ISO new england

Eleventh Forward Capacity Auction for the 2020/2021 Capacity Commitment Period Results Summary & Trends

Reliability Committee Meeting

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Highlights

- The eleventh Forward Capacity Auction (FCA #11) was held February 6, 2017 and successfully procured resources to satisfy the region's Installed Capacity Requirement (ICR) for the 2020/2021 Capacity Commitment Period (CCP)
- Approximately 40,421 MW of qualified resources competed to provide the needed 34,075 MW of capacity (Net ICR)
- Approximately 35,835 MW of new and existing resources cleared the auction
  - Little new generation cleared the auction (264 MW) compared to 1,459 MW in FCA #10
  - Overall, 137 MW of new and existing wind and 66 MW of new and existing solar resources cleared
  - Approximately 515 MW of new Energy Efficiency (EE) resources cleared, which is an increase of 183 MW from FCA #10
- No de-list bids (including retirement requests) were rejected for reliability pursuant to Tariff Section III.13.2.5.2.5.

FCA #11 Details

- The auction was held February 6, 2017
- The Installed Capacity Requirement (ICR) was 35,034 MW
  - After accounting for 959 MW of Hydro-Québec Installed Capacity Credits, the proposed net ICR value was 34,075 MW
  - Capacity purchased was be based on Marginal Reliability Impact (MRI) Demand Curves
  - FERC accepted these values on December 6, 2016
- Three Capacity Zones were modeled:
  - Rest of Pool (ROP)
  - Southeast New England (SENE) as an import constrained zone
    - Local Sourcing Requirement is set at 9,810 MW
  - Northern New England (NNE) as an export constrained zone
    - Maximum Capacity Limit is set at 8,980 MW

** All demand resource MW values in this presentation include the T&D loss factor*

FCA #11 Details, continued

- Over 17,000 MW of new resources entered the qualification process, and approximately 6,076 MW of new resources were qualified to participate
  - Final Qualification Determination Notifications (QDN) were sent on September 30, 2016
  - Some projects withdrew from qualification leaving 5,958 MW to participate
  - FERC accepted the qualification values on December 6, 2016
- Approximately 34,463 MW of Existing Resources participated, including approximately 118 MW of Significant Increases
- No De-list Bids were retained for Reliability

** All demand resource MW values in this presentation include the T&D loss factor*

FCA #11 Details, continued

- Approximately 35,835 MW* (uncapped) of resources cleared the auction
  - Existing Resources (33,779 MW)
    - 31,208 MW of existing supply resources
      - 31,125 MW of generating capacity including intermittent
      - 83 MW of import capacity
    - 2,571 MW of existing demand resources; 0 MW of RTEG
  - New Resources (2,057 MW)
    - 1,417 MW of new supply resources
      - 264 MW of generating capacity**
      - 1,153 MW of import capacity
    - 640 MW of new demand resources (including 515 MW of EE); 0 MW RTEG
- A Dynamic De-list closed the auction (rationed)
- Auction Results were filed with FERC on February 28
  - https://www.iso-ne.com/participate/filings-orders/ferc-filings

*Sums may not add due to rounding.

**Excludes Significant Increase projects which receive existing treatment in the auction.

Capacity Price: Capacity Zones and Imports

Estimated Payment Rates
for Capacity Not Already in a Multi-Year Obligation ($/kw-month)

Status	ROP	SENE	NNE	New York AC	New Brunswick
Existing	$5.297	$5.297	$5.297	$5.297	$3.381
New	$5.297	$5.297	$5.297	$5.297	$3.381

Starting Price of the auction: $18.624/kW-month

- Capacity imports from New Brunswick cleared at lower prices due to excess supply of imports at the pool-wide price
  - Total capacity imports are limited by the physical import capability of the external interfaces into New England; the lowest price imports clear

Highlights of New Cleared Resources

Of the qualified new resources (5,958 MW), about 35% (or 2,057 MW) of new capacity resources cleared the auction

– Mostly import capacity resources* and demand response resources

*No import capacity resources coupled with an Elective Transmission Upgrade (ETU) were qualified for FCA #11

Details of New Cleared Resources

- No new large generating plants cleared in FCA #11
- Most of the new resources, both generation and demand response, were located in Massachusetts
- Approximately 4.6 MW of wind and 6.3 MW of solar new generating resources cleared
  - This does not include Behind-the-Meter solar (BTM-PV)
- Approximately 30.5 MW elected the Renewable Technology Resource (RTR) exemption and cleared
  - Approximately 11.1 MW of Generation and 19.4 MW of Demand Response Resources, leaving approximately 514 MW available for FCA #12

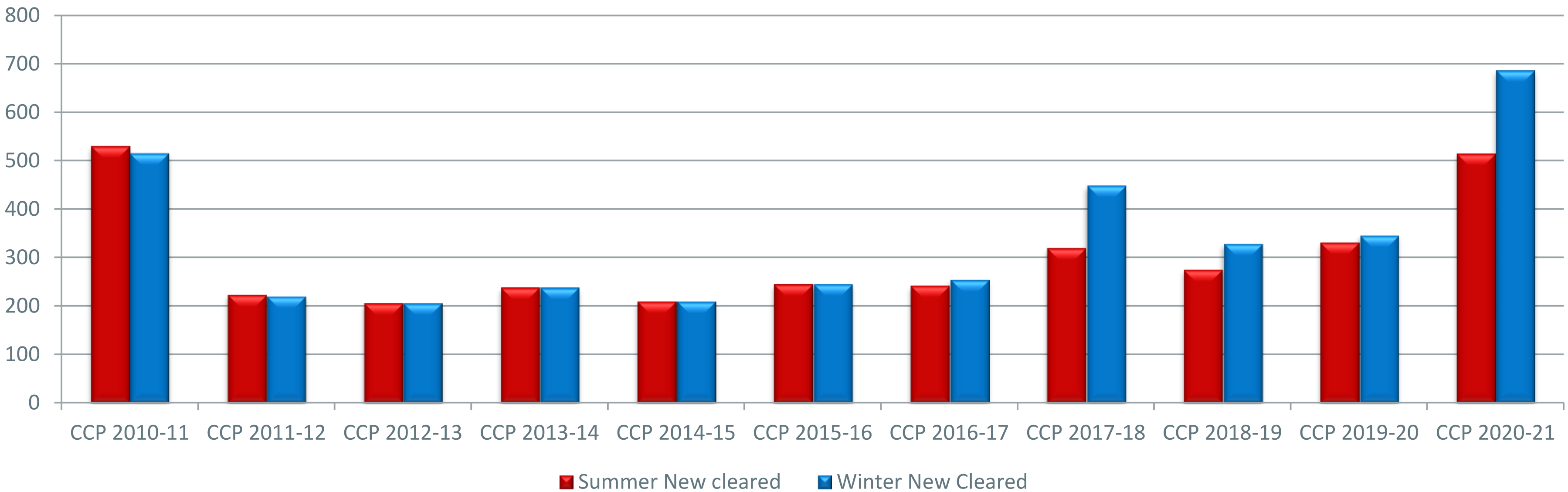
	Summer Qualified Capacity	Cleared	Allowance	Max Cap	RTR Remaining
FCA #9	16.251	16.251	200	200	183.749
FCA #10	62.174	55.936	400	383.749	327.813
FCA #11	92.22	30.5	600	527.813	497.313
FCA #12	TBD	TBD	600	513.564	TBD

Clearing Trends of Demand Response Resources

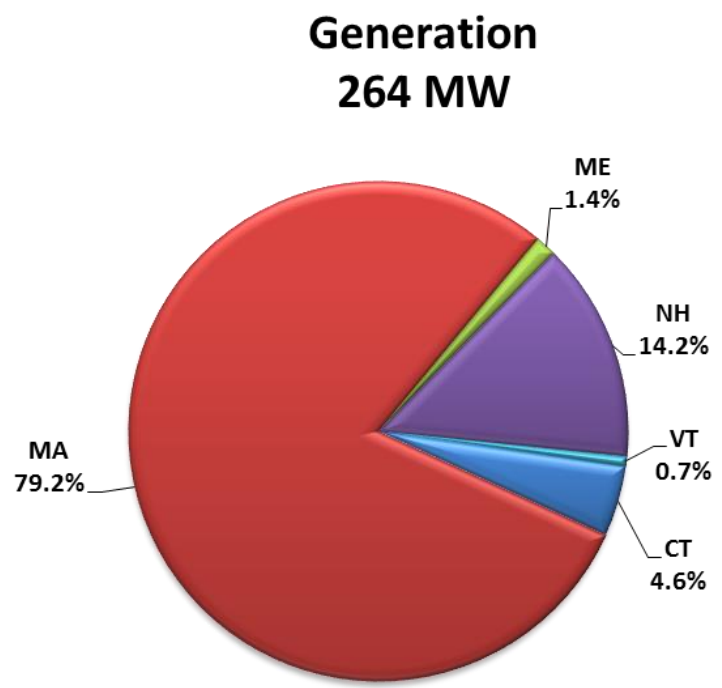
- More demand response resources cleared in FCA #11 than previous auctions

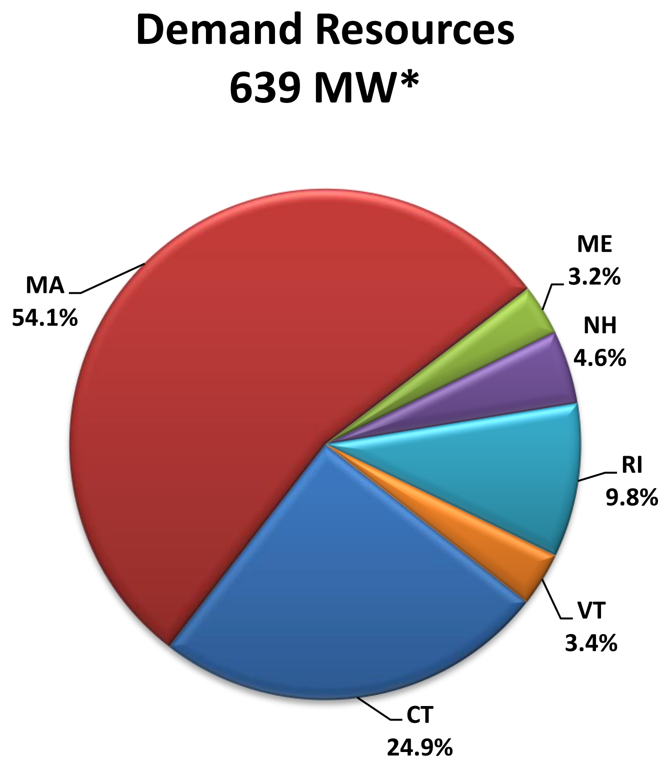
Active (85 MW)	Passive (554 MW)
Load Management - 80 MW	Energy Efficiency - 515MW
Distributed Generation - 5 MW	Distributed Generation - 39 MW

- State Sponsored Energy Efficiency has continued to increase
  - Approximately 183 MWs more cleared in FCA #11 than FCA #10



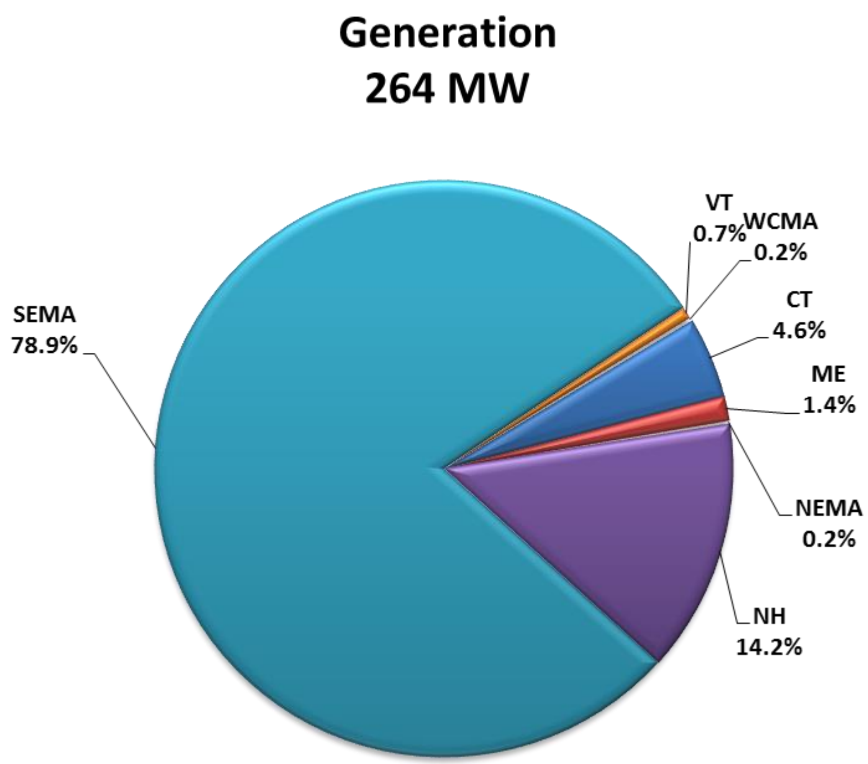
FCA #11 New Capacity Resources by State

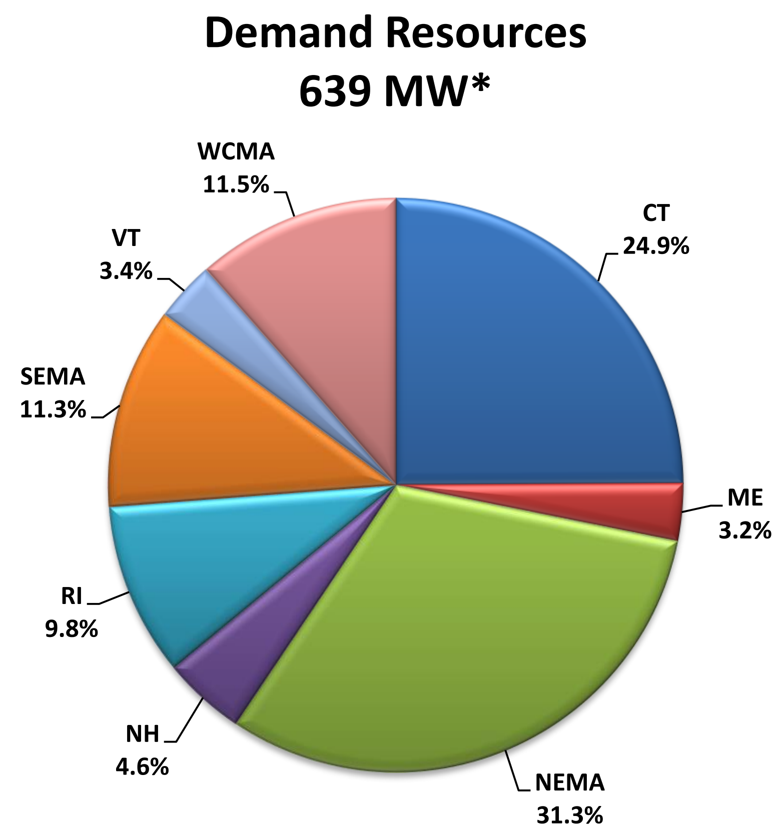




* Includes 8% T&D Gross-up and new RTEG

New Capacity Resources by Load Zone





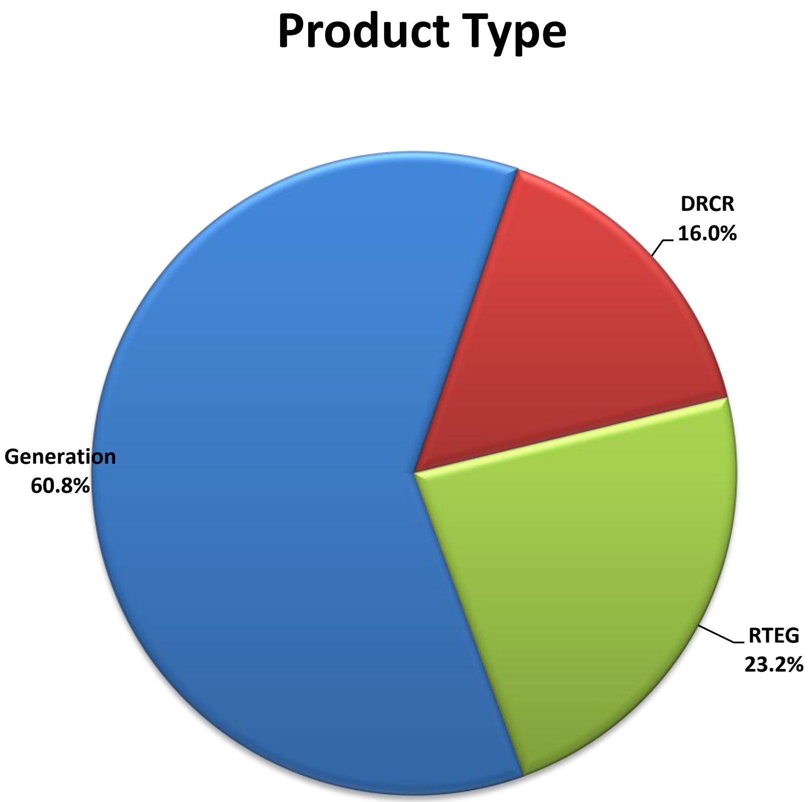
* Includes 8% T&D Gross-up and new RTEG

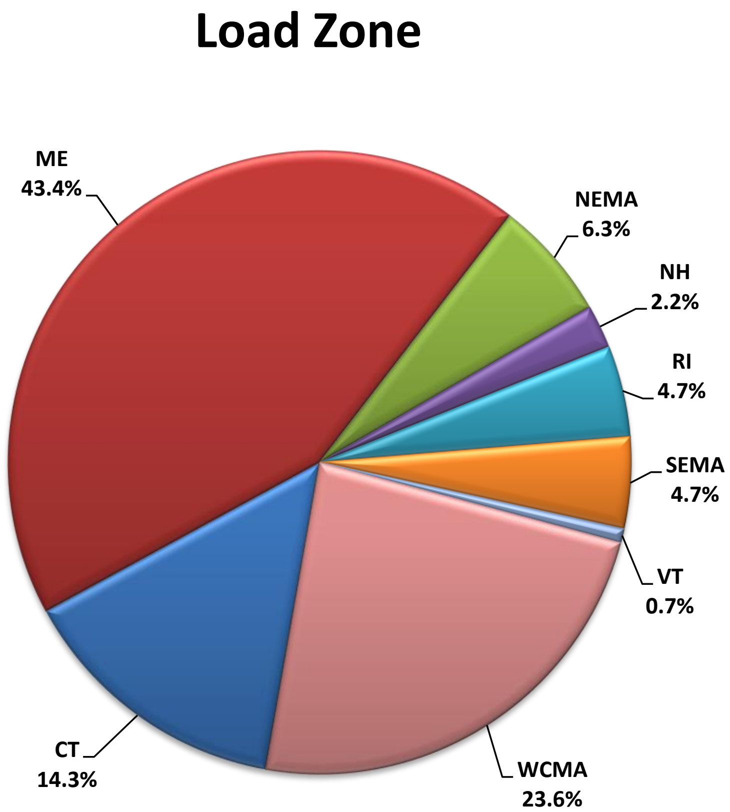
FCA #11 De-list Bids Summary

- A total of 41 Static De-list Bids (approximately 1,500 MW) were submitted from resources in all six New England states by the Existing Capacity Qualification Deadline
  - Approximately 1,257 MW of Static De-list Bids were withdrawn from the qualification process leaving 243 MW to participate in FCA #11
- Two Retirement De-list Bids (27 MW*) were received and chose to retire
  - The transmission operability analyses supporting these retirement de-list bids was reviewed at the August 9-10, 2016 RC/TC Meeting
- No Permanent De-list Bids were received
- One Export Bid (100 MW) was received
- A total of approximately 535 MW of de-list bids cleared the auction
  - 192 MWs of Dynamic De-list Bids
  - 243 MWs of Static De-list Bids
  - 100 MW Export De-list Bid
- No de-list bids were retained for reliability

* This amount was later reduced to 25 MW after accounting for terminations

Cleared De-list Bids (535 MW Total*)
by Product Type & Load Zone



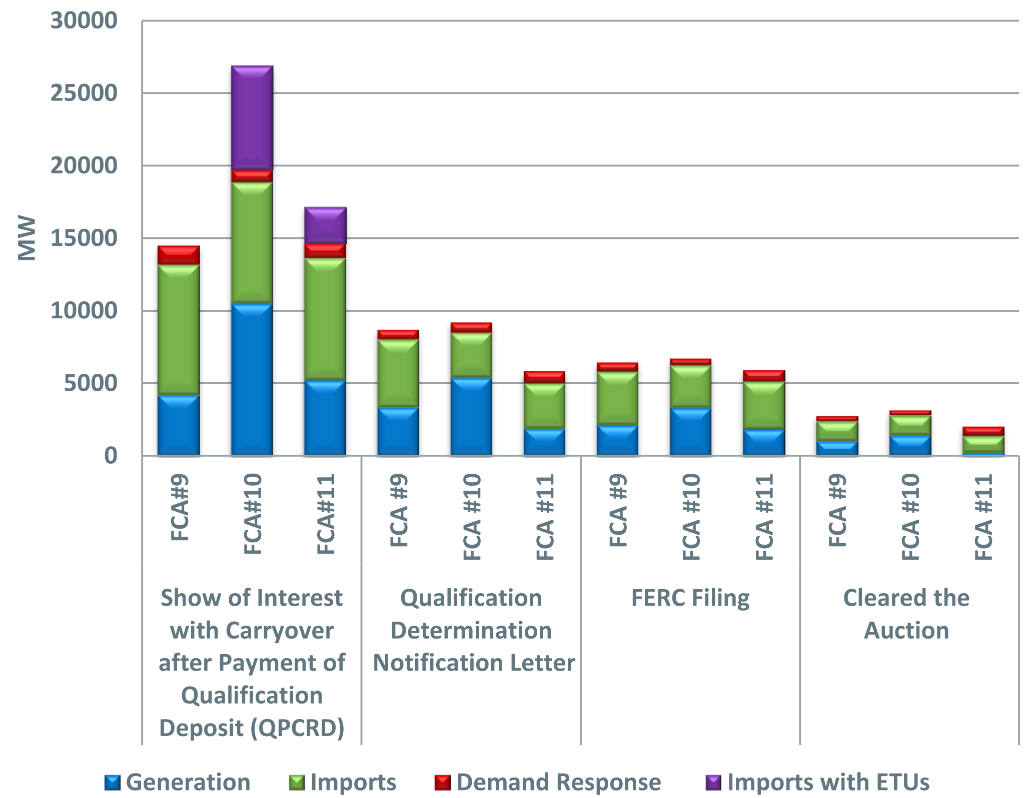


* Includes 8% T&D Gross-up and new RTEG

Participation Trends at Major FCM Deadlines

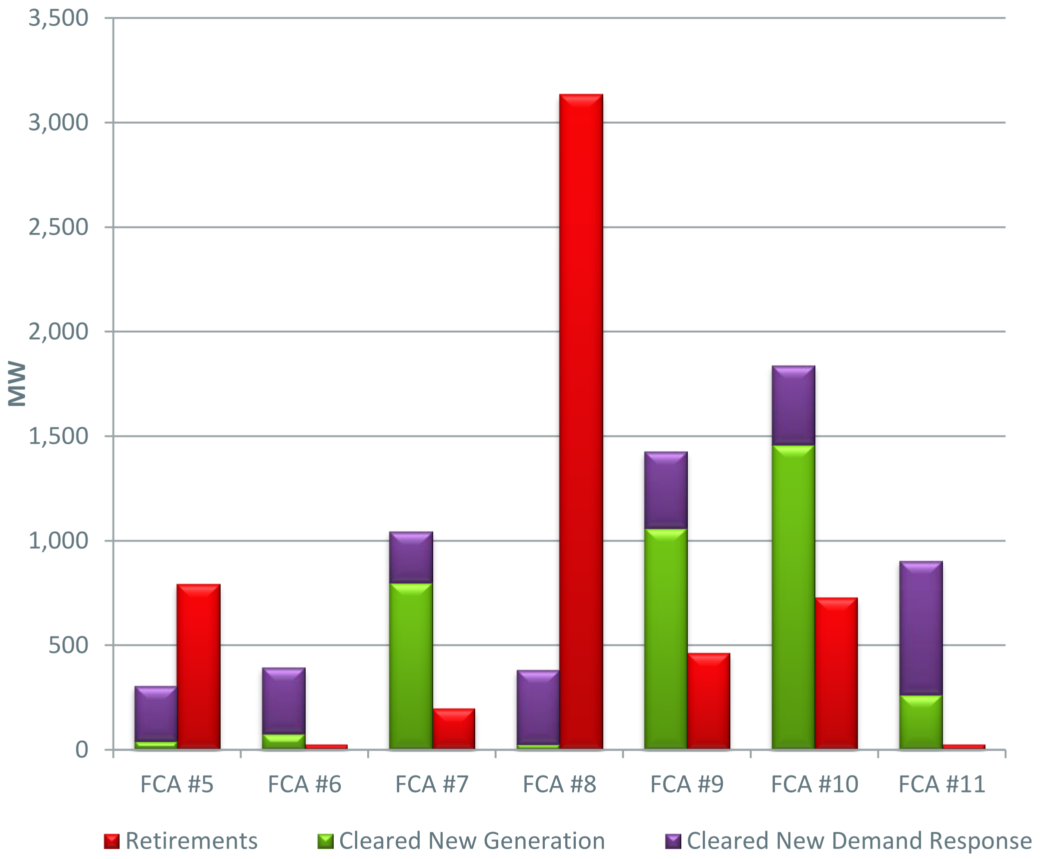
FCA #11 Compared to FCA #9 and FCA #10

- Generation participation in the qualification process continues to be strong even though a significant amount of generation did not clear in FCA #11
- There is interest in bringing forward an Elective Transmission Upgrade (ETU) coupled with an Import resource
- Overall, Demand Response Resource participation has remained the same, despite an increase in Passive resources and a decrease in Active resources



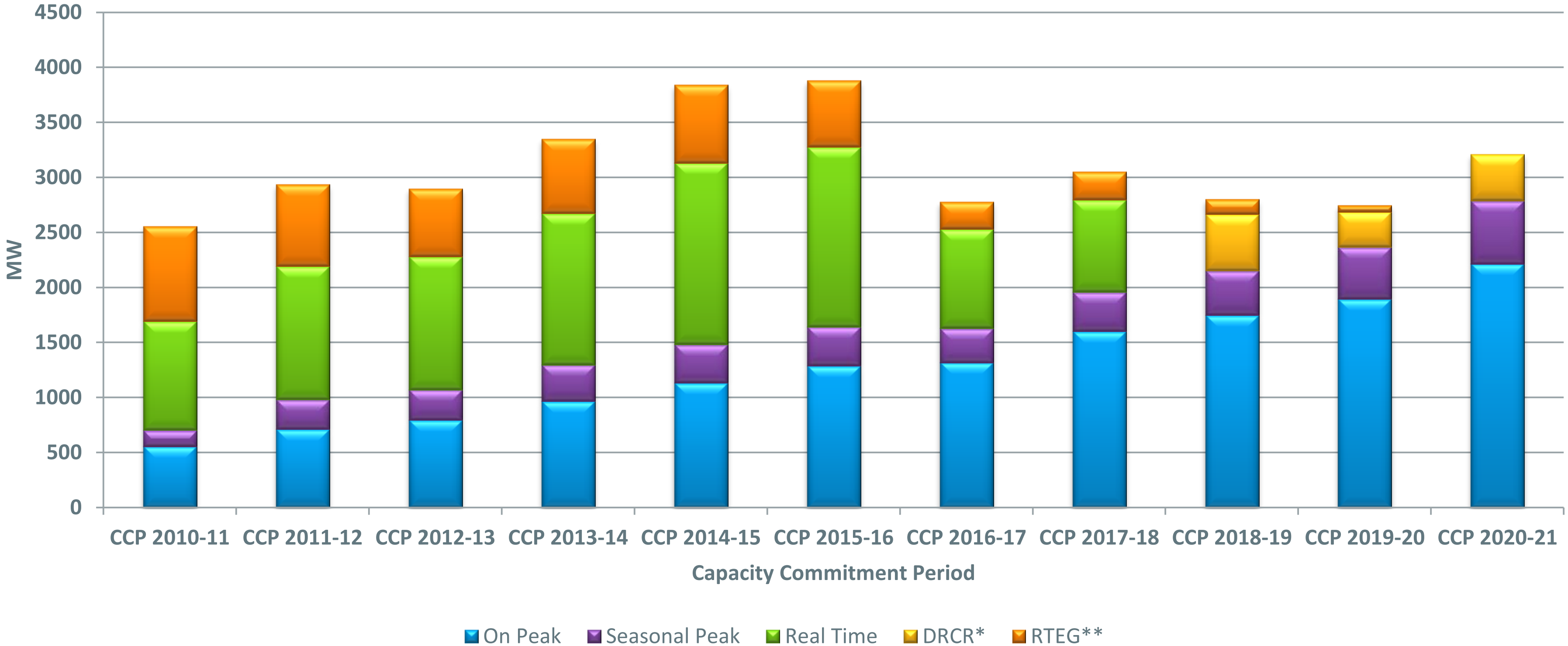
Trends in Cleared Capacity responding to Retirements

- More than 5,300 MW of generation and demand response capacity has retired or will retire in less than 5 years
  - Salem Harbor Station (749 MW)
  - Vermont Yankee (604 MW)
  - Norwalk Harbor Station (342 MW)
  - Brayton Point Station (1,535 MW)
  - Mount Tom Station (143 MW)
  - Pilgrim Nuclear Power Station (677 MW)
  - Approximately 1,100 MW of Active DR
- New Generation Resources have been typically clearing within one to two auctions after major retirements on the system, while New Demand Response doesn't seem to be influenced by resource retirements



Demand Resource Product Type Trends

- The amount of On-Peak and Seasonal Peak Demand Resources (Passive DR) that clears in the FCA continues to increase. There seems to be a decrease in Active Resource participation. No Real Time Emergency Generators (RTEG) cleared in FCA #11



*After June 2018, Real Time Demand Response (RTDR) will be replaced with Demand Response Capacity Resources (DRCR)

** Since clearing a FCA, some RTEGs have converted to RTDRs as a result of 2016 EPA rule changes. Also, pending FERC approval of an ISO-NE February 3, 2017 filing, RTEGs will no longer be able to participate in the Forward Capacity Market

Appendix 1: Forward Capacity Auction #11 Results Summary Flowcharts

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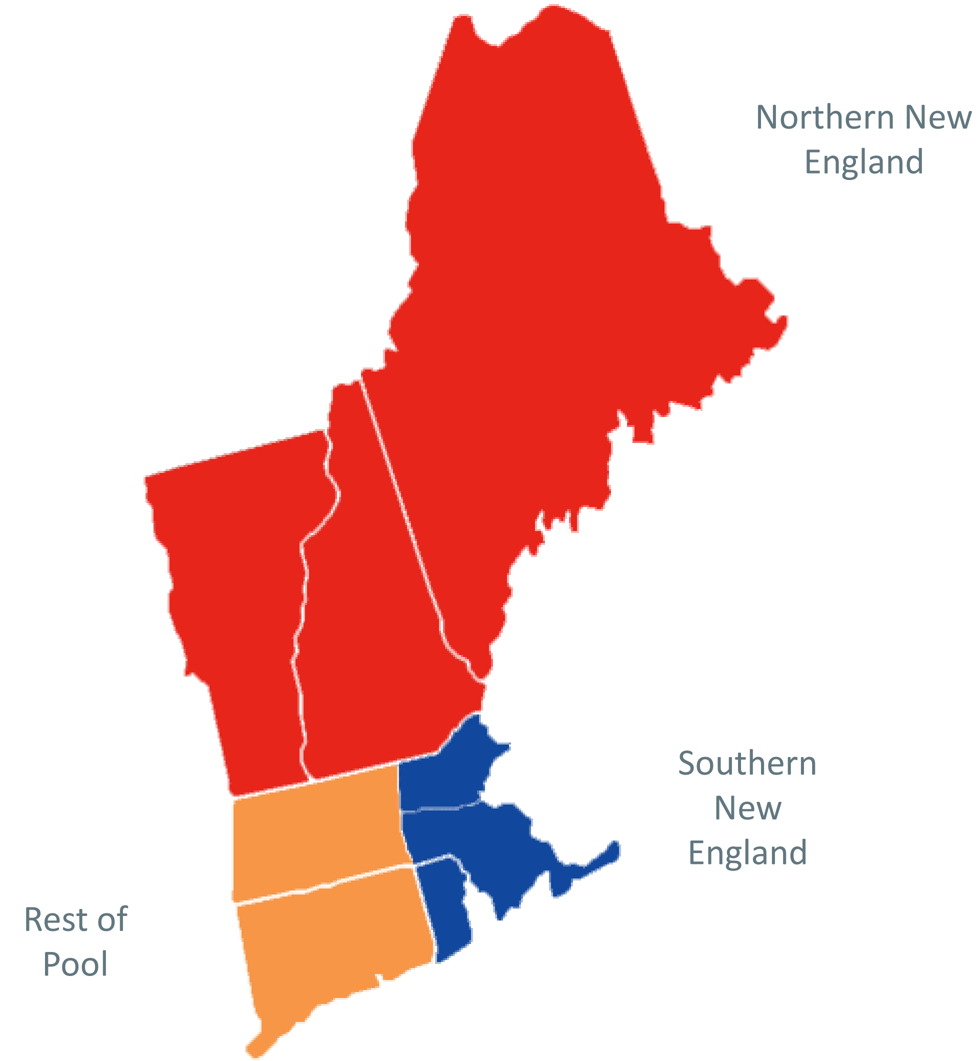
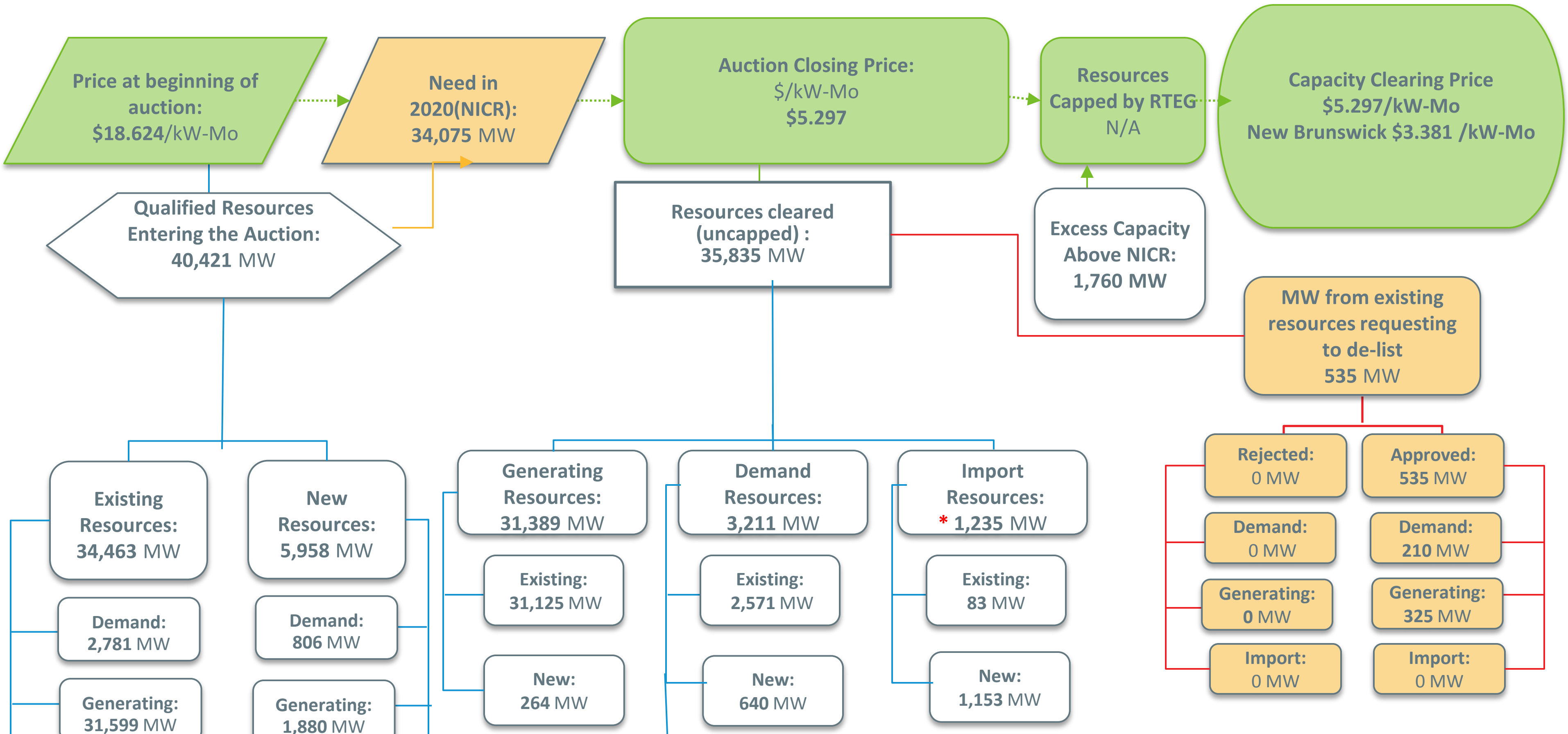
Capacity Zones for FCA #11



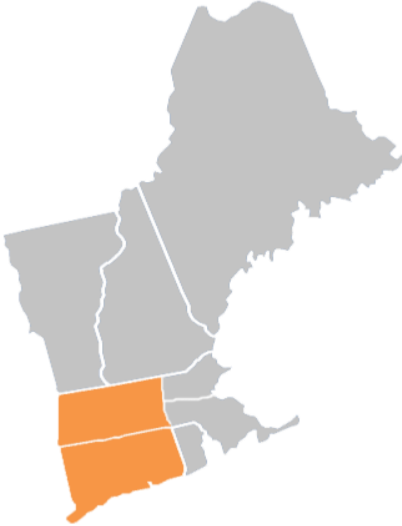
Results of New England's FCA #11



On Peak	2,216 MW
Seasonal Peak	575 MW
Real Time	420 MW
Real Time EG	0 MW

* Rounding Issue (one MW difference)

Rest of Pool Results FCA #11



Qualified Resources Entering the Auction:
18,465 MW

- **Existing Resources:** *__14,815__ MW
  - **Demand:** **1,045** MW
  - **Generating:** **13,688** MW
  - **Imports:** **83**
- **New Resources:** **3,650** MW
  - **Demand:** **302** MW
  - **Generating:** **716** MW
  - **Imports:** **2,632**

Resources cleared (uncapped) in the auction at auction end:
15,755 MW

- **Generating Resources:** **13,584** MW
  - **Existing:** **13,572** MW
  - **New:** **12** MW
- **Demand Resources:** **1,191** MW
  - **Existing:** **958** MW
  - **New:** **233** MW
- **Import Resources:** **980** MW
  - **Existing:** **83** MW
  - **New:** **897** MW

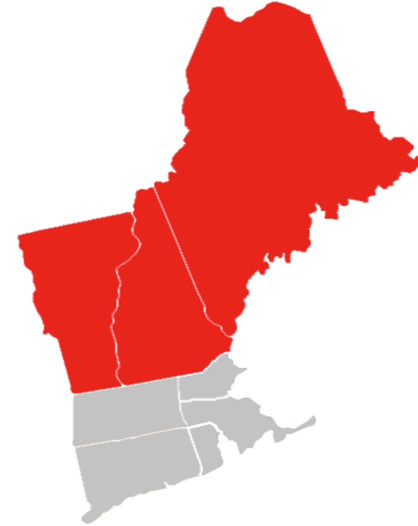
On Peak	464 MW
Seasonal Peak	575MW
Real Time	152 MW
Real Time EG	0 MW

MW from existing resources requesting to de-list
203 MW

- **Rejected:** 0 MW
  - **Demand:** **0** MW
  - **Generating:** **0** MW
  - **Import:** **0** MW
- **Approved:** **203** MW
  - **Demand:** **87** MW
  - **Generating:** **116** MW
  - **Import:** **0** MW

* Rounding Issue (one MW difference)

Northern New England Results FCA #11



Qualified Resources Entering the Auction: 9,030 MW

- Existing Resources: 8,222 MW
  - Demand: 491 MW
  - Generating: 7,731 MW
  - Imports: 0
- New Resources: 808 MW
  - Demand: 120 MW
  - Generating: 48 MW
  - Imports: 640

Resources cleared (uncapped) in the auction at auction end: 8,344 MW

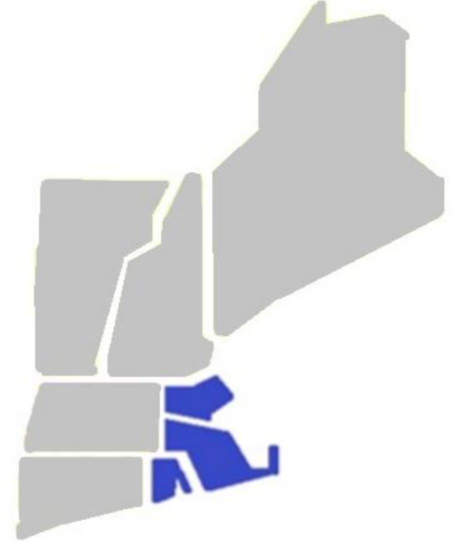
- Generating Resources: 7,578 MW
  - Existing: 7,535 MW
  - New: 43 MW
- Demand Resources: 511 MW
  - Existing: 439 MW
  - New: 72 MW
- Import Resources: 255 MW
  - Existing: 0 MW
  - New: 255 MW

On Peak	357 MW
Seasonal Peak	0 MW
Real Time	154 MW
Real Time EG	0 MW

MW from existing resources requesting to de-list 248 MW

- Rejected: 0 MW
  - Demand: 0 MW
  - Generating: 0 MW
  - Import: 0 MW
- Approved: 248 MW
  - Demand: 53 MW
  - Generating: 195 MW
  - Import: 0 MW

Southeast New England Results FCA #11



Qualified Resources Entering the Auction:
* 12,926 MW

- Existing Resources: 11,425 MW
  - Demand: 1,245 MW
  - Generating: 10,180 MW
  - Imports: 0
- New Resources: 1,500 MW
  - Demand: 384MW
  - Generating: 1,116 MW
  - Imports: 0

Resources cleared (uncapped) in the auction at auction end:
11,736 MW

- Generating Resources: 10,226 MW
  - Existing: 10,017 MW
  - New: 209 MW
- Demand Resources: 1,510 MW
  - Existing: 1,175 MW
  - New: 335 MW
- Import Resources: 0 MW
  - Existing: 0 MW
  - New: 0 MW

On Peak	1,395 MW
Seasonal Peak	0 MW
Real Time	115 MW
Real Time EG	0 MW

MW from existing resources requesting to de-list
84 MW

- Rejected: 0 MW
  - Demand: 0 MW
  - Generating: 0 MW
  - Import: 0 MW
- Approved: 84 MW
  - Demand: 71 MW
  - Generating: 14 MW
  - Import: 0 MW

* Rounding Issue (one MW difference)

Appendix 2: Supplemental Information

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Additional Information Related to FCA #11 Cleared De-list Bids

Supplementing the information provided on slide 12 and 13 of this presentation, the table below provides additional information regarding the breakdown of the cleared de-list bids by resource type, including further information if they were full or partial de-list bids.

Type of Cleared De-list Bid	Number of Full de-list bids	Number of Partial de-list bids	Generation (MW)	Passive DR (MW)	Active DR DRCR (MW)	Active DR RTEG (MW)	Imports (MW)	Total* (MW)
Dynamic	5	6	183	0	6	4	0	192
Static	26	6	43	0	77	123	0	243
Export	0	1	100	0	0	0	0	100

*Sums may not add up due to rounding

Additional Information Related to New Resources Participating in FCA #11 Qualification

- Each FCA qualification cycle, including FCA #11, ISO-NE receives more SOI resource requests than the number of resources that clear the auction. Why this occurs was discussed at the March RC meeting and reasons why some New Generating Capacity Resources did not continue the qualification process and chose to withdraw include:
  - It has been the ISO's experience that during the June to October timeframe, New Generating Capacity Resources withdraw from the qualification process when they perceive that the uncertainty or the risk of pursuing the qualification of the project outweighs the benefits of receiving a Capacity Supply Obligation.
  - Also, lack of maturity regarding project development is another reason we have seen the withdrawal of projects from qualification.
  - Rarely do projects withdraw due to the qualification process requirements or results of the FCM qualification analyses where additional/significant transmission is required.
  - Due to confidentiality, the ISO cannot share who withdrew or where they were located.
- The next slide provides a table of New Generating Capacity Resources that did clear the auction and the Load Zone in which they are located

New Generating Resources that Cleared in FCA #11

Resource ID	Resource Name	Load Zone	June 2020 CSO (MW)
486	MILFORD POWER	SEMA	202.000
1032	BRIDGEPORT ENERGY 1	CT	8.000
1649	EP Newington Energy, LLC	NH	37.486
2432	HUNTINGTON FALLS-NEW	VT	1.720
38437	Ipswich Wind II	NEMA	0.130
38655	Barrett Distribution - Franklin Solar	SEMA	0.230
38669	Future Gen Wind	SEMA	2.700
38695	NEHC - Hanover Pond Hydro	CT	0.066
38696	Blossom Rd 1 Fall River PV	SEMA	0.414
38698	Blossom Rd 2 Fall River PV	SEMA	0.417
38699	Groveland St Abington PV	SEMA	0.390
38700	Stafford St Leicester PV 2	WCMA	0.228
38701	Onset East	SEMA	0.520
38702	Onset West	SEMA	0.520
38704	Richardson Ave Attleboro PV 2	SEMA	0.418
38706	Old Upton Rd Grafton PV 2	WCMA	0.228
38708	Groton School Rd Ayer PV 2	NEMA	0.359
38709	Frank Mossberg Dr Atteleboro PV	SEMA	0.244
38738	Canton Mountain Wind Project	ME	3.600
38757	WOODBRIDGE FUEL CELL	CT	2.100
38760	Norwich WWT	CT	2.000
38791	Branch Solar	SEMA	0.633
		Total:	**264.403**

Additional Information Related to Energy Efficiency Projects that Cleared in FCA #11

Beyond what was provided on slide 9, regarding new EE resources, there was interest in knowing the amount of existing EE resources that cleared the auction. The amount of existing EE resources that cleared the auction is:

- Approximately 2,236 MW of the 2,339 MW qualified for Summer
- Approximately 2,063 MW of the 2,068 MW qualified for Winter

Additional Information Related to Payment Resources that Cleared in FCA #11

Existing resources that clear in a FCA will not necessary receive the existing resource clearing price due to choices made during the qualification process, such as electing self-supply treatment or multi-year payment rate elections from previous FCAs. The multi-year obligation spreadsheet is available at:

https://www.iso-ne.com/static-assets/documents/2017/03/fca_1_11_multi_rate_election.xlsx

Based on the information in this spreadsheet and the results of FCA #11, the anticipated total payment to provide capacity in the 2020-2021 commitment period is approximately $2.4B. A breakdown of the payment types and payment by state is available at:

https://www.iso-ne.com/static-assets/documents/2017/04/breakdown_of_fca11_payment.pdf

Additional FCM Information Related Terminations

- New resources may withdraw (project requested termination) or be terminated by ISO-NE for failing to meet their Critical Path Schedule. All withdraws and terminations are removed from our systems and base cases, and a list is maintained in the termination tracker spreadsheet
- Recently there was an error in the termination tracker indicating the last update was in 2015.
  - The tracker had an old date hard-coded as part of the weblink.
- The termination tracker has been updated to correct this error and lists the most recent terminations.
- Each spreadsheet within the tracker has a separate revision date that can be found on the top left corner of the spreadsheet.
- Also, additional information was added to explain how to interpret the various tabs of the spreadsheet.
- Note: the quickest way to access the termination tracker is to type “FCM Resource Terminations” in the search box of the ISO-NE website