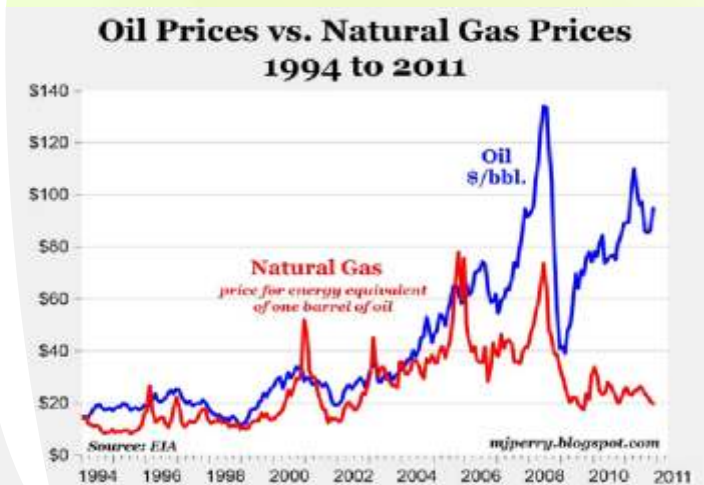




A Natural Gas Option for CARICOM's Power Sector?

Not Green but Clean and Cheap

Natural Gas (NG), a hydrocarbon and fossil fuel, is considered to be a clean alternate energy source to petroleum-based energy, given that it has a much lower global warming potential (GWP) or carbon footprint than petroleum. However, being a fossil fuel it is finite and non-renewable, and is therefore not considered a green or sustainable energy source. Given its lower carbon footprint compared to other fossil fuels such as petroleum and coal, NG is promoted as one of the cleaner fuel options in the fight against Climate Change, and is often considered as a 'bridging fuel' between the status quo and full deployment of renewable energy (RE) resources for power generation. NG is typically transported via pipelines or in the form of liquefied natural gas (LNG) which requires liquefaction at source and regasification at its point of use. Compressed natural gas (an alternative form of NG) is another option, however, this is not yet widely used.



Explore this issue:

	Page
Viewpoints	2
Minister with Responsibility for Energy – Part 7	4
Energy Efficiency Appliance Labelling in CARICOM	5
Msc RE Management Now Offered by UWI	6
High Level Sustainable Energy Meeting of SIDS	7
Steadily Marching On: Geothermal Development in Dominica	9
Guyana Energy Agency's Solar PV Project	11
Outcome of the Rio+20 Conference on Sustainable Development	12

Trinidad and Tobago is the Natural Gas Capital of the Caribbean, being the lead producer and only exporter of NG, with Barbados being the only other producer supplying its power generation and domestic residential markets. The Eastern Caribbean Gas Pipeline Company (ECGPC), a private sector company, is pursuing the supply of NG via pipeline from Trinidad and Tobago to Barbados. This initiative is being supported by the respective Governments.

Indeed, NG has become more important than oil to the economy of Trinidad and Tobago's economy, and since 1996, its production has surpassed oil. It is used as fuel for electricity generation and as feedstock for the downstream NG industry. Additionally, until recently, Trinidad and Tobago was the largest exporter of Liquefied Natural Gas (LNG) to the USA (this has however changed due to abundant discovery of natural gas in form of shale gas by the US in recent years).



Hon. Phillip Paulwell,
Minister of Science, Technology,
Energy and Mining, Jamaica

CARICOM Power Sector is Eyeing the Natural Gas Option: Other CARICOM countries apart from Barbados, which are reeling from the high cost of petroleum-based (mainly in the form of diesel) generated electricity have also been considering NG for many years. From the beginning of the last decade up until the present time, Jamaica has been exploring the NG option. The Hon. Phillip Paulwell, Minister responsible for Energy in Jamaica, has in recent times reiterated the current Administration's policy to continue to pursue the NG option and has *see page 3*

THIRD CARIBBEAN SUSTAINABLE ENERGY FORUM!



St. Kitts and Nevis, 13-14 September 2012

Owing to the late discovery of a clash of schedules between the Third Caribbean Sustainable Energy Forum (CSEF III) and Exhibition and the Islands Renewable Energy Solutions Conference to be held in Malta and being organized by the International Renewable Energy Agency (IRENA) (which will be attended by many development partners and representatives from Member States), a decision was taken to reschedule the CSEF III to **13-14 September 2012** at same venue, the St. Kitts Marriott Resort in St Kitts and Nevis. Arrangements for convening the Forum are being finalised, and there has been a flurry of interest from Member States and various stakeholders for what promises to be yet another significant, exciting and successful staging of the CSEF. As noted earlier, the theme of the Forum and Exhibition is **“Advancing Energy Integration and Energy Access through Renewable Energy (RE) and Energy Efficiency (EE)”**.

The CSEF III is being staged against the backdrop of the Region's continued search for adequate responses to the major existing energy sector challenges. These are:

- *for most Member States, the issue of lack of energy security reflected in the lack of affordability of energy, linked their over-dependence on imported petroleum and its derivatives; and*
- *for all Member States, the matter of lack of energy sustainability in the context of the climate change challenge.*

CSEF III is developmental in focus. Whilst being keenly attuned to the need for identifying critical RE and EE projects and towards mobilizing financial support for same, the CSEF III seeks simultaneously to engage the input of a wide cross-section of the Regional energy sector in identifying critical Regional level (and collaborative) support for Member States' priority areas. In this regard, significant emphasis will be placed on broad participation and dialogue, as reflected by the format for various

sessions which comprise panel discussions. It is also intended that feasible recommendations will be channeled to the decision-making process in the Community. In addition, the Forum seeks to position the Regional energy sector to exploit opportunities on global level platforms represented by the Rio+20 Outcomes, SE4ALL, SIDS Dock and the green economy theme.

Representatives of all Member States, energy stakeholders, partners and experts are invited to join us at the CSEF III, to share and contribute towards advancement of the many issues surrounding the theme. Visit the CSEF III Website www.csef3.org for further details (See *Draft CSEF III Summarised Programme*).

Once again, we wish to thank the main sponsors of the CSEF III, namely, the Governments of Finland, Germany and the United Kingdom, and the European Union for their support in making the CSEF III a reality.

Sustainable Energy Events During the Latter Half of 2012: Even as we prepare for the CSEF III (St. Kitts and Nevis, 13-14 September 2012), we wish to draw to your attention and encourage support for the other significant renewable energy, energy efficiency and clean energy events to be held during the latter half of this year.

In this regard, the CARICOM Secretariat through its Energy Programme is pleased to collaborate with other Development



Mr. Joseph Williams,
Programme Manager, Energy,
CARICOM Secretariat

Partners towards the successful staging of the following events: the **CARILEC Renewable Energy Forum** scheduled for **18-19 September 2012** in Bermuda, the **Caribbean Renewable Energy Forum (CREF 2012)** from **15-17 October 2012** in Puerto Rico, and **CARICOM Energy Week** to be staged in all Member States from **11-17 November 2012**. Also, a **Regional SE Awareness Capacity Building Workshop** targeting energy stakeholders from various sectors will be hosted in collaboration with Organization of American States through its European Union funded Caribbean Sustainable Energy Program (CSEP) in **St. Kitts and Nevis from 10-14 September 2012**.

DRAFT CSEF III SUMMARISED PROGRAMME					
TIME	THEME	FORMAT	TIME	THEME	FORMAT
9:00-10:00	Opening Session	Open Plenary	8:30-10:00	Financing For Renewable Energy and Energy Efficiency Infrastructure	Plenary 4
10:30-11:50	Energy Integration in CARICOM	Plenary 1	10:30-11:50	Renewable Energy Grid Feed-in Mechanism for CARICOM (Wind, Solar)	Plenary 5
11:50-13:10	Geothermal Development: Best Practices, Instruments, Framework, Global Lessons	Plenary 2	11:50-13:10	Bio-energy Integration in CARICOM	Plenary 6
14:30-16:00	Geothermal Progress in CARICOM Member States: The current state of development and plans for exploitation	Plenary 3	14:30-15:45	New Technologies and New Approaches: Waste-to-Energy (WTE)	Parallel 2A
			14:30-15:45	New Technologies and New Approaches: Oceanic and Water Resource Technologies, Marine Renewable Energy, Smart Electricity Grid	Parallel 2B
16:15-17:30	Energy Access and Energy Poverty	Parallel 1A	16:00-17:00	Coordination among Regional and Global Initiatives: Regional Energy Policy, C-SERMS, SIDS DOCK, CCCCC, Implementation Plan, SE4ALL, ECPA and Rio +20 SE Outcomes	Plenary 7
16:15-17:30	Energy Efficiency: Transportation Sector, Standards & Labeling, Electric Vehicles	Parallel 1B	17:00-17:30	Way Forward for CARICOM Energy Sector	Plenary 8

A Natural Gas Option for CARICOM's

Power Sector? from page 1

reconstituted the Government's LNG Steering Committee to lead the National LNG Project.

The NG option has recently become more appealing to CARICOM countries as a result of two developments, viz: i) abundant discoveries of natural gas in North America and other parts of the globe which has led to lower and relatively stable prices, especially in the USA (a departure from the oil-gas price

CARICOM countries is its lower and relatively stable prices which could provide the power sector with lower cost with lower-cost fuel (as much as 20 times less in some cases), thereby addressing the affordability issue. The question therefore, is whether NG prices will remain low for a long time to come. While the jury is still out on this question, the balance of the arguments seem to be tipped in direction that the prices will remain low because of: i) the abundance of NG; and ii) the trend towards spot market pricing for LNG, moving away from the typical long-term contract pricing. Some naysayers think that much of the abundant discoveries in the form of shale gas, particularly in US,

capacity, the high energy cost situation is so adverse that there is need for an immediate shift away from diesel to ensure economic survival and social stability. However, given the size of the markets, the substitution of diesel generation with NG generation could ultimately mean delaying the implementation of RE for the power sector. Yet for others, such as, Dominica, Guyana, and St. Kitts and Nevis, the issue of NG competing with RE may not even be relevant as these countries are already well advanced in pursuing RE to power close to one hundred percent (100%) of their power demand such that, natural gas need not be considered a threat.

Standard LNG Ship	Small Scale LNG Ship	Transshipment
		
<ul style="list-style-type: none"> • Single 145,000 m³ ship can serve ~1,300 MW • Cost = US\$6.78 per MW-hr • Requires large scale terminal 	<ul style="list-style-type: none"> • Single 12,000 m³ ship can serve ~ 100 MW • Cost = US\$19.65 per MW-hr • Can serve small scale terminals 	<ul style="list-style-type: none"> • 145,000 m³ to transshipment terminal (1,500 nm), can serve 1,500 MW • 12,000 m³ serves small scale terminals (500 nm), can serve ~ 300 MW • Cost = US\$11.90 per MW-hr (excl. transshipment fees)

indexation observed before); and ii) the development and use of smaller shipping vessels which makes it economical to supply the relatively small demands of CARICOM countries.

This move towards NG for the power sector in CARICOM is also in keeping with global practice, where it is observed that no developed country uses petroleum to generate electricity for its power sector. Also, Wartsila Caribbean Inc. through its Vice President Power Plant Sales, Rodney George, is promoting the idea of using natural gas (in the form of LNG) to displace the use of diesel fuel in the power sector. This would require the addition of gas-burning capabilities to the Wartsila diesel plants which are used by the majority of electric utilities in the Caribbean. There is also a push by some private sector entities in Trinidad and Tobago for the development of a dedicated natural gas liquefaction plant to supply LNG to the Caribbean.

Will the Price of NG Remain Low? As noted, the key attraction of NG for

will go unexplored because of the environmental challenges associated with hydraulic fracturing which is used to access NG in shale rocks, and the power of environmental lobbyists, as seen in their influencing the US' rejection of the Keystone XL Pipeline Project.

Is it Natural Gas (NG) versus Renewable Energy (RE) for the Power Sector? The question has been raised as to whether it should be NG versus RE for the power sector in CARICOM. One response has been that the two sources (NG and RE) should be viewed as complementary rather than competing. This is true for some territories, such as The Bahamas and Jamaica, and especially where there is insufficient baseload type RE resource to meet the grid demand, as NG could help to provide baseload power and also become a better back-up (than diesel) for the intermittent RE sources.

For other territories such as Antigua and Barbuda, and St. Vincent and the Grenadines that have small demand and

CARICOM's Debate on Trade in Natural Gas: For many years, there has been a debate on trade in NG in CARICOM, which hovers around the issue of pricing and access to the NG resource in Trinidad and Tobago by other CARICOM countries. While this issue remains unresolved, the CARICOM Secretariat in 2010 engaged the Inter-American Development Bank to conduct an independent Energy Pricing Study which sought to clarify many of the issues. Some findings relevant to the debate were that:

- The price of LNG is set by the market and not Government;
- In the context of Trade Rules, LNG is a different product from NG in its unliquefied form; and
- LNG is not consumed in Trinidad and Tobago.



Minister with Responsibility for ENERGY – PART 7

INTERVIEW WITH DR. THE HON. EARL AZIM MARTIN, MINISTER OF HOUSING, PUBLIC WORKS, ENERGY AND PUBLIC UTILITIES, ST. KITTS AND NEVIS

Energy: What is the Government's vision for the energy sector in St. Kitts and Nevis?

Minister: The Federation of St. Kitts and Nevis wants “to become an island nation with a sustainable energy sector where reliable, renewable, clean and affordable energy services are provided to all its citizens”. This will require a comprehensive transition towards a more sustainable energy balance in which everyone – government, utilities, businesses, non-governmental organisations, and citizens – should take part and will extract benefits. This will allow the nation to: (i) transition from the status-quo or business-as-usual to “an island nation with a sustainable energy sector”; and (ii) adapt to the rapidly changing international and local energy market conditions.

Energy: What would you say is the single most important opportunity or single most significant challenge facing the energy sector in St. Kitts and Nevis?

Minister: Given the vulnerability of the economy of St. Kitts and Nevis which is heavily dependent on imported petroleum, and given the sharp and continuous rise in petroleum prices, it is imperative that the Federation does all that is within its power to help ensure a secure and reliable energy supply by exploring alternative forms of



Dr. the Hon. Earl Azim Martin
Minister of Housing, Public Works, Energy and Public Utilities, St. Kitts and Nevis

energy such as solar, wind and geothermal. Our single most significant challenge in moving towards the installation of renewable energy is the instability of our electrical grid and also the current legislation which is now being reviewed to allow for the development of renewable energy.



Energy: St. Kitts and Nevis' aggressive move towards renewable energy development has been noted: St. Kitts is in the process of developing a Wind Farm and Nevis has installed a 2.2 MW Wind Farm, and is also developing its

geothermal potential. One could say that St. Kitts and Nevis is on track to becoming an energy independent nation (at least for electricity) and a carbon neutral country, as well as a net exporter of energy. How soon do you envisage this becoming a reality?

Minister: It is difficult at this time to say when this will become a reality. The development of our geothermal resources could see this happening in the near future. However, the geothermal development has been slow in coming due to some legal matters. Once this hurdle is crossed, we will be in a position to announce our plans to be 100% free of diesel-power generation. Such geothermal development also impacts other energy sectors such as transportation. We are eagerly anticipating the day when we can see geothermal development come to fruition.

Energy: In your view, how important is the Regional approach to energy sector development?

Minister: A Regional approach is very important. We can't do it alone! St. Kitts and Nevis can do so much, but as a collective, we in the Region would be able to move quickly to the production of safe, efficient, reliable, affordable and environmentally friendly energy generation and supply.

  Caribbean Sustainable Energy Roadmap and Strategy (C-SERMS) Update			
Project	Caribbean Sustainable Energy Road Map and Strategy (C-SERMS) - PHASE 1		
Key Objectives	Establishes strategic framework and regional level action plan for sustainable energy development	Funding Agency	Initial funding for Phase 1 from the Inter-American Development Bank
	CARICOM Secretariat	Funding	US\$ 500,000
Targeted Countries	All CARICOM Member States	Implementation Period	25 October 2010 - 24 April 2013
Update on Activities	Component 1: Inputs to C-SERMS – Consultancy to Map Existing Studies & Develop First Phase Roadmap: <ul style="list-style-type: none"> Tender was closed on 29 June 2012 In the stage of finalization of Contract The Consultant is expected to commence work by 30 July 2012 Component 2: Capacity Building for Research, Development, and Science and Technology for Sustainable Energy: <ul style="list-style-type: none"> Work commenced on 28 May 2012 and is expected to conclude by 30 October 2012 		
Upcoming Events	Proposed dates for implementation of training and capacity building for R&D 13 September 2012, Kingston, Jamaica 20 September 2012, Georgetown, Guyana		

CARICOM ENERGY WEEK



NOVEMBER
11-17, 2012

Energy Efficiency Appliance Labelling in CARICOM!!!



CREDP-GIZ and OECS Secretariat Launch Sub-Regional Energy Efficiency Labelling Project in Saint Lucia, April 2012

It is well established globally that in order to significantly improve energy efficiency in the domestic and commercial sectors, the matter of improving the efficiency of appliances and equipment is an absolute necessity. This is typically done through appliance and equipment labelling programmes.

Currently, most equipment sold in CARICOM Member States are not labelled and no minimum energy performance standards are applied in the Region. It should be noted that the Jamaica Public Service Company Demand Side Management (DSM) Programme had in the past attempted to establish a small such pilot sometime ago, however until recently, there has been no significant effort to address this matter.

The success of the Caribbean Renewable Energy Development Programme (CREDP-GIZ) and the Organisation of Eastern Caribbean States (OECS) Secretariat in securing co-financing from the EU ACP Energy Facility to implement an Energy Efficiency (EE) Labelling Project is welcomed and timely. The Project which seeks to promote the introduction of EE labels and standards for electrical household appliances and lighting equipment was launched in Saint

Lucia on 26 April 2012. Although the scope of this twenty-four (24) month Project is quite limited, targeting only the six independent OECS countries in CARICOM, it is intended that the results of the Project will be applied under a more expanded programme for all CARICOM Member States in the future.



Sen. the Hon. Dr. James Fletcher, Minister of Public Service, Sustainable Development, Energy, Science and Technology, Saint Lucia delivering the Keynote Address at the Workshop



Cross-section of workshop participants

energy efficiency (EE) in the six countries by introducing EE labels and standards for electrical household appliances and lighting equipment.

Key Activities: The Project will:

- Raise the general awareness of EE among the population of the six participating countries, and educate importers/retailers of electrical equipment and consumers about the different labels that currently exist.
- Conduct a training programme for importers and retailers, as well as, develop a consumer's guide for EE labels.
- Raise the awareness of the general public through campaigns, awareness activities in schools and a household survey.
- Prepare a Model Legislative Framework for the region - to make EE labelling of selected electrical household appliances mandatory and to establish EE standards.
- Provide capacity building for Bureaus of Standards enabling them to do at least random testing, in order to supervise the adherence to mandatory programmes.

Targeted Countries: The six independent Organisation of East Caribbean States (OECS) countries, namely, Antigua and Barbuda, Dominica, Grenada, Saint Lucia, St. Kitts and Nevis, and St. Vincent and the Grenadines.

Objectives: The objective is to promote



Master of Science in Renewable Energy Management now offered by the University of the West Indies

Through the CARICOM Secretariat executed Caribbean Renewable Energy Capacity Support (CRECS) Project funded by the European Union (EU), the Region now has a full Master of Science (MSc) degree Programme in Renewable Energy Management, which will be offered at the University of the West Indies. **This Masters Programme is scheduled to commence offering in September 2012 at the Cave Hill Campus.**

Course of Study

This 15-month full time course (27 months part-time) leading to an MSc. in Renewable Energy (RE) Management will be delivered face-to-face. A 3-month Research Project/ Research Internship based on campus or with a host organization is included in the Programme. The Programme is highly interdisciplinary and requires basic knowledge of mathematics, physics, and management, as well as, awareness of environmental and socio-economic policy issues.

Programme Content

The Programme comprises renewable energy based courses and management courses. Students must complete nine compulsory and three elective courses.

Course Delivery

The MSc. in RE Management is being offered by the Faculty of Pure and Applied

Sciences at the Cave Hill Campus, with support from the Department of Management Studies in the Faculty of Social Sciences.

Acknowledged experts from the University of the West Indies and other industrial, research and educational institutions will deliver the Programme. In particular, the Programme will benefit from an agreement with the **University of Flensburg, Germany**. To this end, members of that University's renowned and well established Sustainable Energy Systems and Management (SESAM) team, and renewable energy experts from their sister university, Flensburg University of Applied Sciences will deliver some of the courses.

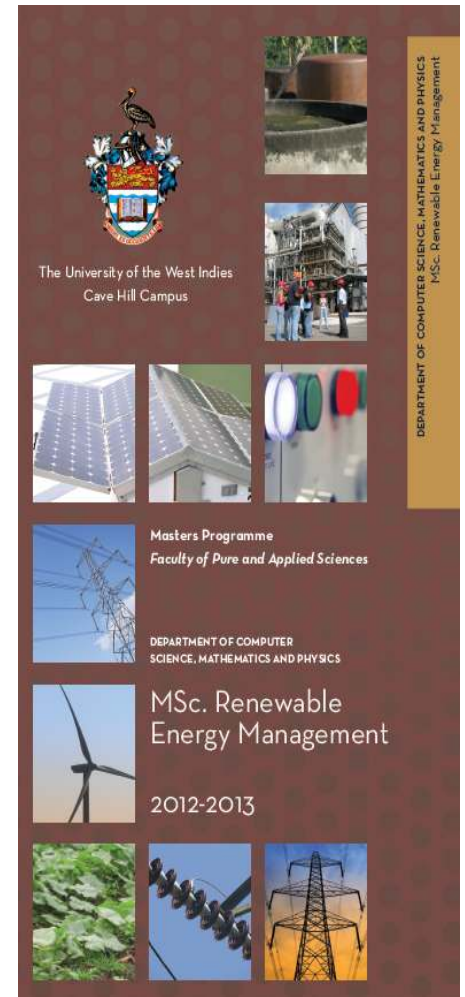
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Cover Page of MSc RE Management Programme Brochure



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Third Caribbean Sustainable Energy Forum (CSEF III) and Exhibition 2012
September 13-14, 2012
Saint Kitts Marriott Resort and the Royal Beach Casino, Saint Kitts and Nevis

High Level Sustainable Energy Meeting of SIDS, Barbados, 7-9 May 2012

under the International Year of Sustainable Energy for All (SE4ALL) in Preparation for Rio+20

The High-Level Conference of the Small Island Developing States (SIDS) on Achieving Sustainable Energy for All (SE4ALL) took place on 7-8 May 2012 in Bridgetown, Barbados, followed by the Rio+20 SIDS Informal Ministerial Meeting on 9 May at the same venue. The Conference which was organized by the Government of Barbados in partnership with the United Nations Development Programme (UNDP) multi-country office for Barbados and the Organisation of Eastern Caribbean States (OECS), in collaboration with the CARICOM Secretariat was attended by approximately 150 participants, including Heads of Government, Ministers and other Government Representatives from the twenty-nine (29) SIDS, UN Officials, Representatives from intergovernmental and non-governmental organisations, and the private sector. The Conference which was organized by the Government of Barbados in partnership with the United Nations Development Programme (UNDP) multi-country office for Barbados and the Organisation of Eastern Caribbean States (OECS) was attended by approximately 150 participants, including Heads of Government, Ministers and other Government Representatives from the twenty-nine (29) SIDS, UN Officials, Representatives from intergovernmental and non-governmental organisations, and the private sector.



The Hon. Freundel Stuart, O.C. M.P., Prime Minister of Barbados stressed Barbados' active efforts in promoting sustainable energy both on the supply and demand sides, through expanding renewable energy and increasing energy efficiency, respectively. He emphasized regional Caribbean initiatives on sustainable energy and strongly commended the creation of the SIDS DOCK.

Barbados' Prime Minister, the Hon. Freundel Stuart O.C. M.P. delivering the Keynote Address

At the conclusion of the High-Level Conference of the SIDS Achieving Sustainable Energy for All, participants adopted the Barbados Declaration on Achieving Sustainable Energy for All in SIDS, which recognizes challenges and opportunities in achieving sustainable energy, and welcomes the voluntary commitments by nineteen SIDS to promote transformational activities in the areas of renewable energy, energy efficiency, energy access and low-carbon development.



Delegates being greeted by a performance by AJA and the Peace Ambassadors during the Opening Ceremony



Section of the audience



The Hon. Joy Grant, Minister of Energy, Science, Technology and Public Utilities, Belize, reiterated the significance of sustainable energy for sustainable development in SIDS, and highlighted SIDS' similar but unique circumstances. Unlike other SIDS, she said, Belize obtains sixty-five percent (65%) of its electricity from renewable energy (RE) and further noted Belize's potential of expanding RE such as biomass, solar and hydro, as well as energy efficiency. She stressed the importance of building strategic regional partnerships with clearly defined roles, institutional capacity building, and financial assistance.

Joseph Williams, Programme Manager, Energy, CARICOM Secretariat, pointed to overarching problem of overdependence on imports. He also noted that a more analytical and data-based approach is integral to the establishment and adjustment of energy policies. He underscored the importance of access to mechanisms, such as micro-financing opportunities towards ensure that effective energy efficient measures are implemented. He opined that it is possible to double the rate of improvement in energy efficiency in SIDS by 2030, but that Governments would need to lead the effort. He reiterated the need for initiatives to be evidence-based, coherent and consistent.

see page 8

High Level Sustainable Energy Meeting...

from page 7



The Hon. Nazim Burke, Minister of Finance, Planning, Economy, Energy and Cooperatives, Grenada, presented the status of sustainable energy initiatives and developments in Grenada and identified SE as one of the five pillars of economic transformation in Grenada. Minister Burke noted that high energy prices continue to constrain the development of SIDS. Burke referred to the extensive requirements of funding institutions as a hindrance to SIDS' access to finance, and stated that the process needed to be simplified to expedite financial access for renewable energy initiatives.



The Hon. Julian Robinson, Minister of State in the Ministry of Science, Technology, Energy and Mining, Jamaica, discussed national policies aimed at achieving sustainable energy goals and highlighted the Government of Jamaica's targets for 2030. He also highlighted several related initiatives and actions, including an Inter-American Development Bank (IDB) funded project aimed at increasing energy efficiency and conservation in the public sector.

CARILEC with Support from the IDB Develops a Model Power Purchase Agreement (PPA) for Renewable Energy Supplied to the Grid

A Prototype Power Purchase Agreement (PPA) to encourage the deployment of renewable energy technologies has been developed by CARILEC. This Prototype PPA is one of the deliverables under the three year IDB-funded Energy Efficiency and Renewable Energy Project being executed by CARILEC. The Project which commenced in 2009 is geared at enhancing CARILEC's capability to assist its members and stakeholders in improving their efficiencies, and promoting the use of renewable energy technologies and alternative fuels in the Caribbean region. The Prototype PPA can be accessed at [http://carilec.com/technical/Carilec Final Prototype PPA.pdf](http://carilec.com/technical/Carilec%20Final%20Prototype%20PPA.pdf)

CARICOM Countries Score Low on RE Investment – IDB

CARICOM countries were rated in the lower half among 26 countries that participated in a Climatescope survey which examined their ability to foster low carbon energy growth. Climatescope which was established by the Multilateral Investment Fund (MIF) of the Inter-American Development Bank (IDB) and Bloomberg New Energy Finance used thirty indicators to measure a country's ability to attract capital to build a greener economy, aggregated into scores from zero to five, with five representing the best investing environment. Countries were ranked based on four parameters: enabling framework, clean energy investments and low-carbon financing, low-carbon business and clean energy value chains, and greenhouse gas management activities.

The highest ranked country was Brazil which scored only 2.6, indicating ample opportunity for improving conditions to attract more capital for low-carbon and renewable energy capacity. Jamaica at number sixteen topped the eight CARICOM countries included in the survey. The other CARICOM countries in order of their rankings were Belize, Barbados, Bahamas, Haiti, Trinidad and Tobago, Guyana and Suriname. The IDB noted that while Latin America and the Caribbean boasts extraordinary renewable energy resources, the local clean energy sector in this region is just beginning to gain traction, attracting less than five per cent (5%) of an estimated US\$280 billion invested worldwide last year.



Steadily Marching On!

Geothermal Development In Dominica

By Michael Faddelle
Senior Project Officer/ Coordinator
Renewable Energy Program Ministry of Public Works,
Energy and Ports, Dominica

The Government of Dominica has placed a high priority on geothermal energy development. The possible benefits of low cost and affordable electricity, energy security and independence, increased foreign exchange earnings and a reduction in the importation of petroleum products, in addition to reduced greenhouse gas emissions, will substantially contribute to improvement in the standard of living of all Dominicans, and will enhance Dominica's international image as *The Nature Island*.

studies to support commercialization of the project. Approximately twenty megawatts (20 MW) of electricity will be reserved for the local market.

The wells which were drilled in a triangular format in Laudat and Wotten Waven within the geothermal resource area have confirmed the existence of a geothermal reservoir extending approximately 15 square kilometres, as suggested from preliminary studies



Geothermal development in the Roseau Valley area, Dominica

This development is also significant from the sub-regional (OECS) and regional (CARICOM) standpoints, in terms of its transformative potential for the energy sector.

Results of Drilling: The exploratory drilling component of Dominica's geothermal resource exploration project was completed at the end of April 2012 with very favourable results.

Three exploratory "test" wells were drilled to depths that would access the geothermal reservoir, and that would provide information on its location, size, temperature and pressure, and therefore its energy potential. Further studies will be conducted to determine the financial and technical feasibility of the export of forty megawatts (40 MW) electricity each to Martinique and Guadeloupe via a submarine interconnection cable, as well as the preparation of economic and business

(studies carried out between 2004 - 2009 with assistance from the Organisation of American States (OAS), and subsequently, the EU- funded Interreg IIIB Project). **The initial flow tests of each well have indicated reservoir temperatures in the order of 240 Degrees Celsius proving beyond any doubt that the Roseau Valley geothermal resource area has the potential to generate at least one hundred and twenty megawatts (120 MW) of electricity.**

Environmental and Social Management: There were no significant environmental or social risks during drilling and testing activities. Toxic gas levels were monitored at all times during drilling and testing. Cuttings, drilling fluid and geothermal fluid are being analysed before a final decision is taken on their disposal. There was no surface run-off and all fluids were collected in concrete pits. Meetings were held at nearby communities

before and during drilling, and well testing activities to inform on the progress of drilling activities, and to sensitise residents of possible risks.

Support and Partners: Support for the proving Dominica's geothermal energy resources in the Roseau Valley include:

- Co-financing from the European Union (EU) and the French Agency for International Development (AFD) totalling 5.5M Euros for initial work on the Project.
- Establishment of the Project Management Unit and costs related to site access and site preparation works supported by the Government of Dominica.
- Grant funding to the tune of €1.1. M pledged by the European Investment (EIB) to conduct feasibility and engineering studies of the submarine electrical interconnection component, and to define the optimal power rating of the proposed link.
- €100,000 from ADEME for the drilling Environmental Impact Assessment.
- A commitment from the Government of Iceland to provide the necessary technical support to ensure the existence of a more knowledgeable, trained, competent and efficient professional pool of technical and administrative personnel in the geothermal energy sector in Dominica, and the emergence of an efficient geothermal energy power sector in that country.
- A Memorandum of Understanding signed between the Government of Dominica and the International Finance Corporation (IFC) leading to the execution of a Cooperation Agreement that will address upstream issues related to geothermal development through IFC's provision of knowledge, strategic guidance and technical support during 2012, to ensure that the conditions are in place for a Public-Private Partnership (PPP).
- A Memorandum of Understanding signed between the Government of Dominica and the William J. Clinton Foundation/Clinton Climate Initiative (CCI) commits both parties to make use of their respective resources to explore cleaner energy options for Dominica. It

see page 10



SATIS 2012 Workshop

Jointly coordinated by the Caribbean Solar Energy Society (CSES) and the CARICOM Secretariat with the support of the Government of Spain through the Spanish Agency for International Development Cooperation (AECID), the Eighth Sustainable Applications for Tropical Island States Workshop (**SATIS 2012**) was held in Bridgetown, Barbados from 9-11 May 2012.

Government of Barbados' wide range of sustainable energy initiatives in establishing that Government's commitment to sustainable energy development.

His Excellency Joaquin Aristegui LaBorde, Ambassador of Spain to CARICOM, also addressed the Opening Ceremony. He informed the audience that

and despite the current challenges faced by Spain, reaffirmed his Government's commitment to lending its expertise to countries and/or bodies within the Region that are interested in advancing the use of RE.

The CARICOM Secretariat was represented by Mr. Joseph Williams, Programme Manager, Energy, and the Organization of American States (OAS) by Mr. Kevin de Cuba, ECPA Caribbean Initiative Manager, Division of Energy and Climate Change Mitigation.



Left to Right: Dr. Jacqueline Bridge (UWI/CSES), Mr. Joseph Williams (CARICOM Sec), the Hon. Sen. Darcy Boyce (Govt. of Barbados), Dr. Indra Haraksingh (UWI/ CSES), H.E. Joaquin Aristegui LaBorde (Ambassador of Spain to CARICOM), and Mr. Kevin de Cuba (OAS) at the Opening Ceremony of SATIS 2012 Workshop.

Steadily Marching On! Geothermal Development In Dominica

from page 9

is anticipated that the results of these development programmes will culminate in a coordinated and integrated approach for geothermal energy development over the next 12 – 18 months.

The Government of Dominica acknowledges the invaluable support of all of its development partners, including the Government of Iceland, the Organization of American States (OAS), L'Agence Française de Développement (AFD), the European Union (EU), the European Investment Bank (EIB), the Regional Council of Guadeloupe, the Regional Council of Martinique, French Environment and Energy Management Agency (ADEME), the French Geological Survey (BRGM) and the French Geothermal Company (CFG), and thanks them for their continued support throughout this initiative and in the further development of Dominica's geothermal resources. The Government of Dominica also wishes to recognize the invaluable support and encouragement of the CARICOM Secretariat through its Energy Unit in advancing the development of the energy sector in Dominica, and in particular, in the rationalization of the institutional and capacity frameworks of the Energy Sector.



Climbing on the roof of the Barbados National Oil Company building to view the PV Installation

The workshop provided training to approximately thirty representatives from CARICOM Member States on various renewable energy (RE) technologies, in particular, solar thermal systems, photovoltaics, wind energy and solar cooling.

Senator the Honourable Senator Darcy Boyce, Minister in the Office of the Prime Minister with responsibility for energy in

Spain was one of the world's largest investors in sustainable energy and indicated that thirty-seven percent (37%) of their electricity needs was met from RE. He outlined some of the challenges with the penetration of RE technologies and further noted that his country had "a wealth of experience in the most problematic areas of renewable energy: cost-effectiveness, technological challenges, and raising public awareness and

Guyana Energy Agency's Solar PV Project: A Model for Solar PV Demonstration

If demonstration projects are supposed to be models in themselves, then the Guyana Energy Agency's (GEA) Solar PV demonstration is a model, model Project to bridge the knowledge gap for the average citizen with respect to the operation, performance and integration of solar PV systems.

time power generation and energy consumption can be viewed from the GEA website www.gea.gov.gy.



While the installed capacity of the system is 8.46 watts, the actual power output will vary depending on a number of factors such as the position of the sun, amount of

removing costs associated with demonstration), the payback would be just under seven (7) years. The carbon dioxide emissions savings is approximately 11, 116 kg per year.

Currently, the system is operating on a net metering arrangement with the local power company using the existing meter. A module upgrade was sourced and installed, allowing the meter to now read energy received from the grid, energy supplied to the grid and net energy. As a first in Guyana, this arrangement serves as a basis for continued dialogue in areas such as legislation, tariff considerations, standards and policy implementation.

Being the first of its kind in Guyana, this

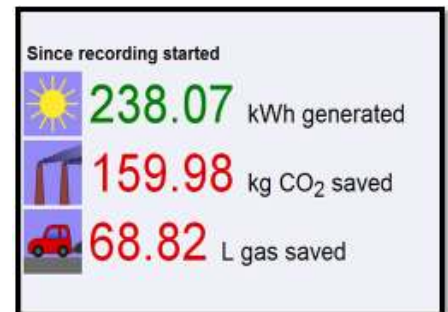


Solar panels mounted on the container shed in GEA's compound

With funding support from Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the Guyana Energy Agency (GEA) recently completed the installation of an 8.46 Grid Tie System. The system, located in the compound of the GEA, will serve as a demonstration project to advance research in solar energy and grid tie technology.



Sample of operational data display from GEA PV Demonstration Project



The overarching objectives of the installation were to:

- promote the use of renewable energy in Guyana;
- gain an understanding of grid tie opportunities to promote the use of renewable energy in Guyana;
- demonstrate the use and application of solar PV grid tie technology.

To assist in achieving these objectives, the system was complemented with a mounted forty inch Sony internet television that displays operational data, including actual power production in kW, accumulated energy production in kWh and avoided carbon dioxide emissions in kg. The benefits of this display are valued in terms of promoting awareness to the public and understanding the accumulated savings over time in a reader friendly format. Real

sunlight, extent of cloud cover, efficiency of the panels and system losses during the day.

It is estimated that the PV system will generate 13,895 kWh per year yielding savings of G\$914,429. With an effective capital cost of G\$6,304,380 (after

Grid Tie Solar PV Demonstration Project provides a working example for the incorporation of renewable energy technology into a national electric grid, and further, represents a marked step in the use and promotion of renewable energy in Guyana.

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Outcome of the Rio+20 Conference on Sustainable Development



Michelle Gyles-McDonnough
UN Resident Coordinator & UNDP Resident Representative Barbados & the OECS

An Interview with Ms. Michelle Gyles-McDonnough, UN Resident Coordinator and UNDP Resident Representative – Barbados and the OECS

vulnerability of SIDS. The agreement on a Third SIDS Conference to be held in 2014 was also an important outcome for SIDS, and the Caribbean will have to play a strong role in defining the scope, expectations and results of this Conference.

Energy : Against the background of the High Level SIDS Sustainable Energy Meeting held in Barbados in May 2012, what were the specific positive outcomes for the Energy Sector?

Michelle Gyles-McDonnough: The Sustainable Energy for All (SE4ALL) initiative was one of the major topics discussed by public, private and civil society participants at the Rio conference.

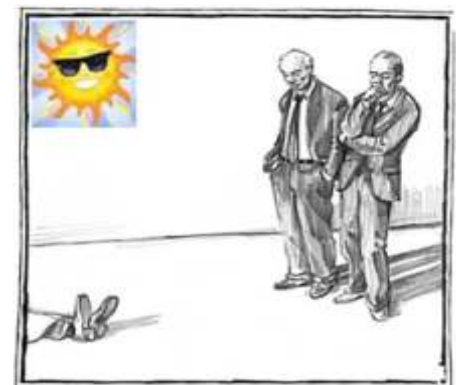
Since its inception in September 2011 and by the time of the Rio+20 Conference, 55 Governments from Africa, Europe, Asia, Latin America and the Caribbean, Arab states and the Small Island Developing States have engaged with the initiative and are assessing the state of their energy sector and developing energy plans and programmes. By the final day of the Conference, some \$513 billion in funding was committed by governments, the private sector, civil society and other groups to achieve a sustainable future. For example, the Government of Brazil demonstrated outstanding host country leadership by committing to invest further \$4.3 billion to achieve universal energy access in Brazil by 2014; and the Brazilian Development Bank (BNDES) will continue to support through its existing credit lines the production of sustainable energy in other countries, including by signing a Memorandum of Understanding with the African Development Bank.

Twenty Small Island Developing States agreed to work towards universal access to energy, switching to renewable energy, and reducing dependence on fossil fuels. These are part of the nearly 700 concrete

commitments registered at the Conference by governments, business, industry, financial institutions and civil society groups, amongst others. The level of commitments demonstrates that a powerful momentum has been established by governments, private sector companies and civil society organizations to achieve Sustainable Energy for All by 2030. Five paragraphs of the 283 in the final text of the Outcome Document are about energy. The five paragraphs are well balanced, addressing energy access, renewable energy and energy efficiency among other development aspects related to energy.

Governments in Rio emphasised the need for green economy policies to be tailored to the needs of each country and contribute to poverty eradication, and gave very clear direction to the UN System and other development partners on expected areas of development cooperation towards a green economy.

The Conference also agreed to put in place a process for the definition of sustainable development goals (SDGs), which will take account of technical inputs from the UN system through a process to be defined by the countries. Sustainable energy is likely to be one of the thematic topics considered for future SDGs.



From the violent nature of the multiple stab wounds The victim was probably a staff member trying to think out of the box, or probably telling the truth as he saw it; or even an energy specialist trying to change old habits

Energy : How would you summarize the Outcome of the Rio+20 Conference?

Michelle Gyles-McDonnough: I believe a good outcome was achieved in Rio. As you know, the Rio+20 was an opportunity to take stock, and focus on the best means for addressing the challenges experienced during the past 20 years in achieving sustainable development, emphasise the importance of, and find a path to sustained and effective implementation.


Firstly, the Outcome Document affirms the centrality of sustainable development. It puts poverty eradication and reducing inequalities at the heart of sustainable development, and highlights that the integration of economic, environmental and social policies and actions is a necessary condition for sustainable development. The recognition in the document of the middle income paradox, and the priority of reducing inequalities and creating greater opportunities for all provides a sound basis for the Caribbean's argument that we need to continue our development efforts in middle-income Small Island Developing States (SIDS).

Secondly, the outcome document highlights the challenges in implementation, and specifically recognises the importance of urgent and concrete action to address the

SOME UPCOMING SUSTAINABLE ENERGY EVENTS

1. CARILEC Engineers Conference, Dominican Republic, 23-25 July 2012
2. Quarterly Sustainable Energy (SE) Coordination Meeting of Partners Involved in SE Development in CARICOM (web-based Meeting), 30 July 2012
3. CARILEC Regulatory Forum, Barbados, 4 September 2012
4. Islands Renewable Energy Solutions Conference, Malta, 6-8 September 2012
5. Sustainable Energy Awareness Capacity Building Workshops: (i) the CARICOM Model Regional Energy Awareness Programme (MREAP); (ii) the Caribbean Energy Awareness and Education Programme (CEEAP); and (iii) Teacher's Sustainable Energy Awareness, St. Kitts and Nevis, 10-14 September 2012
6. Third Caribbean Sustainable Energy Forum (CSEF III) and Exhibition, St. Kitts and Nevis, 13-14 September 2012
7. Geothermal Congress for Latin America & the Caribbean (GEOLAC), Costa Rica, 17-18 September 2012
8. CARILEC Renewable Energy Forum, Bermuda, 18-19 September 2012
9. 12th Annual Energy Caribbean Conference, Trinidad and Tobago, 2-3 October 2012
10. Second Annual CARICOM Energy Week, 11-17 November 2012
11. 2012 Caribbean Renewable Energy Forum, Puerto Rico, 15-17 October 2012
12. Forty-first Special Meeting of the Council for Trade and Economic Development on Energy, Trinidad and Tobago, October 2012

Energy News, Magazines and Newsletters Across the CARICOM Energy Sector, especially related to sustainable energy developments have significantly increased across CARICOM over the past three years. The Caribbean Information Portal on Renewable Energy (CIPORE - www.cipore.org) continues to provide an important repository of all RE matters in the various territories. In addition, the regular monthly publications by the Caribbean Energy Information System (CEIS) are quite informative and are accessible in very user friendly formats. The following summarises the list of regular electronic and print publications which now provide a good source for obtaining updates on RE, EE, Bio-energy, Petroleum and Gas information in the Region:

-  Quarterly Electronic Newsletter - focuses on CARICOM related sustainable energy news and developments in the Region (Published by the Energy Programme at the CARICOM Secretariat).
- Sustainable Energy & Development News Review - published by CEIS
- CEIS Petroleum Update - An electronic publication by CEIS (Subscription: Free; To be added to the mailing list contact: ceis@src-jamaica.org)
- Energy Caribbean - A bi-monthly magazine which focuses on oil, gas and RE (Published by Media and Editorial Projects Ltd. (MEP); (Annual Subscription: Caribbean - US\$150, International - US\$135; Contact: energy@meppublishers.com; Website: www.energy-caribbean.com).
- CARILEC Industry Journal - A magazine for electricity industry professionals is produced bi-annually (in January and July) by CARILEC. To view or download visit: http://www.carilec.com/index2.php?menu=industry_journals&title=Industry%20Journals

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