

GLOBAL SUSTAINABLE ENERGY ISLANDS INITIATIVE

THE RACE TO BE THE FIRST CARBON NEUTRAL NATION

- BY JOHN C. TOPPING, CLIMATE INSTITUTE

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The Global Sustainable Energy Islands Initiative (GSEII) was launched in November 2000 by a consortium of international organizations, to assist the small islands states in their efforts to transform their energy base from fossil fuels to a system based on renewable and energy efficiency technologies.

A number of nations have risen to a United Nations challenge to become carbon neutral - among them New Zealand, Costa Rica, Iceland, Norway and Monaco. Some, such as Iceland with its geothermal and hydropower development and pioneering hydrogen program, and Costa Rica with its forestry programs, have made impressive progress toward winning what some environmentalists have called a Carbon World Cup. However, the betting favorite to become the first carbon neutral nation may be one of two small island developing states - the Maldives, an Indian Ocean nation with 310,000 people and an average elevation of 1.5 meters above sea level, or St Kitts and Nevis, a Caribbean island nation with 43,000 inhabitants.

The Indian Ocean nation of the Maldives can claim to be the most vulnerable nation to sea level rise. Under the 30 year rule of its former President Maumoon Abdul Gayoom, the Maldives moved climate change onto the international agenda both within the Commonwealth and the UN, but its own power sources remained expensive diesel generation. When Gayoom was defeated for reelection in October 2008 by Mohamed Nasheed, a brilliant orator and long-time political prisoner, the Maldives rapidly became a global leader in clean energy. The new President, age 42, unveiled plans in March 2009 for the Maldives to become the world's first carbon neutral nation by 2020 through an investment of US\$110 million annually for the next decade in solar, wind and wave power.

Nasheed, who has strong ties in the United Kingdom and was recently cited by Time Magazine as #1 in the Leaders and Visionaries category of its Heroes of the Environment listing, sees this transformation as freeing his nation from large oil import demands. His ambitious plans envision the construction of a 75 megawatt wind farm in North Malé atoll to provide about 40% of the Maldives' electricity. With his charismatic presence and flair for the dramatic, including recently organizing a meeting of his Cabinet in scuba gear underwater to dramatize the Maldives' vulnerability to climate change and its commitment to decisive action, President Nasheed may well be able to raise the US\$1 billion that his energy transformation efforts require.

The Maldives' most serious competitor to become the world's first carbon neutral nation may be St. Kitts and Nevis - an active member of GSEII. A 1.1 megawatt wind facility is slated for construction on



the island of Nevis in 2010, with a possibility of ultimately realizing a capacity of as much as 10 megawatts. There is a tantalizing possibility of St. Kitts and Nevis becoming not only the world's first carbon neutral nation, but perhaps the first carbon negative nation, if it can succeed in its ambitious geothermal plans on the island of Nevis.

Pres. Nasheed, before his underwater cabinet meeting

Through the OAS Geo-Caraibes Project, GSEII catalyzed exploratory drilling in 2008 by West Indies Power, Ltd., confirming the existence of harvestable power. OAS/GSEII then arranged for legal experts to draft the Geothermal Resource Bill and to help design a Power Purchase Agreement with West Indies Power providing 10 megawatts of electric power. Ultimately, if this succeeds, it is possible that geothermal power might be obtained well past the needs of Nevis, with the excess shipped by underwater cable not only to St. Kitts but to other nearby Eastern Caribbean islands. This is a friendly competition, but should either of these two island nations win the Carbon Cup, all the member nations of AOSIS may be inspired to emulate their example.



Wind anemometer on the island of Nevis

OAS LAUNCHES THE CARIBBEAN SUSTAINABLE ENERGY PROGRAM

In 2008, the Department of Sustainable Development of the Organization of American States launched the Caribbean Sustainable Energy Program (CSEP), a project designed to build upon the successes of the Global Sustainable Energy Islands Initiative (GSEII) in the Caribbean. Working in Antigua and Barbuda, the Bahamas, Dominica, Grenada, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines, CSEP aims to address market barriers to these islands' transition toward cleaner, more sustainable energy use. In particular, CSEP will help these seven nations to:

- Adopt National Energy Policies (NEPs) and Sustainable Energy Plans (SEPs)
- Build technical, legal, financial, and management capabilities of public officials, electric utility personnel, and large consumers within project countries
- Ensure the existence of capable institutions that will coordinate national and regional efforts on sustainable energy; and
- Identify commercially viable sustainable energy projects and pursue the technical assistance necessary for their implementation

During 2009, CSEP made significant progress in the target countries. The first priority has been strengthening the national energy policy framework enabling countries to set and stimulate sustainable energy goals, especially to reduce the effects of world oil price volatility. These frameworks are translated in two



Stakeholder meeting in St Kitts and Nevis

instruments, (1) National Energy Policies (NEPs), conceived as the government's declaration of intent for setting energy priorities and targets, and (2) Sustainable Energy Plans (SEPs) for guidance in NEP implementation.

As a first step the CSEP project organized a launching meeting inviting all relevant stake-

holders to explain the general goals, objectives and timeline. Government stakeholder meetings were held in several target countries, followed by broader stakeholder consultations including utilities, non-profit organizations, international financial and technical agencies, and other potential energy generators. On the basis of the progress accomplished by each target country and the consultations held, the OAS was able to provide technical assistance in several countries through developing and updating drafts of NEPs and SEPs, and encouraged their adoption and implementation.

In February, St Vincent and the Grenadines became the first target country to adopt a NEP through its Ministerial Cabinet. The NEP was announced publicly at a multi-stakeholder consultation held on July 31. Other project countries are currently considering final drafts of their NEPs/SEPs and are expected to submit these for cabinet consideration during the coming year. The OAS will remain engaged in strengthening the capacity of the energy sector stakeholders and provide public awareness, including assisting in the execution of renewable natural resource assessments, prefeasibility studies, and training workshops.

MAKING HOT WATER SUSTAINABLE AND AFFORDABLE

Energy consumption —particularly electricity— for water heating represents a significant cost throughout the Caribbean. The GSEII-UNIDO has been promoting the replacement of traditional electric heaters with solar hot water heaters, which rely solely upon clean, renewable solar power. Based on recent analysis while solar hot water heaters have the potential to provide cost savings over the long term, their up-front cost, some EC\$6,500 for an 80-gallon system, is prohibitive.

Consequently, with UNIDO's support, the Organization of American States launched the Caribbean Solar Finance Programme (CSFP). The Programme is designed to increase the access of low to middle income Eastern Caribbean households to Solar Hot Water Systems (SHWS) by fostering the issuance of loans for such systems through local credit unions. In

order to achieve this purpose, a lending facility for SHWS was created. The Programme also includes a communication and outreach campaign designed to increase consumer awareness about the benefits of SHWS.



Rooftop solar hot water heater

On October 28, 2009, the OAS held a one-day training session in Grenada on methods for analyzing and constructing loans for the purchase of solar hot water systems. The event brought together 15 lending officers from the Grenada Public Service Cooperative Credit Union (PSCCU)—one of Grenada's largest credit unions.

The lending facility provides financing for the full amount of a SHWS at interest rates of 1 to 3% for a term of 5 years. These financial terms allow for the repayment of a \$6,700 loan in monthly installments of approximately EC\$140. A comparable electric heating system would use 6.6 kWh of electricity per day, costing the consumer some EC\$153 per month..

CLIMATE CHANGE – A CHALLENGE FOR PACIFIC NATIONS AND THEIR UTILITIES

– BY THE HON. TOM ROPER, CLIMATE INSTITUTE

From a speech at the Pacific Power Association (PPA) CEO's Conference – American Samoa, August 2009

I'm delighted to participate in this conference which is so important for the ongoing development of the Pacific Nations and their citizens. Your Association is making a growing contribution as is demonstrated by your Conference title "Sharing knowledge and experience for practical, proven solutions".

We meet in an environment of many challenges, including the threat of climate change, the global financial crisis, the crippling cost of diesel on which you all depend and the unacceptable fact that 70% of Pacific Islanders don't have access to electricity.

Small Island States produce almost negligible greenhouse gas emissions but are especially vulnerable to climate change effects, particularly sea level rise and extreme weather events. Already many Pacific countries report regular flooding and Papua New Guinea's Carteret Islands are already being evacuated, the families having the unfortunate distinction of being the world's first climate refugees. Whole nations such as Tuvalu, The Marshalls and Kiribati are under threat.

Although Pacific emissions are minute, you can set an example to the rest of the world and at the same time help your own consumers by developing renewable energy and promoting energy efficiency. The recent Pacific Islands Leaders Forum meeting in Cairns tackled climate change and resolved to "promote renewable energy."

"Leaders commended the initiatives of Tonga and Tuvalu in incorporating renewable energy targets into national energy strategies." Tuvalu has set a target of 100% renewable energy by 2020 at a cost of \$20m plus. "We look forward to the day when our nation offers an example to all – powered entirely by natural resources such as the sun and the wind" said Minister Natano. Tu-

valu's first grid-connected solar system commenced operating last year as a result of an E8/Kansai Power/PPA initiative.

Higher diesel prices have had a huge impact on both national balances of payment and economies – some can barely afford for the tanker to call. Kiribati fuel imports were 25% of GDP last year. Cooks and Solomon Is-



lands customers are paying over US\$0.50 per kWh. Majuro residents were taking out light globes and turning off necessary appliances.

Renewable energy – wind, solar, hydro, biomass, coconut oil – is now cost competitive with diesel. More and more are being introduced – Samoa, Vanuatu, Solomon's – and individual systems are starting to light up the lives of the 70% of Pacific residents without any access to electricity – the Marshalls atolls 'Admire' programme.

Significant barriers need to be overcome: weak national and utility plans, dependence on traditional diesel systems, inadequate awareness and experience of various technologies, the capital cost differential between diesel and renewable, lack of development capital and donor consistency, and fly by night operators and consultants producing poor quality products and systems.

The first step is to develop an agreed government and utility plan with a practical renewable energy target including the phase out of older diesels. Changing your generating mix may result in lower costs for your consumers. Second is to improve technical capacity and experience, working with donors and other utilities. Third is carrying out proper resource assessments (to avoid

building a wind turbine where there is little wind) and identifying practical renewable and energy efficiency projects. Fourth will be to commence a comprehensive efficiency programme to stop expensive wastefulness and to benchmark comparative performance with similar utilities to assess and improve efficiency.

As part of our Global Sustainable Energy Islands Initiative (GSEII) in the Caribbean, a UNIDO sponsored Loss Reduction Strategy for DOMLEC (Dominica, 2005) found net losses of 17.1% and identified 3 interventions – reconductoring 400V lines, Capacitors addition, and reconductoring 230V lines – that would reduce losses by 6.2% of net generation with annual savings of US\$525,000. Annual diesel savings would total 344,400 gallons and 3,470 tonnes of avoided CO2 emissions.

The PPA has received US/EU assistance to promote demand side management (DSM) and will conduct with the E8 and Herb Wade two engineers' workshops in the next 6 months – modeled on last year's successful solar workshops.

Last year the PPA, a member of the Council of Regional Organisations in the Pacific (CROP), was tasked by the Pacific Energy Ministers with implementing energy efficiency and human capacity improvements in power utilities. The 2008 PPA Conference at Rarotonga "agreed that the PPA would coordinate action to improve utilities efficiency, promote the use of renewable energy and develop demand side management to help individual and business consumers reduce their energy costs".

Pacific Governments and their utility managers must act to take up the new opportunities for renewable and energy efficiency projects.

The climate change threat is here now and you and your utility can help meet it and strengthen your community at the same time.

PROMOTING SUSTAINABLE HOUSING IN GRENADA

Hurricane Ivan hit Grenada in 2004, devastating the small Caribbean nation. Approximately 90% of the country's housing stock was damaged, with 10,000 homes destroyed and an additional 18,000 needing repairs. Despite progress, there is still need for additional and affordable housing in Grenada. GSEII, in partnership with UNIDO and the Grenadian government, is working to help rebuilding efforts by introducing sustainable building techniques that utilize renewable and energy efficient technologies.

In October 2009, Nasir Khattak from Climate Institute and John Spears, the leading architect from Sustainable Design Group (Gaithersburg, Maryland) held meetings with the Ministry of Housing, Energy Division, Grenada Housing Authority and local contractors and private sector representatives to discuss how Earth Home concept developed by Mr. Spears could be introduced in Grenada.

As a result a private lot and investor was identified to build a model home in Grenada using sustainable design and building techniques and equipment. Opportunities for additional commercial and government-supported projects were also identified, which is expected to spur development and help lower ever-increasing residential electricity bills.

Planning and design of the first model home will be beginning in early 2010. GSEII is also trying to secure government commitments, including additional land for development of low income housing, marketing support for sustainable and energy efficient homes, and duty exemptions for equipment.

Joint collaborative efforts will be launched with local industries and contractors association, to support the construction of these homes, including teaming agreements

among the various contractors. As part of the project, training programs will be held for contractors on the sustainable technologies that will be incorporated into the homes.

GSEII is also developing a business plan for the Grenada Sustainable Housing Program. This plan would identify financing requirements, and will be used in part to secure capital to help implement and expand the project. The model home will be constructed to serve as the model for selling the larger development projects and to generate public interest.

By successfully incorporating renewable and energy efficient technologies into Grenadian homes, this project is expected to present a viable alternative applicable to all Caribbean nations, while reducing the reliance of the islands on imported fossil fuel.

THE GSEII CONSORTIUM

- *CLIMATE INSTITUTE*
www.climate.org
- *UNIDO (United Nations Industrial Development Organization)*
www.unido.org
- *AOSIS (Alliance of Small Island States)*
www.aosis.org
- *ORGANIZATION FOR AMERICAN STATES*
www.oas.org/real
- *ENERGY AND SECURITY GROUP*
www.energyandsecurity.org
- *COUNTERPART INTERNATIONAL*
www.counterpart.org
- *CLIMATE CARE*
www.jpmorganclimatecare.com



The stages of construction of an Earth Home designed by John Spears

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