

# The Global Sustainable Energy Islands Initiative (GSEII)

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## *Small Island States and the Clean Development Mechanism (CDM)- by Hon. Tom Roper*

Despite contributing a minuscule proportion of the world's greenhouse gas emissions, small island developing states (SIDS) are especially vulnerable to climate change, in some cases facing threats to their very existence. The Alliance of Small Island States (AOSIS) believes that, despite their small size, SIDS have an important role to play in the worldwide movement to fight climate change. For this reason, AOSIS members have been ardent advocates for arrangements that would enable them to take part in the Clean Development Mechanism (CDM).



**A view of the Marshall Islands**

Since most SIDS are especially suited to utilize combinations of modern renewable energy options, it would seem that they would be prime candidates for the CDM. Unfortunately, this has not been the case. According to the 2004 World Bank Carbon Development Fund, "Despite the steady growth of the carbon market over the last three years, four countries (India, Brazil, Chile and Indonesia) today represent two-thirds of the supply of greenhouse gas emission reductions in terms of volume...leaving the Least Developed Countries and Africa essentially bypassed, raising concerns about the long-term distribution of the benefits of the CDM."

Why does this comparative lack of opportunity for the SIDS to take part in carbon trading exist and what can be done to overcome their difficulties? Barriers include: lack of government and utilities' commitment, small size of the utilities; few personnel with the technical competence and experience to plan, develop and maintain facilities, and often high up front cost and scarcity of finance.

Despite these barriers, a number of SIDS (some of which include the Marshall Islands, St. Lucia, Dominica, Grenada) are pressing forward with renewable energy plans, and could be assisted through access to carbon funds. In order to acquire this opportunity, SIDS must meet three important requirements: SIDS governments must be receptive and have international support, SIDS must develop realistic national renewable energy plans, and operational arrangements within SIDS governments must be developed.

Nevertheless, there is still a risk of being ignored or forgotten, as demonstrated by reference to several major CDM programs that have omitted inclusion of SIDS.

To combat this, training about the CDM and its possibilities must be given to utility and government representatives in SIDS countries. Bundling projects may be necessary to lower risks and make small scale projects more financially viable. For example, a group of smaller Caribbean neighbors could combine their projects to make them more attractive to investors. SIDS governments can collaborate with banks and energy companies to negotiate the sale of potential carbon credits. New ideas for projects should be significantly considered as well.

What is certain is that, unless special measures are taken, the CDM will have sailed by with few, if any, SIDS on board.

*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 renewables and energy efficiency technologies.*

## Training in Caribbean

In July 2005, the Climate Institute in collaboration with the Center for Clean Air Policy (CCAP) organized a training session on Clean Development Mechanism for the Caribbean utilities. The training was held at the annual Engineers Conference of the Caribbean Electric Utilities Services Association (CARILEC) held in Antigua. The title of the session was: Clean Development Mechanism & Emission Reduction Credits – Opportunities for the Caribbean Utility Sector. The tutorial covered the information on climate change and Kyoto Protocol, overview of the CDM project cycle and criteria, current status of CDM project pipeline and also dis-

cussed the opportunities and challenges before the Caribbean. The session was attended by two dozen engineers from various Caribbean utilities and resulted in a number of project ideas for the electricity sector.

## Dominica Progress

UNIDO-GSEII in collaboration with Dominica's utility DOMLEC, has nearly completed an in-depth study of DOMLEC's transmission and distribution (T&D) system's operation and performance. The aim of the study is to provide DOMLEC with sufficient information to develop and implement a comprehensive electric loss reduction program.

The study has identified main sources of technical and non-technical losses and develops estimates of the contribution of each source to overall losses. A range of measures and interventions to reduce losses and improve overall operating performance will be analyzed and compared on the basis of different parameters including: i) expected reduction in annual electric losses; ii) capital cost and operating expense; iii) expected annual savings and iv) cost/benefit analysis. In the light of such analysis the study also sets out recommendations to DOMLEC on how to structure a comprehensive T&D system. DOMLEC has already included two reduction losses interventions identified by the study in its 2006 capital investment plan.

## Caribbean Solar Financing Program, St. Lucia

Representatives from the Energy and Security Group and UNIDO traveled to Castries, St. Lucia, on September 7-8, 2005, to conduct the initial phase of the Caribbean Solar Financing Program (CSFP). The Program's objective is to develop a vibrant market for solar hot water systems (SHWS) in the Caribbean Islands of St. Lucia, Dominica, and Grenada, with the program's initial implementation in St. Lucia.

Although solar energy conversion technologies (thermal and electric) have been designed and installed in the Eastern Caribbean for years, the market's growth has been restricted by a lack of sufficient and reliable financing and limited awareness among middle-income consumers as to the benefits of solar hot water heating. In order to address these challenges, the CSFP proposal includes training lending personnel, providing long-term credit, and conducting a consumer awareness campaign.

The UNIDO-GSEII team addressed each of these objectives during its September visit to St. Lucia. Representatives of 10 of St. Lucia's 18 credit unions participated in a training course designed to familiarize them with SHWS technology and introduce methods for analyzing and constructing loans for credit union members interested in pur-



**Solar water heater in St. Lucia**

chasing SHWS.

In addition, the Trust for the Americas and the St. Lucia Cooperative League Limited, the cooperative credit league representing St. Lucia's credit unions, signed an agreement for the establishment of long-term, low-cost lending to support the purchase of SHWS by low- and middle-income credit union members. Under the Trust's supervision, the League and participating credit unions are currently structuring the lending facility.

The UNIDO-GSEII team also addressed the Consumer Awareness Campaign by meeting with the League Advisory Committee, which is coordinating the Campaign's development, and the public relations companies that will conduct the Campaign. Substantial me-

dia interest is contributing to the Campaign's successful launch, with the broadcast of two radio and two television interviews during the visit.

The adoption of SHWS technology in the Caribbean is financially attractive, with an annual cost of approximately U.S. \$167 to produce hot water during a ten-year life-cycle. While the cost would be approximately U.S. \$278 per year for the six-year loan period, the price would then drop considerably because there are no fuel, finance, or operation and maintenance charges, and little additional equipment would be needed. The annual cost of producing hot water with a typical 3.3kW electric heater during a ten-year life-cycle is approximately U.S. \$321 in Dominica and U.S. \$265 in St. Lucia and Grenada.

## Geo-Caraïbes

Geo-Caraïbes, or the Eastern Caribbean Geothermal Development Project is assessing the potential for the commercial development geothermal power in each of the Project countries - St. Lucia, Dominica & St. Kitts & Nevis. It will further establish the feasibility of developing a 50-to-100-megawatt geothermal project in Dominica and/or St. Lucia designed to supply electric power to the generating countries, and to the French islands of Guadeloupe and Martinique via an undersea transmission cable.

A key barrier to the commercial development of geothermal energy has been the lack of transparent and enforceable policies and regulations. Such policies and regulations must address key issues including:

- Governance of the geothermal resource;
- Access to land;
- Rights for Independent Power Producers in an otherwise monopolistic utility structure;
- Arrangements for long-term Power Purchase Agreements (PPAs); and
- Rights and responsibilities with regard to the environment, safety, and labor.

In addressing these matters, Geo-Caraïbes has developed partnerships among energy stakeholders – including the government, electric utilities, energy consumers, and commercial associations – to prepare legislative measures that will provide for the equitable treatment of project developers, ensuring that their investments are protected and that they are provided reliable and fair compensation for their risks. Likewise the measures will ensure the protection of the environment, preservation of the geothermal natural resources, and the appropriate compensation for host governments. It is expected that such policies and regulations will be adopted in each of the Project Countries, by the time the resource assessment and financing tools are established, such that the sustainable development of locally sourced geothermal power will result.

## Activities in the Pacific

### Using Coconut Oil as Feedstock in Fiji

Significant progress has been made in the GSEII consortium's collaboration with the government of Fiji and Caterpillar Power Generation Systems to explore the opportunities for the development of a bio-diesel refinery. In early 2005, a pre-feasibility study was conducted so that the project collaborators could gain a better understanding of the prospects for coconuts as a renewable energy source in Fiji, both for use in refineries and as a component of transport



Coconuts in Fiji

fuels. The study also explored the possibilities for use of coconut husks and shells for rural production of goods and as energy sources.

The pre-feasibility study, conducted by the Energy and Security Group (ESG), focused on the island of Viti Levu, while also considering the possibility of a second refinery in the island of Vanua Levu. It considered four key topics: 1) the use of coconut oil and or coconut-derived fuels for power generation in large diesel gensets; 2) the use of coconut derived fuel for transport; 3) the use of coconut-derived fuels for small gensets in the outer islands; and 4) the use of coconut husks as material for high-value products to enhance rural economic development in Fiji, and coconut shells as a fuel source for biomass power systems.

The results of the study suggest that coconut oil should not be used simply as a fuel additive in refineries, because it is likely to cause corrosion and other problems. However, the study points out that vegetable methyl ester (VME), a fuel made from coconut oil in combination with other vegetable oils, could possibly be used as a fuel additive with very positive results. The authors doubt, however, that the electricity contribution of coconut oil in Fiji could rise very much beyond a small percentage of the country's total electricity production. They therefore recommend the construction of a mini-refinery of coconut-oil based fuel, the cost of which should not exceed \$40,000.

With respect to the use of coconut-based fuels for transport and for small gensets, the study points out the problems encountered with attempts to utilize coconut oil-based fuels for these purposes in the Philippines. It recommends that the government of Fiji conduct more extensive evaluations of coconut oil-based fuel use for these purposes.

The study identifies exciting prospects for enhancing the rural economy of Fiji through the utilization of coconut husks and shells. It recommends that grant funds may be made available so that biomass residues can be used for rural power generation in Fiji.

The completed pre-feasibility study will serve as an important guide for GSEII as it moves forward in its Fiji projects. The Fiji project has become an important priority for GSEII, as it is hoped that the project can serve as a model for other small island states pursuing their energy independence goals.



Mats production from coconut

### GSEII Project Director, the Hon. Tom Roper, Speaks at the Pacific Power Association's CEOs Meeting.

In his August 2005 address to the Pacific Power Association CEO conference in Guam, Climate Institute Board Member and GSEII Project Director Tom Roper warned that meteorological disasters are becoming more intense as a result of climate change. As he pointed out, a recent study in the September edition of the well-known magazine *Science* demonstrates a large increase in the number of hurricanes reaching categories 4 and 5 over the past 30 years. This trend is only likely to continue, as increasing atmospheric and ocean temperatures will promote the development of hurricanes with greater wind speeds. Moreover, climate change is also projected to cause rising sea levels, which will lead to increased storm surge, putting millions of coastal residents

at a much greater risk of catastrophic flooding. And to further darken the already ominous predictions for the future, climate change is 90-99% likely to cause increased rainfall during hurricanes, which in many cases accounts for the largest percentages of loss of life and infrastructural damages caused by these phenomena.

These projections, as Mr. Roper argued, are especially important to small island developing states (SIDS), which are particularly vulnerable to extreme weather events.

Given the likelihood of an increasing number of catastrophic weather events, Mr. Roper urged small islands to take further steps to protect their residents and utilities from them. All SIDS, according to Mr. Roper, should make an utmost priority the adoption of a national plan of preparation and response measures for natural disasters. Mr. Roper also recommended that existing settlements in SIDS should be assessed for vulnerability, and that populations should be relocated in certain cases. He also proposed that better building codes be introduced, and that utility boards develop specific plans of actions to minimize loss and damage in case of natural disasters.

#### Workshop Held For Power Utilities

On March 7-18, the e7 (group of seven utilities within G8 nations) collaborated with the Pacific Power Association to sponsor a workshop to train Pacific island utility engineers and

technicians in the development of sustainable energy sites. The workshop, which took place in the Marshall Islands, specifically focused upon utilizing hydro, wind, and solar systems. Some topics discussed in the workshop included site identification, design, procurement, construction, and others. A second workshop for the southernmost islands is planned for Fiji in November of this year.

#### Marshall Islands Lighting Project

GSEII now has a presence in the Marshall Islands. The initiative is collaborating with the country's government to promote the usage of energy-efficient light bulbs on the island of Majuro. An extensive map of the island is being utilized to target particularly low income areas whose residents suffer from high electricity bills. An educational program to accompany the introduction of the bulbs is also being considered.

#### Climate Institute becomes Affiliate Member of the Pacific Power Association (PPA).

For the last four years, Climate Institute has been contributing to the annual conferences of PPA and has helped organize several training sessions for the PPA engineers on renewable energy. At the invitation from PPA, the Institute has now become an affiliate member of the utilities association. This would further help in promoting sustainable energy options in the Pacific.

#### THE GSEII CONSORTIUM:

##### Members include:

- Climate Institute  
[www.climate.org](http://www.climate.org)
- Organization for American States  
[www.oas.org/reai](http://www.oas.org/reai)
- Energy and Security Group  
[www.energyandsecurity.org](http://www.energyandsecurity.org)
- Counterpart International  
[www.counterpart.org](http://www.counterpart.org)
- UNIDO (United Nations Industrial Development Organization)  
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## GSEII Website Launched!

The GSEII website, [www.gseii.org](http://www.gseii.org) is officially up and running. The site contains information about each of the participating islands and their projects, as well as information about past GSEII events. Publications about GSEII and related issues may be found on the site, as well as links to consortium partners.

The GSEII is also partnering with Climate Care of the United Kingdom to create Carbon Emissions Calcula-

tors. One calculator will allow an individual in the U.S. to determine their automobile and home carbon emissions for the year and make a tax-deductible contribution that will be used to offset these emissions, mainly through the installation of compact fluorescent light bulbs in the Caribbean. The other calculator will allow individuals to pay to offset carbon emissions created in air travel to destinations in the U.S. and across the world.