Transforming the Northeast Power Markets:
Dual Purpose Transmission

NY-Vermont 800MW
NY N-S 1000MW
Maine up to 2000MW
The New Market for Electric Transmission

The grid is evolving to meet new market needs

- From 1955 to 1990, HQ Developed a tremendous transmission system to carry Quebec and Labrador hydro to market
  - Major projects developed to export to NY in the 1980s and to New England in the 1990s
  - But stuck since then...

- In the 2000s, New England and New York built >1800MW of wind; basically using existing transmission capacity.
  - Wind development is at a standstill pending new transmission - currently only 9% of the region’s energy mix is renewable – **but the market wants more!**

- There is general agreement in New England (and maybe New York) that it’s time to expand the Grid for clean energy
  - But remember, under FERC Order 1000, transmission has become a competitive business.
  - So, expect a series of competitive RFPs.
Why the Northeast Needs New Clean Energy Transmission

After years in “transmission limbo,” New England and New York appear ready to commit to building a Clean Energy Transmission System.

Powerful forces are posing challenges that our current power grid cannot meet:

- Renewable Resource Integration
- Power Plant Retirements – including nuclear!
- Natural Gas Infrastructure Constraints

This is less of an engineering challenge than a political and commercial one.

How do we meet the challenge? With innovative projects.

1. Wind+hydro sharing the same transmission
2. Buried HVDC lines where that makes economic and political sense
Political Specifications for New Transmission

• “Load pays” for transmission and therefore load, and its regulators, will choose the transmission additions they want.

• New transmission has to carry clean energy for decades to come.
  • Reliable REC-eligible energy has highest political priority; others forms of clean energy also desired.

• New transmission has to be “permiittable.” Eminent domain may not provide a path for all “elective” projects.

• New transmission has to solve multiple problems: hydro can firm up wind, and wind makes hydro more desirable.

• New transmission has to provide economic opportunities for a broad array of stakeholders.

• New transmission has to diversify New England and New York’s access to resources.
Quebec
1. Desire to export more, at fair price
2. Can play “balancing role” to wind
3. Wants to avoid siting controversy

Southern New England
1. Wants 2000-3000MW of clean energy
2. Considers wind and solar “Class 1” but would welcome hydro as firming energy
3. Wants to avoid siting controversy

New York
1. Wants more clean energy at reasonable price
2. Has lots of northern and western wind
3. Wants to avoid siting controversy

Maine
1. Has lots of wind
2. Would like more hydro and gas

Ontario
1. Still recovering from market design issues;
2. Basically clean power capacity deficient

Vermont and NH
1. Not much if any exportable clean energy
2. “Thru” transmission must be undergrounded

Newfoundland
1. Has lots of hydro
2. Has to deal with 2041 issues

The Electric Power Infrastructure of Northeastern North America
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Seeking a New Model for Clean Energy Transmission

Build transmission dedicated to more wind?

• Up to 4000MW of new wind is readily available in Upstate/Western New York and in Northern Maine
  • PROS
    • Maine and New York want this development opportunity...economic growth and enduring tax revenues
    • Meets the RPS requirement of all states
  • CONS
    • Problem: wind only blows 1/3 of the time; transmission line not deployed 2/3 of time?
    • Too costly; Difficult to finance
Finding a New Model for Clean Energy Transmission

Build transmission for US wind and Canadian hydro

Combined 4000MW opportunity when the resources are brought together by transmission

• PROS
  • Both resources win: wind gets 1/3, hydro 2/3 of transmission rights
  • Resources complement each other: Wind does best in winter, when hydro can be difficult
  • Both US and Canadian resource owners win
  • It is efficient (given RPS standard, “all hydro” line selection means someone would still have to build transmission for wind)
  • Many in environmental community willing to give “mature” hydro long-term contract support when it helps “enable” wind via shared (and therefore lower cost) transmission

• CONS
  • None
The Wind-and-Hydro Solution

By combining wind+hydro transmission, we can efficiently develop 4000MW of clean energy trade between Eastern Canada and the Northeastern United States
The Solution

• The market listens to the customer (“give us wind and hydro”)
• The transition from fossil to clean power is enabled
  • Northeastern states meet RPS and CPP objectives, with clean energy that is reasonably priced
  • 1/3 of energy is affordable, US-based wind
  • 2/3 is hydro, performing the “firming role” for which it is uniquely suited
• Canadian provinces achieve substantial additional export levels
  • Quebec gets 2/3 of 3000MW = 2000MW
  • Maritimes get 2/3 of 1000MW = 666MW
• New England gets firm, clean power... and a more diverse portfolio
• The environment gets a break