

Brookfield



Carbon Adder and Cost Allocation

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November 10, 2016

One of the largest public pure-play renewable businesses globally

100 years of experience in power generation

Full operating, development and power marketing capabilities

Over 2,000 operating employees

\$25B

POWER
ASSETS

10,000+

MEGAWATTS OF
CAPACITY

87%

HYDROELECTRIC
GENERATION



Over **250** power
generating facilities



15 markets
in **7** countries



Situated on
81 river systems

NEW ENGLAND

49 Hydro Stations
1 Wind Farm
1,374 MW

NEW YORK

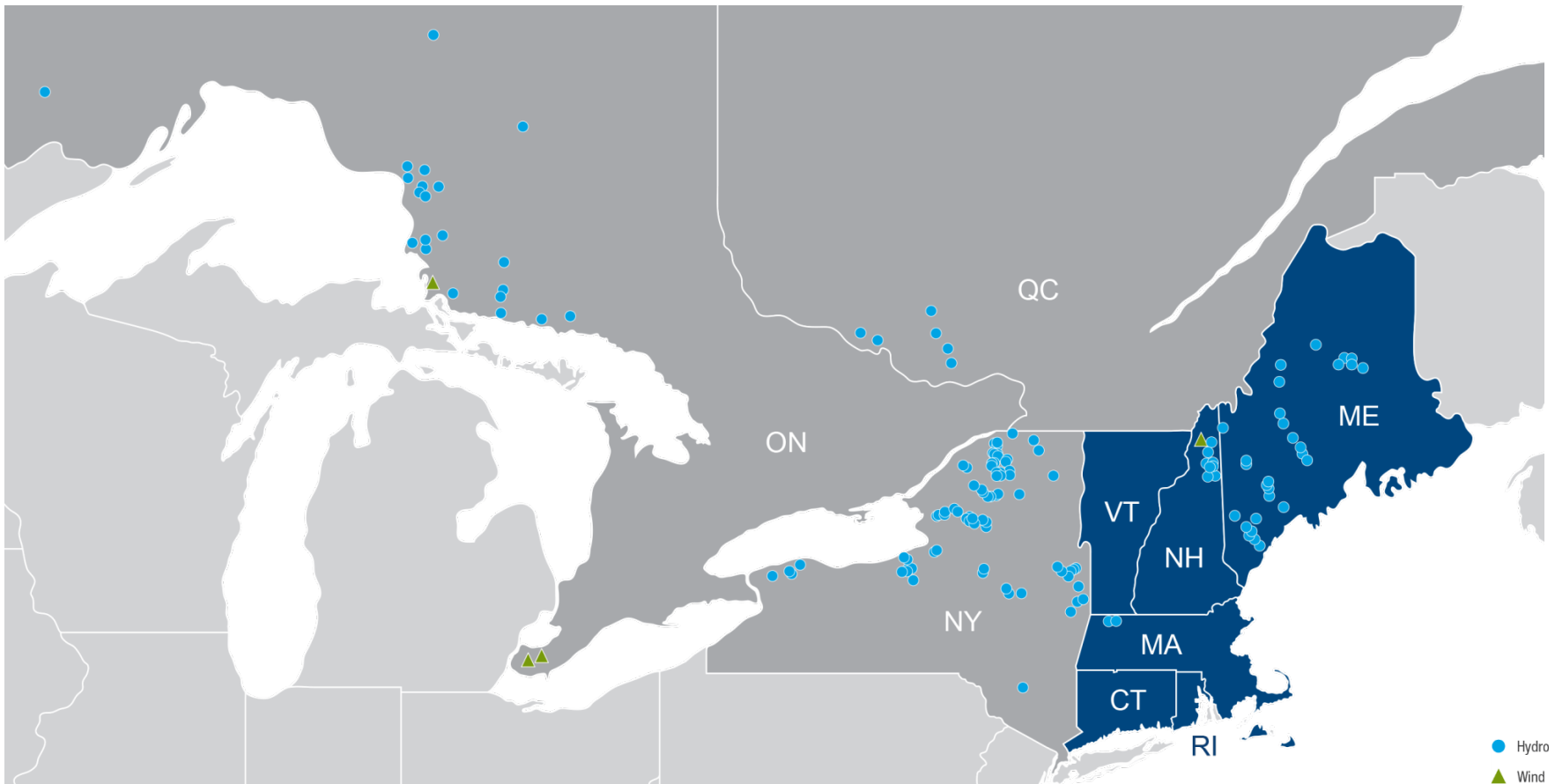
74 Hydro Stations
711 MW

QUÉBEC

6 Hydro Stations
291 MW

ONTARIO

21 Hydro Stations
3 Wind Farms
1,412 MW



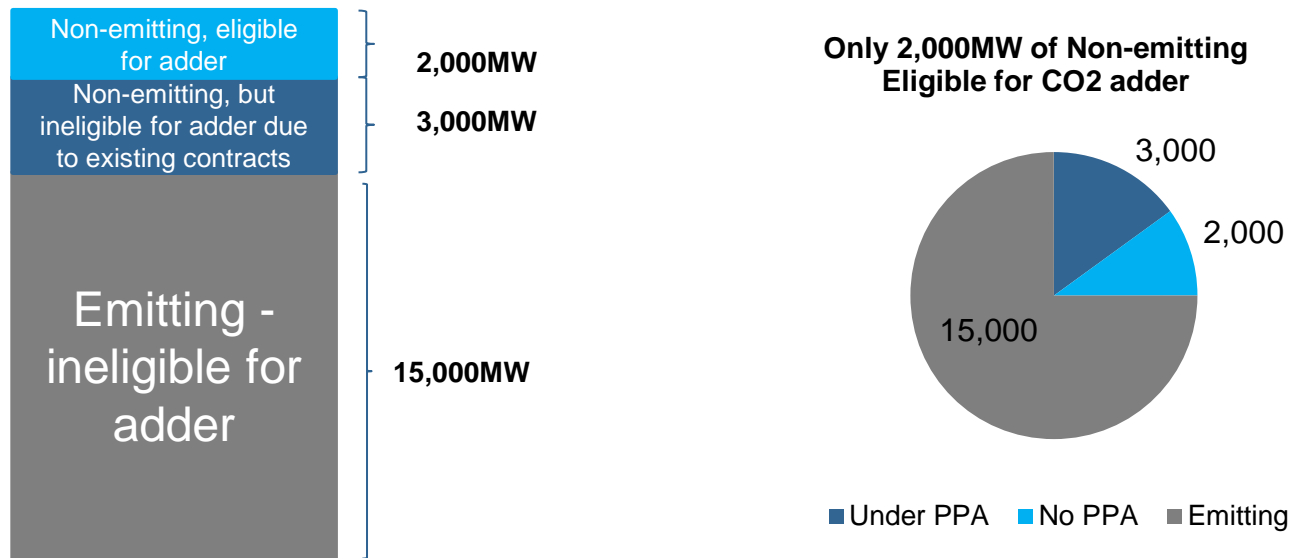
Objective: Reduction of CO2 emissions and meeting RPS goals

- Solution - Ensuring non-emitting resources receive priority in the energy market dispatch (i.e., maximizing MWh of non-emitting resources)
- The carbon adder solution meets this objective to new or existing resources, in a transparent, technology and vintage neutral, cost-effective, non-discriminatory way

Overview of today's discussion points

1. Carbon adder can still allow states to pursue PPAs to non-emitting resources
2. If a state has met its renewable mandates solely from contracts/PPAs then cost from the carbon adder is not allocated to that state
 - One state does not pay for the mandates of another state
3. Existing resources without PPA receive compensation for their non-emitting attributes
4. GIS-like carbon tracker system will track generation from non-emitting generators to determine:
 - a) Carbon adder eligibility
 - b) RPS goals for each state
 - c) Cost allocation

- Assume 20,000MW generated during an hour
 - 15,000MW are from carbon emitting generation (**Not receiving carbon adder**)
 - 3,000MW from non-emitting resources but claimed by a load in the carbon tracker due to an existing PPA that compensates the attribute (**Not receiving carbon adder**)
 - 2,000MW from unclaimed non-emitting resources (**Receiving carbon adder**)



- **Incremental cost of the carbon adder is only associated with the 2,000MW of unclaimed non-emitting MW**

Non-emitting generator with PPA enters in the carbon tracker its generation output to be claimed by the load that awarded the PPA and is ineligible for carbon adder

<p>Load that has contracted the generation via PPA can track the delivery</p>	<p>This non-emitting generator now becomes ineligible to keep the carbon adder (Similar how the PPA for energy works today)</p>	<p>On a monthly basis the carbon tracker adds up the hourly generation claimed per load and is compared against the state RPS goals</p>	<p>ISO-NE uses the claimed MWh per state for cost-allocation purposes</p>
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Non-emitting generation not claimed in the carbon tracker becomes eligible to receive the carbon adder

<p>Each state enters is RPS goals, so some may chose not to participate</p>	<p>If a state has a 20% RPS goals and has claimed 20% of it via the tracker then the state does not receive any cost allocation from the CO2 adder</p>	<p>If a state is short from its RPS goal, then can use unclaimed non-emitting generation from the tracker to meet its goal, and receives cost allocation</p>
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- Assume the carbon tracker identified that loads in MA, CT, RI were short claiming non-emitting generation to meet its RPS goals during a month
- Only these 3 states receive cost allocation from the carbon adder program
 - States can use these unclaimed non-emitting resources (2,000MW from earlier example) toward meeting their RPS goal (e.g., on a load-share basis)
 - **This can be viewed as market procurement of non-emitting attributes via the carbon adder since new or existing resources can be in this 2,000MW mix**

State	Goal	Claimed in carbon tracker MW from non-emitting with existing PPA as % of load	2,000MW of unclaimed non-emitting MW is now available to be assigned to deficient states on a load share basis	RPS Goal after claiming non-emitting MW that received the carbon adder	Receiving Cost Allocation of the Carbon Adder
MA	20%	18%	1100MW	19%	Yes
CT	20%	17%	700MW	18%	Yes
RI	20%	16%	200MW	19%	Yes
VT	20%	21%	0MW	N/A	No
ME	20%	20%	0MW	N/A	No
NH	0%	10%	0MW	N/A	No

States can continue pursuing contracting via PPAs	New and existing resources with PPAs do not receive the carbon adder, which reduces/eliminates cost allocation of the carbon adder to that state/load
	Existing resources without PPAs receive revenue stream for their non-emitting attributes
	New non-emitting generation can come in the market and receive carbon adder without pursuing PPA
States procure non-emitting carbon resources based on their RPS needs	States that have met their are RPS goals do not get allocated cost from the carbon adder program
	States that are short of meeting their RPS goal can use unclaimed non-emitting MW to meet their goals
	One state does not pay for the mandate of another state
Value of carbon tracker for meeting RPS goals	Having generation be claimed in the tracker ensures that existing non-emitting generation remains on-line and is claimed by a New England state