

**INTERNATIONAL SUPPORT TO PROMOTE
TECHNOLOGY DEVELOPMENT AND TRANSFER,
FOR RENEWABLE ENERGY AND ENERGY
EFFICIENCY IN GHANA**

BY

WILLIAM GBONEY
**INTERNATIONAL INSTITUTE OF INFRASTRUCTURAL
ECONOMICS AND MANAGEMENT (I3EM)**
ACCRA, GHANA

February, 2009

Presentation Format

1. Summary of Phase I:

- Objectives
- Policy Description
- Barriers

2. Phase II:

- Study Objective
- Link between Phase I and II
- Approach
- Key Issues

1.0 Phase 1: Case Study on Renewable Energy and Energy Efficiency Sectors: Policy and Regulatory Frameworks.

(a) Objectives:

- (i) Identify key domestic policies which are **SLOW – MOVING**, and would require international support and cooperation.
- (ii) Identify domestic barriers affecting Renewable Energy (RE) and Energy Efficiency (EE) development
- (iii) Explore how international cooperation and support, can be used to increase the scale and scope of RE and EE.

2.0 Summary: Policy Description

(a) Resource Capacity Development:

- (i) Expand exploitation and development of RETs
- (ii) Achieve at least 10% RE in overall energy mix by 2020

(b) Increase Thermal Power Plant Efficiency:

- (i) Covert existing single-cycle oil-fired plants to combined cycle gas fired plants
- (ii) Fuel switching: Light crude oil (LCO) to natural gas

(c) Energy Efficiency in energy intensive industries:

- (i) Undertake energy audit projects
- (ii) Power Factor (PF) enhancement projects for industries to achieve a PF 0.90

2.0 Summary of Policy Description: Continued

- (d) Energy efficiency labeling and standards for equipment and appliances**

- (e) Market Development:**
 - Create and expand market for RE Service
 - Promote use of solar PV, solar water heater and solar crop drying

- (f) Renewable Energy Law:**
 - (i) Establish conducive regulatory framework to promote:**
 - Grid-connected RE systems
 - Mini-grid connected systems
 - Stand-Alone systems

- (g) Bio-fuel development:**
 - Encourage cultivation of Jatropha plant
 - Bio-diesel production in future

2.1 Key Policy Indicators

- Increased access to energy service
- Development of all-inclusive renewable energy policy and legal framework
- Increased access to financing to both local and foreign financing
- Increased private sector participation and Energy Service Companies (ESCOs)
- Increased EE projects, through support to Energy Foundation

3.0 SUMMARY OF BARRIERS FROM PHASE I.

a. **Economic:**

- i. Uneven playing field, due to subsidies granted to competing fuels
- ii. High initial capital cost
- iii. High transaction costs
- iv. Investment analysis tend to favour fossil-fuel power plants

b. **Policy, Legal and Regulatory**

- i. Absence of enabling policies, as well as legal and regulatory frameworks
- ii. Absence of renewable energy pricing framework
- iii. Lack of technical standards
- iv. Lack of coordination between grid-connected and off-grid options for rural electrification

4.0 SUMMARY OF BARRIERS FROM PHASE I - cont'd.

c. Market Expansion and technology deployment

- i. Lack of access to long-term financing

- ii. Wrong perception about Renewable Energy Technologies (RETs): High technical and financial risks

- iii. Lack of skills and information on RETs
 - These increase perceived uncertainties
 - Lack of technical know-how and human capacity
 - Limited information and awareness
 - Weak capacity of local stakeholders
 - Lack of maintenance services for solar PV systems

5.0 Phase II: International Support and Cooperation to promote RE/EE technology development in Ghana

(a) Objective:

To overcome the barriers identified in phase I, and find out how international support could be utilized to **promote technology development and transfer.**

(b) Important to note that: Technology transfer involves:

- building human and institutional capacity
- raising awareness among users/stakeholders

6.0 Link between Phase I and II

- (i) **Phase I: Identified the following as being necessary to promote RE:**
 - **Establish credible policy, legal and regulatory frameworks:**
 - i. Grid-connected RE systems
 - ii. Mini-grid RE systems
 - iii. Stand-Alone RE systems

- (b) **International cooperation, technical and financial support for:**
 - i. Large-scale grid-connected RE systems
 - ii. Mini-grid RE and ESCOs
 - iii. Stand-Alone RETs
 - iv. Energy Efficiency activities

- (c) **Capacity building:** For policymakers, regulators, technicians, financing institutions, enhance technical absorption capacity of the country.

7.0 Approach to phase II

(ii) **BUT: RE/EE technologies** are required to meet the challenge of attaining a **LOW CARBON ECONOMY.**

Examples:

- Construction of new thermal power plants based on combined cycle gas turbines
- Refurbishment of old power plants to enhance their efficiency
- Loss reduction in transmission and distribution networks in the electricity sector
- Utilisation of natural gas as a bridging fuel for thermal power production, until RETs become commercially viable.
- Promoting and expanding the use of solar, wind, small and mini-hydro systems and biomass.

7.0 Approach to Phase II – cont'd.

(i) Screening criteria for investment: Key factors to be considered:

- Cost-effectiveness
- Compatibility with country's development goals
- Associated with climate co-benefits

(ii) Basis of classification of technologies for international support:

- (a) Identify technologies which are financially attractive and commercially viable for support.
- (b) Identify technologies which may not be financially viable, but are economically viable.
- (c) Identify technologies which will require support from a comprehensive RD&D programme

8.0 International and Local Financial Support for RE/EE.

- (i) Even if credible regulatory regimes exist and good policies are in place, **FINANCING** would still be required.
- (ii) Innovative financial instruments to be explored in Phase II for grid-connected, mini-grid and stand-alone systems.
- (iii) Direct government investment required; incentives required to leverage private investment
- (iv) Financing mechanisms should be compatible with country's local circumstances
- (v) Key features of financial support to be considered:
 - Should comprise a mix of grants and carbon finance
 - Should buy down cost of new technologies
 - Support pilot projects
 - Should Mitigate financing and technology risks
 - Must be able to finance incremental costs of moving to high efficiency technologies

9.0 Technology assistance and transfer

- i. More than just providing the hardware. Involves knowledge sharing and ability to adapt technology to local environment

- ii. Phase II to explore:
 - (a) South-South technology transfer
 - (b) North-South technology transfer

- (iii) Identify mechanisms for large scale transfer of technology

Example: Promote International cooperation with equipment suppliers. Requires dealing with Intellectual Property Right (IPR).
- (iv) Technology transfer should also build upon sound and existing local policies (i.e. demand driven and bottom-up approach)

10.0 Stakeholder Workshop

Proposal: One-day stakeholder workshop in Accra, Ghana.

Objective: To collaborate with a broad range of stakeholders

Areas for discussions at proposed workshop:

- (a) Discuss Phase I observations/findings
- (b) Discuss key features for phase II, including performance measuring indicators
- (c) Discuss the role of technology and knowledge transfer of RET to achieve a low carbon economy.
- (d) Discuss actions required to scale up RE use in Ghana:
 - Technological cooperation and assistance
 - Policies, issue of subsidies
 - Regulatory barriers
 - Access to credit and long-term financing
 - Research, Development and Demonstration (RD&D)

11.0 Monitoring & Evaluation

Qualitative/Quantitative Performance Measuring Indicators to be developed to measure:

- Number of new customers connected to or using RE services
- Whether RE policy framework has been developed
- Whether access to local financing for RE/EE has increased
- Whether number of private entrepreneurs for RE has increased
- Whether the number of ESCOs and EE projects has increased
- Number of RE projects and capacities installed and are actually working