The Canadians are coming …

… or rather, their energy could well be. A newly-published study commissioned by the Canadian Wind Energy Association found considerable potential for wind energy exports from the Maritime Provinces to the US north east. In this exclusive extract, PES reveals how the provinces of New Brunswick, Nova Scotia, and Prince Edward Island could transport their surplus energy to the US.

The study, by the Massachusetts-based Power Advisory LLC and commissioned by the Canadian Wind Energy Association (CanWEA), found significant potential for wind energy exports from the Maritime Provinces to the US northeast. Ever-increasing demand for green energy in the US presents an emerging opportunity for wind energy developers in the Maritimes. However there are barriers that must be addressed in order for Canadian producers to gain access to that growing market.

The study noted that that the provinces of New Brunswick, Nova Scotia, and Prince Edward Island could develop more wind energy than the region could use – between 5,500 and 7,500 MW. Conversely, just across the border, legislated renewable energy mandates in six New England states require significant increases in green electricity. Recent shortages of renewable energy suggest that New England will not be able to produce locally the required amounts of renewable energy. The study estimates the New England mandates will require about 4,200 MW of renewable energy capacity over the next 11 years – about 60 per cent of which could come from wind.

"We see there is a huge market and we also see there will be a strong value for wind energy coming from Canada," said Jean-Francois Nolet, CanWEA's Quebec and Atlantic Canada Policy Manager. "The task now is to ensure our producers will have an easier access to this growing market."

Nolet says the cost of getting Canada's wind energy into the US – specifically inter-jurisdictional, (both provincial and international) transmission tariffs and physical constraints – are the main challenge. Competition for jobs is another factor, as many US states are increasingly interested in using wind energy to spur local economic development. John Dalton of Power Advisory LLC agrees there is a window of opportunity for the provinces to take the specific actions outlined in the report for the benefits offered by wind-generation development to be realized. A first step would be to put forward a united voice to articulate the benefits of exports from Canada. "The Maritimes have a wind resource that can play a key role in helping New England reach its renewable energy targets cost-effectively," said Dalton. "This can be a win-win for both regions."

CanWEA expects the Power Advisory study will lend significant support to the Atlantic Energy Gateway Initiative which was announced by the Federal Government in March of this year. The initiative commits $4m, over two years, to the development of additional renewable energy supplies in Atlantic Canada, and the selling of the resulting surplus energy to the US.

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CanWEA engaged Power Advisory to analyze the market for wind power exports from Canada's Maritime Provinces to the US Northeast.

The RFP for this project identified two fundamental questions:

1) What is the export and import potential for wind energy between the Maritime Provinces and the US Northeast; and 2) What are the key market issues that will drive these imports and exports?

Briefly, the answers to these two questions are:

1) Current total export potential for wind power is limited to 1,000 MW because of transmission limitations (and capacity is lower than that if the lines are being used for non-wind power transactions). The total potential for trade is much greater than that; a rough estimate is that New England will need about 2,500 MW of wind power by 2020 (assuming conservatively that other renewable resources provide more than 50 per cent of the region's requirements for renewable energy), and the Maritime Provinces could supply a significant fraction of that if the physical system were upgraded to allow it.
2) The key market issues driving demand in New England are the amounts of renewable energy required and the rules setting out what suppliers are eligible to meet the requirements. From the viewpoint of the Maritime Provinces, the key market issues are access to transmission, both its physical availability and its cost; prices paid in New England for both energy and the environmental attributes of the wind power; the rules and administration needed to participate in the electricity markets; and the ability of the system operators to integrate cost-effectively the wind power.
For this study Power Advisory surveyed all members of the Atlantic Caucus of CanWEA and conducted followed up by interviews with key members and with representatives of other important institutions like governments and system operators. These surveys and interviews told us how developers view the New England market for renewables, what they see as barriers to enhancing trade with New England, and some feedback on suggestions for addressing the barriers.

It is expected that local sources in New England will not 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 qualify to provide RECs if the power is also delivered. One seller from the Maritime Provinces already does so. 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. Power Advisory estimated that the total value in the New England market of wind power from the Maritime Provinces at such times would be 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. Power Advisory estimated that the value in the New England market if there are sufficient RECs is about US$98 per MWh in 2010 (low cost estimate).

Given the nature of the market, 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 border point of injection into the ISO-NE system. Most buyers are generally prevented by regulation from contracting for longer than three years, so the sellers have some price risk beyond the end of the contract. (These rules are being relaxed for purchases of renewable energy, but so far only for those from in-state resources.)

There is limited visibility regarding the development of renewable energy projects given the development lead time for renewable energy resources is relatively short

Transmission tariffs are high, especially when exporting from Nova Scotia or PEI. Access to transmission requires market participation, which is costly and complex. 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. Some developers noted that Canadian projects that are exporting power are not eligible for ecoEnergy incentives while renewable generation in the US does get incentives from the government.

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. Additional transmission could be built to enable additional wind generation for export to ISONE. The cost/value analysis suggests that ISO-NE market prices need to increase to support this transmission investment unless the costs of these facilities are going to be shared with – or borne by - other customers based on the broader societal benefits of wind generation. Potential exporters from the Maritime Provinces should commission or support studies to show that the overall benefits of importing wind power are greater than the cost of associated transmission upgrades.

A long-term perspective is needed when evaluating the benefits of these transmission system investments. In particular, there is a meaningful risk of higher energy prices when the economy rebounds. Furthermore, New England has an increasing demand for renewable and low-carbon generation. Eliminate rate pancaking by adopting uniform transmission tariffs in all the Maritime Provinces or in some other way.

The market needs one or more entities who can be an aggregator which will take on the role(s) of agent or marketer for wind project developers seeking to sell to New England. This entity would, for a fee, be responsible for all the administration and coordination of the required transactions in the markets. The entity could be private or a government-related entity, such as a Crown corporation. While there are currently parties that provide this service on a fee for service basis, wind power developers appear to lack information regarding the terms and pricing for such a service. This along with uncertainty and lack of information regarding the New England market represents a barrier to smaller developers considering and ultimately pursuing such sales. As such, one possibility is for an entity such as NB Power Genco to provide this service under a formal tariff or posted rate.

Given that New England is directly connected with the Maritimes through two interties with New Brunswick; can also be accessed through Québec; and there are proposals for direct transmission connections between New England and Nova Scotia, the focus of this evaluation is the electricity market operated by the Independent System Operator – New England (ISO-NE) and the renewable portfolio standards administered by the various New England states.

With New England REC prices tracking ACPs given the deficit in the supply of RECs and attractive wholesale electricity prices, there has been a strong economic incentive to develop renewable energy projects. However, there has been limited renewable energy project development as a result of a difficult permitting environment for all renewable technologies. With the most attractive wind regimes located on ridge tops and coastlines, New England population densities resulted in land use conflicts for many wind projects. There continues to be considerable supply uncertainty. This is driven by a number of factors:

There is limited visibility regarding the development of renewable energy projects given the development lead time for renewable energy resources is relatively short (two to four years for most RPS eligible projects). Furthermore, with renewable energy projects from adjacent regions able to participate in the market, the supply of RECs can change relatively quickly if high REC prices induce additional parties to participate in the New England market. For example out of region (projects not located in the ISO-NE market) RECs provided 33% of the total Massachusetts REC supply in 2007.

Maine, which has a wind resource potential equivalent to all of the other New England states combined, has recently implemented an expedited permitting process for wind projects and targeted the development of 2,000 MW of wind by 2015 and 3,000 MW by 2020.

The level of wind project development in Maine is also important because it would compete directly with wind projects in the Maritimes for transmission access to the Southern New England market (given that the output from these projects would flow through Maine) which is the major load centre and market area.

The significant potential offered by off-shore wind. A number of off-shore wind projects (the Cape Wind Project is the most prominent) are proposed and these are large projects which would have a significant impact on REC supply. The successful development of one such project is likely to be followed by others. Several of the New England states are making it easier for local distribution companies to sign long-term contracts. As a result it is more difficult in the current economic environment where capital is highly risk adverse for these projects to attract capital (i.e., both equity and debt). This along with significantly lower energy prices and a fall in REC prices is preventing many renewable energy projects from moving forward.

The recently-signed American Recovery and Reinvestment Act (the Act or the economic stimulus package) has a major focus on renewable energy which should help renewable energy project developers respond to these challenges. In particular, the Act includes a three-year extension through December 31, 2013 of the production tax credit (PTC), the primary US policy support mechanism for wind power. In addition, given the challenges of finding parties that can utilize these tax credits the legislation includes a new program that allows renewable energy developers to forgo the PTC, receive a 30% investment tax credit (ITC) or alternatively secure a grant from the Treasury Department in the amount of the ITC. Under this structure the Treasury is reducing the capital requirements for these facilities by 30 per cent.

The grant is available for projects placed in service in 2009 or 2010, or placed in service before 2013 provided construction begins in 2009 or 2010. While the Act is not likely to immediately offset conditions in the credit markets, as these markets return to more typical conditions it is likely to reduce renewable project costs and the likelihood of sustained deficits in the New England REC market. The current economic environment increases the uncertainty regarding the supply for RECs in New England.

In 2007 the Massachusetts REC market actually had a small surplus (i.e., 6%: 88 GWh out of an obligation of 1,529 GWh) as indicated by the Massachusetts DOER's 2007 RPS Annual Compliance Report. Interestingly, Massachusetts DOER suggests that its experience of a surplus in 2007 is likely to be sustained in future years given the anticipated supply of RECs. Massachusetts DOER also assumes that energy efficiency programs are likely to cause electricity demand to be flat through 2015. This is consistent with the significant investment in energy efficiency called for by the Green Communities Act which was enacted in July, 2008.

Power Advisory believes that there is no evidence that the state is taking action which would allow demand to be flat through 2015; as a result this forecast is overly optimistic and understates the likely load growth. In an October 7, 2008 auction administered for the Massachusetts Renewable Energy Trust prices averaged $30.61/MWh for 2008 Massachusetts RECs and $24.50/MWh for 2008 Connecticut RECs. These lower prices are attributable to an increase in supply, continued regulatory uncertainty as well as adverse financial market conditions. Equally as important the 2009 RECs which were offered didn't sell as prices didn't exceed the reservation price.

The current severe economic slowdown in the US is affecting prices for all commodities because of uncertainty over when demand will recover. This uncertainty extends to the demand for electricity and therefore to the demand for RECs. While it is difficult to distinguish between cyclical factors (e.g., adverse financial market conditions) and longer-term trends, it is clear that the REC market is subject to considerable uncertainty and that any multi-year longer term transaction in the current environment would require a considerable discount relative to ACPs.

Thanks to the Canadian Wind Association for their kind permission to extract from this report. For more information, visit: www.canwea.ca