2019 Economic Study – Follow-Up to the December 2019 Meeting

Planning Advisory Committee

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Background:
Three 2019 Economic Study Requests

Requests were submitted by the New England States Committee on Electricity (NESCOE), Anbaric Development Partners (Anbaric) and RENEW Northeast (RENEW)

- Presented to the PAC on April 25, 2019

Requester	Purpose of request
NESCOE	Impacts on transmission system and wholesale market of increasing penetration of offshore wind resources https://www.iso-ne.com/static-assets/documents/2019/04/a2_nescoe_2019_economic_study_request_presentation.pptx
Anbaric	Impacts on energy market prices, air emissions and regional fuel security of large penetration of offshore wind resources https://www.iso-ne.com/static-assets/documents/2019/04/anbaric_2019_economic_study_request.pdf
RENEW	Economic impact of conceptual increases in hourly operating limits on the Orrington-South interface from conceptual transmission upgrades https://www.iso-ne.com/static-assets/documents/2019/04/a2_renew_2019_economic_study_request_presentation.pdf

Background: Past Presentations

- Draft scope of work and high-level assumptions for each of these requests were discussed with the PAC on May 21, 2019
- More detailed assumptions were discussed on August 8, 2019
- A status update was given on November 20, 2019
- Preliminary NESCOE results for cases up to 6,000 MW were presented on December 19, 2019

Reference these presentations for more details about the economic studies.

Today's Presentation

- Provides answers to questions "taken back" during that December 2019 PAC presentation of the NESCOE preliminary results.

- Review tasks and schedule to complete 2019 Economic Studies:
  - NESCOE
  - Anbaric
  - RENEW

Behind-the-Meter Photovoltaic

Q: What is included in the Behind-the-Meter Photovoltaic category (BTM PV) that is used in the Economic Studies?

A: The Economic Studies BTM PV category includes resources that do not participate in the wholesale markets but are reflected in the CELT load forecast.

Separate from the BTM PV category, in the Economic Studies the Utility Scale PV category includes resources that have cleared the FCM, is a Settlement Only Generator (SOG), or otherwise participate in wholesale markets.

LMPs and Congestions Costs

Q: Is there a congestion component as part of the LMP metrics? If so what is it?

Why do average annual LMPs vary by RSP bubble?

A: The LMP metric used in the Economic Studies reflects transmission congestion. When interfaces are constrained the next MW of demand will come from local generation which may be more expensive.

In addition to congestion, Regional System Plan (RSP) bubbles use individual RSP load shapes, which can result in different average LMPs over the course of a year.

Uplift

Q: What constraint(s) in GridView drive uplift?

A: Resource operational limitations drive uplift.

Operational limitations include minimum run time, no load cost, and startup cost, etc.

Since GridView is a DC model operational limitations do not include voltage control, minimum inertia, etc.

Transmission Interface Limit

Q: Should the Surowiec-South interface limit in the study be increased with the inclusion of NECEC?

A: Yes, the Surowiec-South limit will be 2,100 MW (600 MW increase from FCA 14 transfer limits) in the 2019 Economic Studies based on past interconnection studies.

The 2019 Economic Studies will use the FCA 14 transfer limits for all other interfaces.

Offshore Wind (OSW) Interconnection Points

Q: Will ISO New England be evaluating other OSW interconnection points?

A: Only those interconnection points previously presented will be evaluated (see next slide for reference).

Note: Requests were made at previous PAC meetings to evaluate other wind interconnection points. While other interconnection points were reviewed by ISO New England, we have decided to utilize only the identifed interconnection points for the 2019 Economic Studies.

OSW Interconnection Points (cont.)

Interconnection Point	Bourne/Canal /Pilgrim	Brayton Point	Kent County /Davisville	Montville	Mystic	Millstone	Assumed Major Additional Transmission Reinforcement(s)	Total MW
RSP Area	SEMA	SEMA	RI	CT	Boston	CT		
NESCOE_2000	800	500	700				None	2000
NESCOE_3000	1,500	800	700				None	3000
NESCOE_5000	2,400	800	1,000	800			None	5000
NESCOE_6000	2,400	1,600	1,000	800	200		None	6000
NESCOE_8000_1	2,400	1,600	1,000	800	2,200		#1: Direct injection into K Street	8000
NESCOE_8000_2	3,400	1,600	1,000	800	1,200		#2: 345 kV reinforcements from the Cape to Stoughton/K. Street	8000
NESCOE_8000_3	2,400	2,600	1,000	800	1,200		#3: 345 kV reinforcements from Brayton Point to Millbury/West Medway/West Walpole	8000
NESCOE_8000_4	2,400	1,600	1,500	1,300	1,200		#4: 345 kV reinforcements between Montville and Kent County	8000
Anbaric_8000	3,400	1,600	1,000	800	1,200		#2: 345 kV reinforcements from the Cape to Stoughton/K. Street	8000
Anbaric_10000 Anbaric_Sens	3,400	2,600	1,500	1,300	1,200		#2, #3 and #4	10000
Anbaric_12000	3,400	2,600	1,500	1,300	2,200	1,000	#1, #2, #3 and #4	12000

Offshore wind injections distributed to mimic 1) awarded RFPs 2) locations of queue position requests and 3) location of assumed transmission reinforcements

Signals anticipated maximum level of MW injection at the interconnection point before major additional 345 kV reinforcements are needed

Signals MW injection at the interconnection point requiring major additional 345 kV reinforcement(s)

Values shown in MW

Import Spilling

Q: Can ISO New England identify import spilling?

A: Yes, ISO New England will detail import spilling in future presentations.

Next Steps of the NESCOE 2019 Economic Study

- Present GridView results with revised 2015 load/PV/wind profiles for all scenarios in February/March timeframe
- Present requested transmission upgrade cost estimates in April
- Complete ancillary services analysis by May
- Publish final report in June

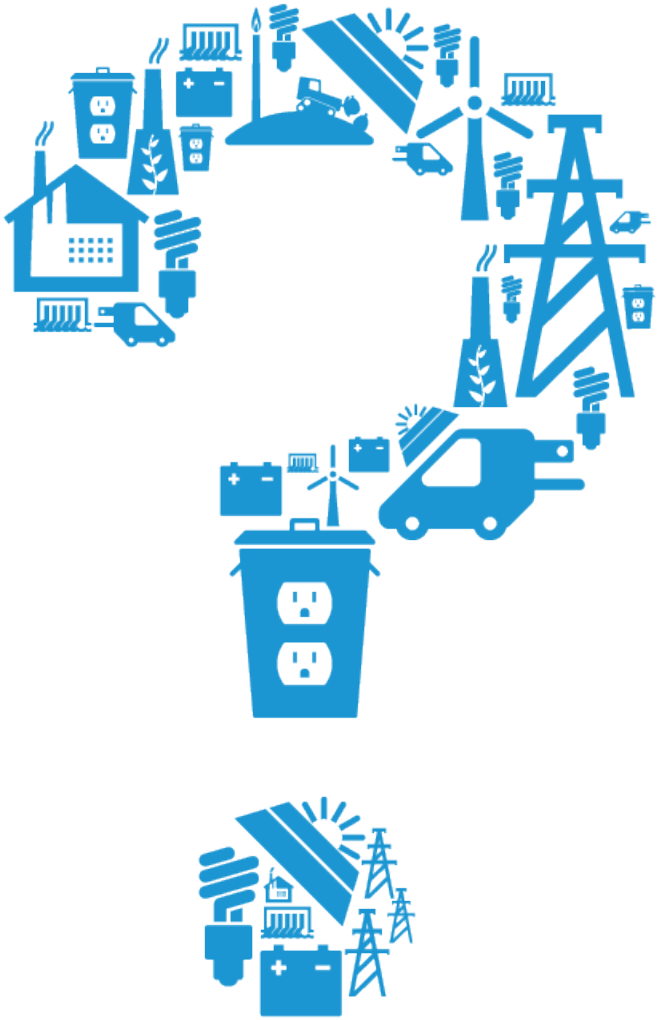
Next Steps of the Anbaric 2019 Economic Study

- Present GridView results with revised 2015 load/PV/wind profiles for all scenarios in February/March timeframe
  - Including a sensitivity where NECEC is curtailed by threshold prices before local renewables
- Present requested transmission upgrade cost estimates in April
- Complete fuel security analysis by May
- Publish final report in June/July

Next Steps of the RENEW 2019 Economic Study

- Present GridView results with revised 2015 load/PV/wind profiles for all scenarios in April
  - Including a sensitivity where NECEC is curtailed by threshold prices before local renewables
- Publish final report in July

Questions



APPENDIX

Acronyms for the 2019 Economic Studies

Acronyms

- BOEM – Bureau of Ocean Energy Management
- CELT – Capacity, Energy, Load, and Transmission Report
- CSO – Capacity Supply Obligation
- Cstr. – Constrained
- DR – Demand-Response
- EE – Energy Efficiency
- EIA – U.S. Energy Information Administration
- FCA – Forward Capacity Auction
- FCM – Forward Capacity Market
- LMP – Locational Marginal Price
- LSE – Load-Serving Entity
- MSW – Municipal Solid Waste
- NECEC – New England Clean Energy Connect

Acronyms, cont.

- NESCOE – New England States Committee on Electricity
- NG – Natural Gas
- NICR – Net Installed Capacity Requirement
- NREL – National Renewable Energy Laboratory
- OSW – Offshore Wind
- PHEV – Plug-in Hybrid Electric Vehicle
- PV – Photovoltaic
- RFP – Request for Proposals
- RGGI – Regional Greenhouse Gas Initiative
- SCC – Seasonal Claimed Capability
- Uncstr. – Unconstrained