Saint Lucia's Contribution: A first version of a technical paper synthesizing submissions on the costs, benefits and opportunities for adaptation based on different drivers of climate change impacts, including the relationship between adaptation and mitigation.

Generally, the **opportunities for adaptation in Saint Lucia** are centred on the following themes:

1. Implementation of Climate Resilience Measures in Critical Buildings
2. Building Resilience in the Coastal Zone
3. Support to National and Community-Level Interventions in Water Resource Conservation and Management
4. Strengthening National Level Policy, Legislative and Institutional Framework for Climate Resilience
5. Public Education and Outreach for Climate Change Resilience Building
6. Research and Systematic Observation and Data and Information Acquisition and Knowledge Management for Climate Change Adaptation
7. Human Resource Capacity Building for Building Climate Resilience

On the **relationship between adaptation and mitigation**, one of the areas of interest for which Saint Lucia requires financial and technical support is renewable energy. It is possible to implement climate change adaptation projects/programmes that alleviate the adverse impacts of climate change while simultaneously benefiting from reduced greenhouse gas emissions (mitigation) and reducing on the fuel import bill.

Solar Energy

Saint Lucia's location at approximately 14 degrees north of the equator means that it is well positioned to take advantage of solar energy. The island receives an almost constant amount of surface solar radiation from month to month and is therefore able to generate electricity using photovoltaic (PV) technology. The island also enjoys a tropical maritime climate with a fairly constant high air temperature averaging near 28ºC. Temperatures seldom rise above 33ºC or fall below 20ºC.

Solar energy is one of the few areas of renewable energy where any meaningful progress has been made. Between 2009 and the present, photovoltaic (PV) systems have been installed on a number of public buildings[1]and these have been net-metered with the approval of the Public Utility Company (Saint Lucia Electricity Services Limited-LUCELEC). It is anticipated that more such installations will come on stream in the near future.

LUCELEC has indicated a readiness to entertain more installations of this type. In this respect, the company will reportedly be preparing a set of guidelines for members of the public wishing to move in this direction.

[1] These include: Saint Lucia National Trust Headquarters; Castries Market; Vieux-Fort Comprehensive Secondary School, Campus B; St. Mary's College; Marchand Community Centre (underway).

LUCELEC is also interested in venturing into larger-scale solar. The company is exploring avenues for placing solar installations at its proposed new southern plant, as well as at its proposed wind farm.

PV technology is relatively expensive, but prices have been dropping for several years. Many small installations can pay for themselves in 10 years or less. Like wind power, solar is not continuous but can significantly offset the use of diesel-generated electricity. Through net-metering, PV systems can supply excess power to the grid. With the use of storage batteries, such systems can provide power beyond sunlight hours.

PV systems are also useful for stand-alone applications (e.g. traffic lights) or buildings that are not connected to the main power grid. Further, noting that electricity outages are commonplace during and following a hurricane and other natural disasters, PV systems are being promoted for use in emergency shelters and hospitals, which may suffer power loss following an extreme weather event. In an emergency shelter, for example, a PV system can provide some auxiliary power (lighting, refrigerator for food and medicine, etc.) in the event of a disruption in the main electricity supply during or after a hurricane. The system can be designed to supply some power into the grid during normal operations, on a net-metering basis. The use of PV technology is therefore an adaptation response to enhance the usefulness of a building in the aftermath of a hurricane or other natural disaster, with accompanying climate change mitigation benefits.

Wind Energy

Saint Lucia lies in the northeast Trade Wind belt, which provides a favourable regime for wind energy development. Although currently there are no major projects where wind is captured for electricity production on the island, preliminary analysis points to a promising future. In 2003, a study was undertaken by the local electricity company which investigated 34 sites on the island. Based on the results the utility concluded that the south-east of the Saint Lucia presented the most favourable conditions for wind energy development. Additional studies undertaken by the company with the assistance of the Caribbean Renewable Energy Development Programme (CREDP) have focused on the three top sites for wind energy development.

Wind energy technology has now been in use for several decades and is now well tested and proven. Large wind turbines are in use in many developed and developing countries all over the world. In the Caribbean, wind turbines can be found, for example, in Jamaica, Saint Kitts & Nevis and Marie-Galante.

Wind electricity reduces the fuel import bill and reduces pollution overall, including the greenhouse gas emissions that contribute to climate change. Wind energy is competitive in terms of cost. As such, it is anticipated that it can be added to Saint Lucia's energy mix without causing a significant increase in the cost of electricity.

LUCELEC had originally intended to install a 12 megawatt wind farm on the proposed site. However, since that time, wind technology has continued to advance and LUCELEC is now

prepared to consider erecting larger or more efficient wind turbines that would generate more power. LUCELEC has also expressed an interest in installing solar panels on the site in order to generate even more electricity and thus maximize the use of the land. This would effectively convert the area into a renewable energy park.

Geothermal Energy

Saint Lucia is a volcanic island with the potential to develop geothermal energy. The scientific data shows the existence of a high-temperature geothermal system in the south-western part of the island. The geothermal energy there can be used as direct heat or can be used to produce electricity. As geothermal energy is very reliable and non-intermittent, it can be used as base load power stations which could replace the diesel powered stations normally used in Saint Lucia.

Geothermal is the only form of renewable energy available to Saint Lucia at this time that can, partially or fully, substitute for conventional base-load on a continuous basis. Therefore, harnessing existing potential should continue to be a major priority. There is, however, a need to better map and quantify Saint Lucia's geothermal potential.

Waste-to-Energy

Waste-to-energy entails the generation of electricity from municipal, agricultural or other waste. In the last decade, a number of parties have approached Government with respect to the development of waste-to-energy. There is potential for energy to be derived from waste in Saint Lucia, especially given the development of the Deglos Sanitary landfill. However the potential and cost will depend not only on the amount of waste generated but the technology used.

Any significant waste-to-energy initiative would have to consider, inter alia, the ability of Saint Lucia's waste stream to sustain such an enterprise and the impact on the operations of the Saint Lucia Solid Waste Management Authority. Some of the proposals received over the years have seemed over-ambitious or have involved the use of unproven technology.

If approached correctly, waste-to-energy can simultaneously assist the waste disposal situation and reduce land and air pollution.

Saint Lucia would further like to draw reference to the Economics of Climate Change Studies conducted by UNECLAC Caribbean Regional Office (Trinidad). The areas of focus are agriculture, tourism, water, health, energy and costal and marine.