Understanding Climate Change

Part 12

Guyana's Low Carbon Development Strategy: Priority Areas for Implementation

The Amaila Falls Hydropower Development

In previous articles we introduced Guyana's low carbon development strategy (LCDS) and identified the priority areas for implementation over the next two years. On the May 24, 2010, the third draft of the LCDS was released and launched by His Excellency President Jagdeo.
The revised draft places greater emphasis on implementation, and outlines seven key priority areas for investment of forest payments over the next two years. This week we will discuss a major priority - the Amaila Falls Hydropower development.

Background to Hydro-power development

Hydropower is electricity generated by the force of moving water channeled through the penstock of a hydropower unit. The kinetic energy of moving water is captured when the water spins a turbine, driving a generator, in turn producing electricity. Hydropower plants may be located below reservoirs or built in rivers (run-of-the-river units) with no water storage capacity. Hydropower is considered a renewable source of energy, as it relies on water which is continuously renewed through the natural water cycle.

Hydropower is a clean source of energy, as it burns no fuel and produces significantly lower greenhouse gas (GHG) emissions and other pollutants, compared with fossil fuels. According to the PEW Center, (2010), hydroelectricity's low cost, near-zero emissions, and ability to be dispatched quickly to meet peak electricity demand have made it one of the most valuable renewable energy sources worldwide.

Renewable energy is currently the fastest growing energy source for world electricity generation, projected by the International Energy Agency to grow by an average of 2.9 percent per year from 2006 to 2030. According to the Renewable Energy Policy Network, the current global share of renewable sources in electricity generation is around 18 percent, with 15 percent of global electricity coming from hydroelectricity.

Burning of fossil fuels for energy production is the biggest current contributor to global GHG emissions. Investment in renewable energy sources, such as hydropower, is therefore an important means of reducing emissions that cause climate change. For developing countries, hydropower can be an important way of reducing reliance on fossil fuels, which are expensive to import and subject to price volatility, and to increase the contribution of renewable energy to total energy consumption, thereby promoting sustainable development.

Hydro-power potential of Guyana

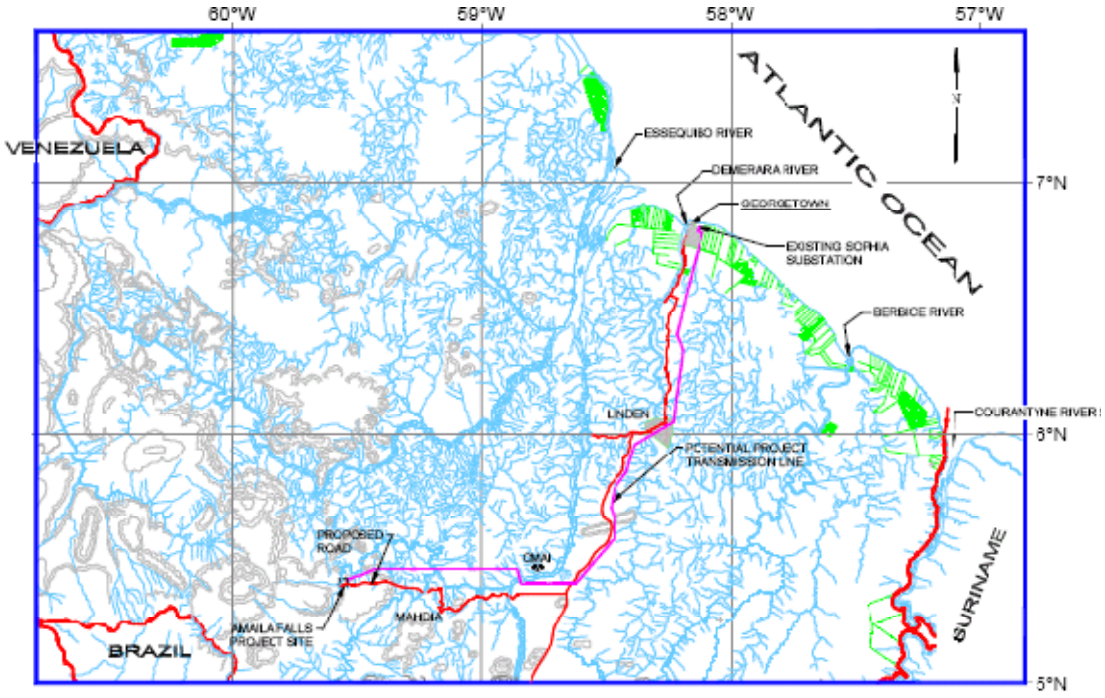
Guyana is currently heavily dependent on imported fossil fuels, which are both expensive and carbon intensive, to meet its energy needs. According to the Guyana Energy Agency (GEA), the country's oil consumption is approximately 10,400 barrels per day (bpd), which represents approximately 0.012 percent of current world oil consumption. Petroleum imports account for about 70 percent of primary energy supply, and in 2008 comprised about 44 percent of Guyana's Gross Domestic Product (GDP).

However, there is significant potential for the use of renewable energy sources, including hydropower, wind, solar and biomass. In Guyana, the hydropower potential is approximately 7,000 MegaWatts (MW). Presently, 67 sites with hydropower potential have been identified in the country, with the most advanced being the Amaila Falls with a proposed capacity of 154MW (GEA, 2010).

Background to the Amaila Falls Hydropower project

The construction of the Amaila Falls Hydropower plant has long been a priority of for development in Guyana. It will represent the largest private investment in Guyana's history, as well as the biggest project to be implemented under the LCDS.

The Amaila Falls site is located on the Kuribrong River in west central Guyana, about 250 kilometres southwest of Georgetown. The dam site is at the confluence of the Amaila and Kuribrong Rivers.



The project will involve creating a storage reservoir using two small dams constructed at the confluence of the Amaila and Kuribrong Rivers, at the top of Amaila Falls. The reservoir area is a forested plateau with rock outcrops near the surface. The river drops about 60 meters at the falls and then continues through a series of rapids and smaller falls to the proposed powerhouse site.

The project will also include the construction of a double-circuit transmission line to connect the hydropower site with GPL's existing grid on the coast, and an access road to the site.

The hydropower plant is expected to have an installed capacity of 154 MW, and will supply a significant proportion of the power demand in Guyana.

Benefits of the project

Once complete, the Amaila Falls hydroelectricity development is expected to provide a long-term, dependable and affordable supply of electricity which will transform the competitiveness of Guyanese businesses and eliminate a key barrier to direct foreign investment.

The average cost for Guyana Power and Light (GPL) of gross electricity generation between 2006 and 2009 was US$ 0.15 per KiloWatt Hour (KWH). By 2014, in the absence of hydropower and assuming constant demand, this would be likely to increase to US$0.18, due to rising fuel prices. When the Amaila Falls hydropower project becomes operational in 2014, the cost of generation should fall considerably, with a subsequent reduction in electricity tariffs to consumers. GPL estimates that average tariffs could fall by 40 percent.

By providing a cheaper and more reliable source of electricity, the Amaila Falls hydropower project will reduce the cost of living of ordinary people in Guyana, thereby improving the average standard of living. Cheaper hydropower will also reduce unit costs in commerce and industry, making these activities more competitive and attracting more businesses and factories, and creating more jobs.

In addition to providing a cheaper and more reliable source of electricity to households, businesses and industry, the hydropower project will reduce Guyana's reliance on imported fossil fuels thereby improving its balance of payments.

The project will also have significant environmental benefits, as it will allow Guyana to meet most of its energy needs in the foreseeable future using renewable energy, thereby eliminating a large proportion of it GHG emissions from the energy sector.

Project financing and management

The project will take about three and a half years to build, and is expected to be operational by 2014. Construction of the hydropower plant is expected to commence in 2011, once the access road is completed and debt financing finalized. The total cost of the project (including the costs of the dam, powerhouse, transmission line, access road, substations, soft costs and contingencies) is expected to be approximately US$ 650 million. Of this, around US$ 306 million will cover construction of the actual hydropower plant, and US$ 145 million will be spent on the transmission line and access road.

The project will be financed by a combination of private and government equity and debt. Private equity will be invested by Sithe Global, the developer, who will bear the risks associated with development. Debt will finance approximately 70 percent of the project costs, and is expected to be in the form of loans from the Inter-American Development Bank (IDB) and the China Development Bank (CDB).

The project is structured as a 20 year Build Own Operate Transfer arrangement, in which the government will make a set annual payment over 20 years through a "take or pay" Power Purchase Agreement with Sithe Global (meaning that GPL will purchase 100 percent of the dependable electric capacity of the plant, irrespective of actual energy demand), after which the project will revert to the Government of Guyana at no additional charge. The Government will have the option to inject funds into the project to reduce Sithe Global's equity and GPL's annual payment, and is expecting to assign around US$ 40 to US$ 60 million in LCDS funds for this purpose. Once the plant is operational, future governments may choose to sell the government's equity stake to private investors.

The life of the project is estimated to be over 100 years, but after the initial 20 year period during which the construction costs are financed, the operating costs will be very low.

Environmental and social considerations

The project will require a relatively small amount of deforestation in order to clear the way for an access road, as well as to clear the area that will be flooded by the construction of a reservoir. However, the total ecological footprint on the rainforest is expected to impact less than 0.001 percent of the state forest area. An environmental impact assessment (EIA) was conducted in 2002 and updated in 2008, and an amended EIA is being prepared to cover the final project

scope. The location of the plant requires no human habitat displacements and the inundated area will be relatively small for the generation capacity of the plant.

The project will work with local and international NGOs to ensure strict environmental, social and safety standards. In addition, the project is expected to apply for emissions reduction credits under the Clean Development Mechanism (refer to article 5 in this series for more information on the CDM), which will require it to comply with international environmental safeguards and guidelines.

Next week we will continue to explore important aspects of Guyana's LCDS.

*Information used in this feature was extracted from the following reports and sources: Guyana's Low Carbon Development Strategy, May 2010; International Energy Agency. World Energy Outlook 2008; Renewable Energy Policy Network for the 21st Century. Renewables 2007: Global Status Report; Mercados Energeticos Consultores. 2009. *Economic and Financial Evaluation Study: Guyana Amaila Falls Hydro Project*; the Guyana Energy Agency; Sithe Global (http://www.sitheglobal.com/projects/amaila.cfm); Pew Center on Global Climate Change; Project Management Office, Office of the President.

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