the volumes traded would also need to transact through a highly reliable physical infrastructure, on which the traded contractual instrument may rest.

The services that support a trading market are not simply the physical structures, but also the intellectual services. Making Georgia a center for trade in energy contracts implies first that the contracts themselves be credible instruments, and must thus reflect the general legal system of Georgia, and the systems of contract and banking laws in particular. Reliable and transparent enforcement of contracts is an almost unspoken absolute requirement. It also requires that Georgian financial institutions have access to capital markets, which in turn implies that bank regulations, financial trade relations, and currency relations and rules, will support a large scale financial market. The supporting infrastructure must include highly reliable information transit, thus, at least, high capacity and reliable, accessible, telecommunications and Internet links and services. All of these services in turn must require their own support systems: programmers, coders, equipment suppliers, accountants, attorneys, brokers, analysts, and managers, to name simply the most obvious. Thus, to invest in energy for reliable supply, Georgia should place resources in assuring that these bank, finance and other support systems and services exist or may be easily created. The reliable energy infrastructure may then follow as a natural result, at minimal capital cost to Georgia. The fees and employment resulting from provision of such services will of course also strongly support the Georgian economy.

#### **IV.A.5. PARTICIPANTS IN A GEORGIAN ENERGY MARKET**

If such a market existed, it would serve primarily the needs of entities outside of Georgia. The possible sellers of contracts could include first, producers, which could be any private or government owned production company in any territory attached to or accessible to a natural gas transit pipeline, that in turn can trade or in any manner transact volumes with the delivery point on which the contract is written. Thus, any producer in Central Asia, Russia, Iran, the Caspian Sea, Azerbaijan, Georgia if it makes commercial finds, and potentially Iraq if that network were to intertie, could be a seller of an underlying contract.

But producers are not the only ones who might offer supply into the market by selling contracts. Sellers of contracts that introduce supply to the system can also include *buyers* of supply. For example, the present holder as buyer of a long term supply contract, might wish to off-load the obligation to take that supply, or some part of it. They might then try to find a particular buyer to assume the contract, which is often difficult. But if there is a futures contract market, they might simply sell into that market sufficient contracts to offset the portion they wish to avoid of their firm take obligation, in the long term contract. Futures contracts can also thus serve as a form of short term volume management by contract buyers. (Indeed, for the shortest periods of time, there might also be a “spot” market for immediate delivery of volumes).

Therefore, any present or potential holder of a long term supply contract shipped over any of the pipelines which could transact volumes, by any device linked to the futures market contract point, is also a potential seller of contracts into the market. These can thus include not only initial producers, but also distribution companies and major industries in Turkey, any of the contract takers of supply over the proposed trans Black Sea route to Ukraine, (that is, any distribution company or major industry in Central, Eastern or Western Europe), and any taker of firm supply on the proposed Central Asian trans-Caspian line, and indeed any other potential buyers of supply who may want to minimize long term contract price risks by selling on shorter term markets. Finally, sellers (and also buyers) of contracts include those who trade for risk-hedging of price, and those who trade simply as their “speculative” business. Indeed a very substantial portion of the number of transactions in a futures market are by traders for such purposes, and thus do not represent an intent to delivery or receive supply at all.

We note that state owned companies constitute a relatively larger share of the regional markets, and the European markets, than in other areas of the world. While participants in such markets are most often private entities seeking to manage various forms of risks, spot markets or futures markets may also have value for state-owned companies. First, such companies must also manage risks of supply against price. Precisely because state owned companies may tend to contract for supply in relatively inflexible ways, the presence of a short term market can offer them a way to off-set their longer term risks and commitments. The possible presence of state companies (from diverse countries) as major participants in the proposed Georgian-based regional market, may thus have an effect on how the market rules are written, but should not inhibit the ability of a market to function. The presence of a wholly commercial market will offer some of these state owned companies a significant advantage, since it may enable each to have access to a broader range of sales and customers, than might be

permitted by traditional mercantilist transactions only between two previously identified parties. Companies that might not be able to trade directly for political reasons, may be well able to trade indirectly through Georgian brokers, since the principal has no direct relationship to the party on the other side of the transaction. Politics may dissolve in the commercial mix.

Finally, historically, Georgia has been an important production center for oil, and is currently being explored for additional deposits of oil and natural gas. We do not speculate on the prospects for significant finds. We do not however that were such finds made, the existence of a trading market could facilitate the ability to more rapidly develop such discoveries. In traditional mercantile trading, one producer finds one buyer. Finding the one buyer may be difficult, and contract risks are large. In a trading based market, the producer could choose instead to simply offer contracts for sale, and not need the “find” buyers at all, nor be limited to “finding” only one buyer. The presence of a futures or commodities market can add liquidity to the market, in a manner that assists development of commerce for all parties.

Thus, in describing a commercial energy market in Georgia, we are discussing a market that would serve commercial interests of global energy trading. That is, we are *not* describing a “wholesale gas market” for purposes of the domestic gas market of Georgia. It may be that some or much of the domestic supply serving Georgia would also be traded on or acquired from the global trading markets described here. Indeed to benefit from the presence of the global markets, Georgian distribution companies and industrial consumers of natural gas, may very likely also seek to acquire supply contracts within that market. But the legal and other infrastructure for operation of these global markets would be different from that required for regulation of domestic consumption within Georgia. Nothing could more certainly prohibit global use of commodities markets within Georgia, than to subject those markets to the same forms of political and policy considerations as determine retail price regulation within the country. To compete for and attract global investment, requires meeting global standards of efficiency and transparency in all aspects of the international markets described here.

#### **IV.B. GAS FUTURES MARKET IN GEORGIA: SUMMARY**

In sum, a central theme of this study is that an important tool to assure Georgian energy security lies in establishing viable energy commercial markets in Georgia, not simply transit facilities.

Based on the above, we suggest that a futures market be established in Georgia to allow international trading in natural gas. The purpose of this market would be as a service to the international market for natural gas. But establishing the trade center or exchange, may also induce investment in transit routes and other facilities that are encouraged by the presence of an active commercial market. The reasons Georgia may want to create a commodities market, including futures market, for global trading, are rather different from the reasons traders on that market may wish to use it. Though the brokers on the Georgian commodities exchange may be Georgian, the trading parties will be predominantly non-Georgian. Trading for Georgian domestic

consumption, if it occurs at all on this exchange, would be at most a small part of the total volume traded.

To understand why a Georgian futures market may be used by others requires understanding first, who uses such markets and why (as also discussed in more depth in Annex 3). Futures markets have been described as continuous auction markets and as clearing houses for the latest information about supply and demand. The primary purpose of a Futures Market is to provide an efficient and effective mechanism for the management of price risks. They can also be used by producers to help assure a more stable market for commodity by transfer of demand risk into price risk which is borne by others. By buying or selling futures contracts -- contracts that establish a price level now for items to be delivered later -- parties can also seek to achieve "insurance" against adverse price changes. This is sometimes called hedging, and is often used as a protection by an operating company against financial risks that are extraneous to its normal operations. Futures market actors may also include speculative investors who accept the risks that hedgers wish to avoid. Most speculators, and many hedgers, do not have the intent to take delivery of the commodity represented by the contract they trade. Rather, they seek to profit from (or avoid loss from) a change in the price. The interaction of hedgers and speculators helps to establish liquidity to the market. In doing so, they create efficient markets that determine prices accurately, and impersonally (without government direction).

As noted in the previous section, there are four principal markets world wide for trading energy future contracts. None reside in or near Central Asia, despite the rapidly expanding energy commerce from that region. Only two of those world markets trade natural gas futures, one in the UK and the other in the US. Given the high volumes of commerce that are likely from the Central Asian markets, eventually one may expect a price determining mechanism to be created for that commerce. The presence of Georgia in those trade routes makes it a natural place to locate the point of trade for commercial markets in natural gas contracts.

Annex 3 provides a deeper discussion of mechanisms normally used in futures markets, and how the presence of those mechanisms can also lead to inducing development of related markets, and the infrastructure associated with them. Just as noted earlier in a footnote, that the presence of a regional energy trading market in Georgia would also both require and induce a stronger banking system, it will also both require and induce a more diversified energy infrastructure. Should Georgia accept the proposal of this study, and seek to create trading markets, it should thus do so knowing that this is closely linked, through indirect but real mechanisms, to broader development of commerce.

#### **IV.C. GEORGIAN COMMODITIES LEGISLATION, GENERALLY**

The law of Georgia allows creation of commodities markets, and in particular, futures markets. The details of the laws related to such specific devices are discussed in Part IV.E below. Here, we give the general background of Georgian contract and civil law in which a futures market would operate.

Under Article 10 (paragraph 2) of the Civil Code of Georgia participants in a civil relation may exercise any action not prohibited by law, including any action not directly foreseen by the law. Under article 319 (paragraph 1) subjects of private law are free to enter into contracts and determine their content within the scope of the law. They may also conclude contracts that are not prescribed by law, but do not contravene it. However, Sole Proprietors, Physical persons and Legal Entities in the areas of natural gas supply, import, export, transportation, distribution and consumption may exercise actions prescribed by the law on “Electricity and Natural Gas” and administrative-normative acts on natural gas issued under that Law. Any transaction that violates rules and prohibitions determined by the Law shall be void under Civil Code of Georgia (article 54).

The authorities of the Ministry of Energy are defined by the law on ‘Electricity and Natural Gas’, as summarized in Part II above. That law regulates relations and activities of Sole Proprietors, Physical persons and Legal Entities in the areas of natural gas supply, import, export, transportation, distribution. Pursuant to the law on “Electricity and Natural Gas” commercial relations arising from the purchase-sale and transportation of natural gas shall be regulated by an administrative-normative act-in the form of an Order of the Ministry of Energy called “Natural Gas Market Rules”. The law “Electricity and Natural Gas’ defines “Natural Gas Market Rules” to mean a document regulating commercial, financial and technical relations arising from natural gas purchase-sale and transportation including development of natural gas balances and their implementation.

While this superficially seems to mean that the Ministry of Energy could thus require creation of a gas futures market and regulate its behavior, that is not quite the case. Under Article 17.2. of the law on “Normative Acts” an order of the Minister shall be issued only in the cases and within the limits defined by a legislative act of Georgia and an edict of the President of Georgia. The order may not resolve an issue regulation of which is provided for in a legislative act of Georgia, or in an edict of the President of Georgia, or in a resolution of the Government. In electricity, the law on ‘Electricity and Natural Gas’ provides for the creation of a legal entity of private law -‘Wholesale Electricity Market’ with the purpose of management of wholesale purchase and sale of electricity (capacity). The law on Electricity and Natural Gas however, does not provide for the establishment of another legal entity called a “Natural Gas Futures Market”.

Therefore, an Order of the Ministry of Energy may not require the *creation of a* Natural Gas Futures Market. The establishment of a Natural Gas Futures Market is a subject of the law on ‘Commodity Exchange and Exchange Trade”, passed by the Parliament of Georgia on June 23, 1999 that regulates creation of commodity exchanges, activities and legal relations regarding the exchange trade. But the commercial relations that may occur in a “Natural Gas Futures Market” might however be subject matter of the law on “Electricity and Natural Gas”. Provided it were also authorized to do so by Law, the Ministry’s Natural Gas Market Rules could recognize the presence of and possible uses for a natural gas futures market, and especially through the Ministry powers on import and export of natural gas, could affect when and how such mechanisms are used (at least as to domestic market participants), or the substantive terms of the contracts.

Thus to create such authority, we advise that the Law on Electricity and natural gas be amended to grant the Ministry the required authority, and/or, in order to remove the ambiguity of possible conflict of the two laws, to amend the Law on Electricity and Natural Gas to specifically create a natural gas futures market. This could be done by including the language below into the law on "Electricity and Natural Gas" to allow creation of Natural Gas Exchange Market:

**Clause 1.**

"Georgian Natural Gas Commodity Exchange Market" shall mean a legal entity of private law trading (buying-selling) natural gas contracts concluded in accordance with specific rules, procedures and guarantees. "Georgian Natural Gas Commodity Exchange Market" shall be created in accordance with the law on "Commodity Exchange and Exchange Market".

**Clause 2.**

Sole proprietors, physical persons and legal entities may at their option trade (buy-sell) natural gas in the "Georgian Natural Gas Commodity Exchange Market".

Or, a special law may be adopted to create a natural gas commodity exchange market.

Note in particular, that we do not recommend creation of a "Georgian Wholesale Natural Gas Market" for supply of the domestic natural gas trade. The Natural Gas Commodities Exchange proposed would be primarily serving the commercial interests of trading entities from outside of Georgia. The purpose is to attract their business to occur within Georgia, for the diverse benefits that may have to the country. Participation of Georgian companies as buyers for supply on that market would be at most, a small fraction of the trades in the Exchange. Participation of Georgian companies as providers of supply contracts to that market at present is at best, high speculative. The effect of the market would be to indirectly induce diversity of supply in Georgia, not, to regulate supply for the Georgian market. Treating this market primarily as a device for Georgian domestic supply and regulating in that form, will also make it completely unviable.

But any such market must also presumably comply with the law on "Commodity Exchange and Exchange Market" for the matters regulated by that law. Thus it is useful to review the law on 'Commodity Exchanges and Exchange Trade' carefully.

#### **IV.D. THE LAW OF GEORGIA ON 'COMMODITY EXCHANGES AND EXCHANGE TRADE'**

The law and regulations issued based on the law regulate activities of commodity exchanges and relations concerning exchange trade and provide for guarantees. Pursuant to the Article 3 of the Law, a commodity exchange is an organized wholesale market created for purposes of organizing and regulating exchange trade, where trade is public, in accordance with predetermined rules, at the determined place and dates. An objective of the exchange is to meet interests of its members. Pursuant to the Law "On Entrepreneurs" it shall be created in a form of the limited liability or a joint-stock company. Pursuant to the Article 4 of the Law on Commodities Exchanges and Exchange Trade, a commodity exchange is authorized to carry out activities related to

organization and regulation of the exchange trade. The commodity exchange may provide for only exchange trade related trade and trade-brokerage activities. Under Article 7.1 participants of the exchange trade may carry out forward, futures and optional transactions, as well as deals on real commodities.

Under the law a futures transaction is a bargain on standard contracts (standard terms established in accordance with articles 342-348 of the Georgian Civil Code) on the exchange commodity supply, purchase of contracts on commodities supply, where the compulsory condition envisages sale of commodities at the price indicated in the contract, following the expiration of the certain time after the contract signing.<sup>7</sup> Pursuant to the articles 342-348 of the Civil Code of Georgia, standard contract terms are provisions prepared in advance for repeated use that one party (the offeror) proposes to the other party; and which stipulate rules that deviate from, or supplement, norms prescribed by law. If the parties have determined their contract terms in detail, such terms shall not be deemed to be standard contract terms. The terms agreed upon by the parties individually shall prevail over standard contract terms. Thus, a commodities exchange or futures market will normally want to have contracts in which the specific parties do not modify the terms from the exchange's standard contract.

Under the law on 'Commodity Exchanges and Exchange Trade' Standard commodity refers to the commodity with one standard (or specific quality), certain measurement unit or other indefinite properties, subject to standardization, allowing sale of commodities manufactured in different countries or regions under one contract, if such commodity meets terms of the standard contract. According to the Law contract shall mean registered exchange transaction (bargain) between contractor parties, which defines rights and obligations of parties, fulfillment conditions, time-frames and responsibilities in case of failure to fulfill terms of the contract. Exchange deals shall be concluded only on the exchange commodity, of certain type and quality, including standard contract and bill of lading of the commodity. The exchange deal is considered to be a contract registered at the exchange commodity, concluded publicly between exchange trade participants on the exchange commodity and during the exchange trade.

Under article 9.1. of the Law any natural or legal person is authorized to found an exchange, except: (1) Supreme state executive and local bodies, state organizations (institutions), funded from the state budget; Banking and credit organizations; Insurance and investment companies (enterprises); (2) public, religious and charity funds and unions (organizations); Natural persons, prohibited to carry out entrepreneurial activities as prescribed by the Georgian legislation. The charter capital shall not be less than GEL 100 000.

In order to ensure settlement services upon conclusion of forward, futures and optional bargains, the exchange shall enter into agreement with the bank or create a clearing centre. The clearing centre shall be authorized to:

- (a) act as a unified party to the exchange bargain counteragents in order to ensure guarantees of fulfillment of the concluded between parties exchange bargain, of identification and execution of demands (requirements);

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<sup>7</sup> Article 2 (l)

- (b) establish types, size, collection rules of payments to ensure fulfillment of forward, futures and optional bargains and compensation of the loss, incurred due to non-fulfillment or partial fulfillment of liabilities under the bargain; in addition, define other financial obligations of the participants to the bargain;
- (c) in accordance with established guidelines, credit and insure participants to the forward, futures and optional bargains within limits necessary to the bargain guarantees, and compensation of loss incurred due to non-fulfillment of such.

Under article 15 of the law on ‘Commodity Exchange and Exchange Trade’ natural and legal persons who are not members of the exchange, may participate in the exchange trade only through the exchange members – exchange brokers. Relationship between exchange brokers and their clients shall be determined by the contract. The exchange administration shall not interfere with relations of exchange brokers and their clients. In addition, the exchange administration, within limits of its competence and in accordance with established guidelines, may apply sanctions against exchange brokers, violating the established rules of relationship with clients. Further, pursuant to the article 22.2 (a) the exchange market shall not define threshold and level of exchange commodities prices at the exchange trade.

## **IV.E. NATURAL GAS FUTURES MARKET IN GEORGIA**

### **IV.E.1 SUMMARY OF LEGAL FOUNDATION**

The above summary demonstrates that the law of Georgia permits creation of a natural gas futures market. The Georgian law on ‘Commodity Exchange and Exchange Trade’ provides for the possibility to create exchanges for natural gas futures, and to enter into the futures contracts. That law governs the forms of contract and topics that must be covered by such contract, among other details. However, any futures contract could be void under the Civil Code of Georgia if it violates rules determined by the Law on “Electricity and Natural Gas” and the Ministry of Energy’s Order on “Natural Gas Market Rules”. The Ministry of Energy can regulate “commercial relations”, but can not contradict the requirements of the law on Commodities Exchanges and Exchange Trade. It may be that because the Law on Electricity and Natural Gas is specific as to the authorities of the Ministry, and does not specifically mention natural gas futures trading as a commercial activity, that there is a conflict in the laws that must be resolved by legislation. If we assume there is no conflict, and that an authority or duty exists in the Ministry now as relates to natural gas futures trading, then Ministry natural gas market rules could regulate only those matters not specified by the Exchange law. For example, the Exchange law requires that futures contracts specify quantities traded within each contract, but does not set the quantity to be stated in the contract. But as that is a commercial matter, the Ministry’s Natural Gas Market Rules could specify the quantities of such contracts. Or, the Ministry could specifically adopt a policy to refrain from setting such matters so long as the Exchange has done so in a commercially reasonable manner which encourages trading.

## IV.E.2 COMMERCIAL BASIS OF CONTRACTS

As an example of the commercial terms in such contracts, one may consider the terms of the ICE-IPE exchange contract for natural gas used in the UK<sup>8</sup>. A contract traded in Georgia would need to define similar issues. For example, as to quantity represented by a single contract, the ICE-IPE contract quantity is a minimum of 5 “lots”, where a “lot” is defined as 1000 therms, and thus a one month contract is 30 days times 5 lots per day or times 5000 therms per day. Thus, the contract implies a quantity (in terms of heat content and thus also a volume since natural gas is delivered at standard qualities of heat per unit of volume), and a period of time and daily flow rate over which delivered.

To effect just that contractual term, a contractual and operational infrastructure must exist, in which a supplier (producer) of gas has agreed to deliver the volume and quantity at that daily rate, a transit route has been identified to carry that volume to the (nominal) contract delivery point, known and stable pricing structures on the pipeline(s) involved, a contractual arrangement exists between the exchange and the producers and pipelines to effect deliveries, and financial institutions and mechanisms are in place to assure that all involved parties pay and/or are paid in proper manners. Thus creation of a natural gas futures market is a rather complex undertaking. For it to occur would require concerted effort within Georgia both by the possible participants in the market, as well as by the likely traders brokers on the hypothetical exchange, and by the regulatory authorities that might affect parts of that complex transaction. Achieving this would not be easy. Having achieved it, would also demonstrate that Georgia can be a place to undertake serious business transactions, not simply to rent land for a pipeline. The benefits to Georgia could be much greater than only those from the gas trading and transit alone.

It would require research well beyond that of this study, to specify the commercial terms desirable in such contract, and the conditions which might assure participants in the markets. These matters necessarily need to reflect very practical commercial considerations. While the brokers on a Georgian exchange may well be Georgian companies, the buyers and sellers in the futures market would be largely or entirely foreign entities conducting trades for uses other than the domestic Georgian natural gas market, the exchange created should probably prefer to create its own detail contract provisions, tailored to the requirements of the market participants. The Ministry of Energy might even stimulate creation of such market by delineating the areas it may choose to not regulate via Natural Gas Market Rules (assuming those Rules could affect a gas futures market), if an organized Exchange instead has done so.

The above also demonstrates that the presence of a natural gas futures market in Georgia, while located financially in the country, in fact implies a wider range of international commercial and infrastructure relationships. The Georgian gas futures Exchange could define the contract terms for trading, but the gas itself must also be managed physically, which has important implications for regional networks. First,

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<sup>8</sup> As an example, detail description of the ICE IPE natural gas futures contract can be found at this link: <https://www.theice.com/productguide/lookupProduct.do?token=&requestId=d684bb160c204f0b727a97cc77a47bd0>

delivery of the gas to a particular point at which traded, implies incurring the transit costs up to that point. This in turn requires that the operators and regulators of the pipelines connected to that market undertake reasonable, stable, and market related policies in setting tariffs. If the owner of a route serving that market (or its national tariff regulator, if any) seeks to extract monopolistic transit prices for example, that act would damage the market by reducing willingness to trade on the market. In contrast, as one purpose (and expected effect) for a futures market is to assure buyers for a predictable level of supply (and thus a predictable market level for producers), then an implied policy for the related pipelines should be to set prices that encourage the line to be full.

This logic should also induce pipeline operators to follow policies on to construction of physical facilities that can increase use of their systems. For example, the greater the degree of interconnection of the regional pipelines into a true grid, and not simply a set of unrelated routes, the more likely it will be for trades to occur across that grid. The pipeline system would then tend to operate more in the style often associated with power grids: generation (production) can be located at essentially any point, and consumption at any point, so long as the pressure in the system as a whole is adequate to assure that the total demand is met. This form of analysis, creating trade opportunities, and also, maintain system pressure, should then also induce operators to consider construction of storage fields within the market, especially, near critical hubs of the pipeline grid. Storage systems can assure pressure despite short term changes in demand or supply conditions. If large enough, storage can also allow inter-seasonal trading of natural gas, in a manner that a pipeline alone would not permit.

### **IV.E.3 OTHER PROBLEMS SOLVED BY FUTURES MARKETS**

As an example of the possibilities created by a natural gas futures market, consider this description of the US natural gas futures market, taken from the on-line description of the NYMEX (the Exchange that trades these contracts in the US).

“Natural gas accounts for almost a quarter of United States energy consumption, and the NYMEX Division natural gas futures contract is widely used as a national benchmark price. The futures contract trades in units of 10,000 million British thermal units (mmBtu). The price is based on delivery at the Henry Hub in Louisiana, the nexus of 16 intra- and interstate natural gas pipeline systems that draw supplies from the region's prolific gas deposits. The pipelines serve markets throughout the U.S. East Coast, the Gulf Coast, the Midwest, and up to the Canadian border. An options contract and calendar spread options contracts provide additional risk management opportunities.

“The spread between natural gas futures and electricity futures the spark spread can be used to manage price risk in the power markets.

“Because of the volatility of natural gas prices, a vigorous basis market has developed in the pricing relationships between Henry Hub and other important natural gas market centers in the continental United States and Canada. The Exchange makes available for trading a series of basis swap futures contracts that are quoted as price differentials between approximately 30

natural gas pricing points and Henry Hub. The basis contracts trade in units of 2,500 mmBtu on the NYMEX ClearPort trading platform. Transactions can also be consummated off-Exchange and submitted to the Exchange for clearing via the NYMEX ClearPort clearing website as an exchange of futures for physicals or exchange of futures for swaps transaction.”<sup>9</sup>

Notice the essential features of the NYMEX market. First, the producing area (the Gulf of Mexico, and parts of Texas, Louisiana and the Southwest, and only a small part of Louisiana) is not the location of the commercial trading market. The trading market is located in New York City. The nominal point of trade is the location where the greatest number of pipelines intersect. The point is “nominal” since the Exchange also allows trading in “basis swap futures” which in effect set prices at many other locations, as the difference in price from the contract price. In general, those differences will reflect differences in transport costs. Thus, the presence of the futures market in New York, for physical transactions in Louisiana, can and does set prices for natural gas in any part of North America; most of that gas however is not physically traded nor shipped through the nominal contract point of the futures market. The physical presence of the “hub” in Louisiana however, and the ease of trading that results, has also induced creation of storage facilities near the hub point.<sup>10</sup>

#### **IV.F CONCLUSION ON FUTURES CONTRACTS**

The gas natural transit infrastructure from Central Asia is not yet as densely developed as is that in North America. However, they are rapidly developing. A basic purpose of establishing a commercial trade center in Georgia is therefore all of, to induce additional investment in infrastructure facilities; to do so in part by making it easier to conduct trades for the source of supply; to use the resulting price mechanism to also determine prices regionally by less political means than are now often used; and thus, to also stabilize the supply to Georgia.

While the two existing natural gas futures markets were established after the transit routes existed, Georgia, as the intended center of transit, can think ahead, and encourage development of the markets by offering such added services.

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<sup>9</sup> See [http://www.nymex.com/ng\\_pre\\_agree.aspx](http://www.nymex.com/ng_pre_agree.aspx)

<sup>10</sup> The existence of this market has also enabled some quite sophisticated derivative markets. For example, via the “spark spread” prices for electricity in certain forms, are also determined from the natural gas futures market. It is no doubt premature to consider such possibilities for the Georgian GWEM. However, if as is also intended and hoped, the restructuring of the GWEM now in initial stages also creates a proper trading market, then those prices might also eventually link to the gas futures market.

## **ANNEX 1: PRICING BASED RELIABILITY**

### ***I. SUMMARY OF THE PROBLEM OF PRICING AND RELIABILITY***

In administered energy systems, a primary tool for assuring conformance with plans is use of penalties, such as through fines for failing to provide reliable supply, reliable payment, or even failing to consume the “planned” amount. But each participant can also claim, with good reason, that they have no effective control on reliability, and thus can not be held liable. Both positions are in some degree right, but administrative methods do not offer solutions. The current energy markets in Georgia lack concepts and mechanisms for, assignment of responsibilities for reliability. The new Amendments to the Law on Electricity and Natural Gas allow the introduction of such devices in power supply contracts, by requiring the contractor assure reserves for their respective loads. But that is only one of the possible solutions. Other methods exist, as discussed in this Annex.

The term “responsibilities” is properly used in the plural, since in a properly functioning integrated energy systems there are different kinds of reliability, correspondingly there are different means to assure them, hence different foci of responsibility. Certain elements of reliability are assured in part by each participant meeting agreed technical standards with their equipment. But assuring the maintenance of technical standards on a continuing basis requires the actions of a dispatcher, who in turn must have access to a transmission system of known reliability, and to supply of energy and capacity of particular sorts, and to other devices on the transmission system.

Thus, all of the dispatch operator, transmission system owner and operator, generating company owners and operators, or even customer, affect system reliability, and no one of them can assure system reliability without close interaction with the others. The retail customer however, usually has contact only with the distribution company, who in turn is responsible not for overall system reliability, but only for assuring reliability for the local system from point of receipt of transmission to point of delivery to the customer. Finally, the independent supply company, or local distributor in role of supplier, must also assure that there is sufficient capacity available for the dispatcher to dispatch, to assure that the customer’s actual demand for energy can be met. This in turn implies a relationship between the customer and/or supply company, and the supply company, and in turn also implies relationships for assuring the delivery through the complex path from supply source to final customer.

What is needed therefore is to assign responsibility for reliability, of a particular type, on that entity best able to assure and control for, that form of reliability. To do this in a market also implies that a given degree of reliability be achieved for a stated price. Different entities in the chain of delivery might however be willing to accept different forms of reliability for different purposes. This in turn also implies that there may be different forms of contract, with different prices, to assure different levels of reliability.

## **II. STANDARD FORMS OF RELIABILITY PRICING**

Many markets in the world solve these issues by the use of various standard kinds of contracting and pricing. Level of reliability of supply is often distinguished as “firm” or “interruptible”, perhaps with different degrees of firmness or interruption required. Since concepts of firmness of supply also tend to assume some form of reservation of an assured level, there are also contract devices (such as “capacity charges”, “reservation fees”, or “contract demand” payments) that associate specific forms of payment with the level and form of assured supply contracted. These concepts are often applied in somewhat similar ways, for each of commodity contracting, generation contracting, high voltage or backbone transmission system contracting, power pool contracting, distribution system contracting, and retail customer contracting.

Thus this chapter describes three basic rate design (tariff) concepts, and their common uses. Very similar ideas are typically applied, for similar purposes, in electric power generation contracting and pricing, gas supply contracting, high pressure long haul gas and electric power transmission pricing, and electric and natural gas distribution. These concepts can simultaneously solve, or clarify how to solve, issues of reliability, liability for failure to meet assigned reliability, and price. The chapter illustrates the concepts using a cost of service and tariff analysis for the wholly hypothetical Porous Transmission Company. A transmission company is used for the example since it has a slightly simpler cost structure.

## **III. COST CLASSIFICATIONS**

Energy market pricing of services usually starts with an analysis of costs of the operating company. The analysis starts with an annual cost of service. We assume first that the market is structured so that the cost of the energy delivered is computed separately from all other costs of operation of the system. Thus, the commodity cost (for the total volume of energy consumed) is not shown in the tables.

On this assumption, the annual operating costs for the Porous Transmission company (its “cost of service” or “COS”) are shown in the table “Porous Transmission Company Annual Cost of Service”. Costs are classified into two categories: “Variable costs” are those which vary with the amount of throughput (with the total amount of energy delivered). These are essentially the value of the fuel used for system operations plus the value of the commodity lost for technical reasons inherent in operating the system.<sup>11</sup> All other costs in this example, and in practice most other costs, are thus called “fixed costs”, including especially depreciation, return, taxes on return, and other annual operating expenses. The sum of fixed plus variable costs is the total cost for the year.

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<sup>11</sup> In a supply company or a vertically integrated or full service distribution company, the cost of the energy delivered is also included into the variable costs and thus, as discussed below, charged via the throughput portion of the rate.

<b>POROUS TRANSMISSION COMPANY</b>	
<b>ANNUAL COST OF SERVICE</b>	
Year 2006	
<b>Fixed or Asset Related Costs</b>	
Depreciation	100
O&M	100
Administrative	50
Return on Rate Base	120
Taxes on Return	40
Other Taxes	20
<b>TOTAL</b>	<b>430</b>
<b>Variable Costs</b>	
Compressor Fuel	200
Technical Losses	100
<b>TOTAL</b>	<b>300</b>
<b>TOTAL COST OF SERVICE</b>	<b>730</b>
Volume of Annual Throughput	2000
Peak Daily Flow Capacity	10
Maximum Annual Daily Flow Capacity	3650
Total Monthly Peak Capacity Units	120

#### **IV. RATE DESIGN CONCEPTS**

Using these basic cost classifications, the examples show three somewhat different cost-based rate designs that are commonly used. These are computed in the table “Porous Tariffs”, using the concepts and methods described below. Because the designs also are applied in somewhat different ways in computing bills, they have different effects on the amount charged to each customer, and on the total revenues, hence also, risk of revenue collection, of the company. The three rate designs are a purely volumetric rate, a two-part rate that separate a fee for capacity from the fee for throughput, and a “100 % load factor” rate. The first two are described just below. The third concept, the 100% load factor rate, is described later in this summary.

**Purely Volumetric One-Part Rates:** A one part commodity rate simply divides the total expected costs by the total expected sales, thus sets price at average total cost. The most commonly used energy rate design in Ukraine is the one part purely volumetric rate.

**Capacity-Commodity Two-Part Rates:** The distinction between fixed and variable costs leads naturally to computing a rate consisting of two parts. (1) Throughput Rate: set a rate per unit of throughput at the average variable cost (in effect, marginal operating cost) of each unit of throughput. This is commonly estimated as the total variable cost divided by the total (billable) throughput. (2) Capacity Charge: The remaining cost is “fixed” in that it does not vary with the throughput (certainly not in the short run), and so more accurately represents the cost of the capacity of the system. Thus a capacity fee (sometimes called a “demand charge”) can be computed by

dividing the total fixed costs by some measure of total system capacity. A typical measure of capacity is to find the total daily (or in power systems, hourly) delivery capacity at the peak load, times 12 months. This gives an annual total of billing units for a capacity charge to be billed monthly. Dividing the total fixed costs by the total capacity units, gives the monthly unit charge for (reservation of) capacity.

## **V. USES OF RATE CONCEPTS**

All three of the rate concepts summarized here are regarded as “simple” thus commonly used. But being “simple” alone does not lead to choices between them. Indeed, despite their simplicity they have subtle but important differences that lead to choices in how to apply them, for a particular purpose. (Hence the origin of the term “rate design” for the art of making such choices).

The one-part volumetric or here, throughput rate, requires only a meter that measures total throughput. Hence it is often applied when the metering is simple, or even, when metering is non-existent, based on estimated sales. Purely volumetric rates however are highly sensitive to total volumes. In energy systems, total volumes delivered depends on often highly unstable factors, such as weather conditions, or shorter to medium term economic conditions. For that part of the costs (the variable cost) which vary with the throughput; the appropriate amount can be billed in proportion to the total volume delivered.. But when the fixed costs are recovered in a volume rate, this instability in expected sales leads to a risk that the operating costs are always either over-collected or under-collected. Thus, unless the total throughput can be assured to remain at a very stable predictable (usually also, very high) level, the purely volumetric rate design is regarded as somewhat risky.

A two-part rate design avoids this problem. In a two-part rate design, the only costs that are applied on a volume basis are those which vary directly with the throughput: here, compressor fuel and technical losses. Such costs thus change in direct proportion to the revenues associated with them. The fixed costs are then put in a separate, contract-based fee, charged monthly. The basis of the contract typically is the customers’ expected peak rate of demand.<sup>12</sup> The underlying theory is that the system must be designed to provide this level of capacity, for all customers; therefore the determinant of fixed costs is peak demand; and, therefore, customer peak demand is the proper billing unit for fixed costs.

While this view is not entirely accurate, it is sufficiently so that total design capacity, allocated among customer design peaks, is typically used as the basis for a “capacity charge”. This also explains why such fee is also commonly called a “demand charge” -- it reflects the maximum rate of customer demand in a period of time. To impose a capacity charge of course requires the use of a meter capable of reading both total volume use, and also of recording peak flow rate through the meter. When the total fixed costs are thus recovered in a monthly contractual capacity fee, the risk of recovering those costs are clearly reduced.

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<sup>12</sup> In a gas system, usage rates are often measured as a daily total consumption. In electric power systems, typically as an hourly total consumption.

In summary, one-part volumetric charges can use simpler metering, but result in more risk of revenue collection. Two-part rates require somewhat better metering, but can result in much less risk of revenue collection. This is the primary reason why two part rates are very often preferred, especially in capital project finance, to one-part rates.

## **VI. REVENUE EFFECT OF RATES ON CUSTOMERS**

The differences in rate forms affect not only revenue stability to the transmission company, but also, distribution of costs (level of total bills) among the customers of that company. The customers of a transmission company might be local distribution companies, and well as various industries. Each of these has different characteristics, in total amount of energy used, and in the pattern of use of energy – including, different relationships of peak rate of use of energy to the total volume consumed. These differences in turn create additional considerations in, and opportunities for, rate design choices.

These effects are illustrated for the Porous Transmission Company in the table below, “Analysis of System and Customer Cost and Operating Characteristics”. Porous has three customers. The biggest is the BigBad Distribution company, which uses half of the total Porous capacity. Distribution companies are typically the largest customers of transmission companies. Typically also, a large distribution company customer of a transmission company has load pattern characteristics similar to the characteristics of the system as a whole. In addition, in the example, Porous Transmission has two industrial customers, who have identical peak day demands, but very different patterns of use. The MaxFlowCo uses energy at a fixed constant rate, exactly equal to its peak use rate. The MiniFlowCo has the same maximum rate of use as MaxFlowCo, but actually uses rather little energy in total in the year.

These patterns of use are reflected in Part B of the table. BigBad has a “load factor” (average use of energy compared to peak use of energy), exactly equal to the system total load factor, while MaxFlowCo has a load factor of 100%, and MiniFlowCo has a load factor under 10%. Correspondingly, the bills arriving at each customer may be very different.

Part A of the table shows that in the one-part rate, each customer pays a price equal to the forecasted average total cost per unit of flow. Compare this to the result of a two-part rate design. The average cost per unit of flow from the 2-part rate is given as the first line in Part B. BigBad pays an average cost in the two-part rate equal to the unit price in the one-part case, because its load factor is exactly equal to the system total load factor. But MiniFlowCo pays a much higher total and average cost under the two-part rate than the one-part rate (\$120 compared to \$32) because their load factor is much less than the system average load factor (less intensive use of energy compared to peak rate of use). In contrast, MaxFlowCo pays much less in the two-part rate scenario (\$244 compared to \$333). This occurs because MaxFlowCo has a more intense use of the capacity dedicated to it. In fact, MaxFlowCo has a 100% load factor, or makes constant use of energy at a rate equal to its maximum rate of use. In

contrast, the total system on average only uses about 55% of the available capacity (54.79% load factor).

**POROUS TRANSMISSION COMPANY**  
**Analysis of System and Customer Cost and Operating Characteristics**

A. RATE DESIGN OPTIONS	Fee Per Unit		Big Bad Distribution		MiniFlowCo		MaxFlowCo		TOTAL SYSTEM										
	Volume	Capacity	UNITS		UNITS		UNITS		UNITS										
			Volume	Capacity	Volume	Capacity	Volume	Capacity	Volume	Capacity									
<b>One-Part Rate Form:</b>																			
Purely Volumetric Rate design	\$	0.37	1000		\$	365.00	87.5		\$	31.94	912.5		\$	333.06	2000		\$	730.00	
Total Cost/Total Annual Volumes																			
<b>Two-Part Rate Form:</b>																			
Capacity Charge, Monthly																			
Fixed Costs/Annual Capacity Units		\$	3.58	60		\$	215.00	30		\$	107.50	30		\$	107.50	120		\$	430.00
Monthly Contract Demand Units				5				2.5				2.5				10			
Commodity Throughout Fee	\$	0.15	1000		\$	150.00	87.5		\$	13.13	912.5		\$	136.88	2000		\$	300.00	
Variable Costs/Annual Volumes																			
<b>Total Two-Part Rate Costs</b>						<b>\$</b>	<b>365.00</b>			<b>\$</b>	<b>120.63</b>			<b>\$</b>	<b>244.38</b>			<b>\$</b>	<b>730.00</b>
<b>100 % Load Factor Rate</b>																			
Total Fixed Cos/(Total Capacity*30.4)	\$	0.27	1000		\$	267.87	87.5		\$	23.44	912.5		\$	244.43	2000		\$	535.75	
Plus Average Variable Cost (30.4 is average days/month)																			
<b>B. ANALYSIS OF CHARACTERISTICS</b>																			
Average Cost Per Unit Flow					\$	0.37			\$	1.38			\$	0.27			\$	0.37	
Annual Contract Flow Capacity				1825				912.5				912.5				3650			
Annual Throughput Assumed				1000				87.5				912.5				2000			
Annual Load Factor				54.79%				9.59%				100.00%				54.79%			
Unused Annual Flow Capacity				825				825				0				1650			

## **VII. OTHER EFFECTS OF RATES**

Thus there are many implications of even these simple rate concepts. For example, if one wanted to encourage efficient use of energy production and transmission capacity (discourage building of additional total capacity), one might pick the two-part rate, as it relatively speaking, penalizes those whose load patterns tend to cause disproportionately more (peak) capacity to be required.

But for present purposes we only explore one additional idea: what would be the cost per unit if the capacity were fully utilized? This is called the “100% load factor rate”. The 100% load factor rate is easily computed as follows: divide the monthly cost per unit of capacity by the average number of days in a month<sup>13</sup>, and then add the average cost per unit of commodity. With our simple assumptions, this is the same for all units, so we already have this element as the throughput fee of the two-part rate. Thus adding the two elements of the computation gives in this example a 100% load factor rate of \$0.27. Note that this is less than the one-part volumetric rate, since the volumetric rate assumed the forecasted actual use, while the 100% load factor rate assumes full maximum possible use of capacity. Therefore also, if the actual tariff were the 100% load factor rate for all transactions, the transmission company in many situations would not cover its total annual cost of service.

However the 100% load factor rate is important because it has found many practical applications. We mention two of them here.

First, in a two-part rate system, consider a customer who has contracted for a level of peak demand consumption, but in some period of time uses more than that peak rate. What should they pay for that excess consumption in that period? Surely, they should pay more than just the two-part rate commodity fee, since in that period they have used more capacity than was contracted. In this situation, it is common to apply the 100% load factor rate to the volumes consumed in excess of the contracted peak amount.<sup>14</sup>

Second, consider this question: who can use the unused capacity in the total system, which exists because BigBad and MiniFlowCo often use less than their contracted capacity? Clearly, whatever the answer, the three customers who have contracted for the capacity, should get preference (called “firm capacity”). But if someone were willing to ship at lower priority (“interruptible”), what should they pay, and to whom should they pay it?

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<sup>13</sup> Or in power system, divide by hours in a month.

<sup>14</sup> Essentially this issue has arisen in the discussions for a power purchase agreement for oblenegros from the Energomarket. The question was posed as “penalties” for exceeding nominate requirements. But as the discussion implies, this can be easily treated simply as a form of cost-based tariff rate, in a two-part tariff system, and using the 100% load factor rate as the cost of consumption in excess of the reserved amount.

The “what should they pay” question is often answered (in regulated tariff systems) by use of the 100% load factor rate. That rate includes the variable cost, plus a fee for use of capacity. The “to whom should they pay” is really a question of the terms of the firm contract. If the firm contract holder is allowed, in effect, to subcontract, lease, or resell their capacity, then they are entitled to the revenue from interruptible sales when they make such sub-contract, within their contracted capacity amounts. When customers are allowed to do this, the presence of such sales is often called a “secondary market for capacity”.

But if no such subcontracting is allowed, or, if the transmission company can at any time sell interruptible use of temporarily unused capacity, then the transmission company gets to keep the revenues. When the transmission company can sell the temporarily unused capacity, this service is often set in a regulated tariff, called an “interruptible” rate. With suitable systems of notification, it is possible to design a system with both a secondary market can exist and that interruptible rates available from the shipper.

## **VIII. SUMMARY**

In summary, the two part rate structure, in combination with the 100% load factor rate, can be used to answer many of the practical questions related to transmission system operations, transmission pricing and even market structure. The concepts of a one-part rate, a two-part capacity-commodity rate, and a 100% load factor rate, together offer powerful combinations of tools for designing many facets of pricing and market structure in energy transmission and supply systems.

## **ANNEX 2: ENERGY-RELATED TREATIES AND INTERNATIONAL AGREEMENTS TO WHICH GEORGIA IS A PARTY**

### ***OVERVIEW AND CONCLUSIONS:***

By signing International agreements Georgia ensured the establishment of commonly accepted foundations for energy cooperation between the states of the Eurasian continent. Exporters of energy and importers need a balanced and efficient framework for international cooperation in energy sector. Thus Georgia established the prospects for mutually beneficial cooperation among various countries in energy sector.

The primary goal facing Georgia as a contracting party is to implement full these international treaties and agreements. This will require the multilateral cooperation over transit, trade, investment, environmental protection and energy efficiency. Following its entry into force on 16 April 1998, the Energy Charter Treaty, together with the other international treaties and agreements provides an important legal basis for the creation of an open international market. The Energy Charter Treaty is a legally binding multilateral document that promotes the international cooperation in the energy sector. The Energy Charter Treaty builds a legal foundation for global energy security, based on the principles of open, competitive markets and sustainable development, provides a multilateral framework for energy cooperation under international law. The role of Energy Charter Treaty is very significant as it is the only one dealing specifically with inter-governmental cooperation in the energy sector. By accepting the Treaty, a Georgia takes on the obligation to extend national treatment (whichever is more favorable), to nationals and legal entities of other Signatory states who have invested in its energy sector. The Treaty thus carries the equivalent legal force of a unified network of bilateral investment protection treaties. Therefore Georgia shall facilitate, encourage actions under the international agreements and shall not make obstacles to achieve the goals of international treaties and agreements. Georgia shall promote long-term cooperation in the energy field, based on complementarities and mutual benefits, in accordance with the objectives and principles of the international agreements and treaties.

Externally, Georgia maintains friendly relations with neighboring countries, including Turkey and Azerbaijan. International agreements among Georgia and neighboring countries serve as an additional encouragement for foreign business intending to come to the region. Development of regional energy projects - the Baku-Tbilisi-Ceyhan Oil Pipeline and the Shan Deniz Gas project, will strengthen Georgia's ties with its neighbors. It is also expected that these projects will bring about greater investment in Georgia due to increased demand for goods and services associated with the development of the energy corridor.

Further the treaties and agreements do not in any way affect the ability of Georgia to have (a) a natural gas (or oil) commodities market in Georgia under Georgian law; (b) the required underlying commodity contracts for physical flows represented by the futures contracts. There is no international treaty or agreement

that establishes a Natural Gas Futures Market in Georgia. Notably, as covered in the main report text, the creation of commodities exchanges are not prohibited in Georgia. Private parties are allowed to create commodities exchanges but the creation of the commodity exchange does not automatically establish the possibility of sole proprietors and legal entities to buy and sell natural gas futures contracts in commodities exchanges. Of course, legal entities and sole proprietors may enter into any contracts (not even prescribed by the law) but as the relationship of sole proprietors, legal entities and physical persons is regulated by the law on "Electricity and Natural Gas" they are limited in their actions by the law on "Electricity and Natural Gas" in the area of natural gas supply, import, export, transportation, distribution and shall act within the limits of the law. The Law on "Electricity and Natural Gas" does not provide the possibility of the sole proprietors and legal entities to buy and sell natural gas futures contracts in commodities exchanges. Therefore Georgia cannot allow transactions in domestic commodities exchanges, without further amendment to Georgian domestic law. The treaty system however allows such markets.

## ***I. INTRODUCTION***

As Georgia is important to world energy markets as a transit area from the Caspian Sea to Europe it is interesting to make the survey of international agreements and treaties to which Georgia is a party and which affect Georgia energy use and supply. Between 1991 and the present, Georgia has become a signatory of numerous treaties, declarations and internationally binding agreements which thereby serve as directly acting law on Georgians. The paper analyses international agreements and treaties to which Georgia is a party and which affect Georgia energy use and supply.

The role and function of international treaties and agreements have an increasing interest in Georgia, as part of its legal and even Constitutional system. International Treaties and Conventions rank immediately after the Constitution of Georgia as the laws superior to any other law of Georgia. Pursuant to the article 6 of that Constitution, the Constitution is the first law of the state. All other legal acts shall be issued in accordance with the Constitution. Georgia has recognized International Treaties and Conventions as part of its legislation. They have higher legal status than domestic legal acts, except for the Constitution. The Constitution of 1995, Article 6.2 clearly states: The legislation of Georgia shall correspond to universally recognized principles and rules of international law. An international treaty or agreement of Georgia, unless it contradicts the Constitution of Georgia, the Constitutional Agreement, shall take precedence over domestic normative acts.

Two other Georgian laws reconfirmed the position of international treaties: The Law on Normative Acts, Article 4, confirms that an international treaty of Georgia is a legal act of Georgia. And The Law on International Treaties, Art 6.1, states that 'An international treaty of Georgia is an inseparable part of the Georgian legislation.' These conventions must not be violated; they are therefore also laws for Georgia. The Georgian law on Normative Acts, Article 19, gives a juridical hierarchy of acting normative acts of Georgia according to which International Treaties and Conventions rank immediately after the Constitution as law superior to any other law of Georgia.

## **II. ENERGY CHARTER**

At the meeting of the European Council in Dublin in June 1990, the Prime Minister of the Netherlands suggested that cooperation in the energy sector could stimulate economic recovery in eastern Europe and the then Soviet Union and ensure security of supply to the Community. Invited by the Council to study how best to implement this cooperation, in 1991 the Commission proposed the concept of a European Energy Charter. Negotiations on this Charter were launched in Brussels in July 1991 and culminated with the signature of a Concluding Document in The Hague on 17 December 1991.

The 51 signatories of the European Energy Charter undertook to pursue the objectives and principles of the Charter and to implement their cooperation in the framework of a legally binding Basic Agreement - later called the *Energy Charter Treaty* - designed to promote east-west industrial cooperation by providing legal safeguards in areas such as investment, transit and trade. The Energy Charter Treaty and Energy Charter Protocol on energy efficiency and related environmental aspects were signed on 17 December 1994 in Lisbon by all signatories of the 1991 Charter except for the United States and Canada. The European Communities and their Member States are signatories of the Treaty and Protocol.

The Energy Charter Treaty (ECT) is the first economic agreement uniting all the Republics of the former Soviet Union, the former centrally-planned-economy countries of Central and Eastern Europe and the members of the OECD (except USA, Canada, Mexico and New Zealand). Its main function is to establish and improve the legal framework for co-operation in energy matters by the European Energy Charter. Thus, the ECT is the first binding multilateral investment protection agreement; the first multilateral agreement to cover both investment protection and trade; the first application of transit rules to energy networks; the first multilateral treaty to provide binding international dispute settlement as fundamental provision.

## **III. ENERGY CHARTER TREATY**

On April 16, 1998, the Energy Charter Treaty entered into force in Georgia. It has been ratified by the parliament of Georgia. The aim of the Treaty is to establish a legal framework in order to promote long-term cooperation in the energy field in accordance with the principles of the European Energy Charter.

III.A. GENERAL PROVISIONS. The ECT's provisions focus on five broad areas: (i) the protection and promotion of foreign energy investments, based on the extension of national treatment, or most-favoured nation treatment (whichever is more favourable); (ii) free trade in energy materials, products and energy-related equipment, based on WTO rules; (iii) freedom of energy transit through pipelines and grids; (iv) reducing the negative environmental impact of the energy cycle through improving energy efficiency; and (v) mechanisms for the resolution of State-to-State and/or Investor-to-State disputes.

With regard to investments made, Georgia as the Contracting Party must encourage and create stable, favourable and transparent conditions for foreign investors and apply to them the most favoured nation principle or accord them the treatment they accord to their own investors, whichever is the most favourable.

Where pre-investments are concerned, however, the principle of national treatment will be applied in two stages. In accordance with the Treaty, it will be applied initially according to the "best endeavours" principle. At a later stage, and subject to conditions to be set out in an additional treaty currently under negotiation, national treatment will be accorded on a legally binding basis for investments.

Trade in energy materials and products between the Contracting Parties is governed by GATT rules. This means that the signatory countries to the Treaty must apply GATT rules to trade in energy materials and products even if they are not party to the GATT or WTO. Georgia as a contracting party shall also establish a legal framework in order to promote long-term cooperation in the energy field, based on complementarities and mutual benefits, in accordance with the objectives and principles of the Charter.

III.B. TRANSIT PROVISIONS: The most important area from Georgia's viewpoint is the issue of transit. The treaty's transit provisions require that members facilitate energy transit without distinction as to the origin, destination or ownership of energy, or discrimination as to pricing, and without imposing any unreasonable delays, restrictions or charges. A contracting party shall not interfere with the transit of energy in the event of a dispute and shall have to abide by the dispute resolution procedures of the treaty.

The treaty recognizes that it is very important that there are no disadvantages to the transit country. All costs and risks have to be addressed and covered, which must also have some incentives in the form of fees and taxes to allow for transit facilities. In view of the importance of transit, it is also proposed to establish a detailed transit protocol. One of the purposes is to make transparent the criteria for setting cost-based transit tariffs and to promote the effective settlement of transit disputes.

In the event that Transit of Energy Materials and Products cannot be achieved on commercial terms by means of Energy Transport Facilities the contacting Parties shall not place obstacles in the way of new capacity being established, except as may be otherwise provided in applicable legislation which is consistent with paragraph 1 of the article 7 of this Charter.

Georgia as a contracting party through whose Area Energy Materials and Products may transit shall not be obliged to

- (a) permit the construction or modification of Energy Transport Facilities; or
- (b) permit new or additional Transit through existing Energy Transport Facilities which it demonstrates to the other Contracting Parties concerned would endanger the security or efficiency of its energy systems, including the security of supply.

In the event of a dispute on transit methods, it is prohibited to interrupt or reduce the flow of energy materials and products prior to the conclusion of the dispute resolution procedures provided for in such cases.

Other provisions oblige Georgia through which energy materials and products transit not to hinder the establishment of new capacities.

III. C. OTHER PROVISIONS: The Treaty creates no new tax rights or obligations. Direct taxation continues to be governed by the national legislation of each country or by applicable bilateral agreements.

As to state and privileged enterprises: any State enterprise or entity to which a Contracting Party has granted exclusive or special privileges must fulfill the Contracting Party's obligations pursuant to the Treaty.

Article V of the GATT prescribes the principle of freedom of transit and certain rules of non-discrimination and reasonableness. It needed elaboration for the purposes of the ECT to tackle the particular problems of fixed pipeline links or electricity grids through which most energy is today traded. Transit, by definition, has to be treated multilaterally rather than bilaterally: in the ECT it was also the area of most innovation. The transit provisions apply even if the energy originates outside the territory of ECT Contracting Parties, or is destined outside that area. The provisions cover not only pipelines and transmission grids but also any other fixed facilities, such as marine terminals, used specifically for handling energy materials and products.

For trade, the ECT relies in general on the rules of the GATT 1947 and related instruments. The special GATT provisions in favor of developing countries were not included. The tariff binding and negotiating provisions of the GATT were not invoked. Instead there was a "best endeavors" commitment not to increase tariffs above the levels notified on the date of signature of or accession to the ECT. The ECT signatories undertook to negotiate an early amendment to define the limits of customs duties and any charges imposed on, or in connection with, import and exports. A separate provision of the ECT, however gives effect in substance to the WTO

The Agreement on Trade Related Investment Measures (TRIMs), banning investment practices which require or induce investors to give trade preferences to domestic production. Separate provisions of the ECT require Contracting Parties to consider any appropriate amendments in the light of the Uruguay Round and also the extension of trade provisions to cover energy related equipment.

#### ***IV. ENERGY CHARTER PROTOCOL ON ENERGY EFFICIENCY AND RELATED ENVIRONMENTAL ASPECTS***

The Protocol was ratified by the Georgian Parliament on December 9, 2004. This Protocol was adopted in accordance with the provisions of the Treaty which expressly provide for the possibility of negotiating protocols and declarations aimed at achieving the objectives and principles of the Charter.

The Protocol's objectives are:

- promotion of energy efficiency policies consistent with sustainable development;
- creation of conditions which induce producers and consumers to use energy as economically, efficiently and environmentally soundly as possible;
- fostering of cooperation in the field of energy efficiency.

The Preamble gives the purposes of the Protocol: The Contracting Parties undertake to establish energy efficiency policies and legal and regulatory frameworks which promote, inter alia, the efficient functioning of market mechanisms, including market-oriented price formation: Convinced that energy prices should reflect as far as possible a competitive market, ensuring market-oriented price formation, including fuller reflection of environmental costs and benefits, and recognizing that such price formation is vital to progress in energy efficiency and associated environmental protection; Appreciating the vital role of the private sector including small and medium-sized enterprises in promoting and implementing energy efficiency measures, and intent on ensuring a favourable institutional framework for economically viable investment in energy efficiency; Recognizing that commercial forms of cooperation may need to be complemented by intergovernmental cooperation, particularly in the area of energy policy formulation and analysis as well as in other areas which are essential to the enhancement of energy efficiency but not suitable for private funding; and Desiring to undertake cooperative and coordinated action in the field of energy efficiency and related environmental protection and to adopt a Protocol providing a framework for using energy as economically and efficiently as possible, have agreed on the Energy Charter Protocol on Energy Efficiency and Related Environmental Aspects.

Pursuant to the article 3 Contracting Parties shall be guided by the following principles:

- 1. Contracting Parties shall cooperate and, as appropriate, assist each other in developing and implementing energy efficiency policies, laws and regulations.
- 2. Contracting Parties shall establish energy efficiency policies and appropriate legal and regulatory frameworks which promote, inter alia:
  - (a) efficient functioning of market mechanisms including market-oriented price formation and a fuller reflection of environmental costs and benefits;
  - (b) reduction of barriers to energy efficiency, thus stimulating investments;
  - (c) mechanisms for financing energy efficiency initiatives;
  - (d) education and awareness;
  - (e) dissemination and transfer of technologies;
  - (f) transparency of legal and regulatory frameworks.
- Contracting parties recognize the vital role of the private sector. They shall encourage action by energy utilities, responsible authorities and specialized agencies, and close cooperation between industry and administrations.
- Under article 6 (2) of the Protocol, Contracting Parties shall endeavour to take advantage of and promote access to private capital markets and existing international financing institutions in order to facilitate investments in improving energy efficiency and in environmental protection related to energy efficiency.
- Pursuant to the article 8 each Contracting Party shall develop, implement and regularly update energy efficiency programmes best suited to its circumstances.

These programmes may include activities such as the:

- (a) development of long-term energy demand and supply scenarios to guide decision-making;
- (b) assessment of the energy, environmental and economic impact of actions taken;
- (c) definition of standards designed to improve the efficiency of energy using equipment, and efforts to harmonize these internationally to avoid trade distortions;
- (d) development and encouragement of private initiative and industrial cooperation, including joint ventures;
- (e) promotion of the use of the most energy efficient technologies that are economically viable and environmentally sound;
- (f) encouragement of innovative approaches for investments in energy efficiency improvements, such as Third Party Financing and co-financing;
- (g) development of appropriate energy balances and databases, for example with data on energy demand at a sufficiently detailed level and on technologies for improving energy efficiency;
- (h) promotion of the creation of advisory and consultancy services which may be operated by public or private industry or utilities and which provide information about energy efficiency programmes and technologies, and assist consumers and enterprises;
- (i) support and promotion of cogeneration and of measures to increase the efficiency of district heat production and distribution systems to buildings and industry;
- (j) establishment of specialized energy efficiency bodies at appropriate levels, that are sufficiently funded and staffed to develop and implement policies.

## ***V. AGREEMENT ON THE CREATION OF A FREE-TRADE AREA BETWEEN AZERBAIJAN, ARMENIA, BELARUS, GEORGIA, MOLDOVA, KAZAKHSTAN, THE RUSSIAN FEDERATION, UKRAINE, UZBEKISTAN, TAJIKISTAN, AND THE KYRGYS REPUBLIC ON THE CREATION OF A FREE-TRADE AREA***

The Member States of the Agreement confirmed their adherence to free development of a mutual economic cooperation, introducing in practice the principles of market economy, acting towards successive implementation of provisions of the Agreement on the Creation of Economic Union, as of 24 September 1993.

This Agreement, intends to form conditions for a free transference of goods and services; providing mutual trade balance and stabilization of domestic economic condition of the participating states, promoting the growth of economic potential of the Member States on the basis of the development of mutually beneficial cooperation relations and cooperation; guided by aspiration to the regular increase of living standard of the population of their states; through stage-by-stage creation of an Economic Union. Thus through creation of a Free-trade area the parties agreed to cancel customs duties, taxes and levies which have equivalent effect and quantitative restrictions in mutual trade gradually; eliminate other barriers to a free transfer of

goods and services; create and develop an effective system of mutual settlements and payments on trade and other transactions; coordinate trade policy with respect to the countries which are not signatories to this Agreement; coordinate the economic policy to that extent to which this is necessary to achieve the objectives of the Agreements (in the area of industry, agriculture, transport, finance, investment, social sphere, development of fair competition, and etc.); promote cooperation of different branches, intra-branch and scientific technical Cooperation; harmonize and/or unify the legislation of the Contracting Parties to that extent to which this is necessary for the proper and efficient functioning of a free-trade area.

Pursuant to the article 2 of this agreement the Contracting Parties reserve the right to a self-dependent and independent determination of a regime of foreign economic relations with the States which are not signatories to this agreement. Pursuant to the article 16 coverage of the agreement with respect to goods Free-Trade Area regime shall apply to goods originating in customs territory of the Contracting Parties and intended for customs territory of the Contracting Parties. Under article 5 all levies and payments (except customs duties, taxes, and levies equivalent to them) established in mutual trade by the Contracting Parties in connection with importation or exportation of goods should not exceed within reasonable limits immediate actual costs. The Contracting Parties will inform of the kinds of levies and payments and will seek an agreed reduction of their number and rates. The provisions of this Article shall apply in particular to levies and formalities relating to: quantitative restrictions; licensing; currency control; statistical accounting; documents, documentation, and certification of documents; analyses and inspection; quarantine, sanitary service, fumigation, and other. Further under article 8 the Contracting Parties will not directly or indirectly impose taxes and fiscal levies on goods originating in customs territory of other Contracting Parties in the amount exceeding their level for national goods. According to the article 9 of the Agreement the Contracting Parties have agreed not to provide export and other subsidies to the enterprises located on their territories if as a result of providing such subsidies terms and conditions of fair competition are violated.

Pursuant to the article 10 of the Agreement (**TRANSIT**) the Contracting Parties agree that the observance of the principle of free transit is the most important condition for achieving the objectives of this Agreement and an essential element of the process of attaching them to the system of international division of labor and cooperation. Transit transportation should not be subject to groundless delays or restrictions. Conditions for transit including tariffs on transportation by any kind of transport and rendering services should not be worse than the conditions provided by the Contracting Parties for their own consignors and consignees and for their goods, as well as for carriers and vehicles for this Contracting Party, or provided to consignors, consignees, their goods, carriers and vehicles of any other foreign State, unless otherwise provided by bilateral agreements. Under article 11 no Contracting Party will permit a non-sanctioned re-exportation of goods for export of which other Contracting Parties, on the territory of which these goods originate, shall apply measures of tariff and/or non-tariff regulation.

According to the Protocol "On Amendment and Supplements to the Agreement on the Creation of a Free-Trade Area of 15 April 1994 States-Signatories of the Agreement on the Creation of a Free-trade area, of 15 April 1994 agreed to

make the following amendments and supplements to the Agreement. According to the Protocol in Article 8, item 1 should be added with the following: "These goods shall be granted a treatment no less favorable than that granted to similar domestic goods in respect of all laws, rules and requirements that affect their sale in the domestic market, offer for sale, purchase, transportation, distribution or use." Article 8 (a) is added with the following content to the Agreement: in mutual trade, the Contracting Parties shall not impose indirect taxes (VAT, excise) on goods (works, services) exported from customs territory of one of the Contracting Parties to customs territory of the other Contracting Party. That means the imposition of VAT at a zero rate, as well as exemption of exported goods from excises. In the States-Signatories of this Agreement in which national legislation does not provide for the imposition of VAT at a zero rate, the exemption of goods (works, services) from VAT shall be applied.

Under the provision 19 of the Protocol Article 10, item 4 shall be with the following content: the conditions of transit, including tariffs on transportation by any kinds of transport and rendering of services, shall be determined by a separate agreement.

Article 10 was added with item 3 of the following content: "Transit via the territory of each Contracting Party shall be carried out on the basis of the transit freedom principle by ways [tracks, routes, roads] more appropriate for international transit transportation and transit transportation to or from the territories of other Contracting Parties without any distinction or discrimination based on the flag of ships and place of origin, shipment, putting in, leaving or destination, or based on some circumstances relating to title to goods, ships or other transport facilities."

Under the article 11 the re-export of goods being delivered within the framework of this Agreement shall be regulated by the Agreement on the Re-export of Goods and Procedure of Granting Permissions for Re-export, of 15 April 1994, between the member States of the Community of Independent States. Pursuant to the Agreement on Re-export of Goods and Procedure of Granting Permissions for Re-export the Parties, proceeding from the provisions of the Agreement on Cooperation in the Area of Foreign Economic Activity, of 15 May 1992, and of the Agreement on the Creation of Economic Union, of 24 September 1993 agreed as follows. Under article 3 the Parties shall not permit a non-sanctioned re-export. The Parties have agreed: When granting permissions for re-exporting goods, the authorized agency of the country of origin of goods shall be guided by national legislation, agreements on trade economic cooperation and trade regime with a re-exporting State, and norms of international law; To obtain a permission for re-exporting goods, interested business entities shall refer to the authorized agency of the country of origin of goods with a motivated application for re-export, to which a copy of the Contract on Acquiring Goods and substantial terms and conditions of the re-export transaction (a country of destination, quantity, prices and quality of goods to be re-exported, basis of delivery, time of delivery, a code of the Harmonized Commodity Description and Coding System) are attached; The authorized agency of the country of origin of goods shall, within ten days from the date on which the application has been received, consider the request and inform the interested entities and the authorized agency of the re-exporting State of the decision made, and if the decision is positive - of terms and conditions of re-export. As one of the terms and

conditions, the country of origin of goods can require from a re-exporting business entity to take a commitment on reimbursing a part, but not more than a half, of difference between the transaction value of the re-export of goods and the transaction value of the export of goods from the country of origin, by transferring this difference in currency of the Goods Re-export Transaction to the account specified by the authorized agency of the country of origin of the goods.

In the event that the interested business entity agrees with the terms and conditions of re- export, the authorized agency of the country of origin of goods shall, within a two-week period, grant a properly prepared written permission for the re-export of the goods. The authorized agency of the country of origin of goods shall have the right, if a positive decision is made, to refer to the authorized agency of the re-exporting State requesting to control the fulfillment of the re-export contract, officially notifying about the actual compliance of the substantial terms and conditions of the re-export transaction that are declared [specified] in the motivated application of the business entity. Under article 5, the Parties have agreed that refusal of permissions may be, if:

- Inadequate data on the transaction are deliberately provided;
- Dumping prices or other elements of unfair Trade practice are used, causing damage to the economic interests of the country of origin of goods;
- There are restrictions on the part of third countries with respect to the importation of relevant goods to their customs territory.

In case of a non-sanctioned re-export, the country of origin of goods may require indemnity and apply sanctions. The Parties shall favor the adoption of national normative acts that provide responsibility of business entities for a non-sanctioned re-export (article 6). Further, pursuant to the article 7 the Parties have agreed that in cases where the volume of a non-sanctioned re-export of goods inflicts economic damage to the country of origin of goods, the Party suffered may suspend deliveries of these goods to the State whose business entities have carried out a non-sanctioned re-export, or it may apply other sanctions provided by norms of international law. The authorized agency of the country of origin of goods shall prove the fact of a non- sanctioned re-export. It should provide the authorized agency of the re-exporting State with necessary and sufficient exhibits of violation of this Agreement by specific business entities.

## ***VI. TRILATERAL INTERGOVERNMENTAL AGREEMENTS (IGA) AMONG GEORGIA, TURKEY AND AZERBAIJAN ON TRANSPORTATION OF PETROLEUM VIA TERRITORIES OF THE AZERBAIJAN REPUBLIC, GEORGIA AND THE REPUBLIC OF TURKEY THROUGH THE BAKU-TBILISI-CEYHAN MAIN EXPORT PIPELINE***

The Intergovernmental Agreement among the Republic of Turkey, the Azerbaijan Republic and Georgia relating to the Transportation of Petroleum via the Territories of The Azerbaijan Republic, Georgia and the Republic of Turkey through the Baku-

Tbilisi-Ceyhan Main Export Pipeline was signed by the presidents of the aforementioned countries on 18<sup>th</sup> November 1999.

In General, this agreement defines the host countries' mutual responsibilities and principles of their support to the Baku-Tbilisi-Ceyhan Crude Oil Pipeline Project. It sets forth the countries common principles regarding the free transit of petroleum; reinforces the principle of non-discriminatory treatment; and reinforces the harmonization of the legal framework and the implementation of appropriate supranational regulatory rules. The objective of signing this agreement is to demonstrate political, legal and commercial support for the project and establish a stable and promoted legal and fiscal regime to attract investment to the BTC pipeline and establish prevailing domestic and international law through ratification and other enabling procedures.

Fundamentally, this agreement evidences political, legal and commercial support on State to State level. It creates various rights and obligations enforceable both by the States and the project investors. It sets standards for securing the facilities and personnel, and constructing and operating the BTC system such as technical, environmental and social concerns.

In addition, this agreement sets forth the establishment of an Intergovernmental Commission to facilitate the implementation and the supervision of the appropriateness of the Agreement. In this Commission, the Deputy Undersecretary of Ministry of Energy and Natural Resources and Ministry of Foreign Affairs represent Turkish Government. In general, within the framework of this agreement, each state involved represented by their governments agrees that:

- In furtherance of the principles set forth in international trade and investment agreements to which each state is a party, signatory or applicant, as well as the Energy Charter Treaty of 1994 each government shall carry out the requirements of the aforesaid agreements.
- All states shall fulfill and perform on a timely basis each of its duties and obligations arising under any applicable Project Agreements.
- In consideration of the importance of creating and reinforcing an appropriate legal framework, commensurate with the transnational nature of such Petroleum transportation projects and the required private initiative and enterprise, to support petroleum sector investment opportunities and to establish more firmly favourable conditions to justify the commitment of capital and resources to the Baku-Tbilisi-Ceyhan MEP Project in and/or across their respective Territories.
- They shall not interrupt or impede the freedom of transit in, across and/or exiting from its Territory through the facilities and the taking of all measures and actions which may be necessary to avoid the interruption or curtailment of such freedom of transit.
- In the project land, full protection of the pipeline and associated installations, their construction and exclusive right of land usage.
- Each state shall ensure the safety and security of all personnel, the facilities, all other assets of Project Investors, and all petroleum in transit within its Territory associated with the MEP Project, and without limiting the foregoing, each state shall use the security forces of that state.

- Each State shall co-operate and co-ordinate with the others and the applicable Project Investors in the formulation and establishment of uniform technical, safety and environmental standards for the construction, operation, repair, replacement, capacity expansion or extension and maintenance of the Facilities in accordance with international standards and practices within the petroleum pipeline industry (which shall in no event be less stringent than those generally applied within member states of the European Union).
- Each State warrants that the State shall not be a party to any domestic or international agreement or commitment that conflicts with impairs or interferes with this agreement.
- The States shall endeavour to settle disputes concerning the application or interpretation of this agreement through the implementation commission or through diplomatic channels. If in the sole discretion of a State, regardless of the status of consultations or any other efforts, a dispute has not been settled, that State may submit the matter for final and binding resolution to an *ad hoc* tribunal. Such an *ad hoc* tribunal shall conduct the principles of the Energy Charter Treaty. On the other hand, any dispute between a State and a Project Investor under an applicable Project Agreement shall be subject to private International Arbitration.

## **VII. HOST GOVERNMENT AGREEMENT (HGA)**

The Host Government Agreement was signed between the Government of the Republic of Turkey (Ministry of Energy and Natural Resources) and MEP Participants on 19<sup>th</sup> October 2000 in Ankara. Likewise, similar host government agreement was signed between Azerbaijan and MEP Participants on 17<sup>th</sup> October 2000 in Baku; and Georgia - MEP Participants on 18<sup>th</sup> October 2000 in Tbilisi.

In common terms, each Host Government Agreement determines each host government's representation and warranties to the Project; and determines principles to ensure free transit of oil and to facilitate implementation of the Project.

The Turkish Host Government Agreement provides government commitment to the provision of pipeline security, government assistance and support regarding land acquisition and issuance of the necessary permits. It determines the scope of liabilities and compensation for failure to fulfill obligations under Project Agreements. Specifically HGA addresses the following issues:

- The State Authorities shall take all actions to restore the Economic Equilibrium established under the Project Agreements if the Economic Equilibrium is disrupted or negatively affected, directly or indirectly, as a result of any change (whether the change is specific to the Project or of general application) in Turkish Law that conflicts with, impairs or interferes with this agreement.
- It contains provisions about guaranties, incentives and exemptions which are aimed to promote the Project Investors and Project financing.
- It sets forth the obligations and rights of the Parties with regard to land and facilities, environment, security, foreign currency processes, import/export.
- Government shall fully support and undertake land acquisition processes.

- All rights, licenses, visas, permits, certificates, authorizations, approvals and permissions to be given throughout the project life shall be granted free of any fees, costs or charges, unless otherwise stated.
- Transit Fee shall be paid by the Investors as Corporation Tax. While determining the transit fee, fixed IRR was assumed to make the project feasible. In doing so, transit fee of the initial years was kept low so as to support the investors for further exploring the oil fields of the project. Likewise, pre-determined operating fee is applicable for the same reasons stated above.
- Detailed tax regime has been defined. Each MEP Participant, Operating Company and Shipper shall be exempt with credit (zero percent (0%) rate) from VAT on all of its activities associated with the Project.
- Limits of the liabilities of the parties and the mechanisms of indemnities.
- Application of international arbitration in the event of dispute.
- Environmental, social, health and safety and technical standards are set forth as Code of Practice.

The package of Agreements specifically refers to:

- Determination of legal, commercial and fiscal structures
- Securing the rights provided for the Project Investors

In Terms of protecting the Cost Overrun of the Project:

- Allocation of the pipeline corridor with fixed or pre-determined price
- Protection of the Project Investors from the international arbitration

## **VIII. AGREEMENT ON FREE TRADE BETWEEN THE GOVERNMENT OF GEORGIA AND THE GOVERNMENT OF THE REPUBLIC OF AZERBAIJAN**

The Government of Georgia and the Government of Azerbaijan as the "Sides" to the agreement, "*Confirmed* their tendency towards free development of reciprocal economic cooperation"

In doing so, they; *Took into account* integral economic relations between Georgia and Azerbaijan; *Did strive* for the development of trade and economic cooperation between Georgia and Azerbaijan on the basis of equality and mutual advantage; *Recognized* that free movement of commodity and service requires implementation of mutually agreed measures; *Were guided* by regulations of declaration on principles of economic relations between Georgia and Azerbaijan, proceeded from the sovereign rights of each Government to implement the independent foreign economic policy; *Intended* to promote the increase in economic activity, insurance of complete employment, growth of productivity and rational utilization of recourses; *Strove* for promoting the harmonized development and growth of world trade as well as the eradication of obstacles to its development; *Acknowledged* the intention of Georgia and Azerbaijan to become participants of the General Agreement on Tariffs and Trade (GATT)/ World Trade Organization (WTO); shared GATT/WTO objectives and principles; take into account results of agreements and negotiations that were achieved in the framework of the Uruguay Round on multilateral trade negotiations.

The Sides to the agreement also *agreed* on the following:

Sides do not impose customs duties and taxes, having an equivalent effect, on import and export of commodity originated from the customs area of one of the Sides and designated for the customs area of another Side. If Sides consider it necessary, exclusion from such trade regime on the agreed commodity nomenclature is generally drawn up through documents that are inherent parts of the present agreement.

The Sides agreed that they will not: :

- impose local taxes or charges, directly or indirectly on goods, covered by the present agreement, of another Side, at the rate that exceeds the level of relevant taxes or charges imposed on analogous goods of the local production or those produced in third countries;
- introduce special restrictions or demands towards export and import of goods, covered by the present agreement, that in similar cases are not used towards analogous goods of the local production or those produced in third countries;
- use different rules towards warehousing, unloading, storage, shipment of goods, originated from another country to the agreement, as well as towards repayments and remittances, with the exception of rules that in similar cases are used towards domestic goods or those originated from third countries.

The Sides agreed that they will refrain from carrying out discriminative measures in reciprocal trade as well as from applying quantitative restrictions or their equivalent measures on export and/or import of goods within the framework of the present agreement. These quantitative restrictions may be ascertained unilaterally and in strictly determined terms in the following cases only:

- In the case of sharp commodity deficiency at the domestic market;
- Until the stabilization of balance-of-payments;
- Where commodity is imported into the area of one of the Sides by such an increased quantity or in such conditions that cause damage to or threaten to inflict damage to domestic producers of similar or directly competitive goods;
- With the purpose of implementing the measures provided by the Article concerning regulation of re-export procedures.

The Side, which will apply quantitative restrictions in accordance with this Article, will provide another Side with full information about the reasons for establishment, forms and possible terms of application of mentioned restrictions; hence consultations are appointed and a separate protocol is drawn up.

Sides are agreed that re-export is acceptable through written consent of the authorized body of the exporter country.

Sides consider that unfair business practice is incompatible with the agreement's objectives and undertake not to permit the following methods:

Agreements between enterprises, decisions of their associations and common methods of business practice that aim to prevent or restrict competition or violate its conditions at the territories of the Sides; Actions through which one or several enterprises using their dominant condition, are deemed to restrict competition on the whole territories of the Sides or on the substantial part of the Side's territory.

During implementation of tariff and non-tariff regulation of bilateral economic relations, for exchange of statistics and for implementation of customs procedures Sides agreed to apply common nine-digit commodity nomenclature of foreign economic activity based on the harmonized system of description and coding of goods and on the combined tariff and statistic nomenclature of European Community. Herewith, for their needs, Sides implement, in case of necessity, development of the commodity nomenclature beyond the bounds of nine-digits. Establishment of standard pattern of the commodity nomenclature is implemented on the basis of mutual agreements through representatives in relevant international organizations.

Sides are agreed that the maintenance of the principle of freedom of transit is the most significant term for achieving the objectives of the present agreement, and the essential element of the process of their linking up in the system of co-operation and international division of labor.

In this regard, each Side insures transit of the commodity originated on the customs area of another Side and/or of the third country and is designated for the customs area of another Side or of the third country, except the cases concerning national security interests of the Sides. Each Side will provide exporters, importers or conveyers with all necessary facilities and services for transit security in terms not worse than the ones for facilities and services that are given to own exporters, importers and conveyers or those of any other third country.

Sides are agreed that tariffs on transit, which is implemented through any kind of transport, including handling tariffs, will be economically proved.

This agreement does not prevent the right of any Side to implement measures adopted in international practice that are considered to be necessary for protection of the Side's fundamental interests and that are essential for fulfillment of international agreement, participant of which the

## ***IX. AN INTERNATIONAL AGREEMENT ON THE TRANSIT, TRANSPORTATION AND SALE OF NATURAL GAS IN AND OUTSIDE OF THEIR COUNTRIES THROUGH THE SOUTH CAUCASUS PIPELINE***

On 12<sup>th</sup> October, 2001 Ex-president Eduard Shevardnadze and Azerbaijani President Geidar Aliyev signed an intergovernmental agreement on the transit, transportation and sale of natural gas in and outside of their countries through the South Caucasus pipeline. The agreement was ratified by Georgian Parliament on 19<sup>th</sup> December, 2001.

The agreement provides for the transportation of Azerbaijani gas from the Shakh Deniz field in the Caspian Sea to Turkey by the Baku-Tbilisi-Erzurum pipeline, and for the sale of this gas to Georgia at low prices. Shevardnadze stressed that the project valued at \$ 2.7 to \$ 2.8 bn "will ensure the energy security" of his country. Georgia was asked to choose between charging \$ 2.5 for each 1,000 cm of gas to be

transported through its territory during the first five years and then raising the rate in the subsequent 20 years to \$ 5 for the same amount, or getting 5 % of the total volume of gas to go through its territory instead of money. The total volume of gas will be 2 bn cm of gas a year and then it will grow to 6.6 bn cm. Georgia will be able to buy, by agreement with Azerbaijan, up to 500 mm cm of gas for its needs at low prices which may be \$ 55 per 1,000 cm of gas. The gas agreement covers a period of 20 years. Gas transportation by the Baku-Tbilisi-Erzerum pipeline was expected to begin in the end of 2004 or in the beginning of 2005. Georgia will get free of charge 5 % of Azerbaijani gas to be transported through its territory by the Baku-Tbilisi-Erzerum pipeline after it has started operating at full capacity.

## ***X. AGREEMENT AMONG THE AZERBAIJAN REPUBLIC, GEORGIA AND THE REPUBLIC OF TURKEY RELATING TO THE TRANSPORTATION OF PETROLEUM VIA THE TERRITORIES OF THE AZERBAIJAN REPUBLIC, GEORGIA AND THE REPUBLIC OF TURKEY THROUGH THE BAKU-TBILISI-CEYHAN MAIN EXPORT PIPELINE***

On May 31, 2000 by Resolution #341 the Parliament of Georgia ratified the Istanbul Agreement “Among the Azerbaijan Republic, Georgia and the Republic of Turkey Relating to the Transportation of Petroleum Via the Territories of The Azerbaijan Republic, Georgia and the Republic of Turkey Through the Baku-Tbilisi-Ceyhan Main Export Pipeline” (November 18, 1999).

It was agreed in this treaty that in case one of the provisions of the Agreement comes into conflict with the Constitution of Georgia, the latter prevails since the Constitution of Georgia has superior legal power over Georgia’s international agreements. Pursuant to the Article 6 paragraph 2 of the Constitution of Georgia, international treaties or agreements concluded with and by Georgia, if they are not in contradiction to the Constitution or Constitutional Agreement of Georgia, have superior legal force over internal normative acts.

The Intergovernmental Agreement consists of a Preamble and 12 Articles. In addition, it has 5 annexes, which are its integral parts. Article I of the Agreement contains Definitions. According to this article, all the appendices to the Agreement, as it may be jointly amended or modified in writing by the States, are integral parts of the Agreement.

The list of appendices to the Intergovernmental Agreement is given in Article II.

They are:

1. The Host Government Agreement signed by the Government of Georgia and the Project Investors;
2. The Host Government Agreement signed by the Government of the Republic of Turkey and the Project Investors;
3. The Turnkey Agreement between the turnkey contractor and the Project Investors;

4. The Government Guaranty by which the Government of the Republic of Turkey guarantees the payment and performance obligations of the turnkey contractor under the Turnkey Agreement;  
and
5. The Host Government Agreement between the Government of the Azerbaijan Republic and the Project Investors.

Of these appendices, the Host Government Agreement between the Government of Georgia and the Project Investors is the most important for Georgia. It is worth noting that the Host Government Agreement was based on the Intergovernmental Agreement, for developing and specifying latter. The Intergovernmental Agreement stipulates the general mutual commitments of the signatory states, while the Host Government Agreement is more detailed and regulates relations between the Host Government and the investors of the oil pipeline project. In many cases, it is directly indicated in the articles of the Intergovernmental Agreement that these articles must be applied unless otherwise stipulated by the Host Government Agreement.

#### **Host Government Agreement:**

The Host Government Agreement was amended and reshaped on April 28, 2000; it is annexed to the Intergovernmental Agreement of November 18, 1999 and is an integral part of it.

The Agreement is composed of 23 articles and three appendices. Article 2 (Authority) envisages the appointment of an authorized representative by the Government of Georgia According to the Presidential Decree #455 of October 17, 2000 “On the Realization of Baku-Tbilisi-Ceyhan Main Export Pipeline Project”, the Georgian International Oil Company is appointed as an authorized representative of Georgia in “Baku-Tbilisi-Ceyhan main export pipeline project.” This authority of the Georgian International Oil Corporation is confirmed in the Presidential Decree #151 of April 24, 2001 “On the Implementation of Projects concerning Transportation of Caspian Basin Oil and Gas through Unified Energy Corridor on the Territory of Georgia, their Coordination and Appointment of GIOC “Georgian International Oil Company” as an authorized Representative of the State of Georgia”.

Pursuant to the article 3 of the Agreement the Host Government Agreement shall continue for a primary term of forty (40) years and shall continue in full force and effect after the Primary Term for two (2) successive ten (10) year rollover terms. In addition, the MEP (Main Export Pipeline) participants may prolong the term of the Host Government Agreement, while the Government of the country is considerably limited in its right to put forward additional commercial issues in order to protect the interests of its country and population.

The Government of the country is also considerably limited in the right to terminate the Host Government Agreement before the established term, while MEP participants may terminate the agreement any time (Article 3.2).

Pursuant to Article 3.3 of the Host Government Agreement the MEP Participants have the right to suspend the commencement of the construction phase up to thirty-six (36) months. After expiration of this term the Government of the

Country has one-hundred twenty (120) days to terminate the agreement. After expiration of this term the Government of the Country completely loses the right to terminate the Agreement.

Article 4 (Grant of Rights) concerns the granting of certain rights by the Government to the MEP Participants. Based on Article 4.1 the Government has actually granted to the MEP Participants the absolute and unrestricted right and privilege to implement and carry out the Project, conduct all Project Activities, and enjoy all other rights and privileges. In fact, the Government gave to foreign legal persons certain parts of State territory, without specifying which part was intended to be discharged. Together with transferring the right to its own land, the Government granted the MEP Participants the right to carry out construction on this land, and also permitted third parties to permanently use, occupy, possess and control the land and carry out ground and underground construction.

Based on the EIA (Environmental Impact Assessment), the Appendix also provides the opportunity for defining additional conditions in connection with the Preferred Route Corridor, Specified Corridor or Construction Corridor (Article 2.2). Together with the right to State land, the State authorities grant each of the MEP participants the status and the right to receive ownership, the right to obligatory selling, the sovereign right of a State to take private property in consideration of pecuniary compensation (eminent domain), the right to expropriation, and other such rights of a state, which enable each of the MEP Participants in the course of the project to provide for, produce and pay relevant persons due remuneration in consideration of the rights to non-state lands. Such right to property is one of constitutional rights in Georgia. Pursuant to Article 21 (3) sequestration of property for necessary social need is permissible in cases directly determined by law, by a decision of the court or in case of urgent necessity by organic law but only if full compensation is made. Construction of the export pipeline is not an urgent necessity, but the Law of Georgia on the Rule of Expropriation of Property for Urgent Social Need (Article 2) establishes that property expropriation necessary because of urgent social need can be made for construction of raw oil, natural gas and oil products.

## ***XII. AGREEMENT BETWEEN THE GOVERNMENT OF AZERBAIJAN REPUBLIC AND GOVERNMENT OF GEORGIA ON EXPANSION OF COOPERATION IN THE ENERGY SECTOR***

The Agreement between the Government of Azerbaijan Republic and Government of Georgia on expansion of cooperation in the energy sector was signed: from the Azerbaijani side by first vice-premier Abbas Abbasov, from the Georgian side – by minister of fuel and energy Nika Gilauri on June, 2004.

Pursuant to the article 5 of the agreement Parties shall work out appropriate legal framework for shipment of electricity, oil and natural gas through the territories of the parties.

### ***XIII. PROTOCOL ON CO-OPERATION IN THE FIELD OF ENERGY BETWEEN THE GOVERNMENT OF THE REPUBLIC OF TURKEY AND THE GOVERNMENT OF GEORGIA (4 APRIL, 1996)***

The terms of that agreement are recited in the following. The Ministry of Energy and Natural Resources of the Republic of Turkey (Turkish side) and Fuel and Energy State Corporation of Georgia (Georgian side) desiring the contribution to the development and strengthening of technical, scientific, economic and commercial relations between the Republic of Turkey and Georgia; Recognizing the substantial potential for co-operation in the field of Energy; Recognizing their mutual interest in fostering technical, scientific, economic and commercial co-operation in the field of J energy as well as the mutual benefits deriving the reform; and considering that they wish to maintain and increase the co-operation in the field of Energy on a long term basis; agreed as follows.

1- In the field of Electricity: a) The Georgian side explained the existing situation of power production in Georgia and stated that a number of power plants in operation need rehabilitation, a number of power plant's construction has been interrupted and that only a small part of the hydro power sources has been used so long. The Georgian side invited the Turkish side to explore the possibilities of carrying out the -rehabilitation works, the completion of the interrupted constructions and construction of new power plants.

2- In the field of pipelines: Both sides agreed to cooperate in transporting third country's natural gas to Turkey via a pipeline to be constructed with connection to existing pipeline system in Georgia.

### ***XIV. HOST GOVERNMENT AGREEMENT BETWEEN AND AMONG THE GOVERNMENT OF GEORGIA AND [THE SCP PARTICIPANTS]***

The agreement was ratified by the Parliament of Georgia on December 19, 2001. The agreement was made between the Government of Georgia and the SCP participants.

Signatories of the agreement (the SCP Participants) say they are considering the development of a secure and efficient pipeline system (which may consist of one or more main trunkline transmission pipelines), to be known as South Caucasus Pipeline System (or "SCP System"), for the receipt, transportation and/or delivery of Natural Gas at various points within, across and/or beyond the territories of the Azerbaijan Republic, Georgia and/or the Republic of Turkey; Based on the agreed terms and conditions of the Project Agreements and other commercial arrangements consistent with the Project Agreements, the SCP Participants shall have the right to implement the Project and construct (or cause to be constructed), own and/or operate the SCP System, including the Facilities, and utilize the resulting capacity in the SCP System and Rights to Land; WHEREAS, the Government acts on behalf of the State and the State Authorities in matters such as those provided in this Agreement.

## AGREEMENT, TERM AND DURATION

This Agreement shall be effective and binding from the date it has been fully executed by all Parties hereto (the “Effective Date”) and shall continue for a primary term of sixty (60) years from the date of first shipment of Natural Gas through the custody transfer meter at the Point of Terminus (the “Primary Term”).

## GRANT OF RIGHTS

For purposes of the Project the State Authorities hereby grant:

(i) to the Project Participants, the Exclusive and Unrestricted right and privilege to implement and carry out the Project, conduct all Project Activities, and enjoy all other rights and privileges provided to any or all of them by the State Authorities as set forth in the Project Agreements;

(ii) to the SCP Participants and such other Project Participants as the SCP Participants may designate to implement Project Activities, the Exclusive and Unrestricted Rights to Land in respect of State Land as set forth in Appendix 2;

(iii) to each of the SCP Participants, acting collectively, such status and powers, including the necessary authority, to exercise the taking, compulsory acquisition, eminent domain, expropriation, or other similar delegated powers of the State to enable the SCP Participants acting collectively for the duration of the Project to secure, maintain and pay reasonable compensation to affected Persons for all Rights to Land in respect of Non-state Land as set forth in Appendix 2;

(iv) subject to any private arrangements entered into by the SCP Participants in respect of Non-state Land, to the SCP Participants, the Exclusive and Unrestricted property right to use, possess, control and construct upon and/or under the Permanent Land, and to restrict or allow (at the SCP Participants’ sole but reasonable discretion) the use, occupation, possession and control of, and construction upon and/or under, the Permanent Land by any other Persons;

(v) to each of the SCP Participants, the Exclusive and Unrestricted right and privilege to construct, own, use, possess and control (or exercise any other form of property rights, as determined by the SCP Participants, with respect to) the Facilities.

(vi) to the Project Participants, (a) the Exclusive and Unrestricted right and privilege, subject to compliance by the SCP Participants with the Principles with Respect to Contract Access to SCP System attached hereto as Appendix 3, to conduct Sales Activities using Sales Participants or any legal or other business structure or structures, including unincorporated joint ventures of co-owners, agency and other representative relationships, limited partnerships, limited liability companies, corporations, branches or any other structure or arrangement as the Project Participants may elect from time to time (and the State Authorities shall ensure that licenses and/or authorizations to be issued to purchasers of Natural Gas in connection with the conduct of Sales Activities shall be on a non-discriminatory basis, it being the intention that there shall be no distinction (either in the identity of such purchasers or in the rights and privileges granted to such purchasers) between those purchasers licensed and/or authorized to purchase services and/or Natural Gas from or in respect of the SCP System and those purchasers licensed and/or authorized to purchase services and/or Natural Gas from or in respect of other providers of such services and/or Natural Gas in the Territory); and (b) the Exclusive and Unrestricted exemption from the application and enforcement of all Georgian Laws imposing on Shippers and other Project Participants, or their respective assets or property associated therewith, any duties or obligations to secure or maintain in

force any licenses, permits, certificates, authorizations or approvals in connection with the conduct of such SCP Activities or Sales Activities; and (c) in carrying out the SCP Activities and conducting Sales Activities, the absolute and unrestricted exemption from all Georgian Laws in respect of business competition, antitrust, anti-monopoly, natural monopoly, restraint of trade, business combinations and other similar legal restraints or prohibitions in respect of all SCP Activities;

(vii) to Project Participants, in connection with services (including the marketing, sale and purchase of Natural Gas) provided in respect of the SCP System, including the entry into and performance of all commercial agreements by the Project Participants (subject to the restrictions set forth herein in respect of such sales), but subject to compliance by the Project Participants with the Principles with Respect to Contract Access to SCP System attached hereto as Appendix 3, absolute and unrestricted exemption from the application and enforcement of all Georgian Laws imposing on the Project Participants, the SCP System, or with respect to the services provided by the Project Participants in respect of the SCP System or SCP Activities, any duties or obligations of any nature whatsoever associated with being a public utility, Natural Gas utility, utility, concessionaire, licensee or other similar regulatory classification or framework (a) that, inter alia, would establish regulatory jurisdiction of any nature whatsoever over the method and manner the Project Participants provide service in respect of the SCP System and/or impose any form of utility regulation, rates and service regulation, tariff and access regulation (including any regulations in respect of supply, distribution and/or transportation of Natural Gas, or any other similar regulations in respect thereof), or impose on the Project Participants or the SCP System any duty or obligation to secure or maintain any licenses (including any licenses in respect of supply, distribution or transportation of Natural Gas), permits, certificates, authorizations or approvals of any nature whatsoever, or to provide service, or particular types of service of any nature whatsoever, to all or any portion of the public generally or in respect of the State Authorities (it being agreed that the only obligation imposed on the Project Participants or the SCP System to provide any service or sell Natural Gas is pursuant to freely negotiated commercial contracts entered into by the Project Participants (subject to the restrictions set forth herein in respect of such sales)), or (b) that otherwise create limitations, conditions or restrictions under Georgian Law on the conduct of the Project Participants' business in relation to the SCP System or SCP Activities in addition to or in conflict with the provisions of this Agreement or any other Project Agreement;

(viii) to the SCP Participants and their designated Contractors free of charge, readily available surface water not subject to prior restriction of sufficient quality and quantity located proximate to the Facilities in order to perform hydrostatic and other testing of the Facilities, together with the right to dispose of same at location(s) proximate to said Facilities upon completion of such testing; the Government SCP Representative shall coordinate with the SCP Participants to identify the source of such surface water; and

(ix) without limiting the rights and privileges granted herein to the Project Participants, to the Project Participants, the uniform, non-discriminatory application of international law standards protecting investments, including non-discriminatory treatment of investors, as set out in bilateral and multilateral agreements to which the State is a party, and to ensure that the Project Participants and Shippers, and their respective investments, in respect of the SCP System and SCP Activities are

accorded treatment that is no less favourable than the treatment the State accords to its own investors or to investors of any other state, whichever is the most favourable.

(x) Under article 5.2. the Government commits the State Authorities to perform and, in respect of all State Authorities other than itself, guarantees to each of the SCP Participants the performance of the obligations of the State Authorities set forth in this Agreement, including: (i) that the State Authorities shall not interrupt or impede the freedom of transit, receipt or delivery of Natural Gas into, within, across and/or from the Territory except in accordance with the provisions of clause (iii) below; (iii) that the State Authorities shall not act or fail to act in any manner that could hinder or delay any Project Activity or otherwise negatively affect the Project, impair any rights granted under any Project Agreement, or (directly or indirectly) interrupt, impede or limit the receipt, flow or delivery of Natural Gas in, from or through the Facilities, except under circumstances in which continued operation of the Facilities without prompt corrective action creates an unreasonable threat to public security, cultural heritage, health, safety or the environment that renders it reasonable to take or fail to take, as the case may be, such action and, then, only to the extent and for the period of time necessary to remove that threat (using, for such purposes in respect of the environment, the applicable standards and practices of Appendix 4 of this Agreement and, in respect of health and safety, the provisions of Section 5.2 of Appendix 4); (v) that the State Authorities shall not claim or demand title to or possessory rights over the Natural Gas, the Facilities, or the Non-state Land; (vi) that the State Authorities shall not claim, demand or restrict any of the Rights to Land granted by the State Authorities to the SCP Participants under Section 4.1 (ii), (iii) and (iv)...

Pursuant to article 8.1 except as otherwise specifically provided in this Agreement, no Project Participant shall be subject to any Taxes or any Tax compliance or filing obligations arising from or related, directly or indirectly, to SCP Activities, the SCP System, the Facilities, the Rights to Land, Natural Gas that is received, transported or delivered through the Facilities or the SCP System or that is sold pursuant to an SPA (including the importation into and exportation from the Territory of, and ownership of, such Natural Gas), or any related assets or activities, whether before, on or after the Effective Date. For purposes of this Article 8, with respect to Natural Gas that is sold and consumed in the Territory, Sales Activities shall include only such activities of the Sales Participants. The Parties anticipate that an agreement as described in Section 8.11(iii) will cover the exemption from Taxes with respect to Sales Activities. (ii) It is acknowledged that, notwithstanding any other provisions in this Agreement to the contrary, Double Tax Treaties shall have effect to give benefits with respect to Taxes. Moreover, any Person that is not entitled to the benefits of such a treaty shall be entitled to the benefits that would have been available if a treaty equivalent to the Organization for Economic Co-operation and Development Model Tax Convention on Income and Capital, updated as of 1 November 1997 (the "OECD Treaty"), were applicable. In either event, no further administrative action shall be necessary to enable the Person to take advantage of such benefits. The provisions of this Section 8.1(ii) shall not affect the liability of an SCP Participant for Minimum Tax pursuant to Sections 8.3 and 8.4 (or the amount of any such liability). (iii) The provisions of this Article 8 shall at all times prevail over all conflicting provisions of the Tax Code of Georgia, including the provisions of Articles 3(2), 4(3), 4(5), 4(7), 6(6), 6(7) and 6(8) thereof, or other Georgian Law. (v) For purposes of Taxes, the SCP System (whether before or after its completion), the Rights to Land, Natural Gas that is received, transported or delivered through the

Facilities or the SCP System or assets or activities in connection with any other Natural Gas transportation system in existence on the Effective Date shall not be regarded as a permanent establishment of an SCP Participant, Affiliate of an SCP Participant, Interest Holder or Sales Participant. The provisions of this Section 8.1(v) shall not affect the liability of an SCP Participant for Profit Tax or Minimum Tax pursuant to Sections 8.2, 8.3 and 8.4 (or the amount of any such liability) or the obligation to satisfy the accounting and filing requirements of Section 8.4.

Article 14 of the Agreement regulates import and export. Pursuant to the article 14.1 at any time and from time to time, each Project Participant has the right to import into or export or re-export from the Territory, free of Taxes and restrictions, whether in its own name or on its behalf, all equipment, materials, machinery, tools, vehicles, spare parts, supplies, Natural Gas, fuels and lubricants to be used in connection with the Project or Sales Activities and all other goods, works, services or technology necessary or appropriate for use in connection with the Project or Sales Activities. At any time and from time to time, each Project Participant has the right to import into the Territory, free of Taxes and restrictions (subject to procuring any applicable licenses in accordance with Section 7.3), whether in its own name or on its behalf, any form of hydrocarbon, electricity or other energy source to be used as fuel in connection with the Project. Provided, however, that no Project Participant shall be exempt from VAT on any import, export or re-export described in this Section 14.1 except to the extent specified in Section 8.10, 14.2 or 14.3, or in Article 13. According to the article 14.3 natural gas transported, or to be transported, by any of the SCP Participants for any Shipper or for its or their own account through the Facilities shall be considered goods-in-transit for all purposes of the customs laws of the State and shall be exempt from all Taxes. Except as may otherwise be provided in this Agreement, the SCP Participants and each such Shipper shall have the right at any time and from time to time to import and export, free of all Taxes and restrictions, all Natural Gas which is, or is to be, transported through the Facilities.

## ***XV. AGREEMENT BETWEEN GEORGIA AND THE AZERBAIJAN REPUBLIC RELATING TO THE TRANSIT, TRANSPORTATION AND SALE OF NATURAL GAS IN AND BEYOND THE TERRITORIES OF GEORGIA AND THE AZERBAIJAN REPUBLIC THROUGH THE SOUTH CAUCASUS PIPELINE SYSTEM***

Under this agreement, the Governments of Azerbaijan and Georgia facilitate transit of gas across their respective territories. Under the agreement, "Georgia and the Azerbaijan Republic (together the "States" or individually a "State"), ... in respect of the pipeline project described in Host Government Agreement involving the transit and transportation of Natural Gas in, across, to and/or through its Territory and sales of Natural Gas into (as herein contemplated) and beyond the Territories; and in recognition that each State desires to be a transit and consumer country and desires to attract and maintain the availability of reliable supplies of Natural Gas on commercial terms; and Affirming that the sale of Natural Gas in and beyond the Territories of the States will contribute to the improvement and further development of additional exploration, production, transportation, and Natural Gas sales opportunities, provide opportunities for greater utilization of existing infrastructure to

deliver Natural Gas in the States, and allow the States (and those purchasers duly licensed or otherwise duly authorized (to the extent required by applicable law) by applicable State Authorities) to have increased access to reliable Natural Gas supplies and to make it possible to have the right to be a potential purchaser of Natural Gas from Sales Participants on mutually agreeable commercial terms on a non\_discriminatory basis.”

Under article 2(4) each state covenants to the other that its State Authorities shall at all times except as provided in the applicable Project Agreements, not interrupt or impede the freedom of transit of Natural Gas moving into, within, across, through or beyond its Territory by use of all or part of the SCP System, the receipt, transportation and/or delivery of Natural Gas within, to or through its Territory by use of the Facilities, and the taking of all necessary and lawful measures and actions required to eliminate any threat of any such interruption, impediment or curtailment of such freedom of transit, receipt, transportation and/or delivery except to the extent such interruption, impediment or curtailment has been effected to address health, safety or environmental concerns, as more fully described in the applicable Host Government Agreement; in respect of the Azerbaijan Republic only and except as specifically provided in the applicable Host Government Agreement between the Government of the Azerbaijan Republic and the Project Investors (or other Project Agreements in respect thereof), secure for Project Investors and Sales Participants the right of access in the Territory to non-SCP System pipeline infrastructure to conduct Sales Activities, which access shall be on terms and conditions no less favourable than those offered or provided by or to other Persons; subject to, and in accordance with, the provisions of the applicable Host Government Agreement or other Project Agreements, and in connection with the conduct of Sales Activities, secure the interconnection of the Facilities with pipelines owned by other Persons, to permit the transit and transportation of Natural Gas in, across, to and/or through the Territories; except as specifically provided in the applicable Host Government Agreement or other Project Agreements, exempt the Project Investors and/or Sales Participants from all applicable laws in respect of business competition, antitrust, restraint of trade, business combinations and other similar legal constraints or prohibitions respecting how they may undertake their respective SCP Project activities.

## ***XVI. AGREEMENT ON ESTABLISHMENT OF FREE TRADE AREA AMONG THE GUUAM PARTICIPATING STATES, 2002***

The GUUAM Agreement was established by Georgia, Ukraine, Azerbaijan and Moldova after the fall of the Soviet Union on October 10, 1997. Uzbekistan was the last to join in 1999, however withdrew from the organization in May 5, 2005, causing the restoration of the original name (GUAM), though GUUAM is also in common use in the associated documents. There are numerous international legal instruments adopted within the framework of GUUAM, listed at the end of this section.

The principal agreement of interest for this study is the "Agreement on Establishment of Free Trade Area among the GUUAM Participating States, 2002". The principal purpose of this agreement is to encourage open trade among the contracting parties, by minimizing costs and tariffs among the parties, assuring open

transit, assuring a form of “most favored nation” treatment among the parties, minimizing trade processing procedures, and so on.

The provisions of this agreement may be summarized as follows.

Pursuant to the Agreement on Establishment of Free Trade Area among the GUUAM Participating States, the Contracting Parties, Striving to develop mutually beneficial trade and economic cooperation based on equality and mutual benefits, Forming the conditions for free movement of goods and services, promoting the growth of economic potential of the States Parties on the basis of development of mutually beneficial cooperation ties and collaboration, Desirous to permanently increase the living standards of the population of their States, Reaffirming their commitment to the principles of the General Agreement on Tariffs and Trade (GATT/WTO), Concluding the Agreement on Establishment of Free Trade Area, shall cooperate in establishing free trade area to ensure:

Elimination of customs duties, as well as taxes and dues having equivalent effect, and of quantitative limitations in mutual trade; Removal of other obstacles to free movement of goods and services; Cooperation in conducting trade and economic policy to achieve the goals of this Agreement in the fields of industry, agriculture, transport, finance, investments, social sphere, as well as in development of fair competition etc.; Harmonization of the legislation of the Contracting Parties to the extent necessary for proper and effective functioning of free trade.

Under article 3, the Contracting Parties shall not apply customs duties, as well as taxes and dues having equivalent effect, and quantitative limitations, to import and/or export of commodities originating from customs territory of one of the Contracting Parties and destined to the customs territories of other Contracting Parties. From the moment of entry into force of this Agreement no quantitative and tariff limitations of import and/or export and measures having equivalent effect shall be introduced to the trade between the Contracting Parties. The Contracting Parties, which apply exemptions from the regime established by this provision shall within 12 months from the moment of entry into force of this Agreement, on bilateral basis arrange their gradual removal and notify the Working Body and the Depositary of the present Agreement thereof.

According to the article 4, each Contracting Party shall accord to the commodities originating from customs territory of any other Contracting Party and imported to its territory, treatment no worse than the treatment accorded to its national commodities or commodities of any third country in respect of technical and qualitative requirements.

Pursuant to the article 5 all dues and fees (with the exception of customs duties, taxes and dues having equal status), imposed by the Contracting Parties in connection with import or export of commodities in mutual trade, shall not exceed, within reasonable limits, direct actual expenses. The Contracting Parties shall inform the Working Body about the types of dues and fees and shall strive towards accorded decrease of their number and size. The provisions of this Article shall relate, inter alia, to the dues and formalities connected with: quantitative limitations; licensing; currency controls; statistical records; documents, documentation and

authentication of documents; analysis and examinations; quarantine, health service, fumigation and other import and export related procedures.

The Contracting Parties shall not, directly or indirectly, levy taxes and other dues of fiscal character on the commodities originating from customs territories of other Contracting Parties at the rates higher than their level for the national commodities. These commodities shall be accorded with treatment no less favorable than the treatment accorded to similar national commodities in respect of all laws, rules and requirements concerning their sale at the internal market, sale offers, purchase, shipment, distribution or use. The Contracting Parties shall present full information about all taxes and other dues of fiscal character currently in force. Further, the Contracting Parties in their mutual trade shall not levy indirect taxes (VAT, excise duties) on the commodities (works, services) exported from customs territory of one Contracting Party to customs territory of another Contracting Party. The provision shall mean zero-level VAT and excise duty levying on exported commodities from within exporting country. In cases when the national legislation of the Member States of this Agreement does not envisage zero-level VAT and excise duty levying, an exemption from VAT and excise duty of commodities (works, services) shall be applied.

The Contracting Parties have agreed that adherence to the principle of freedom of transit presents a paramount condition of achievement of goals of this Agreement and a substantial element of the process of their connection to the system of international division of labor and cooperation. Transit shipments shall not be subjected to groundless delays or limitations. Transit through territory of every Contracting Party shall be conducted on the basis of the principle of freedom of transit through the ways designated for international transit shipments and transit shipments within the territory or from the territory of other Contracting Parties without any distinction or discrimination based on the flag of the ship, origin, location of consignment, call, departure, destination or any conditions relating to the property of the commodities, vessels or other vehicles. The conditions of transit, including transportation fares for any type of transport and service tariffs, shall be determined by the Basic Multilateral Agreement on International Transport for Development of Europe-Caucasus-Asia Corridor of 8 September 1998. Pursuant to the article 12, each Contracting Party shall not allow unsanctioned re-export of the commodities, lists of which shall be exchanged among the Parties in future, with respect to export of which other Contracting Parties, from the territories of which those commodities originate, apply the measures of tariff and/or non-tariff regulation. At that, the Contracting Parties shall exchange the names of bodies authorized in accordance with their legislation to sanction re-export of commodities. The Contracting Parties shall not prevent business entities from including of provisions concerning re-export of commodities into their contracts.

The Contracting Parties shall be guided by the principles and provisions of the General Agreement on Tariffs and Trade (GATT/WTO) in application of antidumping compensational and special measures regarding imports. Free trade area regime shall be applied to the commodities originating from customs territory of the Contracting Parties and destined for customs territory of the Contracting Parties.

Pursuant to the article 17 of the Agreement the Contracting Parties shall

create conditions for liberalization of the national markets of services and, on the basis of reciprocity, shall strive for gradual removal of limitations with a view of creation of conditions for free rendering of services within the territory of the free trade area. The Contracting Parties shall define the types of services for which this Article shall be applied, and define priority types of services in the field of direct servicing of commodity circulation, regarding which the issues of liberalization of imports and exports shall be subject to priority settlement. The Contracting Parties shall reserve the right to coordinate the issues related to rendering services at both multilateral and bilateral basis.

The principal GUUAM agreements are: as follows:

- GUUAM Presidents Strasbourg Communiqué, 1997;
- GUUAM Presidents Washington Statement, 1999;
- GUUAM Presidents New York Memorandum, 2000;
- GUUAM Presidents New York Communiqué, 2000;
- GUUAM Yalta Charter, 2001;
- Final Communiqué of the GUUAM Yalta Summit, 2001;
- Final Communiqué of the GUUAM Yalta Summit, 2002;
- Final Communiqué of the GUUAM Yalta Summit, 2003;
- Convention of GUUAM Member States on Rendering Mutual Assistance in Consular Issues, 2001;
- Statute of the Council of Ministers for Foreign Affairs of GUUAM States, 2002;
- Agreement on Establishment of Free Trade Area among the GUUAM Participating States, 2002;
- Agreement on Establishment of the Business Council of GUUAM Participating States, 2002;
- Provisional Statute of the GUUAM Information Office in Kyiv, 2002;
- Decision of the Heads of GUUAM Participating States on the Status of Observers of GUUAM Activities, 2002;
- Declaration of the Heads of States on Common Efforts to Ensure Stability and Security in the Region, 2002;
- Agreement on Cooperation among the Governments of GUUAM Participating States in the Field of Combat Against Terrorism, Organized Crime and Other Dangerous Types of Crimes, 2002;
- Protocol on Cooperation in the Field of Culture within the Framework of GUUAM for 2002-2005, 2002;
- Agreement on Establishment of the GUUAM Virtual Center for combating terrorism, organized crime, drug trafficking and other dangerous types of crimes and GUUAM Interstate Information Management System (IIMS), 2003;
- Memorandum of Understanding among the GUUAM Participating States on Trade and Transport Facilitation, 2003;
- Agreement among the Governments of the GUUAM Participating States on cooperation in the field of prevention of emergencies and liquidation of its consequences, 2003;
- Agreement on cooperation in the sphere of education among the ministries of education of the GUUAM Participating States, 2003;
- Agreement on Cooperation among the Governments of the GUUAM Participating States on mutual assistance and cooperation in customs issues, 2003;
- Protocol on Cooperation among the State Border Guard Services of the GUUAM

Participating States, 2003;

Protocol on Cooperation among Academies of Science of the GUUAM Participating States on science and technology, 2003;

A number of GUUAM-US joint statements, 2001-2003.

## **ANNEX 3: FUTURES CONTRACT MECHANISMS**

### **I. CONTRACT MECHANISMS**

A “futures contract” is a standardized contract, traded on an organized exchange, to buy or sell a certain commodity at a certain date in the future, at a previously set price. The future date is called the delivery date or final settlement date. The contract price is called the futures price. The price of the underlying asset on the delivery date is called the settlement price. These contracts are traded particularly on exchanges whose prices may change daily based on their current value in the marketplace. Futures contracts are most often liquidated prior to the delivery date and are mainly used as a financial risk management and investment tool rather than for supply purposes. That is, most trades are for purposes other than delivery of the commodity, though, the commodity is eventually delivered to the final holder of the contract.

Futures contracts are different from “forward” contracts. Since forward contracts are not traded through an organized exchange, sellers and buyers (counterparties) must find each other and settle on a price. Finding suitable counterparties can be difficult. Discovering the market price for a delivery at a particular place far into the future is also difficult in absence of an organized market. When the agreed-upon “forward” price is far different from the market price at time of delivery, one of the parties may default (“non-perform”). Also one or the other party’s circumstances might change. The only way for a party to back out of a forward contract is to renegotiate or face penalties, or simply to breach the contract.

Futures contracts solve these problems, through use of an organized exchange and thus a legal framework. Thus the reliability of the legal framework in which the contracts trade is a key to establishing trust sufficient to operate the market. Like a forward contract, a futures contract obligates each party to buy or sell a particular amount of a commodity at a specified price. Unlike a forward contract, buyers and sellers of futures contracts deal with an exchange, not with each other. For example, a producer wanting to sell natural gas in December 2006 can sell a futures contract through the Futures Market (commodity exchange), and a supplier can buy a December 2006 natural gas future also through the exchange. The December futures price is public. If the buyer of a December futures finds later that he does not need natural gas, he can get out of the contract by selling a December natural gas future at the then prevailing price. Since he has both bought and sold a December natural gas future, he has no further obligation to actually take the supply.

A futures contract is normally traded through a brokerage firm that holds a “seat” (or membership) on the exchange that trades that particular contract. Working through their respective brokers, two parties will transact a trade. Two parties negotiate (through their respective brokers) a futures transaction. They agree on the price and the number of contracts. Legally, the transaction is structured as two contracts, each between one of the parties and the exchange's clearinghouse. The Clearinghouse stands between parties. Parties have no legal obligations to each other. Their respective legal obligations are to the exchange's clearinghouse.

This feature, of trading through brokers, not directly between parties, is one important reason Georgia may be a desired place to trade such contracts. Throughout the region are parties (or states) who do not wish direct relationships with each other, but who are each willing to transact business with Georgians. Thus, Georgia can offer a truly “neutral” trading arena for parties who otherwise might not deal at all.

A futures contract gives the holder the right and the obligation to buy or sell. In contrast, an “options” contract gives the buyer the right, but not the obligation, and the seller the obligation, but not the right. In other words, an option buyer can choose not to exercise when it would be uneconomical for him to do so. The holder of a futures contract and the seller of an option have no choice. We are not advising to create an “options” contract, though once a futures market is created, there may well be subsequent interest to create an options market related to it.

Futures prices increase and decrease largely because of the many factors that influence buyers' and sellers' judgments about what a specific commodity will be worth at a particular time in the future. Thus, in January, the price of a July futures contract would reflect the consensus of buyers' and sellers' opinions at that time as to what the value of a commodity will be when the contract expires in July. On any given day, with the arrival of new or more accurate information, the price of the July futures contract might increase or decrease in response to changing expectations.

Finally, note that use of futures markets in this region may require many new concepts not only of contracting, but of operations and possible forms of trade. For example, in the traditional view of a pipeline, a producer at one end makes a long term contract, perhaps 10 or more years) with a buyer at the other. The contract may have long term fixed price, and will assure the pipeline operator their costs are covered in fixed form contracts. This appears to mean that the interests of all the parties are necessarily set for long periods, and thus, futures markets, which typically use monthly contracts rolling 18 months into the future are infeasible. But the above discussion has already noted how long term expectations may change in the short term, and thus induce the need for shorter period contracts or trading. As well, the futures markets serve rather different purposes than long term contracts, since the long term contract is to assure supply, while the futures contract is to manage price risk.

## **II. OTHER TRADING MECHANISMS**

Other differences from the traditional outlook are also implied. First, the pipeline operator may certainly prefer long term fixed transit fee contracts, and will seek them prior to a decision to build. But once a pipeline is operating, the operator has an incentive to assure the greatest total revenue from the pipeline. Because actual flows may differ from the initial long term contract intents, the pipeline operator has an interest in seeking ways to fill the pipe whether or not the long term volumes flow as predicted. Also, in shorter terms, some “valleys” in load may occur, thus presenting opportunities for additional shipments, if transacting parties wish to use the line. To the degree that futures markets allow parties to manage risk by trading contracts,

instead of canceling them, this helps assure revenues to the pipeline for shipment. To the degree that futures markets can create new forms of transactions that have increments in shipments, they allow additional revenue to the pipeline operator.

There are also more subtle considerations. In the traditional view of a pipeline, the line has a capacity of say, 100 units a month. The producer at one end sells 100 units to the buyer at the other, and the pipeline is “full”. But that is not the only way a pipeline can create transactions. Consider an extreme case. After the pipeline is built, a new buyer appears, near the producer. But the producer is already fully committed to the original seller, and there is only one pipeline. So, the new buyer finds instead an LNG shipper, who builds an LNG regassification terminal right next to the original buyer. The LNG seller then contracts to sell their natural gas to the *new* buyer, who is, of course, at the far and “wrong” end of the pipeline.

The pipeline company however can perfectly well undertake both transactions. It can contract to ship 100 units of regassified LNG in one direction, and 100 units of normally produced gas in the other, for a total shipment of 200 units, twice the nominal capacity of the pipeline. The pipeline does this of course, not by physically moving 200 units of molecules the full distance in both directions. Instead, the pipeline delivers locally the volumes received locally. No contracts are breached: natural gas is perfectly fungible, and all molecules are alike. Further, the “capacity” of this pipeline is not limited only to 200 units. Now that the middle of the pipeline is effectively “empty”, the pipeline can find new producers and consumers along the route, and let them trade with each other. The total delivery capacity of the pipeline is only limited by the numbers of producers and delivery points it can feasibly connect, while still maintaining adequate pressure along the entire line.

Once the notion that such more subtle trades can take place are understood, then parties will find many ways to exploit them. The presence of a futures market is not a necessary device for using those means, but it will encourage finding them. For example, at present the seasonal demand for natural gas can not be easily met due to the preferences of producers for flat rate production schedules, and the limits of pipelines to maximum flow rates. Once the market mechanism to trade a variety of contract forms exists, then it will quickly become in someone’s commercial interest to create and operate storage fields; especially, to create them at the down stream ends or at location of major intersections of lines. Storage as an engineering feature is largely an expense. Storage as an economic device can allow inter seasonal load leveling, as well as intra seasonal capacity to meet changes in short term demand. The presence of a futures market (and/or a parallel spot market) then provides an opportunity for a storage market operator, or a gas supply broker, to potentially profit from these variations, by constructing the storage field, and using it in connection with the more flexible market structure.

These kinds of logic should also induce operators of pipelines to seek to intertie them more generally, to be able to take advantage of the ability to create previously unreachable trades. The futures market induces this activity indirectly, by providing a means of knowing that a volume can always be traded, at least there, if necessary. Thus, at least some of the risk of new activity is minimized.

Finally, note that futures markets set prices by wholly non-political means. Thus also, the prices set by those markets can be taken as “index” prices for contracts that do not transact directly in the futures market. As some longer term contracting may not be executed for fixed prices, given the risks of such contracts, the presence of a futures market, by providing an independent means of determining price, can also facilitate at least some longer term contracts that might not otherwise have formed. It provides a form of pricing in the long term that may be more acceptable to many parties.