

Draft 2015 Capacity, Energy, Loads, and Transmission (CELT) Report



Power Supply Planning Committee

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RESOURCE ADEQUACY



2015 CELT Report

Background

- Purpose of this presentation
 - Provide an overview of the CELT Report to new PSPC members
 - Introduce new PV forecast information
- Certain 2015 CELT data is not yet available
 - Load and PV forecasts have not yet been finalized



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Background *(continued)*

- The CELT Report is published annually on May 1st
- Available in both PDF and Excel formats, at <http://www.iso-ne.com/system-planning/system-plans-studies/celt>
- 10-year forecast
- The CELT capacity data is primarily based on Capacity Supply Obligations (CSOs)
 - A snapshot of the CSOs for all commitment periods is taken on or around March 18th
- Individual generator Seasonal Claimed Capabilities are listed in Sec. 2.1
- Draft report will be provided to Participants for review and comment in April

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Section 1: Summaries

- Sec. 1.1 and 1.2: Summer and Winter Peak Capabilities and Load Forecast
 - Load forecast is adjusted for both behind-the-meter (BTM) PV and Passive DR used in System Planning

1.1 REFERENCE - Without reductions	
1.1.1 Behind-the-Meter (BTM) PV (5)	← <i>New</i>
1.2 REFERENCE - With reduction for BTM PV	
1.2.1 Passive DR (PDR) used in System Planning (6)	
1.3 REFERENCE - With reduction for BTM PV and PDR	

- Behind-the-Meter PV refers to PV that is not registered as an ISO-NE asset
 - The PV forecast by category and state is located in Section 3 of the CELT
- The Passive DR forecast is based on the Qualified Capacity (QC) of existing resources and primary auction (FCA) results for new resources
 - For years beyond the FCA results, the passive DR includes an ISO-NE forecast of incremental Energy Efficiency
 - A breakdown of the QC-based Passive DR by Load Zone and DR type is included in Section 5 of the CELT

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Section 1: Summaries *(continued)*

– Capacity Forecast

- Lines 2.1 – 2.4 consist of FCM Capacity Supply Obligations (CSOs) for Generating Resources, Demand Resources, and Imports
 - The Passive DR values are CSOs as opposed to the Qualified Capacity-based Passive DR shown on line 1.2.1
- Line 3.1 includes projections of Seasonal Claimed Capability for each year, based on expected capacity additions and retirements

2. CAPACITY BASED ON FCM OBLIGATIONS
2.1 GENERATING RESOURCES (7)
2.2 DEMAND RESOURCES (8)
2.2.1 ACTIVE DR
2.2.2 PASSIVE DR
2.3 IMPORTS (9)
2.4 TOTAL (10)
3. CAPACITY BASED ON SEASONAL CLAIMED CAPABILITY (SCC) (11)
3.1 GENERATION CLAIMED FOR CAPABILITY

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Section 1: Summaries *(continued)*

1.1 Summer Peak Capabilities and Load Forecast (MW)												
	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	
NEW ENGLAND (Including Northern Maine) (1)												
TOTAL CAPACITY												
TOTAL REFERENCE LOAD												
ISO-NE RELIABILITY COORDINATOR AREA												
1. LOAD (2, 3, 4)												
1.1 REFERENCE - Without reductions												
1.1.1 Behind-the-Meter (BTM) PV (5)												
1.2 REFERENCE - With reduction for BTM PV												
1.2.1 Passive DR (PDR) used in System Planning (6)												
1.3 REFERENCE - With reduction for BTM PV and PDR												
2. CAPACITY BASED ON FCM OBLIGATIONS												
2.1 GENERATING RESOURCES (7)												
2.2 DEMAND RESOURCES (8)												
2.2.1 ACTIVE DR												
2.2.2 PASSIVE DR												
2.3 IMPORTS (9)												
2.4 TOTAL (10)												
3. CAPACITY BASED ON SEASONAL CLAIMED CAPABILITY (SCC) (11)												
3.1 GENERATION CLAIMED FOR CAPABILITY												
4. RESERVES - Based on Reference Load with reduction for Passive DR												
4.1 INSTALLED RESERVES - Based on CSOs of Generating Resources (line 2.1), Active DR (line 2.2.1), and Imports (line 2.3)												
4.1.1 MW												
4.1.2 % OF LOAD												
4.2 INSTALLED RESERVES - Based on Generation SCC (line 3.1), Active DR (line 2.2.1), Imports (line 2.3), and Exports (see footnote 12)												
4.2.1 MW												
4.2.2 % OF LOAD												

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Section 1: Summaries *(continued)*

- Sections 1.3 and 1.4 – Summary of Summer and Winter Capability by Fuel/Unit Type (MW)
 - Values are CSOs

Sample section:

1.3 - Summary Summer Capability by Fuel/Unit Type (MW) ⁽¹⁾										
	2014	2015	2016	2017	2018	2019	2020	2021	2022	
NUCLEAR STEAM	3831	3877	3877	4023	4024	4024	4024	4024	4024	
HYDRO (DAILY CYCLE - PONDAGE)	334	327	329	339	338	338	338	338	338	
HYDRO (DAILY CYCLE - RUN OF RIVER)	280	300	308	275	273	273	273	273	273	
HYDRO (WEEKLY CYCLE)	770	859	871	814	847	847	847	847	847	
HYDRO (PUMPED STORAGE)	1601	1624	1616	1666	1643	1643	1643	1643	1643	
GAS COMBINED CYCLE	9203	8857	8700	8883	8951	8951	8951	8951	8951	
GAS/OIL COMBINED CYCLE	2698	3202	3443	3906	4655	4655	4655	4655	4655	
GAS COMBUSTION (GAS) TURBINE	464	345	339	357	446	446	446	446	446	
GAS/OIL COMBUSTION (GAS) TURBINE	497	629	622	668	861	861	861	861	861	
OIL COMBUSTION (GAS) TURBINE	1600	1613	1532	1573	1606	1606	1606	1606	1606	

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Section 1: Summaries *(continued)*

- Section 1.5 - Actual and Estimated Energy and Peak Loads
 - Monthly peak load and monthly net energy for 2014 – 2016
 - Annual summer and winter peaks and net annual energy for 2014 through 2024

1.5 - Actual and Estimated Energy and Peak Loads ⁽¹⁾												
						2014 ACTUAL						
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
MONTHLY PEAK LOAD - MW												
MONTHLY NET ENERGY - GWH												
						2015 FORECAST						
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
MONTHLY PEAK LOAD - MW												
MONTHLY NET ENERGY - GWH												
						2016 FORECAST						
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
MONTHLY PEAK LOAD - MW (2)												
MONTHLY NET ENERGY - GWH												
												CAGR (6)
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2015 to 2024
SUMMER PEAK - MW												
WINTER PEAK - MW (3)												
NET ANNUAL ENERGY - GWH (4)												

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Section 1: Summaries *(continued)*

- Section 1.6 - Seasonal Peak Load Forecast Distributions
 - Shows the summer and winter peak load forecast at milder than expected and more extreme than expected weather for each year (ranging from 90% chance to 5% chance of being exceeded)

1.6 - Seasonal Peak Load Forecast Distributions											
		Peak Load Forecast at Milder Than Expected Weather				Reference Forecast at Expected Weather	Peak Load Forecast at More Extreme Than Expected Weather				
Summer (MW)	2015										
	2016										
	2017										
	2018										
	2019										
	2020										
	2021										
	2022										
	2023										
	2024										
	WTHI (1)	78.49	78.73	79.00	79.39	79.88	80.30	80.72	81.14	81.96	82.33
	Dry-Bulb Temperature (2)	88.50	88.90	89.20	89.90	90.20	91.20	92.20	92.90	94.20	95.40
	Probability of Forecast Being Exceeded	90%	80%	70%	60%	50%	40%	30%	20%	10%	5%

- Forecast details are posted at http://www.iso-ne.com/trans/celt/fsct_detail/index.html

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Section 2.1

- Section 2.1 is a list of ISO-NE assets with generator details and summer & winter SCC values
- In addition to the data below, this section includes the Resource Name and ID, Lead Participant, state and county, RSP area, Load Zone, EIA Plant Number

ASSET ID	ASSET NAME
194	FOUR HILLS LOAD REDUCER
253	TURNKEY LANDFILL
321	MANCHESTER 10/10A CC
322	MANCHESTER 11/11A CC
323	MANCHESTER 9/9A CC
324	CDECCA
326	ALTRESCO
327	AMOSKEAG
328	GULF ISLAND COMPOSITE
329	ASCUTNEY GT
330	AYERS ISLAND
331	AZISCOHOS HYDRO
332	BAR HARBOR DIESELS 1-4
335	BELLOWS FALLS
336	BERLIN 1 GT
337	BETHLEHEM

GEN TYPE	PRIM FUEL TYP	ALT FUEL TYP
IC	LFG	
IC	LFG	
CC	NG	DFO
CC	NG	DFO
CC	NG	DFO
CC	NG	DFO
CC	NG	DFO
HDP	WAT	
HW	WAT	
GT	DFO	
HDP	WAT	
HDP	WAT	
IC	DFO	
HDP	WAT	
GT	KER	
ST	WDS	

As of Jan. 1, 2015		As of 2014/15 Winter and 2015 Summer Peaks		Change in Summer SCC from 8/1/14
WINTER SCC (MW)	SUMMER SCC (MW)	WINTER PEAK SCC JAN 8, 20	EXPECTED SUMMER PEAK SCC AUG 1, 20	
0.000	0.000	0.000	0.000	0.000
0.730	0.732	0.730	0.732	-0.003
170.000	149.000	170.000	149.000	0.000
170.000	153.594	170.000	153.594	0.000
169.785	148.785	169.785	148.785	0.000
61.334	49.522	61.334	49.522	-5.732
178.879	144.612	178.879	144.612	-6.370
17.500	16.781	17.500	16.781	0.000
32.970	32.970	32.970	32.970	0.000
12.581	8.503	12.581	8.503	-0.143
9.080	8.474	9.080	8.474	0.000
6.800	6.800	6.800	6.800	-0.010
4.000	0.000	4.000	0.000	-3.800
48.540	48.540	48.540	48.540	0.000
50.409	40.260	50.409	40.260	0.000
15.321	15.303	15.321	15.303	0.129

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Sections 2.1E and 2.2

- Since the generator list in Section 2.1 shows the Lead Participant as of January 1, Section 2.1 Endnotes lists changes to Lead Participants that occurred after that time.
- Section 2.2 is the Net of Imports and Exports for the previous winter and the upcoming summer.
 - Totals for Quebec, New Brunswick and New York



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Section 3.1 – Forecast of Solar PV Resources by State

- The PV forecast by state was added to the CELT Report in 2014. The 2015 report will include a more detailed PV forecast, broken down into:
 - PV in Markets (i.e. all ISO-NE Assets)
 - FCM resources with Capacity Supply Obligations
 - Non-FCM resources (energy only)
 - Behind-the-Meter PV
 - Embedded PV (BTM resources that are already accounted for as part of the ISO load forecast)
 - Non-embedded PV (remaining BTM resources)
- The CELT will include forecasts for PV nameplate and estimated Seasonal Claimed Capability
- The final draft forecast will be discussed with the Distributed Generation Forecast Working Group (DGFWG) on April 14
- PV forecast assumptions and methodology are available at <http://www.iso-ne.com/system-planning/system-forecasting/distributed-generation-forecast>

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Section 3.1 – Forecast of Solar PV Resources by State

Category	Sub-Category	States	Annual Total MW - Nameplate Rating											Totals
			Through 2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
PV in Markets	FCMPV	CT												
		MA												
		ME												
		NH												
		RI												
	VT													
	Total	Annual												
		Cumulative												
	Non-FCMPV	CT												
		MA												
		ME												
		NH												
RI														
VT														
Total	Annual													
	Cumulative													
Markets Total		Annual												
		Cumulative												
Behind-the-Meter PV	Embedded PV	CT												
		MA												
		ME												
		NH												
		RI												
	VT													
	Total	Annual												
		Cumulative												
	Non-Embedded PV	CT												
		MA												
		ME												
		NH												
RI														
VT														
Total	Annual													
	Cumulative													
Behind-the Meter Total		Annual												
		Cumulative												

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Section 4.1 – Summary of Capacity Supply Obligations

- CSOs for each Capacity Commitment Period are shown by Load Zone

Sample section:

Load Zone Name	Resource Type	Resource Sub Type	Capacity Commitment Period									
			2014-15 ⁽⁷⁾		2015-16 ⁽⁸⁾		2016-17 ⁽⁹⁾		2017-18 ⁽¹⁰⁾		2018-19 ⁽¹¹⁾	
			Summer CSO	Winter CSO	Summer CSO	Winter CSO	Summer CSO	Winter CSO	Summer CSO	Winter CSO	Summer CSO	Winter CSO
CT	ACTIVE DR	REAL TIME DR	129.415	123.304	114.780	113.925	182.162	182.229	194.260	194.095	75.486	75.486
		REAL-TIME EG	94.999	92.729	107.401	102.070	142.907	142.907	138.338	138.338	52.427	52.427
		TOTAL ACTIVE	224.414	216.033	222.181	215.995	325.069	325.136	332.598	332.433	127.913	127.913
	PASSIVE DR	ON-PEAK	78.377	78.377	71.622	71.248	59.154	59.154	60.862	60.862	58.394	58.394
		SEASONAL PEAK	312.288	312.288	310.682	310.682	260.396	260.396	307.892	307.892	363.379	363.379
		TOTAL PASSIVE	390.665	390.665	382.304	381.930	319.550	319.550	368.754	368.754	421.773	421.773
	DR Total		615.079	606.698	604.485	597.925	644.619	644.686	701.352	701.187	549.686	549.686
	GEN	Intermittent	151.194	163.329	156.661	166.014	181.174	194.289	188.984	203.672	180.099	195.792
		Non Intermittent	7245.281	7321.634	7299.146	7331.395	7075.288	7075.288	8247.693	8247.693	9069.331	9076.362
	GEN Total		7396.475	7484.963	7455.807	7497.409	7256.462	7269.577	8436.677	8451.365	9249.430	9272.154
CT Total			8011.554	8091.661	8060.292	8095.334	7901.081	7914.263	9138.029	9152.552	9799.116	9821.840

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Section 5.1 - Network Resource Capability (NRC) and Capacity Network Resource Capability (CNRC) List

- The CNRC values are as of June 1, 2015
- The capacity values are determined by either the Interconnection Agreement (IA), the Section I.3.9 Proposed Plan Approval, or the historic capability of the resource.

Sample section:

Resource ID	Resource Name	Asset ID	Asset Name	NRC (MW)		CNRC (MW)		Instrument Used to Identify Capability
				Summer (50°F)	Winter (0°F)	Summer (90°F)	Winter (20°F)	
463	AEI LIVERMORE	463	REENERGY LIVERMORE FALLS	35.300	35.630	35.300	35.630	Historic Capability
326	ALTRESCO	326	ALTRESCO	160.000	192.500	151.400	183.401	IA
14271	Ameresco Northampton	14271	AMERESCO NORTHAMPTON	0.800	0.800	0.800	0.800	Historic Capability
327	AMOSKEAG	327	AMOSKEAG	17.500	17.500	17.500	17.500	Historic Capability
1412	ANP-BELLINGHAM 1	1412	ANP-BELLINGHAM 1	292.494	307.500	272.387	307.500	PPA
1415	ANP-BELLINGHAM 2	1415	ANP-BELLINGHAM 2	292.466	307.500	272.617	307.500	PPA
1287	ANP-BLACKSTONE ENERGY 2	1287	ANP-BLACKSTONE ENERGY 2	292.880	307.500	271.317	307.500	PPA
1286	ANP-BLACKSTONE ENERGY CO. #1	1286	ANP-BLACKSTONE ENERGY 1	292.768	307.500	271.822	307.500	PPA
819	ARNOLD FALLS	819	ARNOLD FALLS	0.300	0.300	0.300	0.300	Historic Capability
329	ASCUTNEY GT	329	ASCUTNEY GT	11.460	14.700	10.300	14.700	Historic Capability

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Section 5.2 – Summary of Demand Resource Capacity (MW) Used in System Planning Studies

- Consists of Qualified Capacity (QC) of Existing Resources + FCA Cleared Capacity of New Resources
- These QC-based DR values were added to the CELT Report in 2014

Sample section:

Load Zone	Resource Type	Resource Sub Type	Capacity Commitment Period							
			2015-16		2016-17		2017-18		2018-19	
			Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter
CT	ACTIVE DR	REAL TIME DR	382.987	346.374	351.794	321.934	279.795	250.571	77.400	75.500
		REAL-TIME EG	302.963	287.048	230.543	230.028	138.338	137.824	52.900	52.400
		TOTAL ACTIVE	685.950	633.422	582.337	551.962	418.133	388.395	130.300	127.900
	PASSIVE DR	ON-PEAK	108.686	100.563	94.037	74.094	81.432	60.877	76.600	58.400
		SEASONAL PEAK	311.382	311.366	356.005	252.731	339.454	208.936	382.700	364.200
		TOTAL PASSIVE	420.068	411.929	450.042	326.825	420.886	269.813	459.300	422.600
CT DR Total			1106.018	1045.351	1032.379	878.787	839.019	658.208	589.600	550.500

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Appendices

- Appendix A
 - Definitions
 - Company abbreviations
 - Prime Mover and Energy Source abbreviations
- Appendix B
 - County FIPS codes
- Appendix C
 - CSO and Load Graphs
 - CSOs by Resource Type vs. Reference Load Forecast
 - Generating Resource CSOs by Fuel Type
- Appendix D – Capacity Supply Obligations by Load Zone
 - Tracks the CSOs for each Commitment Period, by Load Zone, from the FCA results through the subsequent prorations, bilaterals, and ARAs
 - Appendix E – FCA 8 Qualified Capacity
 - Lists the QC for all Resources that qualified to participate in the most recent FCA

Questions

