

**Joint Bermuda Workshop between the International Renewable Energy Agency (IRENA)
and the Caribbean Electric Utility Service Corporation (CARILEC)**

17 September 2012

Small Island Developing States (SIDS) around the world face the problem of high energy costs, and the islands of the Caribbean region are no exception to this. The Caribbean region relies on imported fossil fuels for more than 95% of its energy use and its electricity prices are among the highest in the world, averaging USD 0.35/kWh (ranging from USD 0.06/kWh to USD 60/kWh) for domestic use. To meet an increasing demand for energy, Caribbean states spend a significant amount of their financial resources on imported fossil fuels, even though their debt-to-GDP ratio continues to rise above the accepted norm of 60%.

In order to mitigate the dual challenges of energy security due to increasing and volatile oil prices, and the environmental impacts of using fossil fuel, the Caribbean region has been moving towards increased use of renewable energy and energy-efficiency improvements, and has benefitted from the support of various multilaterals and development partners operating within the region. While this support has helped stimulate the electricity sector to improve the enabling policy and regulatory environment, build capacity, and support renewable energy developments, the overall share of renewable energy in the region is still low, accounting for approximately only 5% of total generation. However, there are significant renewable energy resource potentials in the Caribbean that can be tapped into, once the associated challenges to renewable energy development have been further addressed.

The *IRENA Renewable Energy Islands Initiative (iREii)* aims to support islands in their transition to renewable energy-based energy systems and help diversify their energy mix in order to reduce their dependency on fossil fuels and encourage sustainable energy development. This can be done through facilitating necessary solutions for the islands' transitions – including technology assessments, energy planning tools, business models, guidelines and best practice studies for

project development.

In this context, IRENA organised a workshop in collaboration with the Caribbean Electric Utility Services Corporation (CARILEC) to discuss the specific challenges and opportunities for renewable energy deployment in the Caribbean islands, focusing on regional, technical and financing issues. The workshop, held on 17 September 2012 in Bermuda, also provided an opportunity to identify priority areas where IRENA can best contribute and develop a proposed IRENA Work Programme 2013 for the Caribbean.

More than 50 participants from Caribbean utilities, regional organisations and financial institutions, including technical experts and developers, gathered to share their experiences and insights into the ways in which renewable energy deployment can be accelerated within the region. Participants provided valuable inputs in identifying the priority areas where IRENA can play a key role. There was a general consensus that IRENA's efforts would need to be well coordinated with existing regional efforts and initiatives by various stakeholders and that the region expected IRENA to share information on best cases and experiences in renewable energy development from other island regions. The workshop provided the basis for IRENA's further work for the Caribbean.

The outcome of the discussions on the potential areas where IRENA could contribute to accelerating the deployment of renewable energy was formulated in a separate paper into the *Proposed IRENA Work Programme 2013 for the Caribbean*.

There are a variety of opportunities and challenges for Renewable Energy deployment in the Caribbean. The first is that Caribbean islands vary extensively in size, geographical characteristics, energy consumption, economic characteristics, institutional structures and renewable energy resource potentials, although there are some similarities in the energy challenges they face. In addition to a high dependency on imported fossil fuels, the small size of energy systems, monopoly structures of utilities working in combination with uneconomical tariff structures, and a lack of economies of scale pose challenges to regional renewable energy development.

With an increasing energy demand, the region is pursuing an energy transition to reduce its high

dependence on imported fossil fuels and diversify its energy mix. Accelerating renewable energy deployment will not only reduce the high dependence on imported fossil fuels, but will also reduce energy costs, promote a green economy, reduce carbon footprints and provide employment opportunities. It was pointed out at the workshop that energy efficiency is a necessary and complementary component of renewable energy integration. A number of case studies were introduced from Caribbean islands that have already begun their drive to increase the use of renewable energy. They included Dominica (geothermal, hydropower), St. Vincent and Grenadines (hydropower), St. Lucia (wind, geothermal, solar), Jamaica (wind) and Aruba (wind, solar).

The overall regional challenges for renewable energy deployment were identified as a lack of renewable resource potential assessments, access to financing, technical capacity to deal with renewable energy technologies, and unclear regulatory frameworks. Locating suitable sites for renewable energy developments can be also challenging due to land ownership rights and limited land availability. Licenses or concessions for renewable energies are also granted to entities or private persons without a competitive bidding process. Workshop participants also suggested that strong political will and a strategic approach were mandatory for the transition. Appropriate policy and regulations for renewable energy need to be put in place or strengthened. For example, the Caribbean Community (CARICOM) is seeking to develop a regional roadmap on the Caribbean Sustainable Roadmap and Strategy (C-SERMS) in collaboration with CARICOM Member States and other partners. The C-SERMS intends to provide a clear framework to achieve sustainable energy development in the short-, medium-, and long-term.

Although there are existing efforts by various stakeholders, including multilateral development entities, for promoting renewable energy in the region, it is necessary to synchronise activities and pool resources in order to efficiently accelerate renewable energy deployment. Renewable energy technology developments must be considered in the light of the Caribbean islands' specific conditions such as hurricanes, high ambient temperatures and humidity, and salt corrosion.

In most of the Caribbean islands, power is generated by diesel engines with an average age of 20 years. Although island grids face constraints when integrating high shares of variable/intermittent renewable energy no comprehensive grid integration/stability assessments have been conducted

for these grids.

Interconnection between islands with DC-lines would optimise the use, and allow more integration, of renewable energies in the region. At the workshop a case study was discussed on the development of a 120MW geothermal power plant, which could provide more affordable energy in Dominica by interconnecting it with neighbouring islands. It was also pointed out that comprehensive information was needed on technical options for interconnection including submarine cables and their operation and maintenance. Furthermore, technical evaluation of the different renewable energy technologies that could be adopted in the Caribbean was seen as crucial for identifying the constraints and solutions for the deployment of renewable energy in the region.

In terms of finance, based on past experiences in the Caribbean, the drivers for investment in renewable energy development are threefold: political support and social consensus; a stable and predictable regulatory framework; and technical and resource potential capacities. The region faces the problem of state-owned and partly private-owned electricity utilities that are often financially constrained. There are therefore opportunities for Independent Power Producers (IPPs). Projects in indebted island countries often find it difficult to attract financing by banks because of problems related to creditworthiness. Required guarantees by private sector companies or financing institutions are often not sufficiently covered by the governments because of existing high levels of debts. Such financing risks, together with other related risks such as regulatory, political and natural disasters need to be guaranteed.

Some private developers in the region lack expertise and rely on unproven technologies, and sometimes licenses or concessions are granted by governments without a competitive bidding process. Geothermal project development requires high upfront costs for resource exploration, such as the drilling of geothermal wells. Due to the high costs and the associated risk of dusters, or dry holes, financing is often not available. The workshop suggested that governments or multilaterals should try to secure finance for risky investments for renewable energy developments and that best practices for geothermals should be applied.

Small renewable energy developments on small islands very often lack economies of scale, which makes such projects commercially unattractive to project developers/investors and deters

competitive tendering for construction works or technical components. Pooling small projects in the region may generate economies of scale, encourage competitive tendering, and attract investments and developers.

There are, consequently, priority Areas for Action by IRENA. Based on the workshop's discussions on opportunities and challenges for renewable energy deployment in the Caribbean, particularly focusing on the regional, technical and financing issues described above, the following key priority areas for action where IRENA can play a role were identified. Details are described in the separate paper on *Proposed IRENA Work Programme for the Caribbean Region in 2013*.

IRENA can play a key role in facilitating all the existing initiatives and activities for renewable energy deployment within the Caribbean and coordinate well with key stakeholders in the region to make sure duplication of efforts is avoided. IRENA can help identify the needs and gaps for accelerated renewable energy deployment and can further help to define and implement actions to cover these needs and gaps. It can also assist islands to achieve their transition to increased adoption of renewable energy by providing suitable policy, technology solutions and cost analysis for the region. And IRENA can help strengthen capacity in the region, which will help establish a firm foundation for renewable energy development at the research, business and operational levels, and also increase awareness of renewable energy potential. IRENA can also pool knowledge and best practices from around the world on various islands' transition to renewables including policies, technology, standards and analysis of case failures and share this information with all island countries.