Energy Efficiency in the ISO-New England Planning Process

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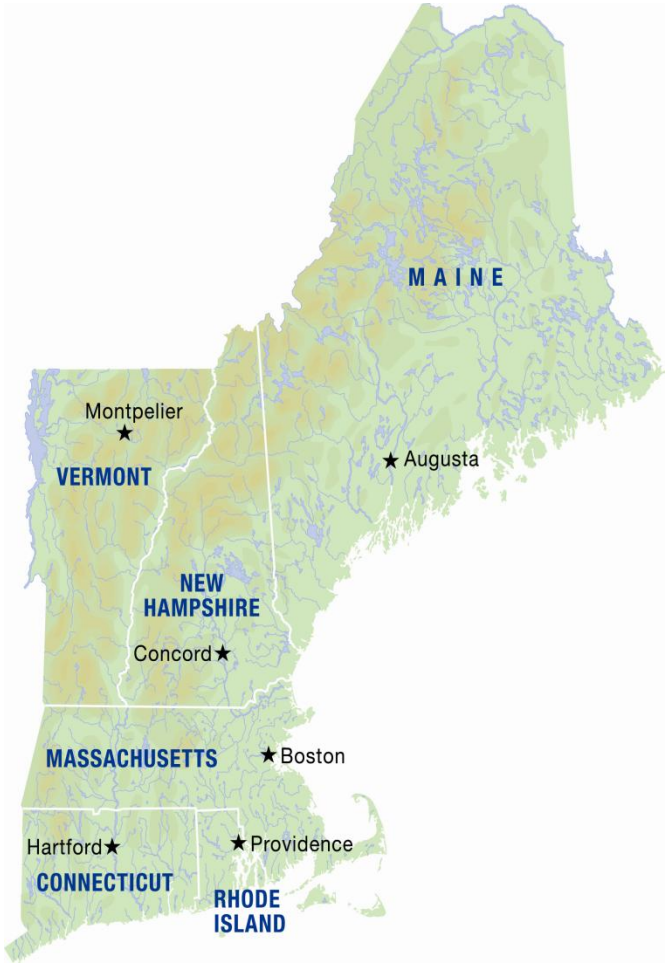
New England's Electric Power Grid at a Glance

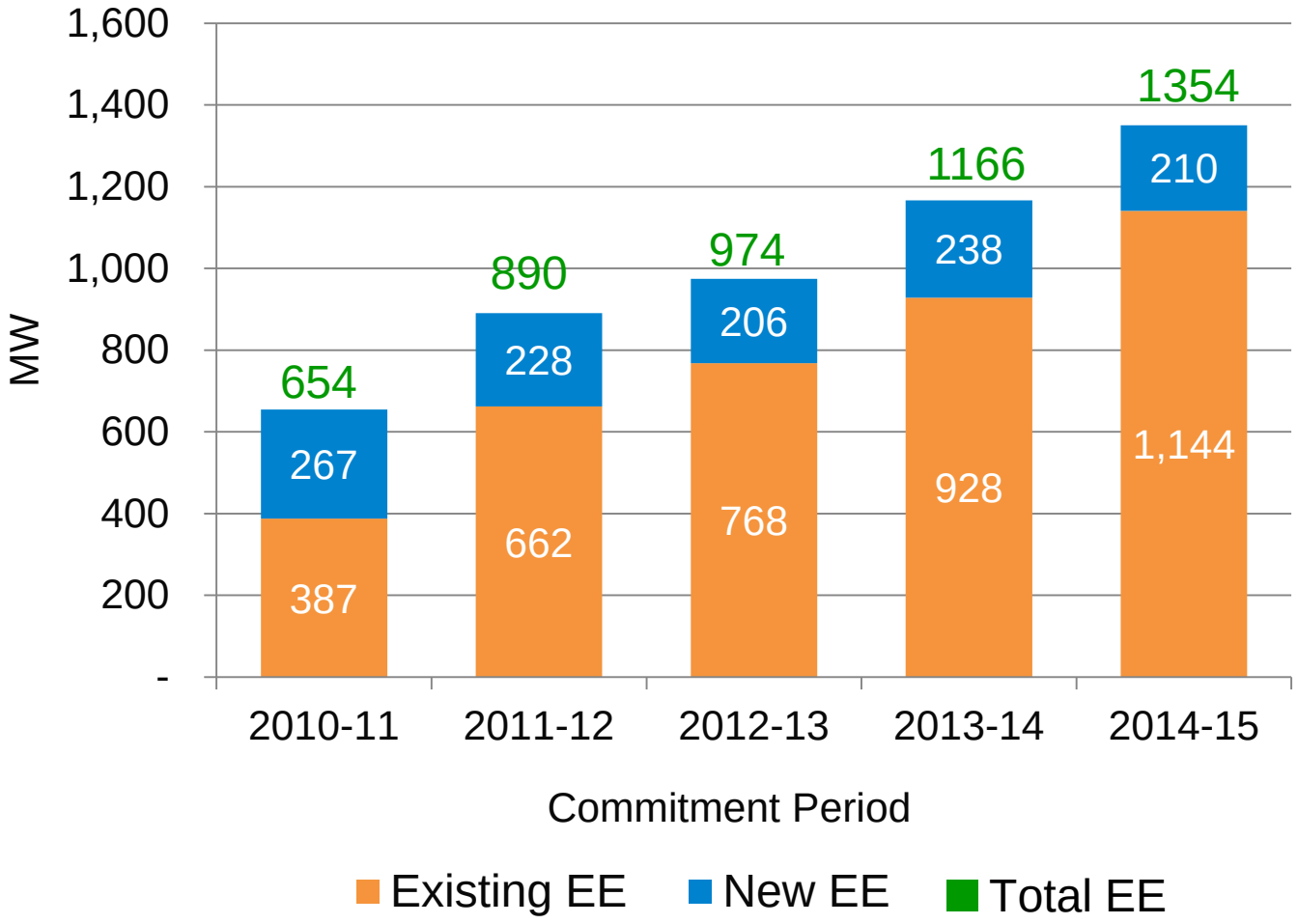
- 6.5 million households and businesses; population 14 million
- More than 300 generators
- Over 8,000 miles of high-voltage transmission lines
- 13 interconnections to electricity systems in New York and Canada
- Approx. 32,000 megawatts of total supply and 2,750 megawatts of demand resources
- All-time peak demand of 28,130 megawatts, set on August 2, 2006
- More than 450 participants in the marketplace
- $5-11 billion annual energy market value



Energy Efficiency in the Forward Capacity Market

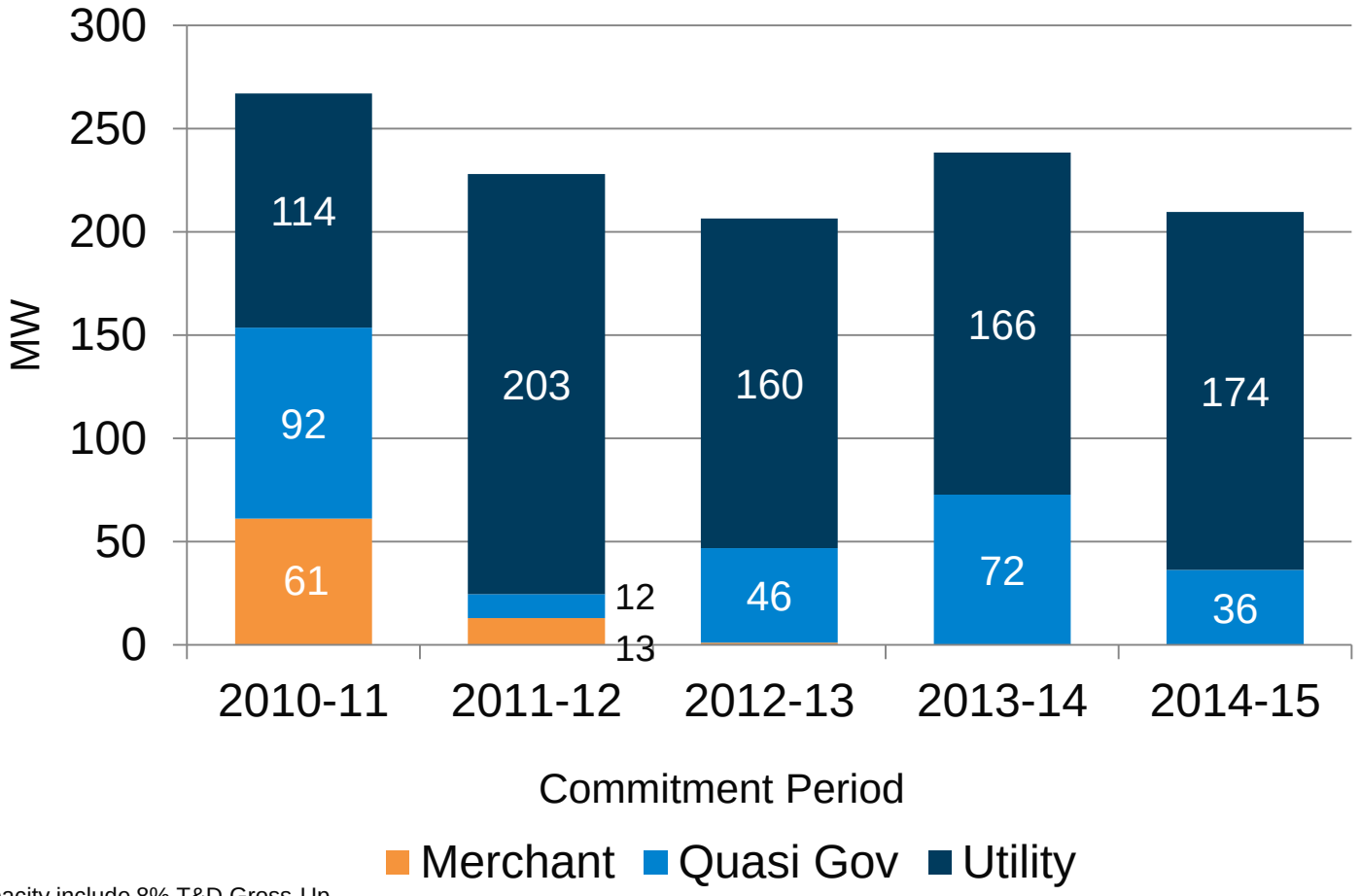
- Supply Resource used to support installed capacity requirement 3 years forward
- Same payment rate as all other supply resources
- Paid a Gross Up for avoided transmission & distribution
- Subject to penalties and termination
- Audited for each summer and winter season
- Required to submit M&V documentation quarterly/monthly
- Capacity payment only allowed for measures within useful measure life

Total Energy Efficiency Cleared Capacity*



•Cleared Capacity include 8% T&D Gross-Up,
•2010-11 and 2011-12 also includes Reserve Margin ,14% and 16%, respectively.

New Energy Efficiency Cleared Capacity by Lead Participant Type*



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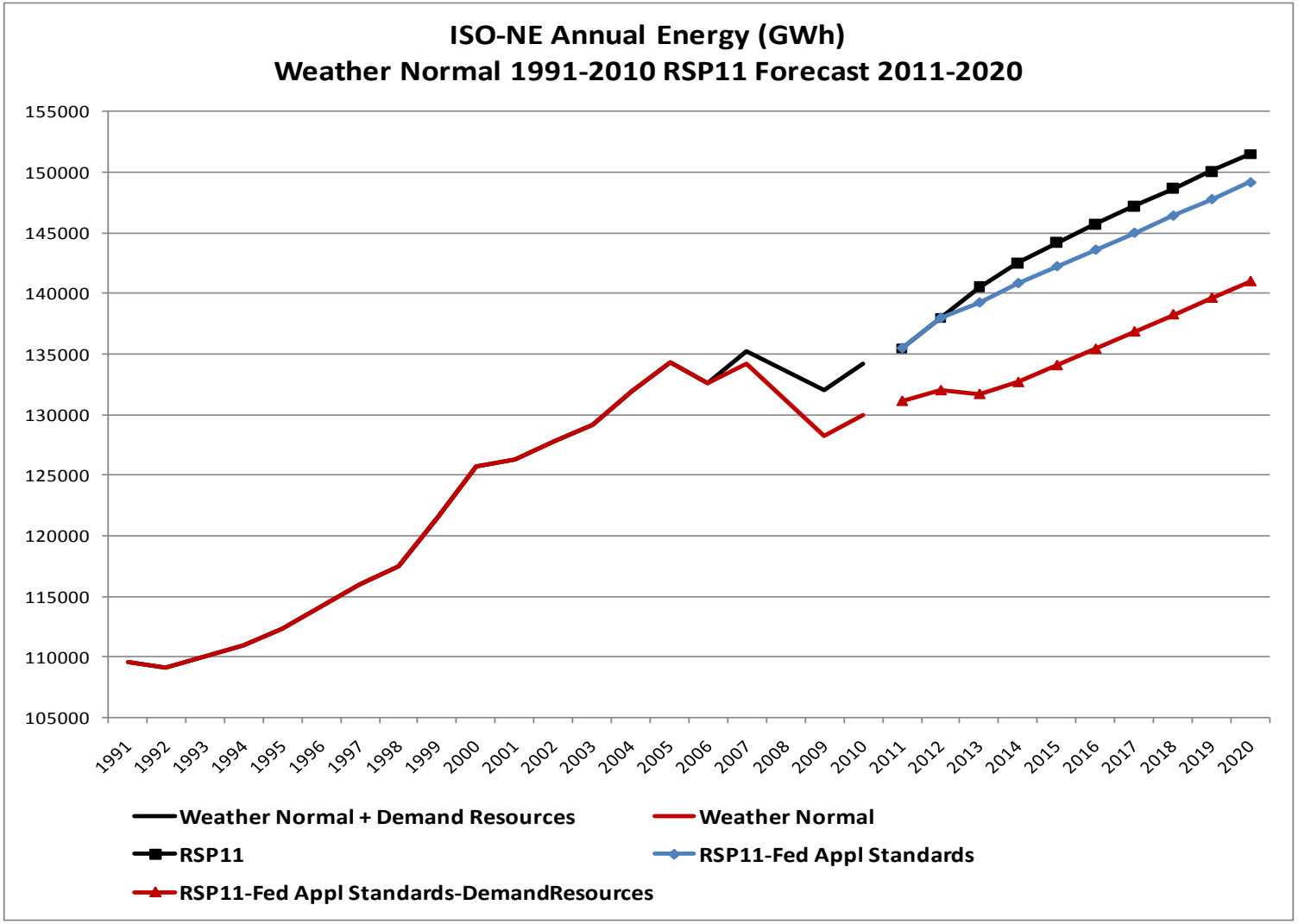
Energy Efficiency in Planning Process ISO's Current Practice

- Installed Capacity Requirement (ICR)
  - EE resources in the Forward Capacity Market (FCM) are treated as resources that contribute toward meeting New England's ICR and are reconstituted into the load forecast

- Load forecast
  - Reflects historical EE not in FCM, econometric data and future Federal appliance efficiency standards
  - Subtracts FCM cleared EE
  - Assumes FCM cleared EE remains constant through the 10 year planning horizon

Energy Efficiency in Planning Process



Background

- New England states are making large investments in EE through many programs
  - States want to be sure that consumers receive the full benefits of their EE investments
- ISO staff is working with regional stakeholders to explore the impact of state-sponsored EE
  - Created the Regional Energy Efficiency Initiative in 2009
    - Met with states & utilities to understand the magnitude of EE programs
    - Results were summarized in the 2010 Regional System Plan (RSP10)

Background, *cont.*

- In August 2010, NESCOE submitted comments on RSP10 indicating that:
  - There are MW of EE outside of the FCM not addressed by ISO and ISO should adopt an EE forecast based on the average of EE in the FCM
- In April 2011, ISO presented results of the FCM EE analysis to the Planning Advisory Committee (PAC)
  - ISO met with all EE PAs to gather additional information
  - Analysis shows that nearly all state-sponsored EE is captured in the FCM
- There is consensus among states that ISO should forecast EE savings beyond the FCM results across the ten-year planning horizon
- Many other stakeholders support this position

EE Forecast Research

- Among other ISO/RTO's, only NYISO currently forecasts EE
  - Their methodology is based on forecasted "production costs" (MWh savings per dollar spent) and budgets of EE programs
  - Discussions with NYISO confirmed:
    - The need for states/PAs to provide reliable data to the ISO
    - An approach that uses EE budgets and estimated costs to predict future EE-related savings is a good basis for EE forecast
- NESCOE
  - NESCOE proposed an alternative approach based on a rolling average of EE in the FCM
    - NESCOE would like flexibility in the timing of data requests for supporting information

Potential Use of EE Forecast

- EE forecast would be used in studies looking beyond the FCM timeframe
  - Long-term transmission planning studies
  - Economic planning studies
  - Other planning studies
- EE forecast would not impact:
  - FCM auctions
  - ICR/Local Sourcing Requirement/Maximum Capacity Limit
  - FCM related reliability studies (qualification, de-list, non-price retirement)
  - Any System Operations analysis across the four-year FCM window

Potential EE Forecast Process

- EE forecast completed during normal forecasting cycle and would be included in RSP12
- EE forecast would be published to accompany the traditional 10-year load forecast, typically in early spring of each year
- Create a task force/working group to provide ongoing input on EE forecast assumptions and methodology
  - ISO New England Technical Working Group
  - Populated with state representatives and utility program administrators, chaired by ISO staff

Outline of ISO EE Forecast Model

Goal: Forecast incremental EE beyond last year of FCM

- The model should be:
  - Simple
  - Intuitive
  - Based on historical data
  - Rational

Methodology: Forecasting the budgeted dollars for EE and adapting historically based MWh saved per dollar spent

- Budget estimates derived from revenue sources
  - System Benefit Charge
  - Regional Greenhouse Gas Initiative (RGGI)
  - FCM payments
  - Policy based

Outline of ISO EE Forecast Model, *cont.*

- MW = $ * %Spent * MWh/$ * Realization Rate * MW/MWh
  - $: an estimate of the dollars to be spent on EE
  - %Spent: percentage of dollars that can be spent on EE programs in that time period – developed from historical data
  - MWh/$: MWh savings per dollar spent – developed from historical data
  - Realization Rate: comparison of observed/measured savings to estimated savings – developed from historical data
  - MW/MWh: peak to energy ratio (inverse of load factor) developed from historical data and possibly load forecast

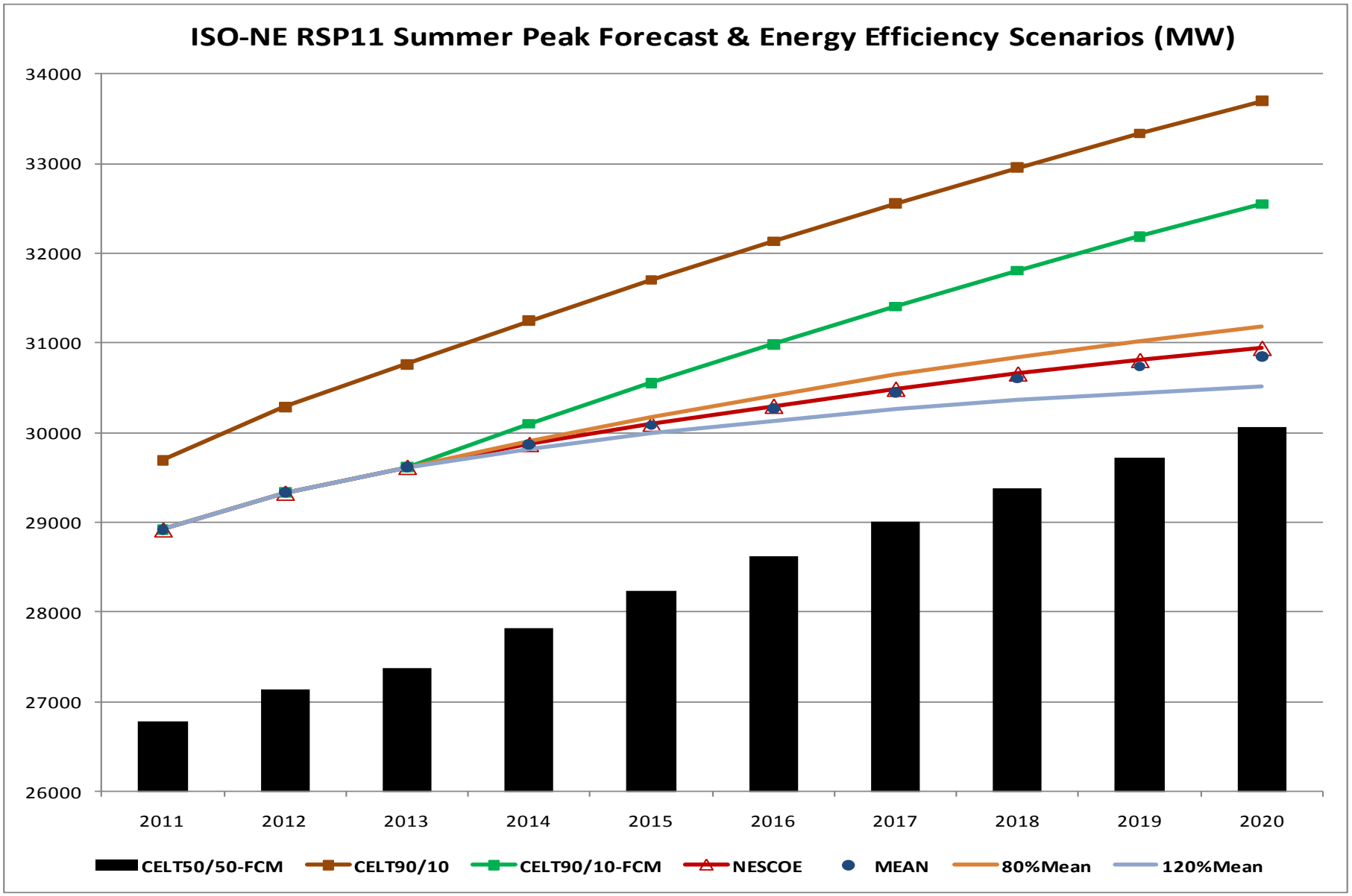
ISO Proof of Concept EE Forecast:
Total Dollars*, GWh, and MW

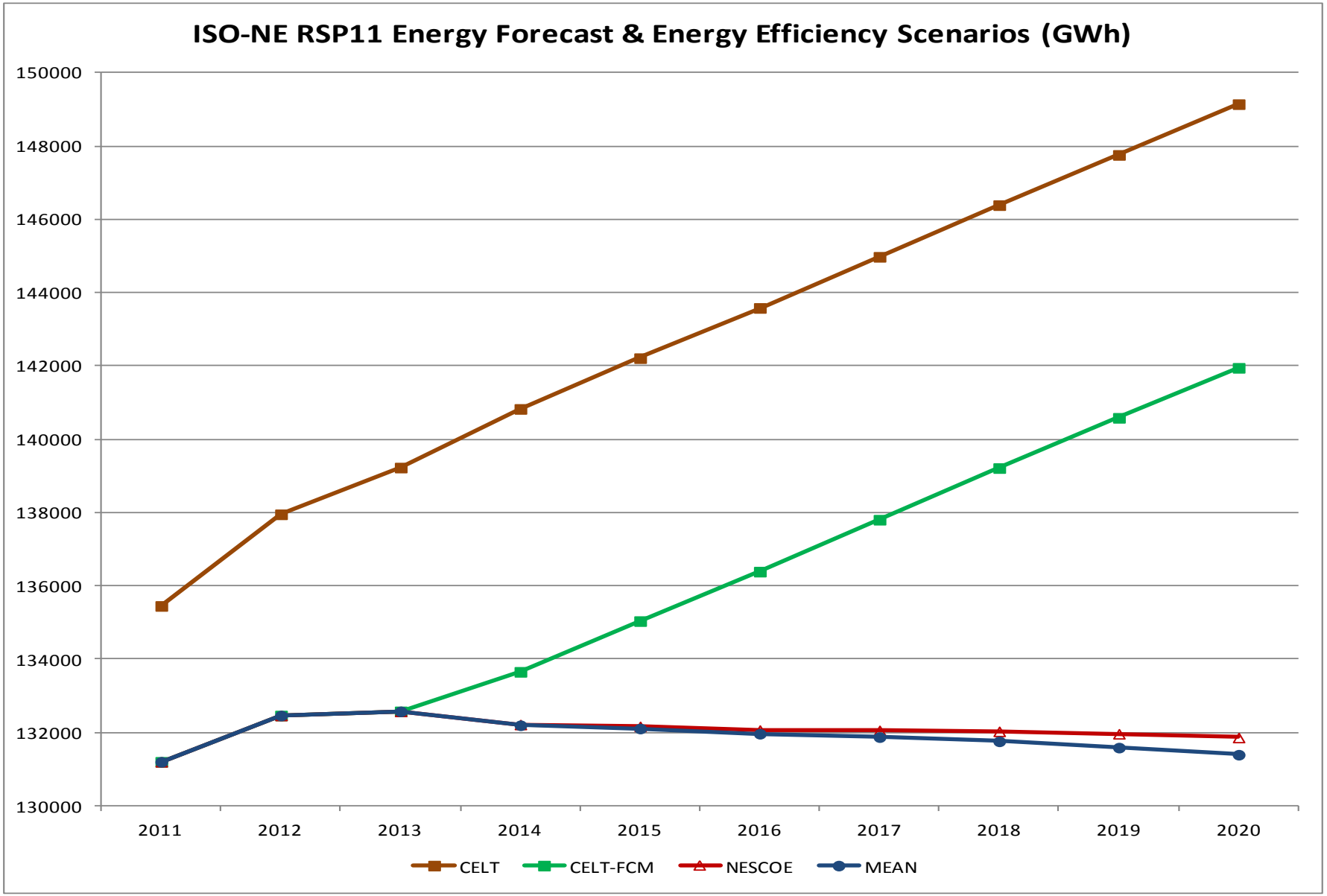
	Total	ME	NH	VT	CT	RI	MA
	Total EE Dollars per Year (Thousands)= SBC + FCM + 4*RGGI & MA Policy (200 Mil$)						
2014	634,151	29,636	35,755	28,747	124,526	23,886	391,601
2015	640,874	30,056	36,432	29,035	126,459	24,326	394,566
2016	647,476	30,480	37,107	29,278	128,290	24,773	397,548
2017	654,273	30,920	37,801	29,555	130,142	25,210	400,645
2018	661,069	31,365	38,487	29,826	131,967	25,646	403,778
2019	667,809	31,812	39,176	30,116	133,756	26,046	406,903
2020	674,530	32,264	39,864	30,381	135,542	26,444	410,035
Total	4,580,182	216,533	264,622	206,938	910,682	176,331	2,805,076
	GWh of EE per Year (SBC,RGGI,FCM $450/MWh MA Policy $500/MWh)						
2014	1424	70	84	68	293	56	853
2015	1440	71	86	68	298	57	860
2016	1456	72	87	69	302	58	868
2017	1470	73	89	70	307	59	872
2018	1486	74	91	70	311	60	880
2019	1502	75	92	71	315	61	888
2020	1520	76	94	72	319	62	897
Total	10298	511	623	488	2145	413	6118
	MW of EE per Year (based on RSP11 MW to GWh ratio via historical load factors)						
2014	236	11	14	10	48	9	144
2015	238	11	14	10	49	9	145
2016	240	11	14	10	49	10	146
2017	243	11	14	10	50	10	148
2018	246	11	15	10	51	10	149
2019	249	11	15	11	52	10	150
2020	250	11	15	11	52	10	151
Total	1702	77	101	72	351	68	1033

* Includes Massachusetts “All Cost Effective” Policy $

FCM Versus ISO Proof of Concept EE Forecast: System Wide and by State

New MW Cleared in First Five Forward Capacity Auctions							
	ISO-NE	**ME**	**NH**	**VT**	**CT**	**RI**	**MA**
FCA #1+RMM	280	26	25	56	20	3	151
FCA #2+RMM	262	0	13	10	144	14	81
FCA #1	246	23	22	49	18	3	132
FCA #2	226	0	11	9	124	12	70
FCA #3	211	36	9	12	42	19	94
FCA #4	258	52	9	24	57	15	101
FCA #5	221	33	7	16	17	9	140
3 Yr Average	**230**	**40**	**8**	**17**	**39**	**14**	**112**
5 Yr Average	232	29	12	22	52	12	107
EE Scen Mean	**243**	**11**	**15**	**11**	**52**	**10**	**145**
Average Annual Growth in RSP11 Summer Peak Forecast							
	400	**33**	**47**	**13**	**94**	**23**	**189**





Summary

- Data-driven production cost forecast method is preferable to an average of FCM
  - Use of specific production cost data supports more accurate responses to NPCC/NERC audits on system load modeling
  - State-level production cost data helps locational nature of EE forecasts to be used in transmission planning
  - FCM rolling average method can be used as a benchmark
- Annual updates of the forecast should capture changes in state EE spending & program design over time
- Timeframe
  - Update PAC (January)
  - Collect data from PAs (January)
  - Run EE forecast model (February)
  - Present draft results to RC/PAC (March)