

Jamaica is one of the highest energy intensive user countries in the Caribbean, currently 90 per cent dependent on fossil fuel sources to meet its needs. In 2004, it consumed 26.1 million barrels of imported oil valued at \$943.4 million, approximately 23 per cent of the country's GDP. The high cost of oil in the international market means the cost of importing it is projected at \$1billion for 2005. This, coupled with the country's pattern of energy consumption, is unsustainable and presents a major challenge to our social and economic development, as well as the business competitiveness of Jamaica.

At the national level, the impacts have adversely affected the levels of foreign exchange, rates of exchange, inflation, transport, production, national and regional airline viability — and the very quality of life for citizens.

Energy policy

Jamaica has focused on three major approaches in dealing with its energy needs: an energy diversification programme; energy conservation and efficiency; and renewable energy development.

In 2000, a major target of the government's Energy Policy was to produce 12 per cent of electricity requirements from renewable energy sources by 2020. This strategy of small-scale distributed energy was aimed partly at the rural poor who could not access the national grid. Renewables, seen as an insurance hedge against volatility and risk, now provide 5.6 per cent of the country's energy. The environmental benefits of using them are critical to a country like Jamaica where the main foreign exchange earner is tourism. Sound environmental stewardship of the country's natural resources, already subject to major natural disasters, is an important priority.

Renewable sources

Jamaica has abundant potential for the development of its renewable energy resources, including wind, biomass, mini-hydro, photovoltaic and solar energy. Some have been tapped at a minimal level in the past and could

Abundant Potential

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describes how developing renewable sources and energy conservation is charting his country's sustainable energy future

provide greater energy requirements with the use of appropriate technology and financial investments.

Central to the energy policy is the use of cogeneration technologies. They are already exploited by some in the hotel industry and manufacturing, but there is growing consensus that the greatest potential comes from the ailing sugar industry. New international trade rules demand drastic changes in this industry, and these will include energy production for electricity generation and ethanol production for use in the transport sector.

Wind energy

Disused windmills from Jamaica's plantation era show that wind energy has been used in the past, and research indicates that the potential is there for

future exploitation. Since 1995, the Petroleum Corporation of Jamaica has conducted wind speed assessments at various sites. Wigton in the parish of Manchester proved to be most feasible and a 20.7 MW wind power plant was constructed. Twenty-three turbines producing 900kW were commissioned in late April 2004, and now supply the Jamaica Public Service with an average 7 MW of power.

The Executive Board of the Clean Development Mechanism approved and published in September 2004 a new "Consolidated Baseline Methodology For Grid-Connected Electricity Generation From Renewable Sources" for renewable energy projects. It has been developed by combining the techniques of different individual CDM proposals, of which the Wigton Wind Farm is one.

Jamaica has a high solar radiation of approximately 5 kWh/m² per day, or 1,800 kWh per annum, and has market potential for photovoltaic and other solar applications such as solar water heating, electricity generation and solar crop drying.

Solar water heaters (SWH) have been installed in approximately 20,000 of Jamaica's 748,329 homes, and are estimated to save about 2000 kWh of electricity per residence per year. An extensive programme of installing solar water heaters in public hospitals is being undertaken. In the private sector, the hotel industry has begun a major use of



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solar water heating systems in an effort to green their businesses.

Second to solar water heating is the use of photovoltaic technology (PV). Photovoltaic applications, although requiring high initial capacity outlay, are encouraged through tax incentives. Current oil prices will make PV even more competitive. Jamaica is also moving to a regime of encouraging net metering.

Two photovoltaic villages, comprising 45 homes in rural Jamaica, were developed in 1999 with World Bank assistance. Established for approximately \$1700 per household, each was supplied with 120 watts of power in an individual stand-alone system that covers inverter, power converter and battery, and accessory equipment.

It is estimated that another 100 homes in Jamaica are fully solarised. The Scientific Research Council has employed simple technologies to develop a solar dryer that is used by farmers and others for some of their produce.

Energy technologies

Jamaica has various rivers suitable for the exploitation of small-scale hydropower. Small-scale electricity generation by using run-of-river plants has been in operation for over 100 years. Jamaica was one of the first countries in the world outside the United Kingdom to install a hydro plant, just outside Spanish Town in the 1890s.

The Public Utility Company currently operates eight mini-hydro plants, with a total capacity of 21.4 MW, accounting for 4 per cent of the electricity generated in 2003. One other mini-hydro plant is to be established and two reactivated.

Bagasse from sugar cane, charcoal and fuel wood are important biomass fuels. Charcoal is an important source of energy in rural households. Jamaica



Julio Etchari/Still Pictures

has also been involved in experimenting with fast growing fuelwood trees. Such trees could provide one solution to problems associated with deforestation as well as provide a useful supplement to the biomass now used in the sugar industry.

Approximately 600,000 tonnes of bagasse — equivalent to about 940,000 barrels of oil at a value of \$37.5 million — are used per annum (as of 2003) in cogeneration in Jamaican sugar factories. Increasing sugar cane production to about 2.7 million tonnes would be needed for the supply of bioethanol. We estimate that excess electricity of approximately 300 GWh per year would be available with bagasse combustion alone, resulting in about 68 MW of available capacity.

The Scientific Research Council in Jamaica has been involved in the development of biogas plants using animal wastes in the agricultural, small manufacturing, educational and residential sectors. A total of 250 of these plants are in operation across the island, though cultural barriers are still to be

broken in order to gain full acceptance of biogas as a fuel for cooking.

In addition to solar, wind and hydropower, the potential for the conversion of waste to energy, ocean thermal technologies and bio-fuels is being explored.

Sustainable future

The need for greater energy conservation is a major thrust of government policy. Incentives are being offered to encourage government agencies to reduce electricity use. A variety of conservation techniques are being encouraged in all offices, homes, businesses, and vehicles. Conservation could mean a substantial reduction in the country's fuel bill. Together with renewable energy technologies, it offers the promise of a sustainable energy future as Jamaica seeks to improve the quality of life for present citizens and future generations alike ■

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