



GLOBAL WORKSHOP ON GRID-CONNECTED RENEWABLE ENERGY

USAID and USEA Host International Energy Professionals to Discuss the Need to Implement Renewable Energy and the Strategies Required

by Jason Hancock, Senior Program Coordinator, United States Energy Association



The **Global Workshop on Grid Connected Renewable Energy**, sponsored by the **United States Agency for International Development (USAID)** and organized by the **United States Energy Association’s (USEA) Energy Utility Partnership Program (EUPP)**, was conducted in Washington, D.C. August 31 to September 4, 2009. The Global Workshop brought together key energy industry officials from eight developing countries, the European Union and the United States to discuss the ever-growing role of renewable energy in meeting today's energy demand and the methodologies and policies required to bring these resources efficiently and competitively to consumers. The Global Workshop included three days of presentations, including a session where each country presented their current renewable energy outlook, followed by two days of site visits to renewable energy facilities within the metropolitan D.C. area.

BACKGROUND

The focus of the Global Workshop was the integration of grid-connected renewable energy in the power sector. The participants-along with key U.S. and European experts-discussed the technical, market, regulatory, and policy barriers of renewable grid connection and the strategies, both conceptual and currently implemented, to accelerate renewable energy development. Utility executives, regulators and policy makers increased their knowledge of the latest renewable energy technologies, financing

INTERNATIONAL DELEGATES

Afghanistan

Amir Alamzai, Ministry of Energy and Water

Egypt

Hatem Amer, Egyptian Electric Utility & Consumer Protection Regulatory Agency

Georgia

Teimuraz Izoria, Ministry of Energy
Gocha Shonia, Head of Electricity Tariff Division, Georgian National Energy and Water Regulatory Commission

Indonesia

Harry Hartoyo, State Electricity Company (PLN)
Ario Senoaji, PT PLN (Persero)

Liberia

Augustus Goanue, Rural and Renewable Energy Agency

Morocco

Issam Badreddine, Regional Center of Investment

Philippines

Zenaida Ducut, Energy Regulatory Commission
Francis Juan, Energy Regulatory Commission
Roy Kyamko, Department of Energy
Mario Marasigan, Department of Energy
Allan Mesina, USAID/Philippines

Tajikistan

Ahad Mahmoudov, UNDP

strategies, policies, and successful project development methodologies to learn how to accelerate implementation of renewable energy in their home countries and create a more attractive investment climate for the renewable energy sector. The site visits were designed to allow the participants to observe the methodologies and technologies discussed during the workshop as they are actually implemented in a real-world environment.

POLICY, INCENTIVES AND REGULATION FOR THE PROMOTION OF RENEWABLE ENERGY PERSPECTIVES



The Global Workshop on Grid Connected Renewable Energy's keynote speaker **Dr. Jan Hamrin, Chief Executive Officer, HMW International**, addressed the need for a set of cohesive policies, incentives and regulatory oversight required to bring renewable energy successfully into the generation portfolios of electric companies. Typically, electricity generated from renewable resources is expensive to implement. The technology required often costs more than conventional

generation equipment and has an extended cost recovery period to recover capital expenditures--although costs are declining. Additionally, most of the ideal locations for the large-scale generation of renewable energy are often remote, located at great distance to the load centers they would serve, which requires the construction of transmission lines to bring the electricity to consumers. Finally, although it is continually improving, the efficiency and availability of renewable generation is still lower than electricity generated from traditional sources.

These considerations are significant obstacles to the implementation of renewable energy large-scale projects. To overcome these obstacles, various policies, incentives and regulatory oversight are implemented to encourage renewable energy development. One policy that has significantly increased the development of renewable energy is the **Renewable Portfolio Standard (RPS)**. RPS requires all electricity suppliers to get a certain, set percentage of their generation from a qualified renewable energy resource within a certain period. The RPS requirement is becoming increasingly more common in state-by-state energy regulation.

Methods to incentivize renewable energy developers are also on the rise throughout the United States and have expanded beyond tax incentives. One common method is the use of the **Systems Benefit Charge**, which is a small fee added to the bill of each utility customer. The money from the Systems Benefit Charge can be pooled and used to offset the higher cost of renewable energy. A more cutting edge method appears to be the **Feed-in Tariff** or **FiT**. Feed-in Tariffs are set by a regulatory authority and allow a higher tariff for renewable energy that gradually diminishes in set increments over the period of the FiT until the tariff for renewable energy is normalized to the tariff for traditionally generated energy. Feed-in Tariffs have been successfully implemented in Europe in the past few years. California is currently preparing to implement FiTs in 2010.

PROJECT FINANCING

In today's volatile economic climate financing for any development is difficult to obtain. Renewable energy projects, with their higher costs and reliance on policies and incentives to ensure profitability are even more difficult to finance. This means that renewable energy projects must be extremely transparent to investors in the manner in which they show a clear cost recovery and profitability. In the past, it was possible to obtain financing without a Power Purchase Agreement (PPA). However, as a result of the credit crunch, it is nearly impossible to do so today, as investors have become more conservative and extremely risk-averse.

As developing countries seek to develop their own renewable energy portfolios, the economic crisis has reduced available financing for such projects. Investors are hesitant to invest in any project that cannot be guaranteed by a stable central government. Yet, it is often these places that would benefit most from the implementation of these projects. To help manage the risk involved in this type of venture, the

World Bank Group established the Multilateral Investment Guarantee Agency (MIGA). MIGA provides political risk insurance for developmentally sound foreign direct investment. If a country attempts to nationalize or otherwise impede a MIGA insured project, the World Bank will intercede for the owner/investors and work to reach a resolution with the government of the country. If a resolution cannot be reached, then MIGA will pay out the claim to the owner/investors and the World Bank will take ownership of the project. If necessary, the World Bank can invoke its lending power and the ability to cut off loans to the country in question. This powerful insurance policy has been very beneficial in opening investment channels by mitigating the risk of central government instability and could be a useful tool as developing countries seek to develop renewable energy.

TECHNOLOGY OVERVIEW

The Workshop included a session to showcase some of the recent advancements in renewable energy technology.



Scott Sklar, President of the Stella Group discussed the introduction of thin film solar cells which though less efficient than other photovoltaics, can be manufactured in a fraction of the time and at a fraction of the cost of other photovoltaics. Additionally, the thin film solar cells can be directly adhered to rooftops greatly decreasing the cost of installation. Mr. Sklar strongly emphasized the importance of accurate resource mapping to find the most efficient positioning for any renewable energy project as well as the importance of standardization of equipment.



Ronald Brzezinski of GE Energy emphasized the need for long-term renewable energy policies to drive long-term growth, pointing out the fits and starts in renewable energy in the past that directly coincided with the end and start points of renewable energy policies of the past. Mr. Brzezinski stressed the importance of stabilizing renewable energy generation to make it behave more like conventionally generated electricity. Mr. Brzezinski also demonstrated how GE wind turbines, despite their massive size, can be installed in one day per crew per unit.



Richard Brent of Solar Turbines highlighted the importance of improving efficiency for industry through the use of Combined Heat and Power (CHP) units. CHP reduces emission of greenhouse gasses while increasing power reliability and reducing grid congestion all at a lower cost than traditionally generated electricity.



Chris Tindal of the Naval Energy Office outlined the Department of Defense Joint Service's programs to use renewable energy resources to offset high energy demand at defense facilities. These programs include using the traditional methods of renewable energy generation including wind, solar and geothermal as well as more unconventional methods including Ocean Thermal Energy Conversion (OTEC) and wave/current generation.



Sylvain Motycka of the Solena Group, Inc. discussed new technology in the field of waste-to-energy through plasma gasification. Through this technology, biomass (waste) could be converted into electricity or as feedstock to create synthetic fuels. Through plasma arc technology, the waste is burned so completely that the only waste material is an inert, not-toxic, vitrified glass.

SITE VISITS

Stafford County Regional Landfill- Landfill Methane to Electricity



The delegation traveled to nearby Stafford, Virginia to visit the Stafford County Regional landfill. This landfill serves the population of Stafford County and operates as a traditional landfill. County waste is collected and brought to the landfill for disposal into specially designed pits that are sealed with layers of clay and other non-permeable materials. Once the pit is filled to capacity, it is covered with clean fill material and left to decompose.

Methane gas is generated in the decomposition process which until recently had been diverted to a large flare where it was burned onsite. In 2008, Stafford County contracted with Ameresco to build and operate two GE Jenbacher turbines to run on the gas that was being flared. The two units now produce 2.14 MW of electricity twenty-four hours a day, seven days a week. The landfill is currently producing enough methane to warrant construction of a third turbine which should go into construction in the near term.

Stella Group's Solar Energy Facilities



Scott Sklar, The Stella Group's founder and president demonstrated his solar home in Arlington, Virginia which has solar water heating, passive solar building features (including double-paned, argon-filled windows, LO/MIT thermal barrier paint in the attic, R38 insulation), energy efficient fixtures and appliances (such as Whirlpool Cabrio washer), 1.2 kW of Solarex polycrystalline photovoltaics and 0.5 kW of UniSolar 'peel-and-stick' modules on a metal-seamed roof on the front porch, and a 24 gel cell battery bank tied to a Xantrex SWPlus inverter. The house boasts Virginia's first direct exchange (geothermal) ground-

coupled heat pump. The Stella Group's Virginia office building has 1 kW of UniSolar photovoltaic roofing shingles, a 3.6 kW GridPoint smart battery bank, a 0.5 kW small wind turbine by Southwest Windpower, solar daylight tube, and has the first commercial lease of a 5 kW Plug Power fuel cell (running on recycled industrial hydrogen in canisters) tied to a dedicated Xantrex inverter.

Covanta Waste-to-Energy



The Alexandria/Arlington Resource Recovery Facility, near Washington, D.C., began commercial operation in February 1988 and serves about 300,000 residents of the County of Arlington and the City of Alexandria, which jointly own the site. Covanta charges a fee to allow disposal of waste at its facility, essentially being paid to take the fuel for its generation. The facility's three, 325 ton-per-day furnaces process 975 tons of solid waste, generating up to 23 megawatts of renewable energy that is sold to Dominion Virginia Power Company. The facility is located on the smallest site of any of the waste-to-

energy plants operated by Covanta Energy.

KEY DEVELOPMENTS OVERSEAS

At the conclusion of the workshop, all participants were asked to make any comments regarding the workshop and renewable energy in their country. Delegates gave presentations on their countries (to view these presentations, please go to:

http://www.usea.org/Programs/EUPP/GCRE_September_2009/gcre.htm

Afghanistan

Afghanistan is currently preparing policies on renewable energy. Increased energy generation in Afghanistan is critical and could be partially met with the region's more than 325 days of solar potential.

Egypt

Egypt needs to prepare the regulatory framework pertaining to renewable energy especially as it pertains to wind. Egypt needs to develop Feed-in Tariffs for both Solar and Wind as a method of incentivizing development.

Georgia

The Republic of Georgia has legislation in place to help facilitate renewable energy which they feel may be ambitious. They would like to eliminate all thermal generation by 2012, and with their abundant hydro resources, they are well on their way.

Indonesia

The delegates from Indonesia indicated that they would like to learn more about micro and mini hydro projects. Additionally, they indicated that Indonesia will be participating in a Heads of ASEAN Public Utilities/Authorities (HAPUA) program aimed at compiling guidelines to interconnecting renewable energy power plants to distribution networks.

Liberia

The delegate from Liberia stated that Liberia needs to work toward rural electrification in compliance with renewable energy requirements as mandated by national energy policies. Utilities that were damaged during the civil war need to be rehabilitated with these standards in mind.

Morocco

Morocco has recently passed a new law requiring regulatory incentives for renewable energy. Morocco has also initiated several pilot programs throughout the country to generate energy from biogas.

Philippines

The delegates from the Philippines indicated that the Energy Regulatory Commission needs to increase its renewable energy mandates by adding required renewable energy portfolio standards and requiring distribution utilities to address renewable energy and energy efficiency in their integrated resource planning, which is not currently required.

Tajikistan

Energy security is Tajikistan's top priority. Tajikistan has a high potential for hydropower. By realizing some of their country's hydropower potential, they hope to reach energy independence by 2015.

To view the presentations from the Workshop, please visit our Website:

http://www.usea.org/Programs/EUPP/GCRE_September_2009/gcre.htm

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