

The University of the West Indies

Report

on

Global Renewable Energy Forum

Scaling up Renewable Energy

Leon, Mexico

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1. Objectives of the Forums

The overall objective of the Global Renewable Energy Forum is to provide a platform for proactive dialogue to strengthen interregional cooperation and encourage innovative multi-stakeholder partnerships aimed at scaling up renewable energy in Latin America and elsewhere. Furthermore, the Global Forum will represent a unique opportunity for highlighting the leadership required to promote renewable energy.

2. Overview of Discussions:

On Wednesday, October 7, at 9:00 AM the forum was opened with an inaugural session led by the President of Mexico Felipe Calderon Ramirez. Other opening remarks were given by Mexico's Secretary of Energy, Senora Georgina Kessel, the Governor of the state of Guanajuato, Senior Juan Manuel Olivia Ramirez, and the Director-General of UNIDO, Dr. Kandeh K. Yumkella. A special session followed with Carlos Slim, chairman, Slim Foundation; Lorenzo H. Zambrano, Chairman and CEO, CEMEX; and Rajendra K. Pachauri, Chairman, IPCC, and Director General, TERI. Over 1000 people from 40 countries were in attendance.

In these opening remarks it was stated that the problem of Climate Change cannot be solve without the large scale deployment of Renewable Energy (RE) Systems. This requires a 400% scale up of investments in renewables over the next 5 years while ensuring equity in fund disbursements to facilitate energy and climate justice. The poorest people in the world suffer the most from the effects of climate change. The world needs to take care of them. A mechanism must be put in place to ensure access to energy for societal development and growth. Additionally, biofuel production must not compete with our food supply.

An overview of the plans for RE development in Mexico was outlined. The need for Research, Development and Marketing of RE devices and systems were highlighted. Among these is the drive to reduce CO₂ emissions while increasing energy efficiency. This forum serves as a platform for the acceptance of Mexico into the International Renewable Energy Agency (IRENA) group of countries.

3. Plenary Sessions:

Seven Plenary sessions consisting of very high caliber panelists (see Appendix II) were conducted over the 3 days of the forum. The focus areas of each session were as follows:

Plenary Session 1: Energy Poverty, Economic and Financial Crisis and Climate Change

Plenary Session 2: Renewable Energy and Energy Transition

Plenary Session 3: Renewable Energy Potential – Reality or Utopia

Plenary Session 4: Renewable Energy and the Access Agenda

Parallel Session 1: Transition to a Low-Carbon Economy- New Techniques

Parallel Session 2: Renewable Energy for Industrial Applications (attended)

Parallel Session 3: Energy Efficiency

Plenary Session 5: Future of Biofuels: Potential and Challenges

Plenary Session 6: Scaling up Investments in renewables

Plenary Session 7: Innovative Policy and Institutional Framework

4. Summary of Plenary Discussions:

At least one panelists per sessions gave a power-point presentation (keynote speaker) highlighting their country's/company's experience, interest, goals and contribution to the development of RE. Their presentations may be viewed at <http://www.grefmexico2009.org/index.php?id=54> . The main highlights from the three days of discussions are as follows:

General:

- Energy is fundamental for addressing the multiple issues of poverty alleviation, climate change, social and economic development, global political stability and food security
- The International Renewable Energy Agency (IRENA) identified 3 major gaps:
 - *Expertise*: lack of a center of excellence to practically advise developed and developing countries willing to make the RE transition happen
 - *Financing*: no “one size fit all” solution
 - *Training/Capacity building*: work with NGO and Universities to develop training programs, incling E learning

- There seemed to be a kind of mental inertia to accepting Renewables. Proactive Policies with increased incentives, partnerships, awareness and R&D is required.
- Need a transformation of energy matrix. Must have trained Human resources, R&D and scientific policies. The role of universities is fundamental
- 1.6 billion People in the world today are without electricity. 3 million has no access to cooking facilities. They are living in areas rich in RE resources. Introduction of RE systems in these areas will provide jobs. RE is very convenient for areas that have no grid access.
- Renewable energy expansion in the Caribbean is seen as very desirable to reduce the dependence on fossil fuel imports (which is a large percentage of its GDP, except for Trinidad). Implementing 'Green' technologies will boost the Caribbean Tourism sector.
- The need for CO₂ reductions to negative values (absorbed faster than it is produced) has been highlighted as an important requirement to curb annual temperature increases.

Technology:

- Enormous potential for biomass as a major source of Renewable Energy. It can be used for a variety of purposes, including: bio-based chemicals; food; feed; fiber; fuels; and fertilizer.
- Brazil's ethanol experience demonstrates the importance of government supporting policies and infrastructure; capacity building to implement technologies and enact legislative frameworks for bioenergy. 30 years ago Brazil formulated policies to support the development of a BioMass industry. Today they are the leading producers of ethanol from sugar cane and more recently production of Bio-diesel. Brazil has 46% Renewables and sets a target of 75% within 5 years. Brazil invests \$100 Mil /year in developing Biofuel. This may be a potential source of funding for researchers. They see this as very important for energy security.
- Dramatic increase in demand for Wind Turbine. 45% of world RE sources are from wind. GE used to manufacture 10 turbines per week, now they are at 13 turbines per day. GE will localize (set up plant) in countries with big ambitious goals. This has set up great demand for maintenance services. GE has partnered with community colleges to provide specific training.
- 1.3 Million people died per year from imperfect Biogas. The black soot from burning of biomass is identified as one of the biggest contributors to Global warming. If Biomass is subjected to a process called Pyrolysis, the CO₂ and other harmful chemicals will be absorbed into the ash, which may then be used as fertilizer. There is an opportunity for developing country to take lead in research and development of Pyrolytic cookers/stoves.
- Biomass is seen as being useful for industry. There are 4000 Biogas plants worldwide ranging from 20kW to 50 MW capacities. Total capacity 1.3 GWatt. Biogas cost ~9cent/kW. Biogas is standalone.
- Sugar cane is the only source of biofuel that is currently competitive with gas at \$70/barrel. Palm oil is good too.

Policy:

- 73 countries have developed some kind of renewable energy policy .
- Policies must be customized to specific needs of the country
- RE policy must target players in energy market to obtain a win-win scenario.
- In some countries, laws are already passed to ensure grid priority for RE
- It was proposed that if CO₂ credit - trading was increased from \$10/ton to \$100/ton, significant incentives would be created for deployment of Renewable technologies
- Poland goals for 2020 are 20% of total energy demand must come from Renewables, and a 20% reduction in CO₂ emissions.
- India has a Cabinet Minister for RE that drives the introduction of new policies to support Renewables. Currently RE accounts for 34% (including Hydro, 9% without) of total demand in India's energy. 5 year goal has been set to realize 16% from renewable (non-hydro) with 4.2% CO₂ reduction.
- Key factor to attract investments is a risk assessment. Investors sees RE as risky since sustainability is usually not guaranteed or reasonable PPA agreement not in place. Need policies to ensure stability. Example, Brazil found that when wind was low in the north, rainfall was heavy elsewhere so was able to develop a wind/hydro long term solution that was seen as low risk. Usually, wind and solar mapping along with annual rainfall trends are useful risk mitigation data.

Investments:

- In 2008, US\$800 Million went into funding Renewable Energy initiatives across the globe with 400% increase between 2004 to 2008
- Current economic situation may provide considerable opportunities for increased focus on green technologies and green jobs
- Without policies and regulatory systems, scaling up investments to the levels needed to reach their potential will not take place
- Investments in the renewable energy area are complex and often risky and fragmented. It usually requires – more than most other investments in the energy sector – a greater involvement of many stakeholders including local communities and private and public sector. Promote investments to include local banks to support RE projects. Strengthen the abilities of banks to access projects, stimulate the banks. Also involve local entrepreneurs.
- Signals for investment are encouraging. Imperative to act – Climate change and Energy crisis. World Bank provides \$6 Billion to promote clean energy. The biggest shares are clean energy fund (5 bil), strategic climate fund (1 bil) and CO₂ fund.

5. Key Recommendations from this Global Renewable Energy Forum

The major points for this forum will be sent off as recommendations for the World discussions on Energy at the meetings in Copenhagen. Based on highlights of the discussions and suggestions from participants, the following recommendations were forwarded:

1. **Global Access Fund (Green Fund):** Complementary to Energy Development Goals (EDGs) strengthen multi-country database of energy services solutions. Inspired by notion of Energy Justice, establish a Global Access Fund to target access in the most chronic situations.
2. **Biofuels:** Establish comprehensive assessment of sustainability criteria of Biofuels with aim to develop a coherent set of standards and guidelines for biofuels production and use.
3. **IRENA:** IRENA has been established at a crucial time; the coming decade is pivotal in addressing climate change and for renewable energy. There has to be a strong push to encourage wide and active country membership. Solutions for fast-tracking IRENA's capacity development are needed.
4. **Regional Research Networks:** Strengthen regional research capabilities, by building on recommendation to accelerate energy R&D. Ensure appropriate regional focus and demonstration projects are being considered. This recognises that localities matter, RE solutions should be in harmony with local ecosystems, an important precursor to adaptation development.
5. **UN Energy and Industry Partnerships:** There is a need to clarify the appropriate governance of the global energy agenda. Should this be focused on a single institution or implemented through consortia and partnership? UN-Energy needs to develop strong working relationships with industry, in its drive to foster sustainable energy solutions around the world. This could include partnerships to address specific issues of joint interest.

6. Benefits to the UWI and Caribbean

The CARICOM programme manager for Energy affairs gave a presentation on RE in the Caribbean. There is a Caribbean Renewable Energy group that currently partner with OAS and UNIDO and several initiatives have been proposed to support the Caribbean perspectives. The fact that the island states are relatively small means that they are not attractive to major funding companies. However, it is believed that our efforts are somewhat scattered and we need to consolidate our resources and embrace partnership for the better good of the region.

The Tertiary institutions in general and the University of the West Indies, in particular, will have a crucial role to play. The CARICOM programme manager for Energy, Mr Joseph Williams stated that he has a vision for RE in the Caribbean and that the Tertiary institutions will have a major role to play.

7. Paul Aiken Proposals

Paul Aiken is making the following proposals based on the discussions of the various panelists and the information received from the many display booths, along with his knowledge of the technology of renewable energy systems:

1. The UWI should lead in formulating programmes that dramatically increase public awareness in clean energy and environment across the Caribbean. Such programmes may include:
 - a. Public lectures
 - b. Regular media publications
 - c. Essay competitions for Secondary and Tertiary school students
 - d. Workshops and conferences
2. Each Caribbean country must set targets for RE implementation. Such targets must include timeline for a specific percentage of RE capacity and percentage CO₂ reduction.
3. Each Caribbean country must identify its Renewable Energy Potential. Such potential may be obtained from the creation of Wind Maps and Solar irradiance Maps for each country, and a study of its annual rainfall patterns. The expertises to perform these analyses already exist within the Climate Studies and Alternative Energy Research groups of the Department of Physics, Mona Campus, UWI.
4. Each Caribbean country must develop and implement policies that encourage the use of Renewable energies. Such policies should include:

- a. Reliable sources of RE have priority to connect to the national electrical grid.
 - b. Reasonable and competitive rates per kWh.
 - c. Government incentives for RE implementation.
 - d. Continuous support for research, development and deployment of RE devices and systems.
5. Implementation of 2, 3 and 4 above will serve as risk mitigation for potential investors. That is, investments will be significantly improved.
6. Develop CO₂ trading and use savings to drive research and development in Renewable Energies.
7. Develop Low cost Manufacturing in the following areas so that lower cost and increased jobs may be realized:
- a. Assembling of Photovoltaic Panels (solar cells)
 - b. Wind Turbine and blades
 - c. Biogas systems
 - d. Hydrogen generation and storage
 - e. Fuel cell technologies
 - f. Sustainable RE Power plants for home and industrial usage
 - g. Energy efficiency solutions

8. Acknowledgements:

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- Vice Chancellor, Prof Nigel Harris for insisting that the UWI should be represented at this important world gathering.
- Annette Insanally for her liaison efforts between the Department of Physics, the Office of the PVC and the Vice Chancellor.
- My colleagues in the Department of Physics for expressing their confidence in my abilities and allowing me the time-off for this trip.

Appendix I

Recommendations that were made from the International Energy Conference, Vienna, Austria 22-24 June 2009:

1. *Energy Development Goals for 2030*: To create Energy Development Goals (EDGs) for energy access, targeting 2030, a 20-year plan with milestones to reach these targets focused at country and regional levels and establish mechanisms for rapid dissemination of best practice and capacity building.
2. *Energy Efficiency Fast Track*: To establish energy efficiency targets with particular focus on sectors (e.g. power generation, transport, buildings, industry) at the country and regional levels. Establish mechanisms for identification and dissemination of best practice and capacity building.
3. *Accelerate Energy Research and Development*: To identify technologies needed to address climate change, energy access and other technologies. To monitor developments, especially best policy and practices. To recommend new areas for government support and consideration.
4. *Diffusion of Energy Technologies*: To catalyze diffusion of technologies needed to address climate change, energy access and other energy targets. To propose solutions to more rapid diffusion of technologies that avoids “technology lock-in”, including financing options.
5. *Strengthen UN-Energy*: The recently constituted UN-Energy is an inter-agency mechanism uniquely placed to influence global energy developments. The legitimacy of the UN, allied with a strengthened proactive secretariat is needed to address the challenges of the coming decade. The area of focus would be energy and its links to security, environment (including climate change), resources (including water and food), and poverty.
6. *Global Energy Support*: UN-Energy needs a deep understanding of all aspects of global energy. The Global Energy Assessment provides a valuable support structure that could be expanded and institutionalized to meet UN-Energy’s needs.

Appendix II

Plenary Sessions and list of Panelist:

http://www.grefmexico2009.org/fileadmin/files/GREF2009_programme.pdf