



Presentation

Evaluation of Opportunities and Barriers to Wind Power Exports from the Maritime Provinces to the US Northeast

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Canadian Wind Energy Association

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Introduction

- Power Advisory engaged to analyze the market for wind power exports from Canada's Maritime Provinces to the U.S. Northeast
- We were asked to answer two questions:
 - 1) What is the export and import potential for wind energy between the Maritime Provinces and the US Northeast?
 - 2) What are the key market issues that will drive these imports and exports?

Significant wind power potential in the Maritime Provinces

- A Danish consultant concluded that 5,500 to 7,500 MW of wind could be economic in the Maritime Provinces
 - ✓ Greater than the peak load in the region
- Current system can integrate about 2,100 MW without upgrades
 - ✓ New Brunswick could integrate up to 1,500 MW (but might require some internal reinforcement)
 - ✓ Nova Scotia about 600 MW, but rely on New Brunswick for balancing about 24 hours a year
- Integrating more wind power would require several measures:
 - ✓ Upgrades of transmission within and between the provinces
 - ✓ Increased transmission capacity for exports of wind power from the Maritime Provinces and
 - ✓ Better coordination between system operators in the Maritime Provinces and neighboring jurisdictions

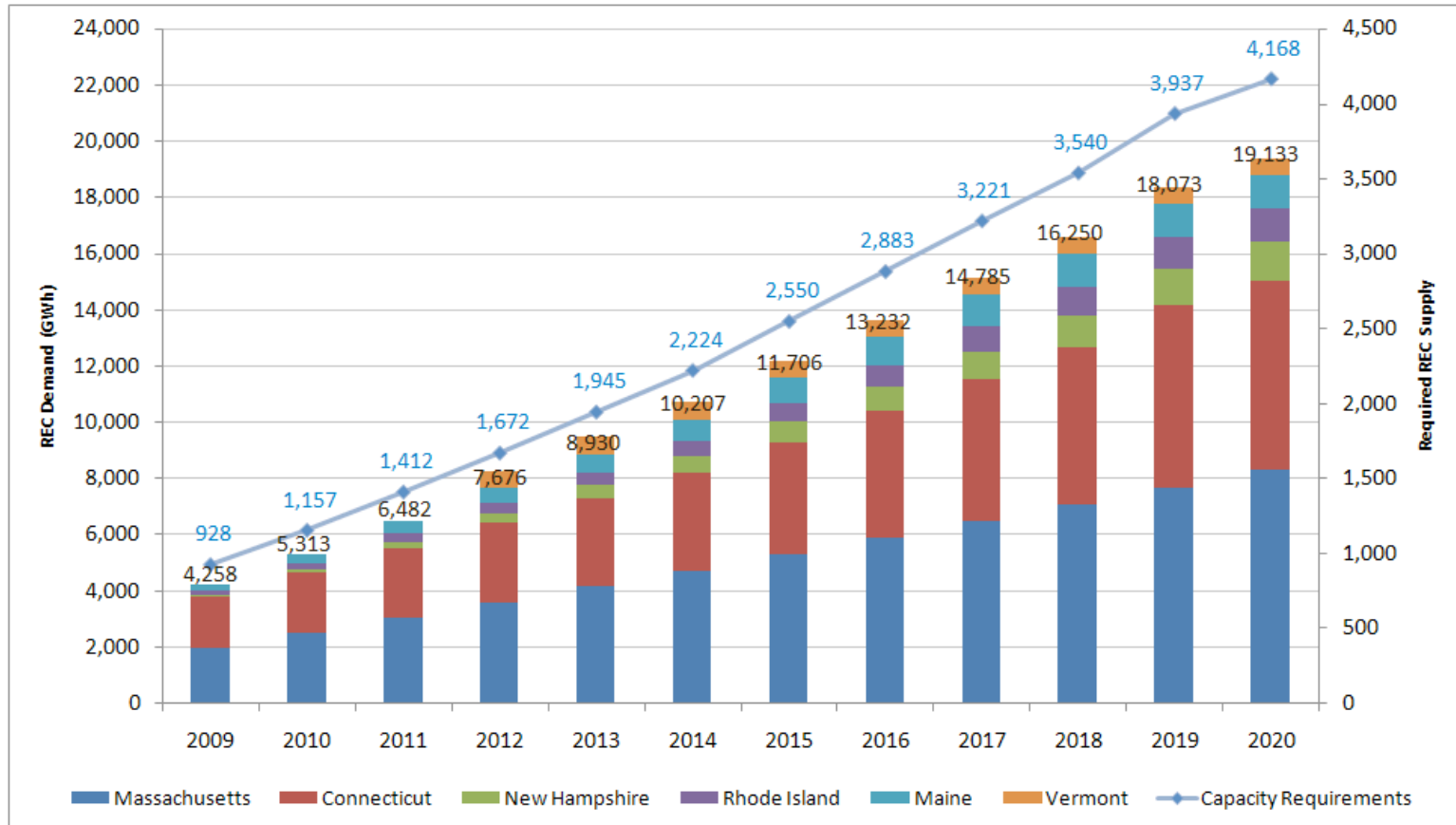
New England renewable energy market is based on RECs

- Demand for renewable energy in New England is driven largely by renewable portfolio standards (RPS) in each state
- RPS require that a growing fraction of total electricity supplied to consumers come from renewable resources
- Local sources in New England not likely to be sufficient to meet the needs of all the state RPS programs
- All but one RPS program use a tradeable certificate (called a renewable energy certificate, or REC) representing the environmental characteristics of the renewable energy
- Wind power from the Maritime Provinces can provide RECs if the power is also delivered
 - ✓ At least one seller from the Maritime Provinces already does so

New England demand increases given higher RPS requirements

- The RPS requirements which are expressed in energy are converted to a renewable capacity requirement (Blue Line)

Demand for Class I Renewable Energy Resources in New England



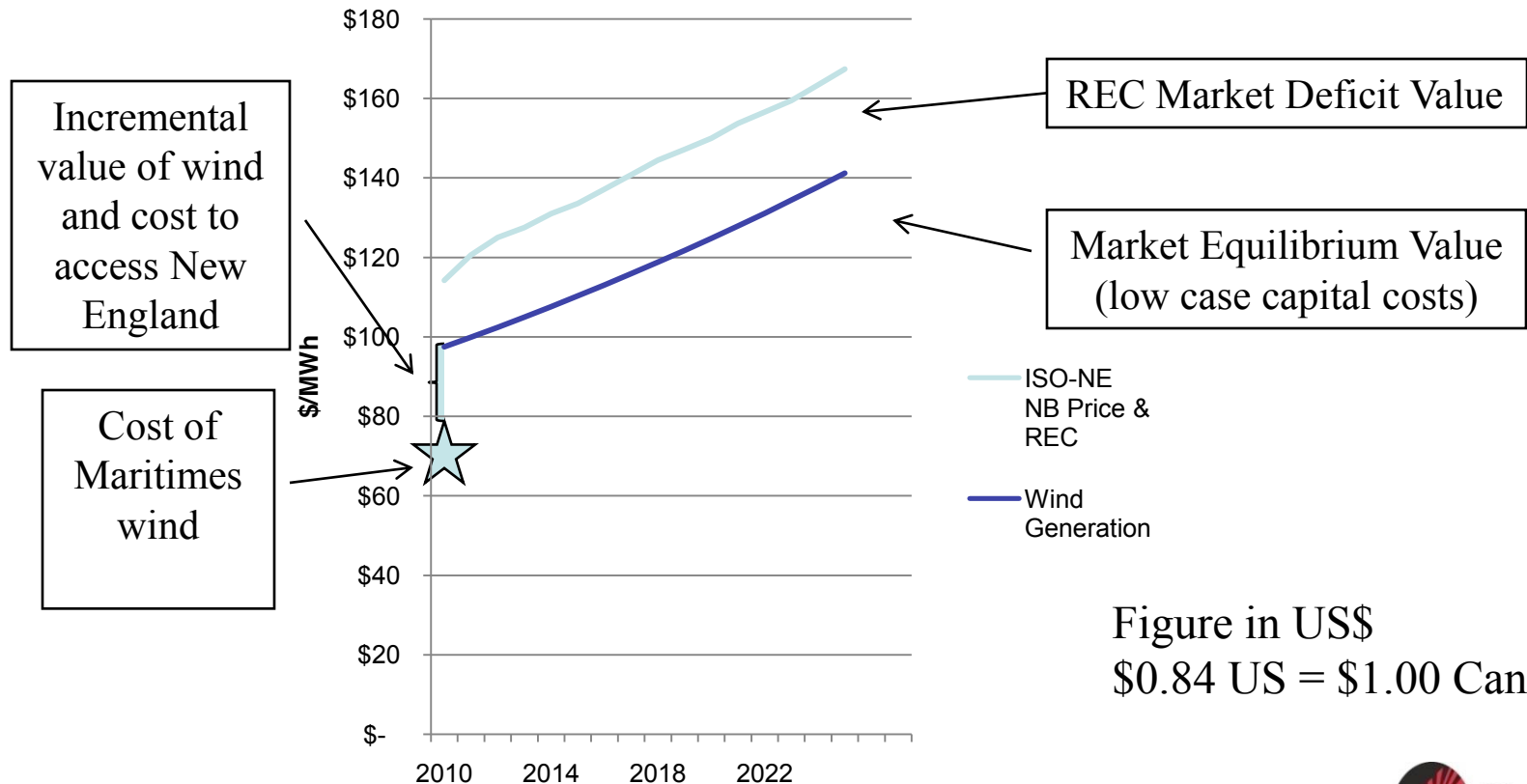
Capacity Requirement assumes that 50% of the capacity is provided by resources with a capacity factor of 34% (e.g., wind) and that 40% is provided by resources with a capacity factor of 80%.

Renewable energy values depends on market conditions

- The value in New England of wind power from the Maritime Provinces is the sum of its REC value and its value in the New England electricity market
- The ceiling for the value of RECs is set by the alternative compliance payment, the amount that an electricity supplier must pay if it does not have enough RECs
 - ✓ If REC market in deficit, total value in the New England market of wind power from the Maritime Provinces is about US\$113 per MWh in 2010
- The floor for the value of RECs is the cost of the New England renewable generation needed to meet the RPS
 - ✓ The value in the New England market if there are sufficient RECs is about US\$98 per MWh in 2010 (low cost estimate)

The upper and lower bounds on the market value of wind generation in New Brunswick are indicated below

- A major uncertainty is the associated supply and value of RECs and wind generation in the market
- This analysis suggests that there is considerable value offered by New England
- The cost to access the New England market also must be considered



The market for exports from the Maritime Provinces

- Physical aspects of exports from the Maritime Provinces are
 - ✓ Wind power exports from the Maritime Provinces must go through New Brunswick
 - ✓ If not originating in New Brunswick, exports pay two transmission tariffs, one in the province of origin and one in New Brunswick
 - This is referred to as rate pancaking
 - ✓ Transfer capacity from New Brunswick to New England is limited and is almost entirely contracted under long-term reservations
 - ✓ Capacity is often available on a short-term (daily) basis
 - ✓ Power can also be wheeled to New England through Québec
 - The additional tariff typically makes this uneconomic
 - ✓ Proposed transmission projects in New England could increase the transfer capacity

The market for exports from the Maritime Provinces

- Commercial aspects of exports from the Maritime Provinces are
 - ✓ The preferred mode of commercial access is through a marketer or agent
 - Buyers need a bundled product, best handled by an agent
 - Scheduling and settlement in these markets are complex, requiring specialized expertise and trading operations to minimize imbalance penalties
 - ✓ Sellers of renewable energy from the Maritime Provinces will have to bear some contract risks
 - The risk for the price differentials between a New England pricing hub and the injection point into ISO-NE
 - Most buyers prevented by regulation from contracting for longer than three years, so sellers have some price risk beyond the end of the contract
 - These rules relaxed in some states, but only for purchases from in-state resources

Key market barriers: Transmission

- Most commonly cited barriers to electricity exports from the Maritime Provinces relate to transmission:
 - ✓ Capacity is limited on the existing interties and most of it is tied up under long-term transmission rights reservations
 - ✓ Transmission tariffs are high, especially when exporting from Nova Scotia or PEI
 - ✓ Access to transmission requires market participation, which is costly and complex

Key market barriers: Risk

- Other barriers relate to risk:
 - ✓ Risk of changes in the rules allowing generators in the Maritime Provinces to access New England markets for both energy and RECs
 - ✓ Contracting risk, including price risks and the inability to find buyers willing to offer reasonable contract terms for sales of 10 years or greater
- Canadian projects that are exporting power are not eligible for ecoEnergy incentives while renewable generation in the United States does get incentives from the government

Recommendations: Transmission barriers

- System operators should pursue further opportunities for integration and coordination of their systems to allow increased electricity interchanges with the existing physical system or with relatively inexpensive upgrades
 - ✓ This will allow more wind or reduce the costs of integrating wind
 - This could be an intermediate term priority
- Additional transmission could be built to enable additional wind generation for export to ISO-NE
- The cost/value analysis suggests that current ISO-NE market prices need to increase to support this transmission investment unless the costs of these facilities are going to be shared with other customers based on the broader societal benefits of wind generation

Recommendations: Transmission barriers

- A long-term perspective is needed when evaluating the benefits of these transmission system investments
 - ✓ There is a meaningful risk of higher energy prices when the economy rebounds
 - Increased penetration of wind power reduces these price risks
 - ✓ New England has an increasing demand for renewable and low-carbon generation
 - Wind is cost-effective alternative for addressing these needs
- There is a need to eliminate rate pancaking by adopting uniform transmission tariffs in all the Maritime Provinces if wind projects in Nova Scotia and PEI are to sell into New England
 - ✓ This could be a short-term priority

Recommendations: Market barriers

- The market would benefit from one or more entities who can be an aggregator and serve as agent or marketer for wind project developers seeking to sell to New England
- This entity would be responsible for administration and coordination of the required transactions in the markets
 - ✓ The entity could be private or a government-related entity
 - ✓ There are currently parties that provide this service, but wind power developers lack information regarding the terms and pricing for such a service
 - CanWEA members should assess the importance of this
 - ✓ This along with uncertainty and lack of information regarding the New England market is a barrier to smaller developers
 - ✓ An entity such as NB Power Genco could provide this service under a formal tariff or posted rate

Recommendations: Market barriers

- Work within existing intergovernmental structures, such as the New England Governors/Eastern Canadian Premiers group, to identify uncertainties and barriers that governments can address
 - ✓ These include uncertainty about the rules, changes in the rules to exclude imports and the limited duration of power purchase agreements available from New England buyers
- Promote the importance to both the Maritime Provinces and New England of a stable market and a stable relationship
 - ✓ Allowing the economic use of Maritime Provinces resources to meet needs in New England