



Holistic Network Design for Offshore Wind & Interregional Planning Webinar: Summary for Policy Makers

On Oct. 12, 2022, the Ecology Action Centre and the Conservation Council of New Brunswick hosted four speakers to discuss the potential for interregional transmission planning and incorporating offshore wind in Eastern Canada. The event featured:

- Pierre-Olivier Pineau, Chair of Energy Sector Management at HEC Montréal,
- Thomas Manicom, Power Systems Engineer for National Grid ESO,
- Rob Gramlich, President of Grid Strategies LLC and
- Elisa Obermann, Executive Director of Marine Renewables Canada,
- with independent journalist Shawn McCarthy moderating the discussion.

The central question of the webinar was: **how do we organize our electricity system and electricity transmission to deliver clean, affordable power to benefit multiple stakeholders?** Canada has set a national goal to get to net-zero electricity by 2035. However, it will be up to provinces to establish what works best in their contexts – in terms of how much fossil fuel is on the grid currently – to reach this target. The government of Nova Scotia has a clean electricity target of 80 per cent clean electricity by 2030 to coincide with coal phaseout in the province.

Key points from each speaker:

Pierre-Olivier Pineau, is a professor in the department of decision sciences at HEC Montréal. His research focuses on environmental impacts of energy trading and he has built electricity market models.

- Pineau provided details on how carbon intensive energy is in Atlantic Canada, having close to 200g of CO₂ equivalent per kWh of electricity. That is comparable to our close American neighbours, but much higher than Quebec and Ontario, who have a few grams to a few tens of grams of CO₂ equivalent respectively.
- From these numbers, it is clear how far we have to go in terms of decarbonizing our electricity grid in Atlantic Canada.
- Pineau's models show that the cost to decarbonize the electricity system could be cut in half by using optimally designed transmission in the region and efficient energy trading.
- Paired with efficiency measures at the household level, efficient transmission planning would balance the electricity system and get the right renewables when and where they are needed in the system. Together, these measures would make the transition more affordable for governments and taxpayers.

Thomas Manicom is a power systems engineer working for the United Kingdom's National Grid Energy Systems Operator (ESO).

- The Energy Systems Operator has become an independent body as the UK separating transmission and distribution. The ESO's focus is getting energy where it is needed when it is needed to effectively and reliably power the UK grid.
- They have managed the development of the large offshore wind build in the UK. Their big challenge is how to effectively deliver this added offshore wind power from the coasts of Scotland to population centres in the south of the UK.
- With the goal of getting to a 100 per cent clean grid at top of mind, they have used a decision-making framework which weighs four factors equally:
 - (1) cost for consumers,
 - (2) deliverability and operability,
 - (3) impacts to the environment and
 - (4) impacts to local communities.
- They have developed a plan to bring offshore wind power to shore at 15 strategic locations, where development of the wind turbines, transmission infrastructure and connections to the existing grid onshore would maximize efficiency in the system but also minimize environmental damage – both on and offshore.

Rob Gramlick is the President of Grid Strategies LLC then provided examples of how different regions in the US have developed regional grid interconnections.

- They have focused on lower cost decarbonization, thinking about how transmission integration can result in lower costs for grid operators and consumers, and result in a grid which is more reliable.
- Gramlick highlighted several instances where a large storm had impacted one region, and because of interregional transmission and connections to grids across regions and states, the affected region was able to get the lights on faster.
- Grid management and effective transmission also supported getting both lights and air conditioners on during the heat wave in California in summer 2022.
- He, like Pineau, brought forward a point relating to the potential to lower costs for building an interconnected renewable energy grid. From studies done in the US, large scale transmission interconnections can allow for 2:1 to 3:1 improvements in a cost benefits analysis. This is because large scale transmission interconnections can allow electrons moving across the system to have to travel on low-capacity lines less often.



Elisa Obermann, the Executive Director of Marine Renewables Canada, then brought us back to the Canadian context.

- Obermann started by framing why offshore wind can be an important resource to consider in Atlantic Canada because it could:
 - support the much-needed transition off coal and allow the region to meet its renewable electricity targets,
 - provide more electricity to the grid, which will be needed as we electrify other sectors to reach net-zero goals,
 - provide energy security and increased reliability, avoiding price shocks like those seen in the fossil fuel sector due to current geopolitical situation in fall of 2022 and
 - use an existing workforce of those specialized in working in other large projects offshore.
- There has been a large increase in interest in the last year in the offshore wind potential off Nova Scotia's coasts.
- Obermann cited a huge potential of as much as 900 GW off the coast of Nova Scotia, and noted that though this shouldn't all be exploited, we need a holistic analysis of how this could support the grid in Nova Scotia, Eastern Canada and the East Coast of the United States. Governments need to work with actors across the region to think about what this interconnected electricity system both on and offshore could look like, and what opportunity it could provide for regional decarbonization and reducing its costs.

We saw from these discussions that there is strong potential for interregional transmission planning to support our transition to net-zero in Eastern Canada, and encourage governments and other stakeholders to pursue further discussion to ensure they are able to provide reliable, clean and affordable energy across the region.

