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**ENERGY TRADE:
THE HIGH ROAD TO ECONOMIC
GROWTH AND INTEGRATION IN
WEST AFRICA**

A diagnostic survey prepared by

USAID's Global Environment Center

Office of Energy, Environment, and Technology

for

USAID's West Africa Strategy Team based in Bamako, Mali

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List of Acronyms:

AfDB	African Development Bank
ECOWAS	Economic Community of West African States
GDP	Gross Domestic Product
G/ENV/EET	US AID Global Environment Center / Office of Energy, Environment and Technology
gWh	Gigawatt-hours
IBRD	International Bank for Reconstruction and Development
IIE	Institute of International Education
IPP	Independent Power Producers
kWh	kilowatt hours
MDB	Multilateral Development Bank
MW	Megawatts
NGO	Non-Governmental Organization
TEC	Traditional Energy Consumed
TotEC	Total Energy Consumption
USAID	United States Agency for International Development

I. EXECUTIVE SUMMARY

West Africa is at a crossroads to economic development. It can continue on the low road or, as is the theme of this paper, it can take the High Road to Economic Growth and Integration for West Africa: the road of regional energy trade in electricity and natural gas. Although the region is rich in natural resources, including energy, its people and economies have remained highly dependent on diffuse and dispersed biomass fuels. It is on the abundant indigenous hydrocarbon and hydroelectric options that West African economies must begin to rationally exploit, in order to build their economies. West African countries have, however, been unable to serve the needs of their economies for low-cost commercial energy because of policies and laws that have excluded private sector participation, promoted "self-sufficiency" in energy at very high costs to the National Treasury and the Economy and failed to envision intra-regional energy trade.

STATUS – No Fuel for Growth

West Africa, home to about 3.8 percent of the world's population, consumes less than 0.41 percent of the world's commercial energy¹. Economies can sustain themselves for a short period on traditional energy but in the long run modern economies must have commercial energy to grow and, in seven of the region's countries, the consumption of commercial energy has actually declined over the last 20 years. In 1995 traditional energy accounted for only 19 percent of low-income countries² total energy consumption, yet, in West Africa traditional energy accounts for a low of 55 percent of total energy consumed in Senegal to a high of 93 percent in Burkina Faso³. Not only does this increased reliance on diminishing traditional fuel resources mean lower growth or unsustainable growth; it translates directly into environmental degradation and carrying capacity of their homelands.

TREND – The Road Ahead

Despite this adverse energy use pattern, there are three encouraging trends in West Africa:

- 1) Virtually all of the region's utilities are moving toward reform and increasing private sector participation. These restructuring efforts are embracing the concepts of market liberalization and competition in the energy sector and should thereby increase private ownership and investment, while modernizing infrastructure and expanding consumer choices.
- 2) Some of those countries that have subsidized energy and electricity prices are taking steps to increase tariffs that better reflect the true cost of service.
- 3) There is already a growing trend in regional cooperation upon which to build. Many of the countries have a common currency, there is a move towards a common market and there are ongoing and expanding experiences in energy trade.

¹ Commercial energy includes petroleum, natural gas, coal, and electricity.

² Low-income countries have a GNP per capita below \$785 in 1997.

³ World Development Indicators, 1998, World Bank.

ENERGY SECTOR PROBLEMS – Images in the rear view mirror are not exactly as they seem

The fundamental energy problems facing the economy are **not** the obvious lack of physical infrastructure or foreign capital, or the low access to commercial energy and consequent dependence on traditional fuels. Essentially the underlying causes of these principal energy-economic problems can be attributed to: “inward looking” economies that (1) promulgated policies and laws that have excluded the private sector provision of energy; (2) promoted subsidized energy under national plans that became recipes for financial insolvency, and, (3) promoted “self-sufficiency” in energy at very high costs to the National Treasury and the Economy

OPPORTUNITIES - Put a Tiger in your Tank

Only through regional trade of energy can economies of scale and uneven distribution of energy resources be properly dealt with. Sustained economic growth and greater regional integration does lie within the hands of the governments of West Africa. The private sector must be encouraged to provide investment in generating new power and transporting energy freely throughout the region. Transparent energy trade policies and enabling regimes are essential in order for investment to occur. A coordinated effort to simultaneously reduce the hurdles to private business that vary from country to country will be the most cost-effective approach. Supranational authority to harmonize and regulate cross border energy flows is needed.

APPROACHES TO REALIZING THE PROMISE – Open the Pump Early

The findings presented in this paper suggest that development assistance should be directed to (a) build on a foundation of change, (b) reinforce and strengthen progressive national regulatory institutions and policies necessary to promote and facilitate greater regional energy integration, (c) create a professional network for continuous and open communication between governments and regulators and, (d) assist market actors in developing the requisite enabling policies and frameworks on a national and regional basis.

Training – Capacity to Stay on the Road

Eliminating those barriers to rational development requires the building of institutional capacity to sustain energy sector reform that allows increased private sector participation. The most successful approach would be to work with a regional entity such as the African Development Bank (AfDB) and its soon to be completed training center, the Joint Africa Institute. USAID training assistance could be provided through this Institute (with AfDB and other MDB support) so that training resources become institutionalized and perpetuated once USAID assistance is complete.

Transnational Gas Pipelines – Pipelines to Prosperity

The quickest way of bringing low cost energy to the region is to clear the legal, policy and administrative hurdles holding back the flow of abundant gas resources such as from Nigeria and

Cote d'Ivoire. This gas may be supplied below world prices for natural gas, thus providing a long term comparative advantage to the economies and future gas users in the region⁴.

West Africa Power Pool

An integral part of a regional energy strategy is support to development of a functioning power pool. A power pool allows electricity to be traded easily, quickly and cheaply across interconnected countries. The policy frameworks and regulatory protocols that govern gas trade are not unlike those that will be conducive to the unfettered flow of electricity.

The Nigeria Factor

Nigeria is the biggest unknown in the intermediate future for increased supply of commercial energy to the rest of West Africa. The draft feasibility study for the West Africa Gas Pipeline was completed in February 1999. If constructed, the pipeline to Benin, Togo and Ghana would transport some (only 10% initially) of the gas currently flared by concessions in the Gulf of Guinea. Other options to increase gas utilization on-shore, including an 1100 MW gas fueled thermal electric generating facility and the possible privatization of the gas distribution system in Nigeria, are also being studied. The hurdles are great, however, and near term prospects for increased power generation are still dim, especially for export to the high priced power markets in neighboring countries.

USAID'S COMPARATIVE ADVANTAGE

USAID has the ability to apply the valuable experiences gained in working in other developing countries and energy economies in transition to assist African nations in making the move to market-led economic structures. USAID can work effectively on regional initiatives while many donors are constrained to work primarily, bi-laterally. USAID brings extensive US experience and numerous state and regional models for encouraging and regulating interstate gas and electricity trade.

CONCLUSIONS – the tank is half full

The diagnostic team was told on more than one occasion, in no uncertain terms, 'if USAID does'nt do it no one else will'.. 'nor do others have the capability to share the diverse U.S. perspective'. The West Africans interviewed, without exception, are eager to improve their conditions and all understood the benefits of energy trade. Only by preparing the legal frameworks and the people to implement them will the gas and electricity that could be abundant and cheap begin to flow. If the West African nations do not create the conditions to capitalize, for example, on the wasted gas in Nigeria, the rich, energy hungry, countries elsewhere will soon

⁴ It has been reported that KMR Energy recently concluded an agreement to purchase WAGP gas at rates well below the world price or the delivered price of alternative fuels.

capture that gas for themselves. Today, USAID is in a unique position to assist in the establishment of intellectual and political infrastructure that has the potential to finally thrust West Africa from the stagnant economies dependent upon traditional energy to the 21st century.

II. INTRODUCTION

A. REGIONAL APPROACH

"The energy sector is near unique in its potential to forge closer economic ties among countries in the region."⁵

West Africa will awaken to the next century with some growing aches and anomalies from its past. Populations have grown significantly, in some cases more than doubling in the last 20 years and economies have recently, again, begun to struggle ahead. Yet, the majority of these countries have seen only small increases in the consumption of modern fuels⁶, while their dependence on wood fuel, crop residues and charcoal (termed traditional fuels) has soared. The astounding fact is that, as the millennium dawns, a greater percentage of West Africans may be without light or clean cooking fuel than their parents were twenty-five years ago!

Poverty alleviation, natural resource management, greater access to education and health, and expanded public participation in governance on a long term sustainable basis (USAID's traditional focus in West Africa) are important goals of any nation, although they have long eluded many of those in West Africa. This strategy builds on the international experience that shows these goals are directly related to economic growth and that for economies to grow they must exploit their comparative advantages, for which energy is often the most fundamental economic building block. West Africa is rich in natural resources, including energy, and it is on this base that West African economies must build. For example, world class reserves of iron ore and bauxite lie undeveloped in the region because the low cost energy needed to extract and/or refine these resources is not available. These economies need low-cost, commercial energy if they are to grow. **It is a simple fact that economic growth has not occurred anywhere without the use of low-cost, high-energy content resources (commercial energy).**

There have been two principal reasons in the past why West African countries have been unable to serve the needs of their economies for low-cost commercial energy.

- First, their policies and laws have: promoted public ownership and management and excluded the private sector provision of energy; promoted subsidized energy so that all could have access (effectively subsidized the elite) and became a recipe for financial insolvency so that fewer have access; and, promoted "self-sufficiency" in energy at very high costs to the National Treasury and the Economy.
- Second, and related to the first roadblock, is that they have not envisioned a role for expanded energy trade nor expanded the infrastructure necessary for that energy trade either because Governments could not mobilize the resources and/or state-owned utilities often relish their monopoly status and see expanded trade as a threat.

⁵ World Bank, Mark Tomlinson, Africa Division, 1999.

⁶ Electricity, petroleum, natural gas and coal.

In other areas of the world, the US Agency for International Development (USAID) has been actively involved in assisting countries to solve these problems. However, traditionally, in West Africa USAID has focused primarily on basic human needs, and agricultural and rural development issues. Given the pressing need for rapid socio-economic development, focusing exclusively on these themes will not provide the necessary catalyst and impetus to increase the economic activity that is a prerequisite for sustainable development. If USAID is to assist in "unleashing West Africa's economic potential" then it will require a re-orientation and transition toward mechanisms geared to the promotion and development of regional trade in commercial energy (oil, natural gas, and hydro) as well as electricity for agricultural, industrial, and residential usage.

High impact but surprisingly low cost development interventions are possible in energy. Tightly targeted technical assistance to develop policy, legal and regulatory frameworks can have huge impacts on longer-term economic development issues. This avoids the often lengthy, costly and management intensive process of designing and implementing new distribution channels and delivery mechanisms needed to reach the ultimate customers in other USAID sectors.

B. ANALYSIS INPUTS

"USAID's new interest in energy in Africa is a most welcome move. The French, Germans and World Bank have been involved, but, up to now, no contact with USAID on this issue. . . . Guinea needs help to attract more private sector investment. We are already getting advisory in put from the French, the Germans, Canada, IBRD, CIDA, KFW - why not USAID? I invite USAID to sit on the donors privatization committee. Guinea doesn't want to reinvent the wheel, but wants to draw on lessons learned elsewhere." Monsieur Facinet Fofana - Minister of Mines and Energy - Guinea

USAID has only recently initiated limited energy sector assistance to West Africa. Therefore, not having much past experience or contacts to build on, the approach for developing this component of the Regional Strategy was to assemble a knowledgeable team to conduct consultations with partners and other counterparts in the region. From February 22 through March 20, 1999, brief visits were made to key public and private energy officials and donor offices in: Bamako, Mali; Conakry, Guinea; Abidjan, Cote d'Ivoire; Lagos and Abuja, Nigeria; Accra, Ghana; and Dakar, Senegal⁷.

The information gathered from these visits served to corroborate and update information the team had gathered prior to traveling. The meetings also provided a tremendous opportunity to confirm the enormous value and benefit that could be gained from a small 'goal oriented' assistance effort directed at energy issues in West Africa: the goal being to increase the availability and reliability, while lowering costs, for energy supplies.

The team was gratified by the reception it received at all interviews. US Embassy counterparts commented several times about how open and eager our host country counterparts were to share information. There were frequent encouragements from

⁷ Minutes and contacts from these meetings are included with the trip report.

country officials for USAID to bring the diverse US energy regulatory and policy experience to bear on the problems they face. At the same time, IBRD and AfDB officers told us USAID definitely had a unique role to play in the current evolution of the sector. The general level of enthusiasm was so great that the team decided to extract some of the comments from these meetings into this report.

The theme of a “High Road to Economic Integration for West Africa” follows on the success accorded the overview of Ghana’s energy situation conducted last summer entitled, “An Energy Roadmap for Ghana”.

The drafters of this document made every effort to focus on the truly regional aspects of the West African energy situation. This means that often interesting and important aspects of the energy development situation in these countries, as pertains to internal regulation, efficiency, restructuring, renewables, etc. have been left aside. The following pages will briefly summarize the status and current trends of the sector, while looking forward to the urgent and pivotal role, a regional approach to energy will play in the future economic development of West Africa.

III. ENERGY SECTOR STATUS AND TRENDS

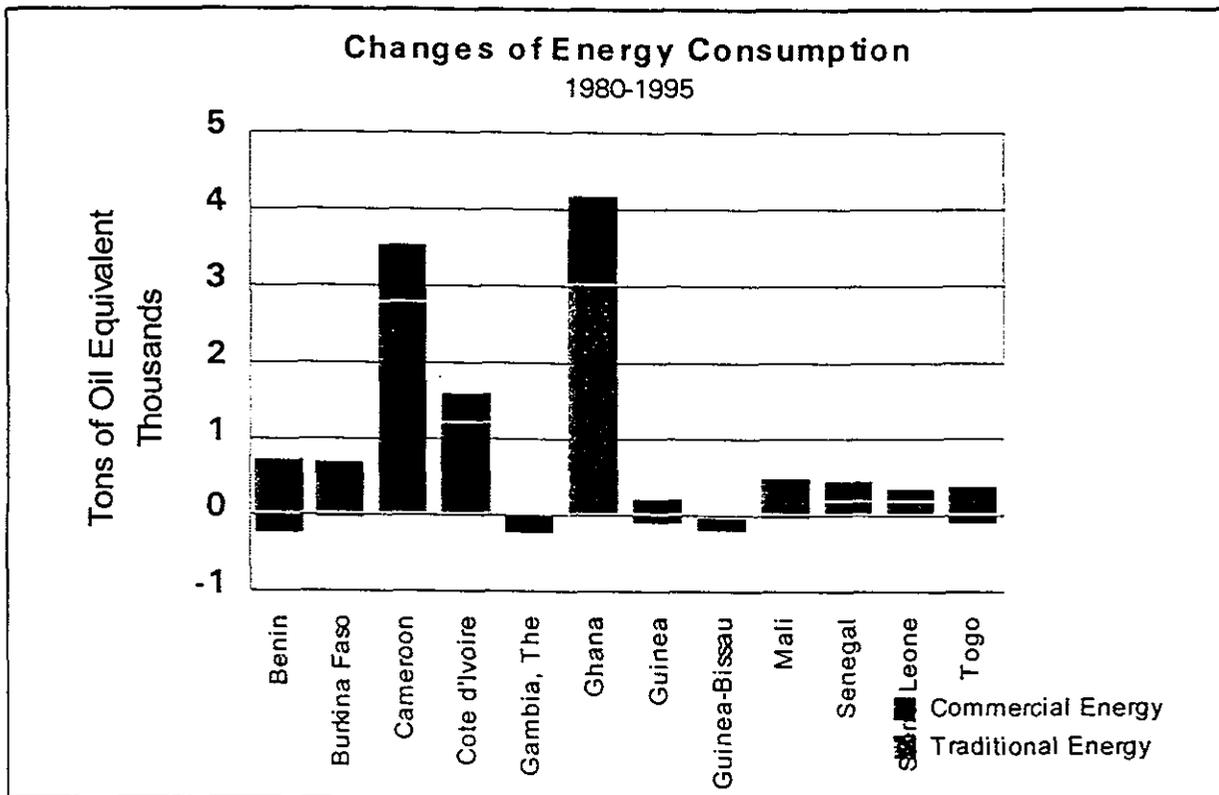
A. STATUS – No Fuel for Growth

"National Development is linked to energy development."

Monsieur Daouda Kane - Deputy Director General - Energy du Mali

West Africa is, by any measure, one of the poorest regions of the world and the countries' energy indicators bear witness to this fact. Four of the world's ten poorest countries are in the region. Regional per capita income averages US \$316 compared to US \$350 for all low-income countries and ranges from a low of US \$170 in Sierra Leone to a high of US \$620 in Cote d'Ivoire. It is no wonder then that per capita consumption of energy is also the lowest of any region in the world.

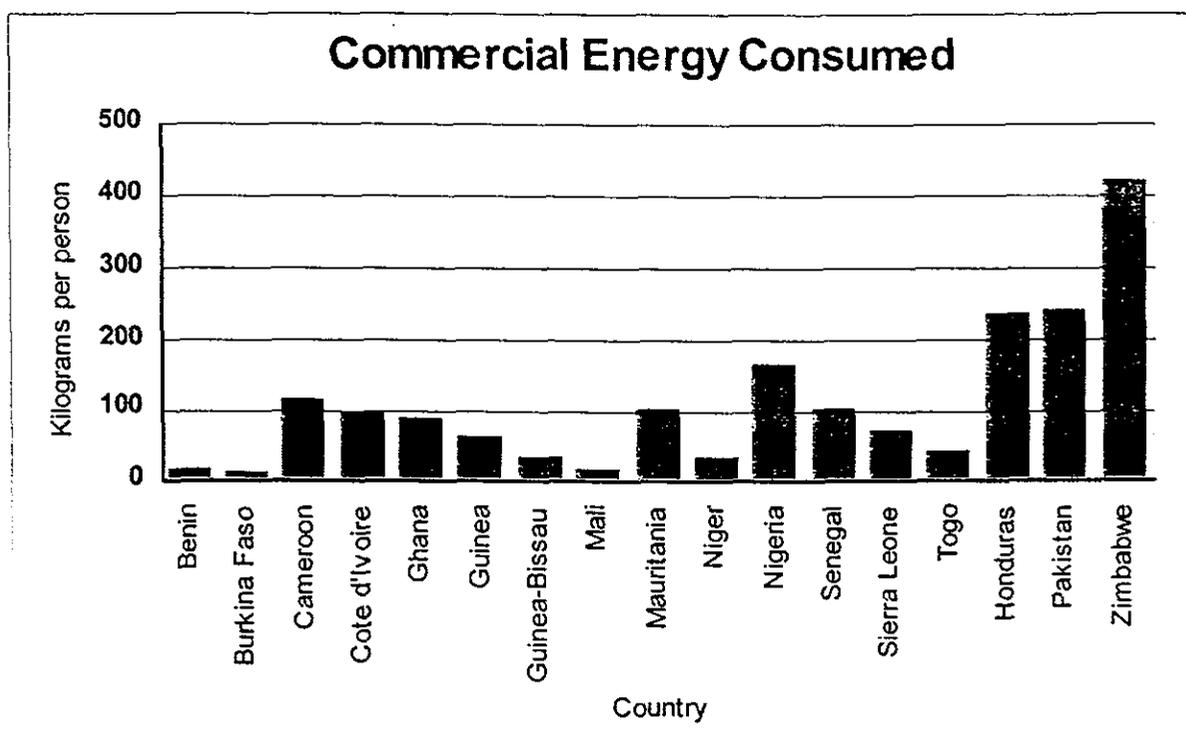
Economic growth and development in West Africa are a paradox: the region has significant natural resources, including energy, which could be tapped as the vehicle for growth. Contrasted against this rich indigenous resource base, the economic poverty and the paucity of energy in the marketplace belie a stark paradox. It is the very lack of energy in the economy that in fact has left these resources untapped or underutilized.



Economies can sustain themselves for a short period on traditional energy but in the long run modern economies must have commercial energy to grow. As can be seen in Figure 1, energy growth in most of the region's countries has come from traditional fuels – fuels that add significantly to the environmental degradation and increased morbidity and

mortality¹, but fuels which add little to sustainable economic growths. Commercial energy consumption actually declined in seven of the region's countries. From 1980 to 1995, consumption from all energy sources increased by 59 percent; commercial energy has grown by only 13.7 percent.

Commercial energy consumption per capita is a measure of how integrated modern energy is into the nation's economy. For example, in 1995 high-income countries consumed an average of 5,118 kilograms (kg) of commercial energy² per capita compared to 1,139 kg in middle income countries and 198 kg in low-income countries. In West African countries per capita consumption ranged from a low of 20 kg in Benin to a high of 165 kg in Nigeria³.



Per capita energy consumed is a measure of how much energy the economy uses but it does not really measure the access that the general populace has to this energy. The percent of households electrified is a good measure of the penetration of modern energy into the everyday lives of people. Access to electricity in the region is among the lowest

¹ Commercial fuels are not without their negative environmental impacts. However, the impact on bronchitis, lower respiratory infections in children and other disease from indoor air pollution associated with cooking, lighting and heating with traditional fuels is a much greater health hazard. Moreover, most traditional fuels are used in a nonsustainable manner, i.e., fuelwood is harvested at an unsustainable rate and biomass and/or dung needed as important soil constituents are not returned to the soil.

² Kilograms of energy on an oil equivalent basis is standardized unit for aggregating different kinds of energy.

³ It is important to note that apparent higher consumption levels in Nigeria are linked to large inefficiencies, losses and smuggling. While Mauritania's higher consumption is linked to the energy intensive phosphate extraction and processing industry.

in the world and traditional energy usage is the highest. In most of the region's countries, fewer than 13 % of households have access to electricity.

Reduced economic competitiveness

Said another way, West Africa is home to about 3.8 percent of the world's population, yet, they consume less than 0.41 percent of the world's commercial energy¹¹. The average commercial energy consumption in the region is one-third the per capita amount used in Africa as a whole. Effectively, denied access or reliable access to modern fuels for economic growth, three things happen:

1. **Industries do not develop or expand and in some cases leave;** For example, in Mali and Guinea there are significant mineral resources that go untapped because energy is unavailable or too expensive at this point in time.

"Textiles and agribusiness would expand if more power was available."

Monsieur Daouda Kane, Deputy Director General, Energie du Mali.

In Cote d'Ivoire, much of the agribusiness is operating near capacity and would expand if a reliable supply of low cost energy was available. It is anticipated that ceramic, plastics and fertilizer production would develop if gas were made available in sufficient quantities. On a positive note, the development of a gas distribution network proved a pivotal factor that convinced Cargill to invest in an agroprocessing plant. Demand for the gas has already doubled in the first year.

Export zones in Togo and Benin could become more attractive if energy were available, reliable and low cost.

Private Ghanaian industrial interests are presently blocked by lack of enabling frameworks from purchasing 600 GWH of electricity annually directly from Côte d'Ivoire making use of the Ghanaian power grid for transport.

In 1998 in Nigeria, a new aluminum smelter came on line using previously flared gas for fuel. The greatest hurdle it faced was the negotiation of a gas price with different government entities.

2. **Industries purchase their own generation at a much higher cost to themselves and the competitiveness of the local economy;** Throughout the team's trip the experiences of all large industry in all the countries visited demonstrated that they had purchased either backup power or completely generated all their own needs. Moreover, in all cases they would have preferred to purchase reliable power from the utility if they had the option. The ominous roar of diesel generators fills the air twenty-four hours a day in Nigeria. Industry in Nigeria is operating at around 27% of capacity, with a black market for fuel and generators.

¹¹ Commercial energy includes petroleum, natural gas, coal, and electricity.

In Ghana, perhaps the single country in the region where businesses until recently were assured of reasonably reliable power, the entire country experienced rotating blackouts for much of 1998. Most business that could afford it, purchased diesel generators – expensive substitutes for large power plants but a necessity if companies were to remain in business. Initially companies did not raise prices to avoid losing market share, but over the longer term this is not a strategy for profitability; and,

3. **The economy and people use fuelwood, charcoal, crop residue and other wastes for cooking, heating lighting and for many small industrial activities.** This is more dramatically seen in the region's energy statistics and in Figure 1. Since 1980 energy consumption has grown in all but one of the countries but in every case, except Nigeria, traditional energy consumption accounted for the bulk of the growth. Seven of the countries actually exhibited declines in commercial energy consumption

"Energy will have a multiplier effect on the rest of the country. We should be able to increase our growth rate considering the region's resource potential."

Monsieur Facinet Fofana , Minister of Mines and Energy, Guinea

Environmental Stress

In 1995 traditional energy accounted for only 19 percent of low-income countries¹² total energy consumption. Yet, in ECOWAS countries traditional energy accounts for a low of 55 percent of total energy consumed in Senegal to a high of 93 percent in Burkino Faso¹³. Not only does this increased reliance on diminishing traditional fuel resources mean lower growth or unsustainable growth, it translates directly into environmental degradation. The growth away from traditional fuels consumption is so important that the World Bank \$100 million energy sector adjustment loan to Senegal includes a component to reduce utilization of traditional fuels, as well as to sustainably manage the forests that produce fuel wood for charcoal.

Despite the apparent scarcity of energy available to the region's economies, the area as a whole is well endowed with energy resources. Table 1 presents the commercial energy balance (production minus consumption) for countries in the region. Note that most countries consume much more commercial energy than they produce. At the present time they must import energy to make up the difference. For example, Burkino Faso consumed the equivalent of 2.5 million barrels of oil in 1995, all of which was imported. Cameroon, on the other hand, produced more commercial energy than it consumed, leaving it with a surplus to export. The region as a whole has a net positive balance indicating that trade could be immediately expanded within the region as demand grows. The picture of production against consumption presents only a partial picture and to get the complete picture energy reserves must be analyzed. Proven reserves are the insitu resource which can be economically recovered under the current price scenario.

¹² Low income countries have a GNP per capita below \$785 in 1997.

¹³ World Development Indicators, 1998, World Bank.

Table 1
West Africa's Commercial Energy Balance
(millions of barrels of oil equivalent)

Country	PRODUCTION Barrels of oil equivalent	CONSUMPTION Barrels of oil equivalent	Net Balance Barrels of oil equivalent
BENIN	.703	1.23	-.53
BURKINO FASO	0	2.46	-2.46
CAMEROON	39.04	9.84	29.17
COTE d'IVOIRE	3.338	17.22	-13.89
GHANA	3.865	11.77	-7.91
GUINEA	0.176	12.81	-2.64
GUINEA BISSAU	0	0.53	-.53
MALI	0.18	1.23	-1.05
NIGER	0.878	2.64	-1.76
NIGERIA	712.27	81.69	630.5
SENEGAL	0	6.68	-6.68
SIERRA LEONE	0	0.88	-0.88
TOGO	0	1.58	-1.59
West Africa-Total	760.41	140.56	619.85

Source: World Resource Institute, 1997.

Table 2 presents proven reserves and technical hydro potential of the West African countries. Note that the region has much more energy resources than it consumes. In fact, one measure of the potential to supply itself is the ratio of reserves to annual consumption which gives a rule of thumb for the number of years of reserves left at the region's rate of consumption. Total energy consumption rate converted into natural gas equivalents. This fact is more dramatic when it is considered that Nigeria alone flares close 2 billion cubic feet of natural gas per day. Clearly, harnessing the region's commercial energy would provide an invaluable boost to the economies of energy strapped countries.

Some countries that should have sufficient energy resources, such as Nigeria, suffer from having underpriced their domestic energy to the point that they can no longer maintain or expand their energy supply and demand is much greater than it would be if energy was priced appropriately. Other countries have little energy of their own but because of inefficiencies, isolated markets and imported primary energy, energy prices are too high and too little energy is used in their economies. For example, Nigeria prices electricity at less than US\$ 0.02 per kWh while countries such as Burkino Faso and the Gambia face prices in excess of US\$ 0.19 per kWh and Guinea Bissau by prices of US \$ 0.31 per kWh. Consumers in Cote d'Ivoire pay an average of US \$0.083 per kWh. (See Table 3)

Table 2
West Africa's Energy Resources – 1993

Country	PETROLEUM Millions BOE	NATURAL GAS Billions of Cubic Meters	Hydro Potential MW
BENIN	27.48		27.48
BURKINO FASO			
CAMEROON	389.07	681.45	1070.52
COTE d'IVOIRE	50.995	141.6	192.595
GHANA	25	35.4	60.4
GUINEA			
GUINEA BISSAU			
MALI			
NIGER			
NIGERIA	12384.3	18531.9	30916.2
SENEGAL			
SIERRA LEONE			
TOGO			
Sub-Total	12876.84	19390.35	32267.19
ALL AFRICA	76544.16	54591.51	131135.7
W. Africa/Africa			

Source: World Resource Institute, 1997; US DOE, EIA, International Energy Review, 1998.

B. TREND – The Road Ahead

Energy statistics alone paint a downward energy-economic trend. As figure 2 indicates energy resources available to the region grew from 1980 through much of the 1990s, but most of this growth was from traditional energy, 93 percent. More importantly, per capita commercial energy consumption¹⁴ actually declined 27% and per capita current dollar GDP fell by 26 percent. Electricity consumption has also been declining. For example, in Cote d'Ivoire per capita consumption fell from 192 kWh per person in 1980 to 159 kWh in 1995, in Ghana from 426 kWh per person to 318 kWh, and in Senegal from 97 kWh per person to 91 kWh. This downward spiral is now being addressed in a few countries but energy consumption still has not recovered. While there are some formidable challenges to increasing commercial energy in the region's countries, the underlying causes are now being addressed by most countries with varying degrees of success.

Sector reform

"Many countries are now in the reform process but the enabling frameworks are not in place: this would make it easier to adopt regionally applicable frameworks."

Dr. John Sesay, Director, Department of Transport, Communications and Energy, ECOWAS

¹⁴ Nigeria and Mauritania are excluded because its per capita energy consumption and its significant decline in per capita GDP are outliers. Cape Verde is excluded because of the dominance of expatriated earnings to its economy.

Table 3
West Africa Power Sector Status

	Avg Elec Price USc/kWh	Mgmt Contract / Concession	Private Power IPPs	Privati- zation of Assets	Restruc- turing	Regulatory Body	Inter- connects
Benin	12.1	M (Dec 99)					X
Burkina Faso	19.0		Draft Bill in Parliament		Draft Bill in Parliament		In Progress
Cameroon	11.0			IMF Con- ditionality			
Cape Verde	16.0						
Cote d'Ivoire	8.3	C until 2005	X		Under Discussion	X (Electricity)	X
Gambia	19.2						Planned
Ghana	4.4		X			X (Electricity)	X
Guinea	18.0	C	X	By Dec 99	X	Study in Process	Planned
Guinea-Bissau	31.0						Planned
Liberia							Requested from CI
Mali	14.0	M	Opened to PP-Mar 98	Under Con- sideration		Under Con- sideration	Planned/ Delayed
Mauritania	16.0						In Process
Niger	10.0			IMF- backing			X
Nigeria	2.0		Awaiting Approval	Planned, but new govt			X
Senegal	14.0		X	X	X	In process	X
Sierra Leone							Planned
Togo	16.9						X

M = Management Contract; C=Concession

First, virtually all of the regions' utilities are moving toward policy reform and increasing private sector participation. Reform policy must embrace the concept of market liberalization and competition with the energy sector, in order to promote energy efficiency, promote private ownership, increase investment, modernize infrastructure, provide for sustainable development, and expand consumer choices. Government's role should be limited to that of regulatory oversight. For example, Senegal, Ghana and Cote d'Ivoire have introduced private generation. Senegal has recently announced plans to completely privatize the sector. Guinea, Mali and Cote d'Ivoire have private firms that manage utilities and Ghana is moving toward a privately held, unbundled utility. In Guinea, US \$80 million of future World Bank lending for all sectors is partially contingent on restructuring of the energy sector. The exceptions are Benin and Nigeria (which may begin in June 1999), while Liberia and Sierra Leone are not in a position to manage,

let alone, reform the sector. Burkino Faso has taken steps to allow independent private power producers. Table 3 presents the status of the electricity industry in West African countries.

Tariff Adjustments

Second, tariffs are being rationalized in spite of political obstacles. Those countries that have subsidized energy and electricity are taking steps to increase tariffs to reflect the true cost of service. In some countries this is in response to the obvious problem that the private sector provision of electricity requires market based prices. In other cases, tariff reform is a conditionality imposed by donors who see this as a first step on the road to market liberalization. Lastly, there are those utilities that simply can't function anymore in the face of low prices and shrinking government assistance. Although there is progress, this is a slow and difficult process. Ghana increased tariffs by 100% in September 1998. Mali has had several small increases during the last five years that targeted industrial (6-7% increase) and large residential consumers (12% increase), but realizes that significant additional tariff increases across all sectors are needed.

Regional Cooperation

"The future lies in a regional market. . . We must work regionally. Côte d'Ivoire wants to get into a power pool to spread the needed investment, plus diversify for reliability. Cote d'Ivoire wants to be a leader "by doing" in encouraging development of a regional power pool. . .In addition to providing power to Ghana, Togo and Benin, we are about to complete construction of an interconnect with Burkina Faso, we are investigating an interconnect with Mali and we need a second line to Ghana. . . Wheeling will be a key concept leading to a wholesale market." (Wheeling is payment of a tariff for the use of a third party's transmission system to deliver power generated by one party to another)

Monsieur Patrick Achi, Special Advisor to the Minister of Energy, Cote d'Ivoire

Third, there is already a growing trend in regional cooperation upon which to build.

- Many of the countries have a common currency and there is a move towards a common market. There is now an ECOWAS telecommunications compact with a common tariff band and there are regional compacts on customs tariffs and duties, vehicle insurance and immigration.
- Cote d'Ivoire, Ghana, Togo and Benin have been trading electricity on a bilateral basis, strengthening the desire of other countries to "connect to the grid." In fact, the regional trade in electricity has provided Ghana with a cushion in this most recent drought. Ghana, traditionally an exporter to Benin. Cote d'Ivoire and Togo, was able to increase its imports from Cote d'Ivoire to partially offset the loss in output from Akosombo dam.
- Transmission links planned and under construction between Nigeria and Benin, Cote d'Ivoire and Burkino Faso and Mali and Senegal and Mauritania can help to further reduce the vulnerability and costs if the proper enabling frameworks are in place. Other transmission links being studied include Guinea to Mali and Côte d'Ivoire, and Senegal to The Gambia and Guinea-Bissau.
- The Manantali Dam project demonstrates an encouraging regional approach, bringing together three countries and 15 donors. Mali, Senegal and Mauritania each own 1/3 of the

project, but each have different priorities and interests (navigation, irrigation, drinking water and electricity). Mali's greatest need is electricity, so 52% of the electricity produced will flow to Mali, 33% to Senegal, and 15% to Mauritania.

"There could be real synergy by having a regional energy market."

Mr. Paul Caldwell, Chairman/Managing Director, Mobil Producing Nigeria Ultd.

Overall, therefore, the conditions in West Africa are positive. Although the road to reform may be slow in some countries, the subject is clearly on everyone's mind and advances are being made. New generation and transmission investments are more likely to attract private capital once the policy environment permits it and once the regulatory environment sets out deliberate, transparent rules. Distribution, on the other hand, will require more than new laws to attract much private investment. Increasing tariffs and collections will eventually improve financial conditions and increase prospects for investment in new access, where governments do not determine to subsidize electrification directly.

USAID can play a unique catalytic role in keeping these positive trends moving while leveraging the other donors and private sector to make the major investments. If the policy environment is right, private capital will seek the economic rent available in generation, transmission and cross-border trading.

C. ENERGY SECTOR PROBLEMS

The energy problems facing the economy are not the lack of physical infrastructure or foreign capital, low access to energy and dependence on traditional fuels or even lack of indigenous energy resources. These challenges are symptoms of deeper rooted problems. Essentially the underlying causes of these principal energy-economic problems can be attributed to:

"inward looking" economies that promulgated policies and laws that have:

1. promoted public ownership and management and excluded the private sector provision of energy;
2. promoted subsidized energy so that all could have access (effectively subsidized the elite) and became a recipe for financial insolvency so that fewer have access; and,
3. promoted "self-sufficiency" in energy at very high costs to the National Treasury and the Economy

With the growing realization of vicious effects of these policies some countries have begun to make progress in introducing independent power, private management and private ownership of electricity infrastructure. Many of the region's countries have made the policy decisions to reduce state ownership and control of industry but lack the necessary enabling frameworks and the institutional capacity to deal appropriately with the private sector, or they still have high levels of inflation, high external debts, and low saving rates associated with the past economic policies and practices. However, the countries are still living with the decisions made in the past. For example, Guinea made the decision to hire a private sector firm to manage the utility but because of low tariffs the firm is running losses and is unable to buy fuel. At the time of the

team's visit, the utility had enough fuel for only a few more days and could not find a supplier because of past credit problems.

Missing Legal and Regulatory Frameworks:

When the state runs most areas of commerce, there are often no clear written "rules of the game". Each entity operates with relative impunity in its sphere of influence and rules of the game are only written when one or more government entities have overlapping areas of interest. Private investors, on the other hand, have a definite need for written codified rules of engagement. They need to know about such things as market entry and exit conditions, competition from government entities, the size and scope of their markets, and regulation of price and/or competition. "Foreign investors need reassurance that critical matters such as rate increases will be dealt with in an impartial and professional manner rather than being placed in the hands of the relevant government minister."¹⁵

Results of the team's visits indicate that all countries in the region lack well-developed legal or regulatory frameworks. In fact, only a few countries in West Africa (Ghana, Senegal, and Cote d'Ivoire) have begun to create regulatory entities varying degrees of needed autonomy. "Moreover, these [Sub-Saharan] governments have weak regulatory capacity, reflecting a limited tradition of adhering to the rule of law, a scarcity of skilled resources and, in many cases, widespread corruption."¹⁶ This has often resulted in taxation and permitting practices that are costly, opaque, cumbersome and subject to ad-hoc adjustments.

Political instability and risk:

Investments in infrastructure are immobile and, in the Africa context, very large relative to their economies and can require long time frames to amortize. Their prices and rates of return are politically sensitive. So political stability and interference are important considerations in investment and operations. War, civil unrest, transfer risk, and expropriation are still important concerns in the region, albeit of declining importance in some countries.

While development of energy and the subsequent economic development can be threatened by political instability, it is also clear that energy availability strengthens political stability and the economy. This past summer, civil and political unrest in Nigeria may have been sparked by the frustration over chronic fuel shortages and the prospect of long-term imports of petroleum products because the national refineries were on the verge of total collapse. Suspected sabotage of oil field systems was one aspect of the unrest, especially in politically sensitive provinces. The government was forced to impose fuel rationing, despite being a major crude oil exporter to both Europe and the US.

The manifestations of the outlined above problems are:

- Inefficiency in generation, transmission and distribution, and consumption. The inefficiencies associated with public ownership and unregulated utilities are well

¹⁵ Brian Samuel, Chief Corporate Financial Development, International Finance Corporation, Zimbabwe.

¹⁶ Privatizing Africa's Infrastructure, World Bank, 1998.

documented. Although technical losses are high in the West Africa region they are not nearly as high as non-technical losses¹⁷. For example, the private company managing the Guinean National Utility, SOGEL, estimates nontechnical losses may be as high as 33 percent¹⁸ compared to less than 3 percent in a well run, privatized utility. Moreover, political control of tariffs has resulted in subsidized prices in some countries and lack of resolve to curtail service to customers not paying in other countries. This is, in turn, impacts all areas of system operations.

- Lack of capital to maintain, rehabilitate or expand the system that is exacerbated by inadequate pricing, poor bill collection and mismanagement. This leads to poor credit because of weak financial performance and often large external public debt.
- Low electrification rates. Fewer than one in eight households in the region have electricity.
- Small Markets. "One of the main constraints on private investment in power infrastructure in Sub-Saharan Africa is the small size of Africa's power markets.¹⁹" This is particularly true in West Africa where the small customer base prevents potential investors from recovering returns commensurate with the perceived risks and/or mitigates against larger scale, more efficient investments.
- Isolated systems are prone to risk. Many of the region's utilities have been disproportionately dependent upon hydroelectricity and run the risk from cyclical and seasonal variations in rainfall. This is not to mention fuel supply problems as witnessed recently in Guinea, Nigeria and Sierra Leone.
- High cost to the economy. The cost of production is high (costly indigenous energy, high transportation costs and/or inefficiencies) or the cost to the economy of unserved energy demand is high. In other developing country contexts, for example, the Asian subcontinent, it has been estimated that each kWh of undelivered electricity can cost the economy as much as \$1 in lost production opportunities.

Countries are now beginning to address these problems through a number of initiatives such as the World Bank sponsored restructuring studies in Cote d'Ivoire, Senegal, Mali and the USAID funded tariff reform work in Ghana. But if the region is to realize the potential from its low cost energy resources, then every effort must be made to address those issues which reduce the potential for trade in energy.

D. THE NIGERIA FACTOR

Nigeria covers only 14% of the territory of the West African region, but with a population of 144 million is home to 58% of the region's people. In addition to abundant human resources, Nigeria also boasts having the majority of proven hydrocarbon reserves in the region. It is the only net exporter of oil in the region besides Cameroon and is currently exporting about 2.1 million barrels per day (mb/d). Its proven oil and gas reserves are estimated at 45.1 billion barrels of oil equivalent. Gas associated with oil exploitation is currently being flared at the rate of 2 billion cubic feet per day or about 25% of the volume flared world wide! This amount of natural gas that is burned and released into the atmosphere is more than double the amount flared in Saudi Arabia. If converted to electricity, this would produce enough to supply the actual power demand

¹⁷ Nontechnical losses refer to losses from unbilled customers, theft and mismanagement.

¹⁸ Based on a conversation with the Deputy Manager of SOGEL.

¹⁹ ESKOM (1995)

for most of the African continent. Penalties imposed, by the Nigerian Government, for flaring the associated gas have been increasing and all the major oil companies do either some re-injection of the gas, compression of the gas for export, or sale of gas into the Nigerian Gas Company pipelines.

Besides its petroleum potential, Nigeria currently has more installed electrical capacity (6000 MW) than the rest of the region combined. Of this, 2400 MW are of hydro-electric origin and significant additional hydroelectric capacity could be developed.

Nigeria is the biggest intermediate term unknown in the supply of commercial energy to the rest of West Africa. The feasibility study for the West Africa Gas Pipeline (WAGP) was just completed in February 1999 and is being finalized this month (March 1999) after a meeting with the WAGP committee at Akosombo Dam in Ghana during the first week of March. If constructed, some of the gas currently flared by Chevron and Shell in the Escravos concessions in the Gulf of Guinea would be transported by the pipeline to Benin, Togo and Ghana. (Note: Cote d'Ivoire and its international gas companies have just decided they would support construction of a pipeline to connect with the WAGP at Takoradi in Ghana, making for a continuous pipeline from Escravos, Nigeria to Vridi in Cote d' Ivoire.)

Depending on its size and demand for off-take, the WAGP would only harness a small amount of the gas currently vented and burned into the atmosphere. Consequently, other options to increase gas utilization on-shore are being studied. There is talk of privatizing and expanding the gas distribution system in Nigeria. More importantly, Mobil is in negotiations with the Nigerian National Petroleum Company (NNPC) to build and operate a 100 MW gas fueled generating plant.

The hurdles associated with greater use of gas to generate electricity for Nigeria and for the region are momentarily large. The country is only producing about 2400 MW of its 6000 MW of installed capacity because lack of maintenance has downgraded and shut many facilities. Virtually every commercial or industrial facility has full back up generation capability, and the resulting struggle is to buy fuel since most petroleum products must be imported after the refineries were cannibalized in the early/mid 90's due to lack of funds for maintenance.

With regard to potential export of electricity, the current problem is that Nigeria can only supply a fraction of its existing demand. Even Mobil recognizes that the minimal \$0.02/kWh that it would get for capacity charge might not be met in the current political environment where the price to customers is less than that and the government cannot collect bills since it rarely supplies power for more than 10 to 12 hours a day to the best customers and neighborhoods.

Therefore, the near term prospects of greatly increased generation from the abundant and almost free gas are still dim, especially for export to the high priced power markets in neighboring countries. Simply put, no one would invest under these circumstances, and if prices and the economy do grow enough to justify investment, then any foreseeable increments in power would be consumed locally. The political sensibilities about exporting power while the existing internal demand is unmet might prevent cross-border sales in spite of the interconnect with Benin now under construction. Electricity, unlike the vast quantities of petroleum products that are

smuggled across borders because of large price differentials, cannot leak so discreetly to neighboring countries.

IV. ENERGY SECTOR DEVELOPMENT ACTIVITIES

A. SELECTED PAST AND ONGOING DONOR EFFORTS

The international donor community traditionally financed very costly energy infrastructure. Today, however, constructing just one power plant sized to achieve minimum economies of scale can cost \$500 million. Indeed, maintaining, refurbishing and expanding the energy sector of Sub-Saharan Africa alone is estimated to require \$10 billion per year²⁰. Clearly, this is beyond the means of developing country governments and donors: only the private sector can fill this gap. Thus, some of the donor community has introduced emphasis on addressing address the issues perceived to block the private sector from making the urgently required massive investment.

Success has often been elusive thus far:

- Symptoms have often been addressed without remedying the underlying root causes and problems.
- Key problems are regional in nature but multi-lateral donors are usually restricted to lending (and providing limited grants for technical assistance) to individual governments, while bilateral donors continue to provide technical and financial assistance of a country-specific nature.
- Countries accept multi-lateral development loans to build infrastructure. Loans to finance technical assistance are often both politically unpalatable and produce no resultant "mortar and bricks
- World Bank loan funds are not be usually used for the training needed to improve Institutional capacity.

Donors are paying more attention to addressing fundamental problems on a country-specific basis, but regional energy issues are rarely addressed. However, some of the present donor assistance will certainly help prepare individual countries to participate in regional solutions.

The representative sampling below of donor energy activities in West Africa demonstrates a wide range of priorities.

Africa Development Bank (AfDB). While continuing to increase multi-national lending, the AfDB is considering or already supporting a wide range of energy activities in West Africa, including:

- Regional projects with cross border impacts such as the Manantali Dam co-owned by Mali, Senegal, and Mauritania, studies to identify hydro sites for the multi-country Gambia River Development Authority (OMVG), a hydro project to serve Togo and Benin and several cross-border transmission lines.
- Rural Electrification/Poverty reduction projects (Gambia and Benin)
- Alternative Energy and Energy Efficiency through a new regional center in Bamako, a project in Senegal to use peat for cooking, and supporting efforts to make regional

²⁰ World Bank

development banks equal partners in the Global Environmental Facility (GEF) with UNDP, UNEP and World Bank.

- Privatization and restructuring in Senegal in cooperating with the World Bank (a rare case of the AfDB participating in a sector adjustment program), financing for an Independent Power Producer in Cote d'Ivoire, and cooperation with the World Bank and IMF to establish a Joint Africa Institute in Abidjan to focus on macro-economic issues that could be expanded to include energy and the environment.

World Bank

The World Bank is strongly encouraging the necessary steps to open energy sectors to the energy infrastructure that now only the private sector can provide. For example, in Guinea, where the World Bank Resident Representative sits on a donor privatization advisory board, the Bank has made \$80 million in future lending to Guinea *in all sectors* partially contingent on restructuring several sectors, including energy. The Bank is also encouraging institutional capacity building through a training program that includes Francophone Africa level seminars, and proposed Joint Africa Institute co-sponsored with AfDB and IMF.

The World Bank is actively supporting West Africa energy sector restructuring and privatization by funding advisory services and studies in a number of countries, including Mali, Guinea, Côte d'Ivoire and Senegal. The IFC has recently provided financing for an independent power producer in Côte d'Ivoire, which was complemented by an International Development Association (IDA) partial risk guarantee of a syndicated commercial bank loan.

Bilateral Donors

USAID has had minimal involvement in the energy sector in West Africa for the past ten years, limited primarily to training courses under Global Bureaus Energy Training Program (ETP). For example, in Ghana alone over 300 people have participated in courses from one week to four months duration in aspects of energy management, energy planning, efficiency, etc.

The **French Development Agency** (AFD, Agence Française de Développement) continues to be very active in West Africa. The AFD has provided financial support and/or subsidized loans for the Manantali Dam Project (Mali, Senegal, Mauritania), development of the off-shore FOXTROT gas deposit in Côte d'Ivoire, for the development of preparatory work for an independent power producer in Ghana, privatization advisory services in Guinea, and refurbishment of a generating unit in Togo. In addition, AFD has helped several countries respond to crisis energy supply situations by supporting the emergency acquisitions of diesel generators (Mali, Togo, Benin). In Mauritania, AFD is supporting a rural electrification program.

Others. Canada, Germany and several other donor countries also have activities in the region, ranging from support for privatization advisory services, improving transmission and distribution systems, alternative energy, etc. The EEU's program have focussed on roads, conflict resolution, and strengthening regional integration outside the energy sector.

Regional Organizations with energy components include:

- **UEMOWA** (Economic and Monetary Union of West Africa), whose West African Community Energy program includes eight energy working groups, each chaired by a different country, to provide a forum for addressing issues of regional concern and interest. Working group focus subjects range from renewable energy (Mali chair) to Interconnects (Côte d'Ivoire chair). The working groups have only recently been created and are just now starting to function.
- **ECOWAS** (Economic Community of West African States), a relatively new regional organization of sixteen member countries, is generally regarded as capable and well-qualified, with a positive and credible reputation. ECOWAS, based in Abuja, is active in regional energy issues including:
 - Although the West Africa Gas Pipeline project is an initiative featuring only four ECOWAS countries, ECOWAS maintains a keen interest in this project as a potential prototype for future energy integration.
 - The West Africa Power Pool, based on a regional energy master plan developed under ECOWAS auspices and funded by the donors according to the ECOWAS energy experts meeting paper, a study titled "Development of Hydropower and Interconnection of Electric Power Grids of ECOWAS Member States" was funded by UNDP and Economic Commission on Africa (RAF/88/047). A number of West African countries that are taking steps toward sector privatization have not yet developed many of the enabling legal, regulatory, and technical frameworks. Consequently, ECOWAS advocates developing regionally applicable transparent frameworks that harmonize the methodologies underlying these frameworks. Of significant regional value is the supra-national role of ECOWAS: once seven of the sixteen member states ratify a decision made by the Ministerial-level Energy Steering Committee (e.g., adopting an enabling framework for power sector privatization), the decision is binding upon all the other member States.

B. GAPS IN DONOR ASSISTANCE

Clearly, the missing element in the transition to a viable energy sector in West Africa is the regional overlay to provide the regulatory and legal frameworks and improved regional institutional capacities required to nurture cross-border power trading on a transparent and harmonized basis.

V. REGIONAL PROGRAM POTENTIAL

"USAID assistance in a regional role would be very welcome."

Monsieur Alioune Fall, Director of Energy and Coordinator for the Preparation of Energy Sector Reforms, Ministry of Energy, Mines and Industry, Senegal

A. OPPORTUNITIES

Resources are there –

The road to a better life, more sustained economic growth and greater regional integration lies within the hands of the governments of West Africa. The energy resources exist in great abundance and the costs of transforming and transporting that energy can be significantly lower than existing costs, provided that the "right" frameworks are in place. West Africa has the clear potential to find its way on a brighter and firmer road to progress in the next millennium.

The private sector will invest –

The private sector must be encouraged to provide investment in generating new power and transporting energy freely throughout the region. When free to operate in an environment that protects their investments and offers a rate of return on their investment consonant with the risk, the private sector will usually take up an activity. The smuggling of highly subsidized petroleum products from Nigeria to surrounding countries dramatizes the entrepreneurial drive. With power selling above US \$ 0.15 per kWh in many of the region's countries, the opportunity for highly profitable arbitrage exists and, the private sector would enter to provide such services under the right conditions – conditions that benefit all parties, all economies. For example, it is probably cheaper for Burkino Faso to import most, if not all, of its electricity²¹ from Cote d'Ivoire and Ghana (if such were available) than to produce it from imported diesel fuel. The cost of power in Burkino Faso is US\$ 0.192 per kWh and Cote d'Ivoire has stated it is willing to sell power at US\$ 0.05 per kWh. The gain to the economy of Burkino Faso would be US\$ 0.142 per kWh or about \$47 million per year, assuming that demand does not rise as a result of lower prices.

"The Azito private power project is the first time a commercial bank has been involved in an infrastructure project in Sub-Saharan Africa in a long time."

Monsieur Patrick Achi, Special Advisor to the Minister of Energy, Cote d'Ivoire.

Regulatory frameworks will evolve –

Opportunities for assistance have been viewed in light of the regional needs and ability and intent of all donors to address the important issues. It is clear that in many countries policy, legal and regulatory frameworks are being addressed, albeit to extreme ranges in the region. Donors are coming forward to address needs for transmission infrastructure and restructuring. In the future the region must rely on the private sector for financing capital improvements and this will only be forthcoming if the necessary frameworks are in place. Even if the "right" policy conditions prevail, many of these markets are simply too small to attract low cost energy.

²¹ This does not obviate the need to maintain some diesel capacity for peak or backup power.

Regional Energy Trade is essential -

Even if countries individually are beginning to make the correct choices to address the problems listed above, there are still major constraints facing greater regional energy trade and consumption such as: the need to have enabling frameworks in place to promote and facilitate regional trade in electricity and natural gas; institutions, and their staff, attempting to attract and negotiate large pipeline infrastructure projects desperately need skills in many areas: and, technical standards for voltage, gas pressure, communication, and tariffs need to be harmonized.

Regional Legal and Restructuring -

A transparent and enabling regime to encourage open cross border trade in energy is essential. But in order for investment to occur there will be a need to have a simultaneous effort to reduce the hurdles to private business that vary from country to country. Corruption, rule of law, crime problems and taxation need to be further addressed to reduce the high transaction costs and the tendency of investors to concentrate on lower risk short-term gains.

Additionally, because restructuring and privatization are so new, there is an excellent opportunity to begin to develop uniform standards across the region to form a common, transparent language of trade. Utilities have worked on standard operating procedures but with the introduction of Independent Power Producers, they must now develop grid codes or the technical parameters that define connection to the grid and govern how it takes place. The Volta River Authority has for sometime dispatched the load in neighboring Togo and Benin. However, now communications protocols and rules of dispatch will need to be developed so that private investors feel comfortable. In most countries, there are no clear guidelines for electricity price determination. Each country will begin to develop these on their own. Thus, a unique window of opportunity exists now, through a regional effort, to establish common methodologies, standards and approaches. The desirability of this type of regional approach was echoed by many of the people the team interviewed.

B. AFRICAN OWNERSHIP OF REGIONAL ENERGY INTEGRATION

In every interview with key African officials and decision makers, the team found that regional energy trading was already a hot topic. Typical comments included:

"The future lies in a regional market We must work regionally."

Monsieur Patrick Achi, Special Advisor to the Minister of Energy, Cote d'Ivoire

Interconnection and buying and selling energy is the fastest method to develop the countries of the region."

Monsieur Moussa Sene, Chief of the Department of General Economic Studies and International Development, Société Nationale d'Electricité (SENELEC), Senegal

"We must have a regional vision, while striving to make Mali attractive in an open economic market."

Monsieur Adama N'Douvegué, Secretary General, Ministry of Mines and Energy, Mali

"Eventually, we foresee interchanges between Mali, Guinea, which has hydro, and Cote d'Ivoire, which has gas."

Monsieur Abdoulaye Barry, Director, National Energy Management,
Ministry of Mines, Energy and Environment, Guinea.

C. APPROACHES TO REALIZING THE PROMISE

The findings presented in this paper suggest that development assistance should flow to (a) build on a foundation of change, (b) reinforce and strengthen progressive institutions & policies necessary to promote and facilitate greater regional energy integration, (c) create a network for continuous and open communication between governments and regulators and, (d) assist market actors in developing the requisite enabling policies and frameworks.

Training – Capacity to stay on the road

Assisting the region to overcome the problems in order to achieve the goals outlined throughout this strategy requires well-trained and motivated people working within functional and supportive institutional structures, nationally and regionally. But well-trained people are only part of the required institutional change. The traditional highly centralized and hierarchical institutional structure found throughout the region does not lend itself to the kinds of efficiencies required for moving to a modern regional economy. Eliminating those barriers to rational development requires the building of institutional capacity to sustain energy sector reform that allows increased private sector participation. USAID's vast experience with capacity-building programs in developing countries has shown that the best training and technical assistance will simply be wasted if the institutional structure is not supportive and cannot take advantage of the often expensive foreign training.

Therefore, changes in institutions and attitudes will also be needed to solve energy/environmental problems for the long-term. New technologies alone will not solve these problems. The changing nature of the world's interconnected economies and environment calls for a cadre of personnel trained beyond narrow traditional skills, operating within viable, functional institutional settings. Institutional reform, however, is not separate from training.

The most successful approach would be to work with a regional entity such as the AfDB and its soon to be completed training center, the Joint Africa Institute. USAID training assistance could be provided through this Institute so that training resources become institutionalized and perpetuated once USAID assistance is complete. Training will be needed in order to understand and perform restructuring, but more importantly then to manage and regulate the new cross-border energy trading.

In addition to training, both formally and on-the-job, technical assistance is required to achieve all of these objectives. This can be accomplished by working to support the two current regional energy trade initiatives presented below and in conjunction with regional organizations such as the AfDB and ECOWAS. An advantage of coopting ECOWAS is that if any seven ECOWAS countries ratify agreements such as tariff guidelines or right-of-way conditions, then it become

applicable to all ECOWAS countries. The technical assistance provided to reach agreement on these, and other important frameworks, can be leveraged into ECOWAS agreements that then make it much easier and cheaper for other transnational pipelines to develop and for trade in electricity to expand to other countries, carrying low-cost gas fired electricity from Ghana, Cote d'Ivoire and Nigeria inland to countries in need of lower cost electricity.

Transnational Gas Pipelines – Pipelines to Prosperity

The quickest way of bringing low cost energy to the region is to clear the legal, policy and administrative hurdles for the abundant gas resources such as from Nigeria, Cote d'Ivoire and, potentially, Guinea. For example, the West Africa Gas Pipeline will bring natural gas that is now flared off the coast of Nigeria to a productive use in Benin, Togo, Ghana and, perhaps, Cote d'Ivoire. It is anticipated that this activity will be supported by USAID assistance. This gas may be supplied below world prices for natural gas, thus providing users a comparative advantage in energy²². While there may be private financing available, the major constraints lie with the individual country governments through which the pipeline will pass and which will take the gas.

A pipeline will provide a competitive source of energy for direct conversion to process steam or thermal energy and a boon to new industrial development in the participating countries. It will also provide an inexpensive source of new thermal generation, thereby increasing the electricity supply and reducing supply risk and the pressure on Ghana's Akosombo dam.

To take full advantage of the opportunities provided by this new source energy and agreements between governments, USAID assistance should be focused at facilitating dialogue, helping governments to understand complex commercial contracts and develop uniform protocols. There are numerous issues that must be decided, some on a country-by-country basis and others on a uniform basis. Missing commercial framework concerns include: access provision, competition, commercial boundaries, customs duties and tariffs, transport tariffs, allocation of risk among parties, and environmental compliance requirements.

The next area of assistance would be to strengthen the ability of this energy to flow among connected countries by facilitating the West Africa Power Pool (WAPP) and its constituent utilities²³.

West Africa Power Pool

An integral part of a regional energy strategy is support to development of a functioning power pool. A power pool allows electricity to be traded easily, quickly and cheaply across interconnected countries. Depending upon the individual country industry structure, a utility or industrial user in Mali could contract for purchase of power on a long term basis with an IPP in Ghana, for example. The West Africa Power Pool is only a dream at this point in time. There is, however, a kernel or the Cote d'Ivoire-Ghana-Togo-Benin interconnect. Rather than beginning

²² It has been reported that one IPP recently concluded an agreement to purchase WAGP gas at rates well below the world price or the delivered price of alternative fuels.

²³ Assistance might actually be given to a subset of utilities in WAPP – those that are currently interconnected or that soon will be interconnected

anew, USAID should consider working to institutionalize and codify the trade already taking place on. Standardization here will make it easier in the future when true markets in power develop, reduce the costs for other countries soon joining the grid – Nigeria, Niger and Mali, and Burkino Faso. Moreover, if these other countries are included in the initial agreements, then the ECOWAS seven country requirement is met for general acceptance of protocols.

Environmental Implications

Taking gas that is now flared and using it to produce electricity or energy in Ghana, Togo or Benin will result in an environmental bonus – oil will be displaced and a waste product will now be put to use. If this energy is further used to displace diesels in countries such as Burkino Faso or Mali, another benefit is derived. Finally, if events in Nigeria result in the rehabilitation or modernization of their existing-electricity generating facilities, dirty diesels will be replaced by cleaner natural gas. For example, if the Takoradi plant in Ghana converts to Nigerian gas from light crude oil the gas now flared will be put to productive use and crude oil not burned. Annually, there will be a reduction in SO₂ of 17,193 tons, 5,560 tons of Nox, and 1.4 million tons of CO₂ for each 300 MW of light crude oil replaced with natural gas²⁴. For every 30 MW of diesel displaced by gas, there will be an annual reduction in SO₂ of 960 tons, 2,266 tons of Nox, and 205,400 tons of CO₂. While there is no way to accurately predict just how much flared gas will be used to displace existing fuels or forestall the use of other fuels, it is safe to say that once this gas has been tapped and the infrastructure is in place to evacuate it, most if not all will find its way into productive use: uses which would have otherwise been fueled by some other fossil fuel or by traditional fuels. This is both an economic and environmental bonus to the region and because of global climate change concerns to the world at large.

D. USAID'S COMPARATIVE ADVANTAGE

"Many issues must be resolved in cross-border energy trading. USAID could help with experience from the United States. "

Monsieur Gilbert Yougoubaré, Director General,
PetroCI Exploration and Production, Government of Côte d'Ivoire.

The major obstacles facing the region are all in areas where USAID and US industry have a comparative advantage over other bilateral donors and multilateral development banks. While MDBs and other bilateral donors can and do address the physical infrastructure, they do little to address the major policy, regulatory and institutional building barriers.

USAID has the ability to apply the valuable experiences gained in working in other developing countries and energy economies in transition to assist African nations in making the move to market-led economic structures. Specifically, in the energy sector, USAID can call upon its reference and resources base to develop programs of technical assistance to overcome and remove barriers and constraints currently existing in the region. In this respect, USAID already has well-designed and tested mechanisms for assistance in:

- Analysis of energy sector reform options; (e.g. Pakistan, Central America, Eastern Europe)

²⁴ This assumes 70% capacity utilization.

- Provision of resident technical advisors to strengthen institutional and human capacity; (e.g. Indonesia, India, Brasil)
- Elaborating and drafting coherent and consistent policy and legal frameworks for private power development; (e.g. Philippines, Egypt, Central America)
- Supporting financial and investment reforms for attracting private capital; (e.g. India, Philippines, Eastern Europe.)
- Establishing training and utility and regulatory partnerships for exchange of information, best practices, and operational techniques; (e.g. New Independent States, Philippines, Indonesia)
- Cooperation in clean energy technologies and transfer of energy efficiency techniques; (India, Brasil, Mexico.)
- Facilitating regional integration of energy and electricity markets; (Central America, Southern Africa, Eastern Europe.) and
- Brokering commercial interactions between the US and foreign private sector firms.

USAID brings expertise and institutional memory to address these issues. USAID's experience has shown that successful exploitation and development of a country's energy resources requires joint private-public sector approach with the private sector tackling commercial issues while the donor community works with national governments to remove institutional, legal, policy and fiscal barriers. (Eastern Europe, Central America, Philippines, India)

USAID has experience from Asia, South America, Eastern Europe, and the New Independent States (NIS) in virtually every facet of energy sector promotion. The Agency has even been active in Africa, in Egypt, and Morocco. More recently, the Global Bureau has begun to help Southern and West Africa address important issues in expanding regional energy trade, through a collaborative program with the **Southern African Development Community's (SADC) Energy Sector** and in Ghana with assistance in formulating a strategy and conducting a tariff study.

USAID is well placed to fill the critical regional niche: in addition to the diverse experience of the US in addressing such issues in varying ways through its 50 state regulatory bodies and several power pools. USAID has flexibility in applying grant funds to provide well-targetted technical assistance and training on a regional basis outside of bilateral agreements.