“Smart Development” Initiative

QUARTERLY PERFORMANCE REPORT
April – June 2009

Prepared for:
Energy Division—Energy Sector Governance Program
Office of Infrastructure & Engineering
Bureau for Economic Growth, Agriculture and Trade
U.S. Agency for International Development

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During this reporting period, CEE-UT and its partners in West Africa organized or participated in several activities. All impacts are based on USAID strategic objectives upon which SDI was built; these objectives and how SDI meets them are discussed further later in this report in the Objectives section.

As reported before, SDI ideas and initiatives are taking root and local partners are taking ownership. Key developments of this period follow.

- KITE in Ghana, our SDI partner, held its first working session for the Members of the Parliament on Tuesday, April 28 with CEE-UT participation. This workshop was part of the Oil and Gas Sector Research and Advocacy Project (OGSRAP) based on KITE’s Ghana Research and Advocacy Programme (G-RAP) award.
- KITE and CEE-UT are working on a proposal to extend the scope of the OGSRAP.
- CEE-UT and its local partners reported on SDI at the 2nd annual conference of the Nigerian Association for Energy Economics.
- A partnership with GIMPA, a highly respected university providing business education in Ghana, is under development for an Oil & Gas MBA program in Ghana.

**IMPACT**

There were two special activities during this reporting period with significant outreach impacts.

- CEE-UT’s SDI partner KITE held its first working session for the MPs on Tuesday, April 28 under OGSRAP (see Attachment 1 for the agenda). Dr. Gülen participated as a resource person (see Attachment 2 for his presentation). The session was very well received by the MPs, GRAP sponsors, and participants from USAID Ghana Mission and US Embassy; and it is seen as a good foundation to build on for addressing following issues:
  - Managing expectations in Ghana regarding the oil & gas industry revenues and their impact on the country’s economy.
  - Ensuring and improving sector governance and transparency, including the implementation of programs such as EITI.
  - Identifying human resource needs in the country to develop Ghana’s oil & gas industry efficiently.
- KITE and CEE-UT are now working on capturing these challenges and offering programs to address them in a proposal. We are seeking the support of the key entities in Ghana, starting with the Ministry of Energy.
- On a parallel track, CEE-UT is in talks with the Ghana Institute of Management and Public Administration, or GIMPA, to initiate short training programs as well as an MBA degree on the oil & gas business. GIMPA is highly respected for its regular MBA program but their current faculty lacks oil & gas industry experience. The proposed partnership will build this capacity. This effort may eventually become part of the KITE-CEE proposal mentioned above and may expand beyond GIMPA to other universities.
• At the 2nd annual conference of the NAEE, we had a special session on Energy Security, Investment, & Critical Institutions, which highlighted our SDI work in West Africa. The session was chaired by Dr. Gülen, who presented on investment considerations in West Africa regarding WAGP and WAPP. Prof. Adeola Adenikinju of University of Ibadan presented some of the findings from the West Africa Energy Security Report he helped to produce for the SDI project. Finally, Mr. Ishmael Edjekumhene of KITE presented on the roles of various institutions in energy security and investment (see Attachment 3 for presentations). The presentations were followed by a lively Q&A session with an audience of about 70 attendees. The conference was sponsored by Shell Petroleum Development Company, Chevron, Energy Commission of Nigeria, NAPIMS, Federal Ministry of Power, and Power Holding Company of Nigeria among others.

OUTPUT

There were two activities during this quarter.

• April 24, 2009. CEE-UT organized a special session, Energy Security, Investment, & Critical Institutions, at the 2nd Annual NAEE conference in Abuja to showcase the SDI effort and some of its lessons learned.

• April 28, 2009. CEE-UT presented on upstream oil & gas fundamentals at the first working session of KITE’s OGSRAP program.

We postponed the leadership activity in Abuja until we have the support of the U.S. Embassy in Abuja along with high level officials from various entities in Nigeria. Based on our continuous interactions with colleagues in the region and our experience so far, we believe that only an event with such high level participation will have a positive impact on energy sector policy development and implementation.

General

CEE-UT houses a page for the initiative within its web site to publicly disseminate developments: http://www.beg.utexas.edu/energyecon/IDA/Smart_Development/. Website statistics in the past quarter are provided in Performance Indicators section below.

OBJECTIVES

USAID Strategic Objective and Intermediate Results

The strategic objective of the Energy Division is to improve the quality of life, increase economic growth, and promote sustainable communities by increasing access to environmentally sound energy and improving environmental management. And the intermediate result is increased production and use of environmentally sustainable energy. Areas of special interest include:

• Improving policy, legal, and regulatory frameworks to establish necessary conditions of energy service delivery;
• Increasing institutional ability to provide or deliver energy management services; and
• Increasing public understanding of, and participation in, decisions regarding delivery of energy services.
**CEE-UT Smart Development Initiative**

The CEE-UT *Smart Development* Initiative fits well with the USAID objectives. We believe that enhanced public education on the basic principles inherent in the energy value chains and associated economics and technologies can contribute greatly to improved energy sector performance worldwide. We have been working with various stakeholders in West Africa (primarily Ghana, Nigeria, Benin and Togo), including energy companies (state-owned and private), regulators, ministries, universities, NGOs and journalists both to improve general understanding of energy industry economics and technology and to assist with specific problem solving and project evaluation.

Under the previous Energy Sector Governance grant, we worked with energy sector stakeholders in Ghana and established the Resource Center for Energy Economics and Regulation (RCEER) housed within the Institute of Statistical, Social and Economic Research (ISSER) at the University of Ghana – Legon. CEE-UT worked with RCEER to improve its capability to address public education and participation, as well as transparency needs for effective energy sector governance while also contributing to development industry analysis and regulations.

Shortly after its launch, the RCEER was hired by the Ministry of Energy to study the effects of deregulating petroleum product prices on the consumers. The RCEER followed a very successful model of combining its academic resources with outside experts and delivered the study in two months. The Ministry has used it and also shared it, as we understand, with the IMF among others. The Ministry organized a workshop on petroleum deregulation where RCEER presented material developed together with CEE-UT. Although not scheduled activities under our grant, this study and the workshop helped the RCEER gain visibility and respect within the Ghanaian energy community as well as the public. Ghana is one of the few countries where petroleum product price deregulation has been implemented successfully, helping the country limit the costs associated with current escalation in crude oil and product prices.

As part of the grant, the RCEER wrote a report on natural gas with two parts, a primer on fundamentals and a detailed guide to natural gas in Ghana; published a *Guide to Electric Power in Ghana*; held educational outreach activities associated with both of these products; developed university and professional course syllabi; initiated a database for the Ghanaian energy sector; and developed a sustainability plan. Much of what has been produced by the RCEER achieves goals established in our proposal for development of a “tool kit” that could launch and encourage the “smart development” process in Ghana.

The current cooperative agreement allowed us to provide additional technical assistance to RCEER and other partners in the region. The key topic of interest for the West Africa Mission has been the establishment of a natural gas market in Ghana, Benin, Togo and Nigeria associated with the West Africa Gas Pipeline. The pipeline’s completion was originally scheduled for December 2006 but has been postponed until late 2007 and again until the first quarter of 2008. At this point, only free flow gas is available due to an accidental rapture offshore Benin, delays in production in Nigeria, inappropriate quality of gas and delays in construction of the compression station.

During the second half of 2005, the USAID Mission in Ghana used the TIPCEE project to develop a legal and regulatory framework for creating a natural gas market in Ghana. Dr. Asante, coordinator of RCEER, participated in the TIPCEE team. In the spring of 2006, the West Africa region started experiencing serious electricity shortages; the low level of water at Volta Dam in Ghana has been a main culprit. The completion of the WAGP and delivery of gas gained further importance and urgency to provide opportunity to bring in gas-fired power generation to supply the grid. However, officials had been slow to finalize frameworks for maximizing the benefits of gas once it arrives. Accordingly, our focus for
FY06-FY07 was on natural gas and gas-power linkages. In 2007, we started working more directly and extensively with an RCEER Advisory Board member and an NGO, Kumasi Institute for Technology and Environment (KITE) as the regional programs needed more detailed logistical support and new content on communication with different audiences, community relations and public participation, and energy and environment interactions.

In FY08, natural gas and gas-power linkages across the region remain central to our activities that are designed to build critical support for energy infrastructure investment and regulatory oversight. In particular, we have been working with elected officials, professional staff assisting them, key news media, and leaders and long-term professional staff of the regional bodies (such as ECOWAS, WAPP, and others). We have seen some results in increased awareness among members of the parliament and some journalists as indicated by news coverage identifying real problems for the first time and increased inquiries we and our colleagues in Ghana have been receiving for more information and for more programs from elected officials, potential investors and professional staffs at various agencies. The discovery of oil in Ghana within the last six months and the realization of the potential for similar discoveries of gas are also helping to increase demand for our programs as Ghanaians are trying to develop professional capacity at their ministries, regulators and national oil company, GNPC. A particular emerging concern is ensuring the transparency of oil revenue management along the lines of EITI.

**Project Specific Activities**

Overall, there are five tasks in our cooperative agreement.

1. Continue work in Ghana with RCEER
2. Replicate the Ghana model elsewhere in Africa
3. Extend the Smart Development Initiative to Latin America
4. Conceptual and applied work to further define “Smart Development” variables and metrics
5. Capacity building for USAID

Tasks are not meant for simultaneous and continuous effort; guidance from USAID and Missions determine our focus. Accordingly, our work plan for FY06-FY07 focused primarily on Task 1, but had significant overlaps across other Tasks, in particular Tasks 2 and 4. We continued with a similar focus in FY08.

Since late 2005, the regional considerations gained further support as mentioned before. In 2006, we focused on getting stakeholders in Ghana ready for natural gas and increased interactions with Nigeria. In 2007, we included delegates from Benin and Togo in our activities, which led to more interaction among sector professionals across the region to discuss issues associated with the WAGP. We also attracted participants from Côte D’Ivoire as the gas needs of the country raised their interest in the WAGP and associated developments in the region. In 2008, we continued with the same regional focus, expanding our target audiences to elected officials, their professional staff, key media and regional organizations.

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**PERFORMANCE INDICATORS**

**Selected Performance Indicators**

Following recommendations of the Mid-Term Evaluation Smart Development Initiative report, CEE-UT tracks, wherever possible, results/impacts of program activities. A more comprehensive methodology/approach will be developed for the future reports. For this
quarterly report, CEE-UT is using a standard set of program-level indicators, issued by USAID. These are eighteen which are currently used under the Economic Growth/Infrastructure/ Modern Energy Services portfolio, as follows.
<table>
<thead>
<tr>
<th>Indicator</th>
<th>Current Quarter</th>
<th>September 06 to Date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Capacity constructed or rehabilitated as a result of USG assistance</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>CEE partner activities continue to focus on the importance of electric power restructuring and related issues and approaches in the WA region as key elements of WAGP primary/secondary market development and WAPP implementation.</td>
</tr>
<tr>
<td>2. Energy saved as a result of USG assistance</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>CEE partner, KITE, is in very early stages of human resource needs assessment in Ghana’s oil &amp; gas industry. The current focus is on the Parliament and the members of the Mines &amp; Energy Committee.</td>
</tr>
<tr>
<td>3. Legal separation of generation, transmission and distribution functions in the electricity sector established this year with USG assistance</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>CEE presented on oil &amp; gas industry fundamentals in KITE’s workshop for MPs.</td>
</tr>
<tr>
<td>4. Number of energy agencies, regulatory bodies, utilities and civil society organizations undertaking capacity assessments as a result of USG assistance</td>
<td>2</td>
<td>160</td>
<td></td>
</tr>
<tr>
<td>5. Number of energy agencies, regulatory bodies, utilities and civil society organizations undertaking capacity strengthening as a result of USG assistance</td>
<td>2</td>
<td>160</td>
<td>CEE presented on oil &amp; gas industry fundamentals in KITE’s workshop for MPs.</td>
</tr>
<tr>
<td>6. Number of energy companies prepared and offered for privatization as a result of USG assistance</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>7. Number of energy enterprises with improved business operations as a result of USG assistance</td>
<td>0</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>8. Number of people receiving USG supported training in energy related business management systems (total/men/women)</td>
<td>122</td>
<td>647/527/120</td>
<td></td>
</tr>
<tr>
<td>9. Number of people receiving USG supported training in energy related policy and regulatory practices (total/men/women)</td>
<td>122</td>
<td>647/527/120</td>
<td></td>
</tr>
<tr>
<td>Indicator</td>
<td>Current Quarter</td>
<td>September 06 to Date</td>
<td>Comments</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
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<td>----------------------</td>
<td>----------</td>
</tr>
<tr>
<td>10. Number of people receiving USG supported training in technical energy fields (total/men/women)</td>
<td>122 (see note 2)</td>
<td>647/527/120 (see note 2)</td>
<td></td>
</tr>
<tr>
<td>11. Number of people with increased access to modern energy services as a result of USG assistance</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>12. Number of policy reforms/regulations/administrative procedures analyzed to enhance sector governance and/or facilitate private sector participation and competitive markets as a result of USG assistance</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>13. Number of policy reforms/regulations/administrative procedures drafted and presented for public/stakeholder consultation to enhance sector governance and/or facilitate private sector participation and competitive markets as a result of USG assistance</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>14. Number of policy reforms/ regulations/ administrative procedures for which implementation has begun to enhance sector governance and/or facilitate private sector participation and competitive markets as a result of USG assistance</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>15. Number of policy reforms/ regulations/ administrative procedures passed/approved to enhance sector governance and/or facilitate private sector participation and competitive markets as a result of USG assistance</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>16. Number of utilities with improved billing and collection systems and practices as a result of USG assistance</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>17. Quantity of greenhouse gas emissions, measured in metric tons CO2 equivalent, reduced or sequestered as a result of USG</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>Indicator</td>
<td>Current Quarter</td>
<td>September 06 to Date</td>
<td>Comments</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
<td>-----------------</td>
<td>----------------------</td>
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</tr>
<tr>
<td>assistance in energy, industry, urban, and/or transport sectors.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Total public and private dollars leveraged by USG for energy infrastructure projects</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1. This includes all agencies that have participated in CEE-UT training and public outreach events (in Ghana, Nigeria and the U.S.) held under the Smart Development Initiative from September 2006 through June 2008.
2. Number of people trained in programs may include duplicate attendees; we estimate these at 10-15% of the total number. If the same person attended two completely separate events, it is counted as “2”. Training events on business management systems, policy and regulatory practices, and technical energy fields may overlap.
**SDI Performance Indicators – Current Quarter and September 06 to Date**

In addition to the standard USAID indicators, CEE-UT is working to develop specific indicators which will allow tracking some concrete results from SDI activities. Below are some indicators we have selected, in line with the recommendations provided in the Mid-Term Evaluation of the Smart Development Program report. Some of the indicators are not applicable for the ongoing activities; others will require additional time to collect the information. CEE-UT will continue to enhance these indicators to produce some valuable measurement of the performance. Targets for the next quarter will be developed when FY08 workplan is finalized.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Current Quarter</th>
<th>September 06 To Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>plan</td>
<td>actual</td>
</tr>
<tr>
<td><strong>TRAINING EVENTS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program Info</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Number of training programs held</td>
<td>#</td>
<td>0</td>
</tr>
<tr>
<td>2. Type of training programs to be held (meeting, workshop, degree program, seminar, conference, study tour)</td>
<td>1 conference, 1 workshop</td>
<td>Workshops, public outreach events, US study tours</td>
</tr>
<tr>
<td>Unit</td>
<td>Current Quarter</td>
<td>September 06 To Date</td>
</tr>
<tr>
<td>------</td>
<td>----------------</td>
<td>-------------------</td>
</tr>
<tr>
<td></td>
<td>plan</td>
<td>actual</td>
</tr>
</tbody>
</table>

**Participants**

1. Number of participants.  
   - NA  
   - ~70 in NAEE session; 52 in KITE workshop  
   - 330  
   - 484 (registered)

2. Affiliation (categories of organizations: ministry, utility, regulator, private)  
   - %  
   - n/a  
   - Academic institution ~16%  
   - n/a  
   - Academic institution 10%  
   - Association 0%  
   - Association 2%
<table>
<thead>
<tr>
<th>Unit</th>
<th>Current Quarter</th>
<th>September 06 To Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>plan</td>
<td>actual</td>
</tr>
<tr>
<td>company, national company, academia, media)</td>
<td>Bank 0%</td>
<td>Bank 3%</td>
</tr>
<tr>
<td></td>
<td>Development/ AID Agency ~5%</td>
<td>Development/ AID Agency 1%</td>
</tr>
<tr>
<td></td>
<td>Embassy/ Foreign Service ~2%</td>
<td>Embassy/ Foreign Service 2%</td>
</tr>
<tr>
<td></td>
<td>Media ~17%</td>
<td>Media 21%</td>
</tr>
<tr>
<td></td>
<td>Ministry 10%</td>
<td>Ministry 5%</td>
</tr>
<tr>
<td></td>
<td>National company 10%</td>
<td>National company 14%</td>
</tr>
<tr>
<td></td>
<td>NGO ~2%</td>
<td>NGO 3%</td>
</tr>
<tr>
<td></td>
<td>Parliament/Other Government ~25%</td>
<td>Parliament/Other Government 6%</td>
</tr>
<tr>
<td></td>
<td>Private company ~10%</td>
<td>Private company 18%</td>
</tr>
<tr>
<td></td>
<td>Regulator ~5%</td>
<td>Regulator 13%</td>
</tr>
<tr>
<td></td>
<td>Utility 0%</td>
<td>Utility 2%</td>
</tr>
</tbody>
</table>

3. Gender distribution (male/female) | n/a | n/a 80/20 |

4. Position level (senior, mid-level, junior) | % | n/a  
~50% senior  
~30% mid-level  
~20% junior  
~75% senior/mid-level  
~25% junior |

5. Media coverage | Newspaper articles in Ghana, Nigeria, Togo and Benin. | Numerous articles in Ghana, Nigeria, Togo and possibly in Benin |

**PUBLICATIONS**

6. Number of public education or outreach materials developed | 1 - Guide to Natural Gas in Ghana | 1 - Guide to Natural Gas in Ghana  
2 – Stakeholder Communiqué, July 2007  
3- West Africa Energy Security Report |

7. Number of copies of public education or outreach materials distributed | 500 copies in circulation; 1+ articles in media | 500 copies in circulation; 10+ articles in media  
Stakeholder Communiqué published |
<table>
<thead>
<tr>
<th>8. Number of research papers produced/published</th>
<th>plan</th>
<th>actual</th>
<th>plan</th>
<th>actual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>Joint paper in The Oil &amp; Gas Journal, August 27 issue “Net WAGP economic benefit requires Ghana development” by J. Essandoh-Yeddu (Ghana's Energy Commission), Dr. F. Asante (ISSER, Univ. of Ghana) and CEE's Dr. G. Gülen</td>
</tr>
</tbody>
</table>

**RCEER Sustainability Development**

9. **Business plan established and approved**

We developed a sustainability plan for RCEER in 2005; the plan was approved by the RCEER Advisory Board but not implemented. Throughout 2006, the Advisory Board developed some alternatives but has not reached a consensus to implement them. As a result, in late 2006 we developed a new plan, which called for hiring of permanent staff and selecting a permanent home for RCEER with some initial USAID funding. Following on decisions made during Fall 2007, we are working to relocate the RCEER program from its initial base at University of Ghana-Legon to KITE where visibility and impact can be increased. KITE is developing a business plan to support this re-organization; with its recent award from G-RAP, KITE is now better poised to house RCEER activities.

10. **% of funding for RCEER activities provided by internal and external sources**

<table>
<thead>
<tr>
<th>%</th>
<th>n/a</th>
<th>n/a</th>
<th>100% USAID</th>
<th>Approximately - 58% USAID, 42% Other *</th>
</tr>
</thead>
</table>

* These are based on documented cost sharing by CEE/BEG, NNPC and other institutions that helped with programs in West Africa and Texas. Significant contributions from organizations in West Africa that sent speakers and delegates to workshops in West Africa have not been documented yet.
## Internet Statistics

<table>
<thead>
<tr>
<th>USAID Smart Development Initiative Pages</th>
<th>Nov-Dec 2005</th>
<th>Jan-Dec 2006</th>
<th>Jan-Dec 2007</th>
<th>Jan-Dec 2008</th>
<th>Jan-09</th>
<th>Feb-09</th>
<th>Mar-09</th>
<th>Apr-09</th>
<th>May-09</th>
<th>Jun-09</th>
<th>Grant Total (Nov-05 to Jun-09)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet Hits - Selected Pages</td>
<td></td>
<td></td>
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<tr>
<td>Guide to Electric Power in Ghana</td>
<td>144</td>
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<td>2,799</td>
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<tr>
<td>Guide to Natural Gas in Ghana</td>
<td>n/a</td>
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<td>15</td>
<td>5</td>
<td>18</td>
<td>18</td>
<td>7</td>
<td>10</td>
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<tr>
<td>Energy Economics Syllabus</td>
<td>35</td>
<td>163</td>
<td>92</td>
<td>86</td>
<td>8</td>
<td>4</td>
<td>15</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>419</td>
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<tr>
<td>USAID - CEE Smart Development Initiative - One pager</td>
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<td>57</td>
<td>225</td>
<td>300</td>
<td>9</td>
<td>2</td>
<td>24</td>
<td>11</td>
<td>7</td>
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<td>RCEER Article 041105</td>
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<td>5</td>
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<td>125</td>
<td>98</td>
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<td>Minister Speech 071305</td>
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List of Attachments

1- Agenda for KITE workshop on Tuesday, April 28.
2- Presentation by Dr. Gülen (April 28).
3- Presentations at the NAEE Conference Special Session by CEE-UT (April 24).
**ATTACHMENT 1**

**OIL & GAS SECTOR RESEARCH & ADVOCACY PROJECT (OGSRAP)**  
1ST WORKING SESSION

Date: Tuesday, 28th April, 2009  
Venue: La Palm Beach Hotel

<table>
<thead>
<tr>
<th>TIME</th>
<th>TOPICS</th>
<th>INSTRUCTORS / PRESENTERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1030 – 1040</td>
<td><strong>Program Overview</strong></td>
<td></td>
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</tbody>
</table>
| 1040 – 1110| **TOPIC I: Understanding the Oil and Gas Sector**  
✓ The Oil and Gas Value Chain | **Harriette Amissah-Arthur, Director, KITE**  
**Dr. Gürcan Gülen, Centre for Energy Economics, University of Texas**  
**Mr. Thomas Manu, Director, GNPC** |
| 1110 – 1140| ☐ Overview of Ghana’s Oil and Gas Sector  
➢ Oil and Gas Potential and estimated revenue  
➢ Licensing regimes and processes | **Dr. Apiagyei Gyamfi, Director of Petroleum** |
| 1140 – 1210| ☐ Policy, Legislative and Regulatory Frameworks | **Hon. Dr. Kwame Ampofo** |
| 1210 – 1300| ☐ Facilitated discussion - Assessment of the Policy Formulation Process in Ghana | **KITE**  
**Dr. Gürcan Gülen, Centre for Energy Economics, University of Texas**  
**George Amoako-Adjei, WAPCo** |
| 1300 – 1400| **Lunch Break**                             |                                                              |
| 1400 – 1530| **TOPIC II: Oil and Gas Sector Governance**  
✓ Principles of Good Governance  
✓ Industry Structure and Commercial Frameworks | **Ishmael Edjekumhene, Snr. Projects Mgr, KITE**  
**Dr. Gürcan Gülen, Centre for Energy Economics, University of Texas**  
**George Amoako-Adjei, WAPCo** |
| 1530 – 1550| **Tea/Coffee/Cocoa Break**                  |                                                              |
| 1550 – 1700| **TOPIC III: Oil and Gas Policy Formulation Process**  
✓ Key Policy Considerations  
✓ Facilitated discussion  
✓ Wrap Up and Next Steps | **Dr. Gürcan Gülen, Centre for Energy Economics, University of Texas**  
**Dan Amoah, Director, NPA**  
**Ishmael Edjekumhene, Snr. Projects Mgr, KITE** |
ATTACHMENT 2

Presentation by Dr. Gülen at the KITE working session
April 28, 2009
Oil & Gas Value Chain Optimization

Natural Gas Value Chain ($/MCM)

Oil & Gas Exploration and Production

- Cost of discovering new reserves
- Cost of developing & producing proven reserves.
- Cost involved in marketing oil and gas
- Sharing of value added between the producing company and government
  - Production Sharing Agreements (PSA)
  - Old type concession (with royalty and tax)
  - Service contracts
**Refining**

- If a refinery has the right structure to produce the products required by the market, there may be value added.
  - Historically refinery investment has been marginally profitable at best. More often it has not been profitable.
  - In recent years, sophisticated refinery investments have been profitable; but economic slowdown hurt.

---

**Marketing**

- For the governments in most of the countries oil marketing companies “act” as tax collectors.
- When marketing companies are owned by government or prices are administered, this part of the value chain can result in loss making as happened recently.
- This is where there is maximum scope for tax avoidance and also diversion of subsidized products.

---

**Which Part of the VC Yields Maximum Value to Government?**

- For an oil producing country it is likely to be from upstream: Nigeria, Mexico.
- For an oil importing country it is likely to be downstream: Kenya, Tanzania, Peru.
- For political reasons, value added may be shifted from upstream to downstream.
- For some transit countries pipelines could add considerable value: Georgia, Cameroon, Pakistan, Bangladesh, Afghanistan.

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**Case Studies - 2007**

<table>
<thead>
<tr>
<th>Country</th>
<th>Midstream</th>
<th>Gas</th>
<th>Power</th>
<th>Marketing</th>
<th>Refining</th>
<th>Upstream</th>
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<tbody>
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<td>Nigeria</td>
<td>120%</td>
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<tr>
<td>Mexico</td>
<td>90%</td>
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<tr>
<td>Kenya</td>
<td>60%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Tanzania</td>
<td>30%</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
</tr>
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<td>India</td>
<td>0%</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Georgia</td>
<td>-120%</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

- Nigeria: Midstream 120%, Gas 90%, Power 60%, Refining 30%, Upstream 0%
- Mexico: Midstream 90%, Gas 60%, Power 30%, Refining 0%
- Kenya: Midstream 60%, Gas 30%, Power 0%
- Tanzania: Midstream 30%, Gas 0%
- India: Midstream 0%
- Georgia: Midstream -120%
Indian Government Tax Revenues v Losses Due to Subsidies ($billion)

- Petrol & diesel tax rev
- P&D subsidies
- LPG subsidies
- Kerosene subsidies
- Subsidy diversion cost

Upstream E&P

Oil and Gas Processes

- Exploration
- Discovery
- Characterization & Delineation

- Exploitation Plan
- Dynamic Model
- Static Model

- Investment and Operation Plan
- Execution of Investment Plan
- Production

- Refining, Gasification
- Marine Transport
- Pipelines

- Fuels, Synthesis Gas
- Market
- Decommissioning

Uncertainty is Key

- Where are the hydrocarbons (is there a source rock)?
- Is there a trap and seal?
- What is the quality of the reservoir?
- Where should wells be located?
- How much will wells cost to build?
- How will they perform?
- For how long?
- How much oil saturation? Gas? Water?
- How will the production be transported to market?
- What will be the price for production (market, price structure for petroleum products)?
Data Across Many Scales

Advanced 3D Seismic Helps Detect Deposition and Channel Patterns

Where should wells be drilled?
Can they be drilled?

Integration of Core and Log Data

1770’ with little or no water
How much will they produce?
What fluid composition?
Complex Multilaterals

How much will the wells cost?
Will they contact the right producing zones?

Production and Conditioning

How to size surface facilities?
Artificial lift pumps?

Hydrocarbon Classification Framework

Source: SPE
International Upstream Investment

- The financial issue of how costs are recovered and profits divided.
- Division of profits is commonly referred as contractor take and government take.
- The objective of a host government is to maximize wealth from its natural resources by encouraging appropriate levels of exploration and development activity by private companies; governments must design fiscal systems.

Sample Countries: Upstream Regimes

| Recent fiscal regime changes (more/less favorable) |
| Sample Countries: Upstream Regimes |
| Quality of Commercial Frameworks |
| Relative Risk/Reserve Position |
| Favorable |
| Worldwide risk capital “equilibrium” |

Favorable Regimes:
- U.S. Gulf of Mexico (Federal, non-moratoria)
- Canada
- United States (all)
- United Kingdom
- Norway
- UAE
- Nigeria
- Venezuela
- Mexico
- Iran
- Other FSU

Favorable Risk/Reserve Positions:
- Brazil
- Colombia
- India
- China
- Mexico
- Norway
- United States
- Other FSU

| Source: Daniel Johnston |

Magnitude of Economic Rents

- Oil & gas often generates substantial economic rents because value often greatly exceeds cost of production.

Source: Daniel Johnston

From: Paul Boothe, Fiscal Instruments in Oil & Gas Regimes, UN Workshop on Oil & Gas in Iraq, 2006

Total value of natural resources production

Rents available to be shared among other stakeholders

“Excess” profits captured by firms

Normal return to oil & gas firms

Operating costs

Exploration and development costs

Total economic rents available for sharing among stakeholders

Total economic cost of producing natural resources

Royalties/Tax Systems

PSG

Risk Service Contracts

"R" factor

Rate-of-Return Systems

Effective Royalty Rate

From: Paul Boothe, Fiscal Instruments in Oil & Gas Regimes, UN Workshop on Oil & Gas in Iraq, 2006
Oil & gas rents flow to many different stakeholders...in a wide variety of ways

**To the owners of the resource**
- Royalties
- Equity stakes
- Production sharing
- Sale / auction of exploration, development and production rights
- Black market sales / smuggling

**To governments**
- Taxes on production from privately owned oil & gas
- Revenues devolved/shared by other levels of government
- Export taxes
- "Excess profit" taxes
- Specific targeting of resource sector by corporate, property, sales or other general taxes
- Sale/auction of pollution permits
- Carbon tax

**To private citizens**
- Above-average wage rates or corporate profits in resource sector
- Subsidized prices for end use of oil & gas (e.g. as fuel) by residents
- Theft / black market sales
- Graft and corruption of public officials (regulatory officials, managers of state assets, etc.)

From: Paul Boothe, Fiscal Instruments in Oil & Gas Regimes, UN Workshop on Oil & Gas in Iraq, 2006

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**Combinations of Fiscal Instruments**

Illustration of “front-end” bids and “back-end” royalties/taxes

- Volatile prices
- Gross revenue generated
- "Excess" profits
- "Normal" return to firms
- Rising production costs
- Start of production
- End of production
- Pay-out

From: Paul Boothe, Fiscal Instruments in Oil & Gas Regimes, UN Workshop on Oil & Gas in Iraq, 2006

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**NOCs Are Gatekeepers**

- Full access 6%
- Equity access to reserves controlled by NOCs 11%
- Limited equity access (NOCs control reserves) 77%
- Reserves held by new Russian companies 6%

---

Oil & Gas Industry Structure and Commercial Frameworks

Results of CEE Research and CEE/World Bank Collaboration

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IOC and NOC Objectives

**IOC**s
- Commercial goals dominate: maximize return on equity to shareholders
- Corporate social responsibility goals playing greater role since 1990s. Issues re: execution capacity

**NOC**s
- Effective development of country’s hydrocarbon sector (commercial)
- Contribute to country social/economic development (non-commercial)

Closer look at 5 publicly traded NOCs

<table>
<thead>
<tr>
<th>Business Segment</th>
<th>Sinopec</th>
<th>StatHydro</th>
<th>Petrobas</th>
<th>PetroChina</th>
<th>Pemex</th>
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<tbody>
<tr>
<td>Domestic E &amp; P</td>
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<td>X</td>
<td>X</td>
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<tr>
<td>International E &amp; P</td>
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<td>Parent</td>
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<tr>
<td>Domestic Refining</td>
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<td>International Refining</td>
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<tr>
<td>Midstream pipelines, processing</td>
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<td>Downstream distribution/retail sales &amp; marketing</td>
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<td>LNG</td>
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<td>Electric Generation</td>
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</table>

Key Observations: CEE/World Bank

- Limited reporting and quality of reporting
  - Best for NOCs with some public shares (domestic and/or international listings)
- NOCs with best value creation also score highest on parameters (governance, fiscal regimes, commercialization, etc)
- High cost structures for many

Key Observations (cont’d)

- Large yields back to sovereign governments in total fiscal contribution to the state (effective tax rates, dividends, etc);
  - Some NOCs must borrow
  - Contribute to low levels of reserve replacement and production and are disincentives to commercialization
- Even more commercialized NOCs with some public shares carry large numbers of employees
  - Affects value creation results on per employee basis
  - Difference between domestic only v international operations (Petrochina v CNOOC)
Not All NOCs Are the Same

NOCs vary by:

- Extent of government ownership
  - with 49.9% Gazprom has highest private ownership
  - most 100% state-owned
- Access to international credit markets
  - Whether any shares are publicly traded under securities regulatory (e.g., US SEC) governance
  - Amount of (audited or auditable) financial and operating data provided
- International operations and outbound investment
- Extent of competition in their “domestic” markets

Effective Development of Hydrocarbon Sector: Ability to Find and Develop Hydrocarbons

<table>
<thead>
<tr>
<th>Performance Metric</th>
<th>Attributes Measured</th>
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<tr>
<td>Production Replacement Ratio (PRR)</td>
<td>Capital/project mgmt. effectiveness; technical competence; sustainability.</td>
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<tr>
<td>Reserve Replacement Cost (RRC)</td>
<td>Technical competence; sustainability</td>
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<tr>
<td>Production and Reserve Growth Rates</td>
<td>Competitiveness; sustainability</td>
</tr>
<tr>
<td>Cash Margin/RRC (BOE)</td>
<td>Level of costs relative to cash generated; ability to generate adequate investment capital.</td>
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<tr>
<td>Cash Flow/Capital Expenditures</td>
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</table>

2004-2007 based on data availability

- StatoilHydro international reserve replacement costs >$56/BOE
- CNOOC spends a lot more than its competitors internationally

Data labels in RED are NOCs with some private ownership

Excludes South Africa (PetroSA)
Effective Development of Hydrocarbon Sector: Ability to Produce Hydrocarbons Profitably

**Performance Metric** | **Attributes Measured**
--- | ---
Earnings Before Taxes & Depreciation (EBTDA) per BOE of Annual Production | Operating efficiency; competitiveness.
Earnings After Taxes & Depreciation (EATDA) per BOE of Annual Production | Impact of fiscal regime on NOC sustainability.
EATDA/Long Term Assets | Capital management effectiveness; profitability.

Domestic Social/Economic Development

**NOC Contributions**

**Performance Metric** | **Attributes Measured**
--- | ---
Tax, royalty and other payments to the state per BOE; Spending on non-commercial programs | Capital formation for development
Excess Employment (Employees/BOE) | Contribution to social, economic, environmental well-being
Domestic Oil/Gas Price Subsidies | Provision of affordable energy to citizens
Domestic Social/Economic Development

**Summary**

- Some companies provide detailed information on social/economic development.
  - Petrobras, CNOOC and Statoil also contribute outside their home countries.
  - Petrobras, Statoil acknowledged as industry leaders.
  - PetroChina does not provide data
- Countries with significant domestic fuel subsidies (Brazil, Mexico, China) are also importers of refined oil products.
- Tax contribution of Norwegian NOC is low on per BOE basis compared to other countries but non-NOC contributions are much larger.

Commercial Frameworks: Implications

- Norway’s more competitive hydrocarbon sector produces the greatest contribution to the state
- Increasing non-NOC participation in Brazil and China to significant levels should benefit total sector contribution to their countries’ economies
- Allowing non-NOC participation in Mexico could relieve financial pressure on Pemex without diluting the sector’s contribution to the state
NOC Performance: Implications

- Tax regimes and debt levels threaten financial sustainability
- Additional and/or new equity issuances by existing or new partially privatized NOCs
  - Key consideration: global credit and credit risk trends for new issues
- Impact of financial market turmoil plus falling commodity prices on NOC viability
  - Implications for FDI and global oil supply and deliverability

Strategic Considerations Going Forward

- For NOCs engaged in outbound investment:
  - How well do they perform?
  - What issues do they face?
- NOC governance structures
  - Organization of sovereign ownership and control
  - Balancing sovereign/shareholder investors for partial offerings (or transition to public ownership)
  - Establishing and asserting “independent” regulatory oversight

Many NOCs Don’t Report

- Some of the major NOCs around the world do not have financial reports
- Transparency is poor (EITI may help)
- Human resources are lacking to run companies efficiently and effectively
- Governments like to milk these companies but the extent is often unknown

Policy considerations
Country Commercial Frameworks Evaluation

• Public Sector Governance (15%)
  – Defined national hydrocarbon policy; clear NOC goals; functional separation; full disclosure NOC non-commercial goals
• Corporate Governance (15%)
  – Independent BOD; Merit personnel policies; audited financials/reserves; strong internal financial and planning oversight
• Fiscal Regimes (25%)
  – Allows adequate capital investment; good credit availability; predictable/separate NOC budget process; attracts sufficient non-NOC capital

Country Commercial Frameworks Evaluation (con’td.)

• Commercialization (30%)
  – Upstream competition; NOC/Non-NOC JVs, alliances; midstream competition; partial NOC privatization
• Regulation (15%)
  – Limits NOC market power upstream and downstream; provides good quality data to all participants; resolves disputes/conflicts

Country Commercial Frameworks Summary

• The partially privatized NOCs have the best corporate governance.
• The fiscal regime in Mexico has a very negative impact on Pemex commercial performance.
• Statoil’s tax burden could become problematic in the future.
• In China the fiscal regime favors its NOCs and discourages non-NOC investment.
• Upstream competition matters and can overcome faults in governance and regulatory regimes.
Best Practice “Advice” to Countries

• Separate commercial, policy and regulatory functions
  – NOC can focus on commercial operations.

• Allow non-NOC competitors in the upstream/midstream;
  – it can increase overall sector contribution to the economy (Norway) and improve NOC performance (Brazil).

• Enact fiscal regimes that allow NOCs to retain adequate investment capital and evolve the fiscal regime as the resource base evolves.

“Advice” to Countries (cont’d.)

• Separate the NOC’s budget process from the government’s
  – NOC can plan.

• Reduce/eliminate price subsidy burdens on NOCs.

• Provide adequate resources, capital and human, for policy and regulatory functions.
  – Develop this expertise outside of the NOC.

• Adopt transparent and equitable “oil rent” distribution processes/practices to avoid public backlash against the sector.
  – Relieve NOCs of this burden.

Best Practice “Advice” to NOCs

• Even a small degree of partial privatization can be good (Norway, China, Brazil).
  – “Market discipline” encourages NOCs to adopt best practices for management and commercial development and improves NOC performance.
  – It also improves access to capital.

• Promote competition.
  – It can result in a better performing NOC (Statoil, Petrobras) and can offset faults in governance and regulatory regimes.

“Advice” to NOCs (cont’d)

• Get IOCs involved in meeting non-commercial social/economic objectives.
  – IOCs can learn a great deal from NOCs in this area.
  – NOCs can benefit from IOC management and project expertise.
  – NOCs can be “strategic bridging” organizations among IOCs, governments and NGOs.
  – It can help to overcome NOC/IOC trust barriers and lead to commercial cooperation.

• Be open to NOC/IOC, NOC/NOC, NOC/service company joint ventures/alliances.
  – It increases learning from “best in class” companies and leverages NOC capital.
ATTACHMENT 3

Presentations by Dr. Gülen, Prof. Adenikinju and Mr. Edjekumhene
at the special session on SDI at the 2nd Annual NAEE Conference
April 24, 2009
The Link Between Capital Flows and Commercial Frameworks

Defining Commercial Frameworks

*An “Evolving Bargain”*

Institutional & Professional Infrastructure


Commercialization

Can you produce / “monetize” the resource?

Can you get the resource to the market?

Do you know your customers?

Production

T&D

End use


Just over half of all investment needs to 2030 of $22 trillion are in developing countries
IEA 2007 Reference Scenario:
Cumulative Investment in Energy-Supply Infrastructure, 2006-2030

Will $ flow to where it is needed?*

• Half of the investors (~50 companies) are less interested in developing country power sectors as compared to the 1990s

• Several priorities for governments:
  – Ensure adequate cash flow (adequate tariff levels and collection)
  – Maintain stability and enforceability of laws and contracts
  – Improve responsiveness to investors’ needs
  – Minimize government interference (with operations and management in particular)


Issues

• Reduction in capital E&P spending as industry consolidates
• Reduced energy financing with fewer merchant risk managers
• Sovereign debt with fiscal scrutiny and liberalization
• Development assistance with budget and performance scrutiny in donor countries
• Incentives to attract capital
State of Global Capital Markets

Before Fall 2008
- Unprecedented breadth and strength.
- $118 trillions of assets to $200 trillion by 2010.
- Much of the growth comes from a rapid expansion of corporate and government debt.
- Cross-border capital flows and foreign holdings of financial assets continue to grow rapidly.

Now
- Narrowing markets
- Declining asset values
- Corporate debt practically gone
- Over-leveraged governments?
- Capital flows slowed down significantly and restricted to opportunity buys rather than new investment.

Barriers to Sustained Investments in West Africa

Three major barriers:
- Inadequate tariffs
- Weak sector institutions – utilities & regulators
- Insufficient government attention and investment

Observations from 2007-08 workshops.

Dealing with Subsidies

Define Subsidies ↓
Define Tariff Rebalancing ↓
Define Subsidy Phase-out Plan ↓
Finance Subsidy ↓

tariff
Cost recovery tariff target
Below cost recovery tariff
Transition period

*Results from a DT Emerging Markets Group study on successful cases*

Additional Issues…

- WAPG, WAPP and level of regional preparedness
  - Funding for generation – investment promotion authorities?
  - Vision for WAPP to include regional standards for contracting, procurement, etc

*Observations from 2007-08 workshops.*
Gas competitive in Ghana

<table>
<thead>
<tr>
<th></th>
<th>Crude oil</th>
<th>LPG</th>
<th>RFO</th>
<th>Diesel</th>
<th>Natural gas</th>
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</thead>
<tbody>
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<td>US$ per barrel</td>
<td>Average US$/MMBtu</td>
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</tr>
<tr>
<td>60</td>
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<td>8.25</td>
<td>14.40</td>
<td>4.05–7.15</td>
</tr>
<tr>
<td>45</td>
<td>7.75</td>
<td>12.30</td>
<td>6.60</td>
<td>11.00</td>
<td>3.70–6.75</td>
</tr>
<tr>
<td>30</td>
<td>5.51</td>
<td>8.80</td>
<td>4.60</td>
<td>7.70</td>
<td>3.30-6.30</td>
</tr>
</tbody>
</table>

As long as the price of oil > $30/bbl, natural gas can be competitive if demand is high enough.


WAGP Delays

- Only up to 60 MMcfd can be shipped as free flow. This shortage is caused mainly by:
  - the lack of investment (pricing, security concerns).
  - the disconnect between eastern and western pipeline networks in Nigeria.
  - the increased demand for gas in Nigeria (primarily for power generation).
  - the increased gas demand for LNG exports.
- The gas that is available was wetter than the gas that can be shipped via the WAGP under contract terms.
- Even if there was sufficient gas to meet foundation volumes, the compressor station will be needed for more.

Observations from 2007-08 workshops.

WAGP Development Issues - Scorecard

<table>
<thead>
<tr>
<th>Issue</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas availability</td>
<td>Improving economic environment for investors (pricing in NG, security in Niger Delta)</td>
</tr>
<tr>
<td>Gas specifications</td>
<td>Addressed with additional processing</td>
</tr>
<tr>
<td>Volume of free flow gas</td>
<td>Increase pressure in ELP - 30 Mcfd to start soon</td>
</tr>
<tr>
<td>Limitation of the pipeline capacity</td>
<td>Add one more compressor - longer term</td>
</tr>
<tr>
<td>Security of the pipeline</td>
<td>Offshore Damage Prevention Program</td>
</tr>
<tr>
<td>Funding of the WAGP Authority</td>
<td>Review of WAGPA charge for full compression; Set WAGPA charge for free flow gas; intermediate funding from governments</td>
</tr>
</tbody>
</table>

Observations from 2007-08 workshops.

WAPP Meeting Electricity Demand

Source: Amedeo Simoncini, WAPP Presentation, May 2, 2008, Abuja

<table>
<thead>
<tr>
<th>Country</th>
<th>Met</th>
<th>Unmet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benin</td>
<td>661</td>
<td></td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>688</td>
<td></td>
</tr>
<tr>
<td>Cape Verde</td>
<td>3,004</td>
<td></td>
</tr>
<tr>
<td>Gambia</td>
<td>170</td>
<td></td>
</tr>
<tr>
<td>Ghana</td>
<td>7,773</td>
<td></td>
</tr>
<tr>
<td>Guinea</td>
<td>860</td>
<td></td>
</tr>
<tr>
<td>Guinea Bissau</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Liberia</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Mali</td>
<td>841</td>
<td></td>
</tr>
<tr>
<td>Nigeria</td>
<td>38,370</td>
<td></td>
</tr>
<tr>
<td>Senegal</td>
<td>1,800</td>
<td></td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td>Togo</td>
<td>674</td>
<td></td>
</tr>
</tbody>
</table>

Met 54%  Unmet 46%
THE CHALLENGE: Integrating Fragmented National Power Systems

Source: Amedeo Simoncini, WAPP Presentation, May 2, 2008, Abuja

Interconnected Countries 2011-12

Source: Amedeo Simoncini, WAPP Presentation, May 2, 2008, Abuja

Regional Energy Development: Generation Projects

Source: Amedeo Simoncini, WAPP Presentation, May 2, 2008, Abuja

Investment Requirements

Source: Amedeo Simoncini, WAPP Presentation, May 2, 2008, Abuja

Overall Generation and Transmission Investment Requirements

Source: Amedeo Simoncini, WAPP Presentation, May 2, 2008, Abuja

- 9 billion USD by 2011 (2004 prices)
- Under construction or financing closed
- Under development

Investment Requirements:
- 0 1 000 2 000 3 000 4 000 5 000 6 000
- 2004 USD millions

- generation
- WAPP projects
- transmission reinforcement

- Under construction or financing closed
- Under development
**WAPP Development Issues - Scorecard**

- WAPP Operations Manual is developed
- A draft methodology on WAPP transmission tariff has been developed
- ECOWAS Regional Electricity Sector Regulatory Authority is proposed
- Many feasibility studies underway
- Funds raised from various sources
  - KEPCO is working on Information and Coordination Center
- Yet, there are delays in financing some projects
- Without WAGP gas, WAPP is delayed

*Observations from 2007-08 workshops.*

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**Power Sector Issues**

- Seasonal fluctuations and unexpected weather patterns increase the risk to the availability of electricity
- Risks are compounded because regional trade is limited (hence the importance of WAPP)
- But trade will not help unless
  - Additional capacity is built
  - System losses are reduced significantly

---

**Investment Challenges**

- $19 billion (mostly generation) between 2004 and 2020 v ECOWAS GDP of $100 billion
- The service quality has been poor ➔ self-generation, non-payment and theft of electricity
- Under these conditions, it is difficult to address a key concern for investors (and state utilities): inadequacy of electricity tariffs.
- As regulatory agencies, tasked and empowered to set tariffs, implement gradual increases to allow cost recovery, they need
  - the support of governments and
  - to work hand in hand with the utilities to improve service quality so that the customers will see the advantage of paying their bills regularly.

*Observations from 2007-08 workshops.*

---

**Alternatives**

- Much focus has been on gas but alternatives such as imported LNG or coal can be considered for mid to long-term
- Regional resources of oil, gas, coal, biomass, hydro can be better identified and their development can be encouraged
- Given large rural populations, solar, wind and other small-scale renewables can be useful

*Observations from 2007-08 workshops.*
Comparing cost of generation CEE model (cents/kWh)

<table>
<thead>
<tr>
<th></th>
<th>Coal</th>
<th>Oil</th>
<th>Natural gas</th>
<th>Nuclear</th>
<th>Wind</th>
<th>Solar (CSP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>8.1</td>
<td>7</td>
<td>7</td>
<td>9.4</td>
<td>7.2</td>
<td>21</td>
</tr>
</tbody>
</table>

**Assumptions**

<table>
<thead>
<tr>
<th>Source</th>
<th>$/kW</th>
<th>O&amp;M ($/kWh)</th>
<th>fuel ($/MMBtu)</th>
<th>const (yr)</th>
<th>loan interest</th>
<th>loan period</th>
<th>PLF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>2500</td>
<td>0.0060</td>
<td>2.5</td>
<td>3</td>
<td>8%</td>
<td>15</td>
<td>85%</td>
</tr>
<tr>
<td>Oil</td>
<td>750</td>
<td>0.0100</td>
<td>6.9</td>
<td>3</td>
<td>12%</td>
<td>10</td>
<td>85%</td>
</tr>
<tr>
<td>Natural gas</td>
<td>1000</td>
<td>0.0038</td>
<td>5.0</td>
<td>3</td>
<td>12%</td>
<td>10</td>
<td>85%</td>
</tr>
<tr>
<td>Nuclear</td>
<td>4500</td>
<td>0.0180</td>
<td>7</td>
<td>7</td>
<td>8%</td>
<td>15</td>
<td>90%</td>
</tr>
<tr>
<td>Wind</td>
<td>1500</td>
<td>0.0020</td>
<td>1</td>
<td>1</td>
<td>8%</td>
<td>15</td>
<td>35%</td>
</tr>
<tr>
<td>Solar (CSP)</td>
<td>3000</td>
<td>0.0050</td>
<td>1</td>
<td>1</td>
<td>8%</td>
<td>15</td>
<td>24%</td>
</tr>
</tbody>
</table>

**In conclusion**

- WAGP & WAPP offer opportunity to increase availability of reliable energy to West Africa
  - more balanced fuel portfolio
  - single control area for power flows
- But, investment in gas development, grid interconnection and generation capacity has to happen soon.
  - commercial frameworks need to be finalized
  - local capital markets need to be mobilized
  - capacity building for various stakeholders should continue

**Contact Information**

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[www.beg.utexas.edu/energyecon/IDA/Smart_Development/](http://www.beg.utexas.edu/energyecon/IDA/Smart_Development/)
for CEE’s capacity building program
[www.beg.utexas.edu/energyecon/IDA/new-era/](http://www.beg.utexas.edu/energyecon/IDA/new-era/)
West African Energy Security Report
Prof. Adeola Adenikinju
University of Ibadan

Energy and Development
Electric Power Consumption vs Gross National Income, per capita
(2005, selected countries)

Energy and Development
GDP per capita (U.S. dollars)

Energy and Development
Agriculture

Energy and Development
Industry
Energy Security

- Energy is essential for economic growth and improving standard of living
- High prices add to the cost
- Availability of resources – domestic vs imports
- Environmental impact of energy production and consumption

ECOWAS Vision

Expected Changes between 2005 and 2015

**Issues**

- Seasonal fluctuations and unexpected weather patterns increase the risk to the availability of electricity
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Sound Energy-Sector Governance: The Key to Unlocking Private Capital

Ishmael Edjekumhene, Senior Projects Manager, KITE

The Facts

- Significant capital investment required to meet sub-regional energy needs - $19bn required between 2004 and 2020

- Traditional sources of funding (i.e. ODA and Concessionary Loans) have dried up, even worsened now by the global credit crunch

- Huge financing deficits exist, which only private capital can help bridge.

But...

- Private capital – both debt and equity – are drawn to safe havens where funds are likely to grow and provide returns on investment

- Legal, regulatory and policy regimes that ensures a stable environment characterize locations in which investment can flourish

- Experience shows that private sector funds flow to areas that have established economic, political and legal foundations (proper and workable governance structure) amenable to development

- Private funding is difficult to attract in the absence of and predictable good governance principles

What is Energy-Sector Governance?

- Institutional scaffolding (i.e. transparent, predictable and enforceable political, legal and economic market rules) of public administrations that enables transactions for energy services and products to be economically viable/sustainable.

- Is this scaffold in place in West Africa?

- Unfortunately NO!
Some Constraints to the Creation of Required Enabling Environment

- **Weak and Inefficient Energy Sector Institutions**
- Inappropriate energy sector policies
- Weak local capital markets
- Lack of adoption of best practices and standards by energy sector institutions and the public sector
- Lack of consumer knowledge about legal and commercial requirements for sustainable energy services
- **Lack of roles for civil society in formulating public policy for energy services and in demanding accountability for sector institutions**

Tackling the Constraints

- Practice of good governance in the energy sector can help resolve the constraints
- Good governance embodies transparency, accountability, efficiency and rule of law
- It leads to relatively low levels of corruption; consistent cost-effective levels of service provision; responsiveness to changing conditions and public needs
- Energy sector reforms are embodiment of improved governance

Unfortunately...

- Energy Sector Reforms in the Sub-region have not worked as envisaged
- Reforms have only largely succeeded in creating new regulatory bodies usually with limited capacity (in terms authority, financial resources, information, human capacity – skills, knowledge, experience, etc – and supporting processes
- Regulators need authority, strong legal/regulatory frameworks, have the knowledge, skill and experience to do the job assigned to them
- In fact all actors in the sector need to be adequately equipped to carry out their respective roles effectively

The CEE/KITE Intervention – the Smart Development Initiative

- Over the past 2 years, CEE and its partners have been working in the sub-region to build the capacity of energy sector and civil society stakeholders to:
  - Effectively draw on the pool of relevant global information and best-practices to tackle various policy, regulatory and institutional bottlenecks
  - A combination of 'supply and demand side' approaches to capacity building have been used so far
  - Some relevant capacity have been built within these stakeholder institutions as confirmed by recent evaluation exercise
However...

- Two years is not long enough to develop adequate capacity

- USAID funding cycle ended last year with only one activity left to be undertaken

- The challenge now is how this initiative can be sustained.

- How can we all ensure that our respective governments understand the need to continue developing the capacity of various actors until sufficient skills/expertise have been acquired and implemented?

Conclusions

- Let us all leave this conference with the clear message that unless and until the ideals of good governance are practiced in the energy sectors of our countries, the only likely source of funding needed to tackle capacity constraints in the sector will continue to be elusive

- Developing the capacity of relevant stakeholder institutions to function effectively should be a top energy sector priority for which resources must be devoted to.

Thanks for your attention