

## Community Leadership in Wind Energy and Sustainability

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Sustainable Energy – A Community Matter  
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## Content of the Presentation

- Elements of Context of Wind Energy
- Wind Energy in PEI
- Model of Denmark
- Community Wind Energy
- Conclusion



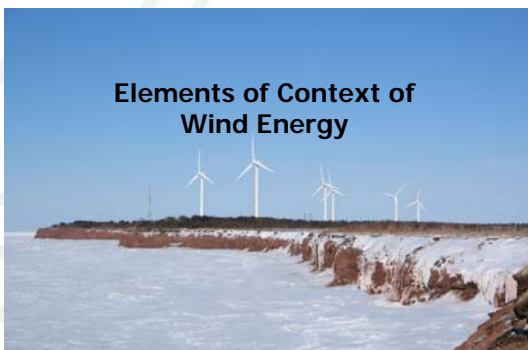
North Cape, PEI



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## Elements of Context of Wind Energy



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## Electricity Sector in North America

- Deregulation of the electricity generation sector
- Disengagement of public utilities in the installation of new electricity generation plants
- Emergence of new “players” – Wind Developers
  - New enterprise or existing enterprise diversifying in wind energy
  - Sector characterized by acquisitions
  - Respond to RFPs for the purchase of electricity generated from wind energy



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## Wind Developers

- Objective: Secure Power Purchase Agreement
- Ultimate objective:  
*Generate maximum revenues and value for Shareholders*
- Results for a jurisdiction:
  - Typically large wind farms (50 to 200 MW)
  - Foreign technology; foreign investors
  - Practically no participation by local communities or investors
  - Relatively low price for electricity
  - Significant reduction in GHG emissions in electricity generation portfolio



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## Wind Developers (cont.)

- Success factors for Wind Developers
  - Sign land lease options with land owners
  - Obtain Power Purchase Agreements
- Drawbacks:
  - Negative stories regarding the prospecting for land
  - Small local economic impact (land lease, property taxes)
  - Communities live with large wind farms without having substantial tangible benefits
- Consequence:
  - Opposition to how wind energy is being developed
  - Communities want to participate and benefit from the wind energy sector



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## Stake of Wind Energy

Who will benefit  
economically and socially  
from the development of this  
natural resource?

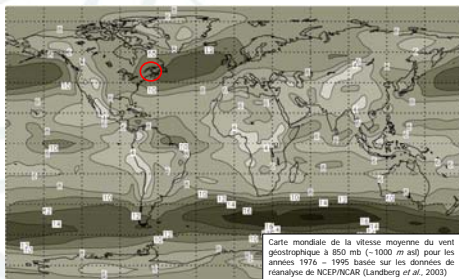
How: Ownership of wind farms

## Wind Energy in PEI



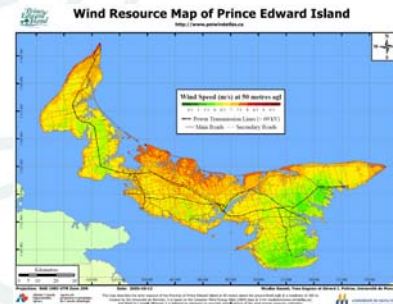
## World Wind Resource

Landberg et al., Riso National Laboratory, 2003



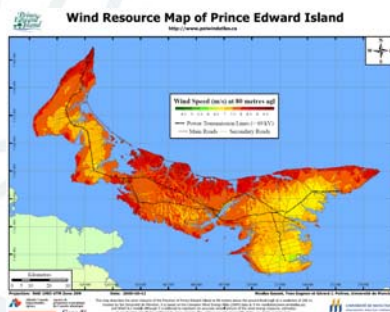
## Wind Atlas of PEI (50 m)

Gasset N., Gagnon Y., Poitras G.J., Université de Moncton, 2006



## Wind Atlas of PEI (80 m)

Gasset N., Gagnon Y., Poitras G.J., Université de Moncton, 2006



## Status of Development - PEI

- Installed to date: 152 MW (18% of electricity consumed)
  - North Cape Wind Farm, PEI Energy Corp., 10 MW
  - East Point Wind Farm, PEI Energy Corp., 30 MW
  - West Cape, Suez, 100 MW
  - Norway, Suez, 9 MW
  - North Cape, Vestas, 3 MW
- Planned: 500 MW by 2013
- Renewable Portfolio Standard:
  - Currently: 15% of electricity sold, by 2010
  - Planned: 30% of electricity sold, by 2013



### Wind Energy Objectives – PEI

- Maximize energy security, independence and price stability
- Revenues from green energy exports
- Demonstrate community support
- Collaborative approach – Transmission
- Maximizing economic benefits
- Sound land-use planning
- Compliance with environmental review processes
- Fair and equitable land leases
- Consistent taxation and business support environment
- Partnering with proven developers

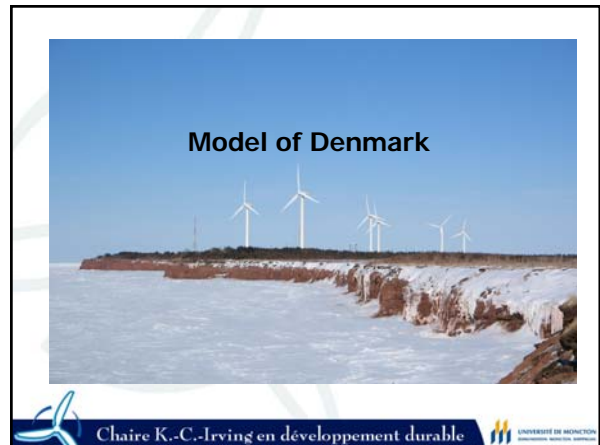
Source: Securing Our Future: 10 Point Plan, Gov. of PEI

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### Wind Energy Assets of PEI

- Expertise and knowledge
  - Consultants, installation and operation of wind farms (notably Frontier Power Systems)
- Wind Energy Institute of Canada
  - Research, development, testing, consultation
- Entegrity Wind Systems inc.
  - 60 kW wind turbine
- Holland College
  - Wind Energy Technician Program

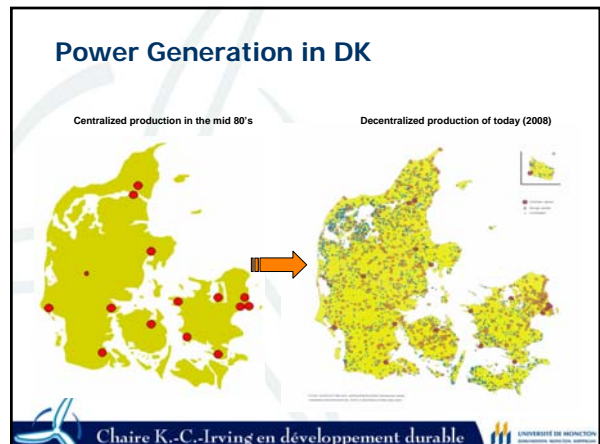
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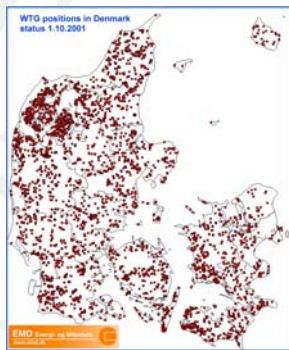
### Wind Energy in Denmark - Status

- Wind installed capacity = 3 200 MW (average of 20% of electricity demand; some days, 100% of electricity demand)
- Strong manufacturing sector:
  - 21 000 jobs / 5 billion euros (8 G\$) per year
- Half of wind energy is installed on the distribution grid
- Standard Offer Contracts / Feed-in Tariffs
- Seamless integration of electricity on the grid (technical and market participation)
- Target: 30-50% of electricity consumption by 2025

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## Wind Turbine Generators in DK (2001)

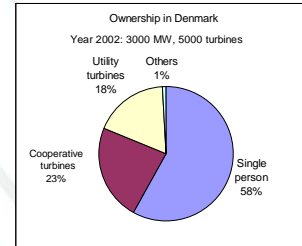


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## Ownership of WTG in DK (2002)

- 81% of wind turbines are local and community-based (2002)
- Main ownership model:
  - Individuals
  - Cooperatives
  - Electricity Utilities
  - Joint projects
- Drivers:
  - Feed-in Tariffs
  - Grid connection policy
  - Local investments



Source: J.H.M. Larsen, Copenhagen Environment and Energy Office, 2008

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## Samsø Island, Denmark

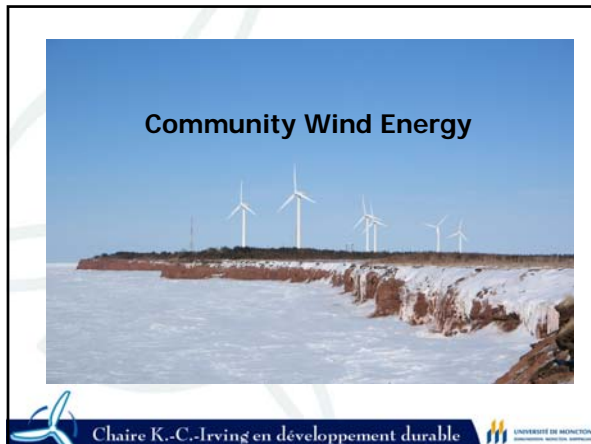
- Island in the center of Denmark
- 4 000 inhabitants
- 100% self-sufficient for electricity
  - Wind energy
  - Biomass
- 100% carbon offset for transport



*Net-Zero Carbon for the Energy Consumed on the Island*

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### Community Wind Energy

- Elements of definition:
  - Local initiative
  - Local ownership
  - Wind farm of commercial scale
  - 15 MW is an upper limit on the size of the wind farm
  - Wind farms typically connected to local distribution grid

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### Community Wind Energy (Cont.)

- A few advantages
  - Maximizes local economic benefits
  - Increases the social acceptability of wind farms
  - Develops local and community entrepreneurship
  - Small wind farms (less impact on the landscape)
  - Cooperation between communities (installation and operation of the community wind farms)
- A few disadvantages
  - Higher cost for electricity

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### Vision – Community Wind Initiative NB

- Maximize the economic benefits of wind energy developments for communities in NB
  - Communities in general
  - First Nation communities
- All regions of the province participate in the NB Energy Hub
- Individuals and communities will have the opportunity to assist the province in reaching its climate change goals
- Working with communities to achieve self-sufficiency

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### Mandate NB

- Recommend a community wind energy policy to the government for consideration
- Methodology:
  - Public consultations (10 communities)
  - First Nation Dialogue
  - Research work
  - Best practices from other jurisdictions

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### R: Allocation for the Program

- Pilot phase :
  - 100 MW
  - Investments of 220 MS
  - Revision of the allocation depending on the success of the program

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## R: Characteristics of the Individual Projects

- Maximum per project:  
15 MW
- Between 7 and 10 projects in NB
- Standard Offer Contracts
- In the pilot phase, one project per promoter as majority owner

## R: Eligible Owners

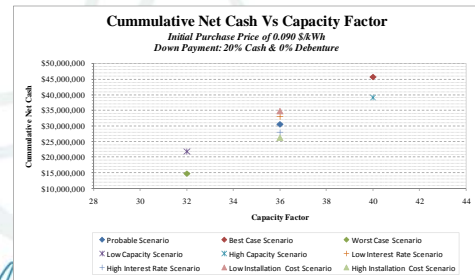
- Majority Owners (at least 51%):
  - Municipalities (or subsidiary company)
  - Cooperatives
  - Not-for-profit organizations
  - Institutions
- Possibility of being a participant (minority owner) in other projects

## R: Eligible Owners (cont.)

- Participants (minority owners):
  - Private corporations of NB
    - Maximum of 15% of the capital
    - 51% of shareholders are residents of NB or production facilities in NB
  - Private investors
    - Maximum of 15% of the capital
    - Resident of NB
  - NB Power
    - Maximum of 20% of the capital

## R: Purchase Price of the Electricity

- Initial price of 0.09\$ per kWh, fully indexed at 2% per year
- Potential Profits:



## Financial Needs

- Financing of a project (15 MW):
  - Total cost of a project:  
33 M\$
  - Equity (cash contribution):  
20% (6 M\$)
  - Debt financing:  
80% (27 M\$)

## Some Sources of Financing

- Traditional sources - Equity:
  - Municipal Funds
  - Gas tax
  - Funds of the cooperative
  - Private corporations
  - Private investors
  - Electricity Utility
  - Provincial economic development funds
  - ACOA
  - Etc.

### Some Sources of Financing (cont.)

- Traditional sources - Debt:
  - Banks
  - Credit Unions
  - Insurance companies
  - Etc.
- Potential sources - Debt:
  - Loan guarantees (Province or ACOA)

### R: New Sources of Financing

- Renewable Energy Investment Fund :
  - Eligible for residents of NB
  - Investments:
    - Minimum : \$500 (one time)
    - Maximum : \$10 000 per year
  - Minimum term of 5 years
  - Interest rate based on prime rate
  - Fiscal advantages (RRSP and tax credits)
  - Administered by independent corporation
  - Investments exclusively in renewable energy projects

Model: PEI Energy Bonds  
(used for the East Point Wind Farm)

### Conclusion



### Conclusion

- Atlantic Canada has an important wind resource that can be exploited to the benefit of the communities

*Wind energy can be  
an important source of electricity,  
an engine of economic development,  
a source of wealth  
for PEI*

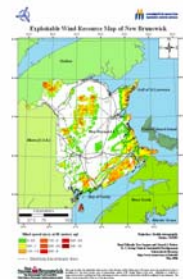
### Conclusion (cont.)

- Guiding principles for the development of wind energy:
  - Economic benefits for communities and the province
  - Social acceptance of wind farms
  - Protection of the environment (notably landscape)
- Opportunities for PEI:
  - Community-based approach for wind energy
    - Need good public policies and support by Government
  - Development through the PEI Energy Corporation

[www.peiwindatlas.ca](http://www.peiwindatlas.ca)  
[www.nbcommunitywind.ca](http://www.nbcommunitywind.ca)  
[www.umoncton.ca/chaired](http://www.umoncton.ca/chaired)

### Sources of Funding for Research Work

- Natural Sciences and Engineering Research Council (Canada)
- NB Environmental Trust Fund
- Government of New Brunswick
- Atlantic Innovation Fund
- New Brunswick Innovation Foundation
- Research contracts
- Université de Moncton



[www.umoncton.ca/chaired](http://www.umoncton.ca/chaired)