

Eastern Caribbean Electrical Transmission Potential Supported by Guyana Hydropower



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H A R D Y
S T E V E N S O N
A N D A S S O C I A T E S

NEED FOR DIVERSIFICATION ACROSS THE CARIBBEAN



- Very intense use of carbon based generation
- N-2 criterion requires high reserves
- Dependence on price of oil and off-shore oil supplies
- Electricity consumption rising
- Costs of imported oil harms economies
- Unsustainable

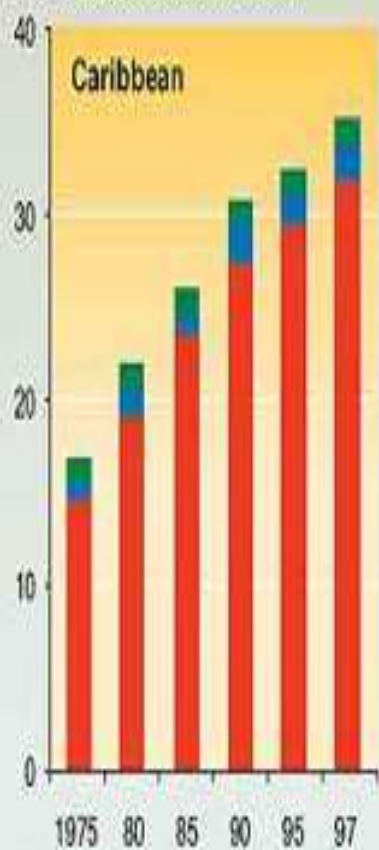
Vision for Sustainable Energy Future



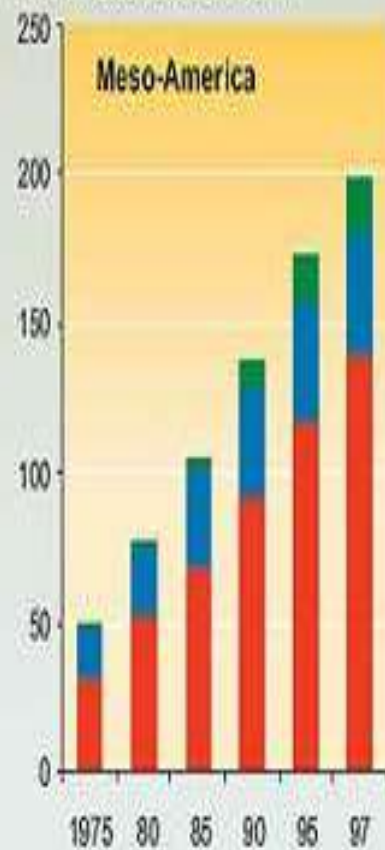
- Carilec and others envision sustainable energy future
- Lowering of greenhouse gas emissions
- Minimizing effects of climate change
- Opportunity to diversify generation mix
- Reducing foreign oil expenditures
- Carbon credit opportunities

Sources of electricity in Latin America and the Caribbean

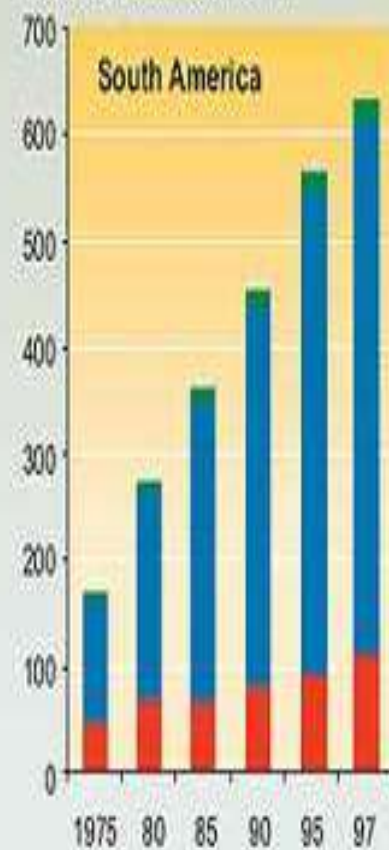
Electricity production, GWh



Electricity production, GWh



Electricity production, GWh



Note that the horizontal scales are different

Fossil fuels Hydropower Other



United Nations Environment Programme (UNEP)

Sources: UNEP 2003, World Bank 2004



The Case for Diversification of Energy Sources



- Provides choice of supply
- Lowers greenhouse gas emissions
- Dependable
- Lowers cost
- Requires grid

Potential for Hydropower as Base Load Power



- Large hydropower project to serve as sustainability anchor
- Turtruba Rapids Hydropower project as an example
- Current petroleum generation sources become peaking plants or standby
- Add renewables

HVDC Cable

- Proven technology
- Off the shelf converters to AC
- Some distances long, but not exceptional
- Many islands already using it
 - Philippines, Hawaiian Islands



Guyana Hydropower

- Guyana has up to 7000 MW of undeveloped hydropower
- Both dam and run of the river energy generation is possible so as to minimize environmental footprint



Turtruba Rapids

- Mazaruni River
- 650 MW Full Supply Level
- 423 MW at Optimized Power
- Less than \$.05 per KWh at dam site
- Private financing
- Optimized for power production
- Optimized for maximum Kyoto Credits
- Outside of hurricane zone



Caribbean Grid

- In the south Guyana to Trinidad and Tobago
- Eastern Caribbean and north to Puerto Rico
- All points in between
- Would integrate both current fossil fuelled and new and future renewable energy sources
- Private financing available



Bringing Current Renewables onto Grid



- Waste to Energy
- Wind
- Geothermal
- Ocean thermal
- Biogas
- Hydropower
- Solar

A Trans-Caribbean Grid is a Clean Development Mechanism

- Helps to remove barriers to renewable energy development
- Supports a sustainable renewable energy industry
- Becomes a framework to provide mutual support for regional and national renewable energy projects



Carbon Trading/ Reduction Benefits



Carbon Trading

- Formation of energy market
- Sell GHG benefits of new sustainable energy to more petroleum intense utilities



Carbon Reduction

- Shift to hydropower as base load
- Use on-line renewable energy available from other utilities as peak power to reduce GHG production



Other Benefits of Grid

- Sharing capital costs of new renewable energy projects
- Creates economies of scale
- Allows technologies suited to large market and best generation technologies
- Security of supply
- Promotes energy integration



Other Benefits of Grid

- Easier shutdowns of current system for maintenance and scheduled outages
- Provides for shared risks and benefits
- Lowers unit costs
 - Particularly if more hydropower brought on line
 - Improves purchasing power of utilities
- Provides stability in electricity pricing for connecting countries



Conclusion

- Inter-Caribbean cable provides diversity of supply and sustainability benefits.
- Significant reduction of dependence on fossil fuels.
- Pre-Feasibility Study complete for Guyana Hydropower
- Carbon trading benefits
- Strong interest among private financiers

