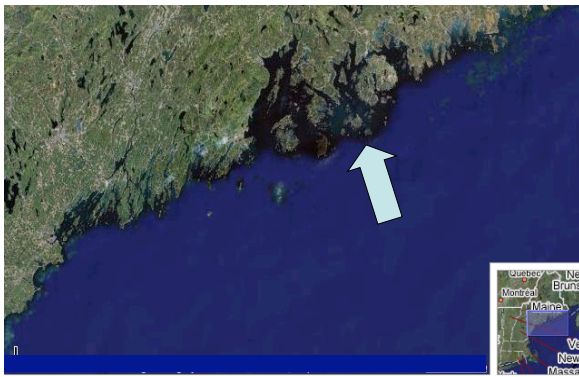


# A Preliminary Analysis of the Economics of Wind Power at the Swans Island Electric Co-op

George Baker  
September 10, 2007

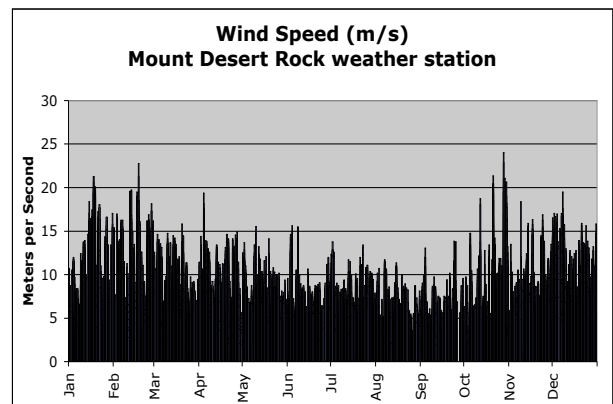
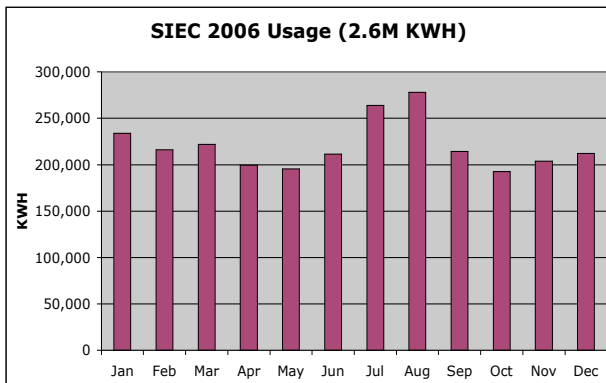
## Swans Island Electric Coop

- Serves the islands of Swans Island and Frenchboro, between Penobscot and Blue Hill Bays
- Year round and seasonal residents
  - Swans: 350/1000
  - Frenchboro: 50/80
- About 500 electric meters



## SIEC power supply

- Customer-owned cooperative
  - Purchase our power via submarine cable from Bangor Hydro
  - Sell to customers on Swans and (via a second cable) to Frenchboro
- Retail electricity prices are very high
  - Over \$.25 per kWh
- Pay between \$.08 and \$.12 per kWh to Bangor Hydro



### Vestas V-47; 600KW Wind Turbine



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### Assumptions

- Pattern of hourly wind speed the same as MDR
- Average wind speed adjusted to actual on the islands
- Currently considering 6 sites on Swans Island, one on Frenchboro

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### Sites

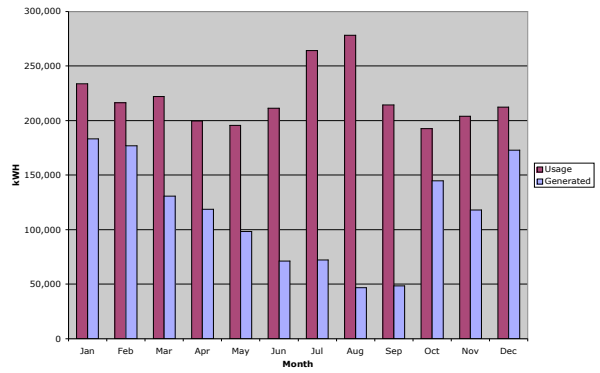
| Site   | Wind Speed (m/s) | Average KWH/Year |
|--------|------------------|------------------|
| Site 1 | 7.7              | 1.72M            |
| Site 2 | 7.5              | 1.64M            |
| Site 3 | 7                | 1.41M            |
| Site 4 | 6.6              | 1.23M            |
| Site 5 | 6.4              | 1.15M            |
| Site 6 | 8.3              | 1.99M            |

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2006 Simulation



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### Wind speed variability

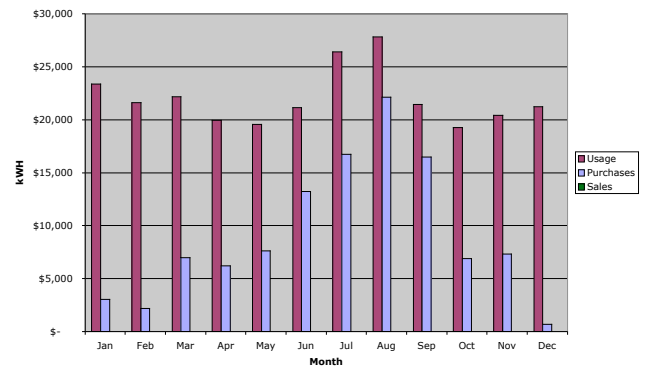
- This single turbine generates about 60% of the power used on the islands
- We would be *buying* power during 70% of the hours in the year
- Net metering plays an important role in the economics of this project

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2006 Simulation: One 600 kW turbine (Monthly net metering)

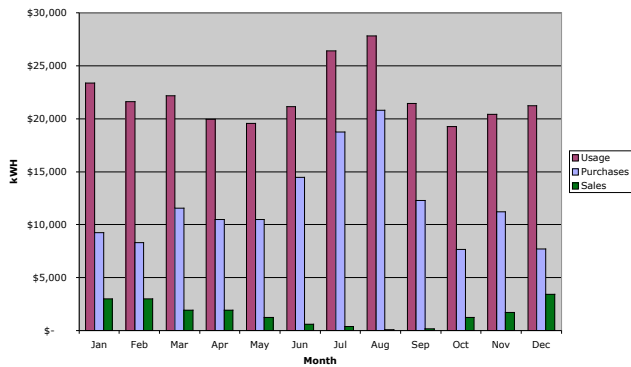


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2006 Simulation: One 600 kW turbine  
(Hourly net metering)



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## Economics

- With monthly net metering, SIEC goes from spending \$264,000 per year for power to about \$110,000 per year
  - Savings of about \$150,000 per year
  - Does not include the cost of maintenance (~\$30-50k)
  - Less without net metering
- The turbine is expected to cost over \$1.5 million
- How do we finance such an investment?

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## Financing

- Several options
  1. RUS mortgage notes
    - (This is how the co-op is currently financed)
    - 30 years, 5% interest
  2. Clean Renewable Energy Bonds (CREBs)
    - 15 years, zero interest
    - Not necessarily available
    - CFC charges 1% administrative fee
  3. Private sector financing using Production Tax Credits (PTCs)
- Different options have different costs/benefits

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## But...

- Will anyone lend this much money to such a small company?  
*(The total assets of the co-op are less than the cost of this project!)*

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## Where do we stand?

- Currently doing wind speed monitoring to assess the resource
- Pursuing possible sites
- Working on community education and outreach

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## Summary

- With a small-scale project, we would generate less power than we use in a year
  - With two turbines we would be slight net power sellers over the course of a year
- The economics of community wind at the Swans Island Electric Coop look promising
- The community is enthusiastic about the prospect of wind power

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## Public acceptance of community wind

- With a project like this, the (direct) benefits of the project accrue directly to those who will live with the turbines
  - Though everyone enjoys the benefits of renewable energy generation
- Contrast Vinalhaven with Isleboro

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## Issues

- Transmission
  - Note that at this scale, there is no impact on the transmission system
- There are large “soft” costs that arise before we can even know if the project is feasible
  - Wind resource assessment
  - Project planning
  - Community outreach
  - Environmental impact assessment
- We are a small company...
  - Can we really manage this large a project?

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## What would help?

- Small-scale wind projects would benefit greatly from an increase in the capacity limit on net metering
- We need help getting started...
  - Feasibility studies, community outreach, impact assessments
  - We have gotten free support from the University of Massachusetts Renewable Energy Research Laboratory in doing wind speed monitoring and measurement
  - Mass Technology Collaborative (for instance) provides grants for many of these types of costs

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We feel like we are working  
“out in the wilderness” on this  
project

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