Wind Energy – Grenada

Contents

About Grenada

- Location
- Three Islands
  - Grenada
  - Carriacou
  - Petit Martinique

About Grenlec

- Grenada Electricity Services Limited
  - created in 1960 by an Act passed in the Grenada Legislative Council
  - the sole provider of electricity on the islands of Grenada, Carriacou and Petit Martinique.
  - At present, 50% of the shares are held by a foreign investor, WRB Enterprises Ltd. USA.
  - Remaing shares owned by employees, Grenadian, other Caribbean nationals and the Government of Grenada
- The Electricity Supply Ordinance
  - gives the company the sole and exclusive licence to generate, transmit, distribute and sell electricity
  - for a period of eighty (80) years with effect from 1st January 1961.

History

1999
Wind resource monitoring program begun on Carriacou

2002
Met tower removed from Carriacou, Wind not economically feasible at the time

2004
Renewables program restarted. Met towers ordered, installation delayed by Hurricane Ivan.

2005
Initial site location defined, constructability studies conducted.

History

2006
Lease developed, in negotiation. Independent met tower installed.

2007
GRENLEC renewable inter-connection policy developed. Renewable targets included in strategic and business plan. Met towers installed on potential wind sites.

2008
Economics change! Renewables are economically feasible. Full-time renewable staff on-board.

Strategic Goals

- Evaluating viable renewable alternatives based on economic and technical feasibility;
- Developing concrete resource assessments and bankable engineering studies;
- Land control through lease, purchase or negotiations with the Gov't of Grenada;
- Wind capacity installed by 2010/11 timeframe;

Strategic Targets

- Reduce diesel consumption on Carriacou and Pettite Martinique by 40% by 2010
- 10% of capacity from renewable energy by 2013
- 20% of capacity from renewable energy by 2017 pending feasibility studies.
  - 12 MW of installed wind capacity on Grenada
  - 1 MW of installed wind capacity on Carriacou
  - 100kW of installed wind capacity on Pettite Martinique
  - 100kW of PV Solar on Grenada

Additional Strategic Goals

- Retain and train a core team of renewable energy expert GRENLEC in-house staff by 2009
- Develop in-house capacity to offer energy efficiency consulting/customer service.
- Execute plans in loss reduction and increased efficiencies in generation.

Progress

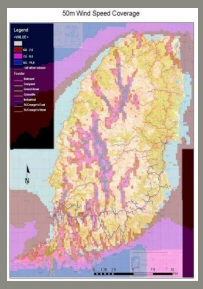
- **Working on land control and enhancing the wind resource assessment program.**
- **Final stages of executing lease with River Antoine site owners.**
- **Pursuit of four alternative wind sites on Grenada.**
- **On Carriacou and Petit Martinique:**
  - **Reviewing existing data,**
  - **Initiation discussions with government about turbine sites**
  - **Modeling a high penetration 1 MW system (four 250kW turbines with advanced control system).**

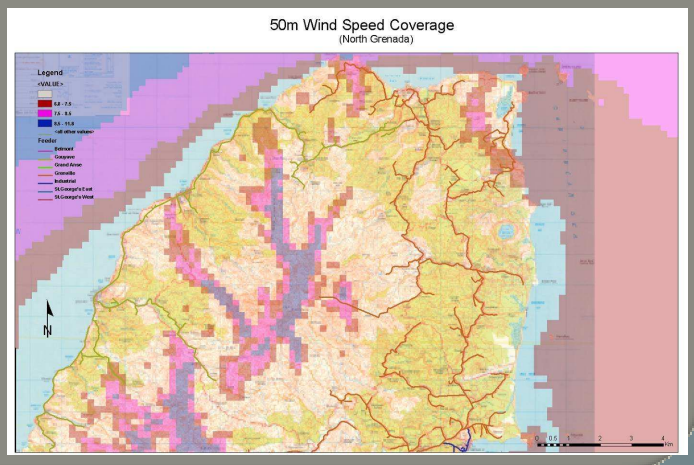
Constraints

- Access to land for wind projects – Negotiating with Gov't
- High capital costs for cutting-edge technologies.
- Duplicate capital costs for intermittent generation resources.
- Steep learning curve for internal technical human resources.
- Long lead times on equipment supply agreements.
- Small project challenges - access to and cost of capital, access to and cost of technology, and availability of technical assistance.
- Insurance against hurricane damage and its impact on financing.

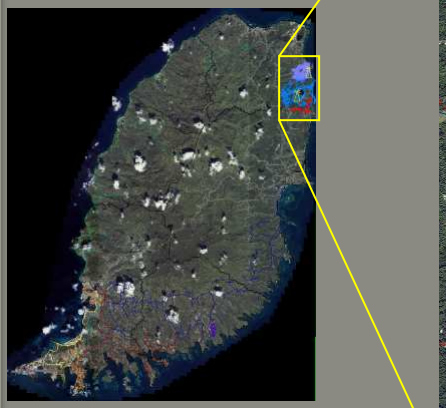
Potential Sites

- River Antoine and Levera





Wind Logging Sites

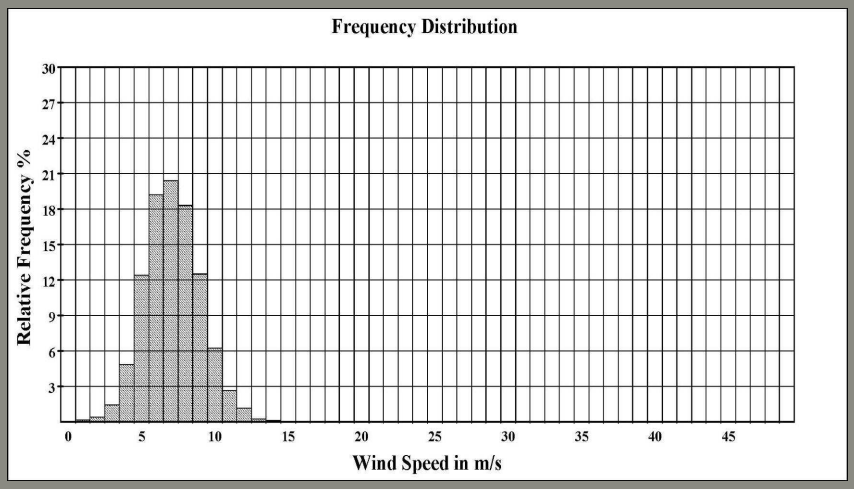


Logged Data

- Summary

50m Anemometer	River Antoine	Levera
Min 10min Average	0.4 m/s	0.5 m/s
Max 10min Average	15.8 ms/s	15.2 m/s
Min Sample	0.4 m/s	0.4 m/s
Max Sample	20.2 m/s	19.9 m/s
Overall Average	7.09 m/s	7.52 m/s
Average 10min Standard Deviation	0.83	0.57
Average 10min Turbulence Intensity	12%	8%

Logged Data – Wind Distribution



Conclusion

Grenlec and Grenada are actively pursuing wind energy, and based on the promising wind data obtained thus far, penetration is expected to commence by 2011.

Everyone Onboard