Final 2014 Energy-Efficiency Forecast 2018-2023

Energy-Efficiency Working Group

ISO Staff

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Acronyms

- EE – Energy Efficiency
- EEFWG – Energy-Efficiency Forecast Working Group
- FCM – Forward Capacity Market
- ICR – Installed Capacity Requirement
- LSR – Local Sourcing Requirement
- PA – Program Administrator
- PAC – Planning Advisory Group
- RGGI – Regional Greenhouse Gas Initiative
- SBC – System Benefit Charge
- CSO – Capacity Supply Obligation (FCM)
- RSP – Regional System Plan
- CELT – 10-year forecast of capacity, energy, loads and transmission

Introduction

- This presentation contains the 2014 final energy-efficiency forecast for the 2018-2023 period
- The forecast estimates reductions in energy and demand from state-sponsored energy-efficiency programs in the New England control area by region and state (CT, MA, ME, NH, RI, VT)
- Data used to create the forecast originates from state-sponsored energy-efficiency Program Administrators and state regulatory agencies
- The forecast is informed by a stakeholder process facilitated by ISO New England's Energy-Efficiency Forecast Working Group (EEFWG)

Introduction (cont.)

- The energy-efficiency forecast is based on averaged production costs, peak-to-energy ratios and projected budgets of state-sponsored energy-efficiency programs
- This forecast follows the same fundamental forecast process and methodology used since the first EE forecast in 2012
- Inputs to this final forecast include:
  - EE forecast methodology, developed by the ISO
  - EE program data provided by EE Program Administrators
  - EE Forecast Working Group Stakeholder input provided at the November 26, 2013 meeting
  - Budget projections provided by NE regulators and program

Introduction (cont.)

- The EE forecast is used in ISO studies looking beyond the FCM timeframe such as:
  - Long-term transmission planning studies
  - Economic planning studies
  - Other planning studies
- The Final EE forecast is incorporated into the 2014 CELT report and 2014 Regional System Plan
- The EE forecast will continue to be developed on an annual basis by the ISO with stakeholder input from the EEFWG

Introduction (cont.)

- EE forecast will not impact:
  - ICR/Local Sourcing Requirement/Maximum Capacity Limit
  - FCM auctions
  - FCM related reliability studies (qualification, de-list, non-price retirement)
  - Any System Operations analysis across the four-year FCM window
- In the near term (0-4 years), EE is integrated into the planning processes as qualified capacity delivered by regulated utilities through the ISO-NE Forward Capacity Market

Introduction (cont.)

- The ISO received formal public comments on the initial draft 2014 forecast and discussed these at the February 11, 2014 EEFWG meeting. Comments and the ISO response may be viewed at http://www.iso-ne.com/eefwg

- Along with this final 2014 forecast, the ISO plans to issue an EE Forecast Report in May 2014 and may be viewed at http://www.iso-ne.com/eefwg

2014 ENERGY-EFFICIENCY FORECAST SUMMARY

Summary of 2014 Forecast

- Final forecast results are slightly larger than the 2013 forecast results due to increased budgets in ME and CT
- Program performance changes from 2013 forecast
  - Production cost increased slightly, resulting in an decrease in energy reductions from equivalent budget dollars
  - Peak-to-Energy Ratios decreased slightly, resulting in smaller demand reductions from equivalent energy reductions
- Results vary state by state
- Generally, energy remains flat for the region with continued notable reductions in energy in VT and RI
- Generally, demand reductions from EE slows peak growth rate in the region

EE FORECAST ASSUMPTIONS

EE Forecast Model General Assumptions

- Annual budgets provided by the Utility Commissions or representatives on their behalf are used in model and are held constant in years after the latest approved budget
- Realization Rates and Percent Spent variables are combined into a single budget uncertainty factor (BU)
- Production cost baselines are derived from a 3 year average of recent performance
- The production cost escalation rate is set at 5% per year
- Inflation rate is set at 2.5% per year
- Peak-to-Energy Ratios are derived from a 3 year average of recent performance and held constant through forecast period
- Current CELT/RSP energy forecast used in conjunction with System Benefit Charges (SPC) to forecast future SBC dollars

2014 Updated EE Forecast Model Implementation Assumptions

- 2013 CELT/RSP Energy Forecast
- FCA8 Clearing Price and CSOs were used for calculating budget $
- Production Cost: Updated with PA 2010-2012 average
- Production Cost Escalation Rate: Remains 5% + 2.5% inflation
- Peak-to-Energy Ratio: Updated with PA 2010-2012 average
- State Budget Data:
  - historical budgets used for MA, RI, VT, and NH
  - CT and ME submitted new budgets
- Budget Uncertainty factor: MA at 20% and RI at 10%, based on average spend rates observed in PA data and large increases in budget dollars
- Maine production costs and peak-to-energy ratios from state budget due to substantial increase in budget and its impact on planned performance

Fundamentals of EE Forecast Model

1) MWh = [(1-BU) * Budget $] / [$/MWh * PCINCR]

where:

Budget $ = an estimate of the dollars to be spent on EE ($)
(System Benefit Charge + RGGI + FCM + Policy)

BU = budget uncertainty (%)

$/MWh = production cost ($/MWh)

PCINCR = production cost increases (%) (includes 2.5% inflation)

2) MW = MWh * PER

where:

PER = peak-to-energy ratio (MW/MWh)

EE Forecast Model Budget Assumptions Regarding Forward Capacity Market

- FCM capacity clearing price was held constant at $7.025/kW-month,† the latest FCA existing capacity clearing price for Capacity Commitment Period 2017-18
- ISO assumed that all achieved EE capacity would be bid into and clear in future FCA's‡
- The forecast calculated Capacity Supply Obligation was used to determine FCM contribution to budget dollars

† FCA clearing price used is for forecasting purposes only and should not be considered an indication of future clearing prices.

‡ The ISO assumption that all achieved EE capacity would be bid into and clear in future FCA's is only for forecasting purposes and should not be considered an indication of any future FCA outcome.

Comparison of EE Forecasts

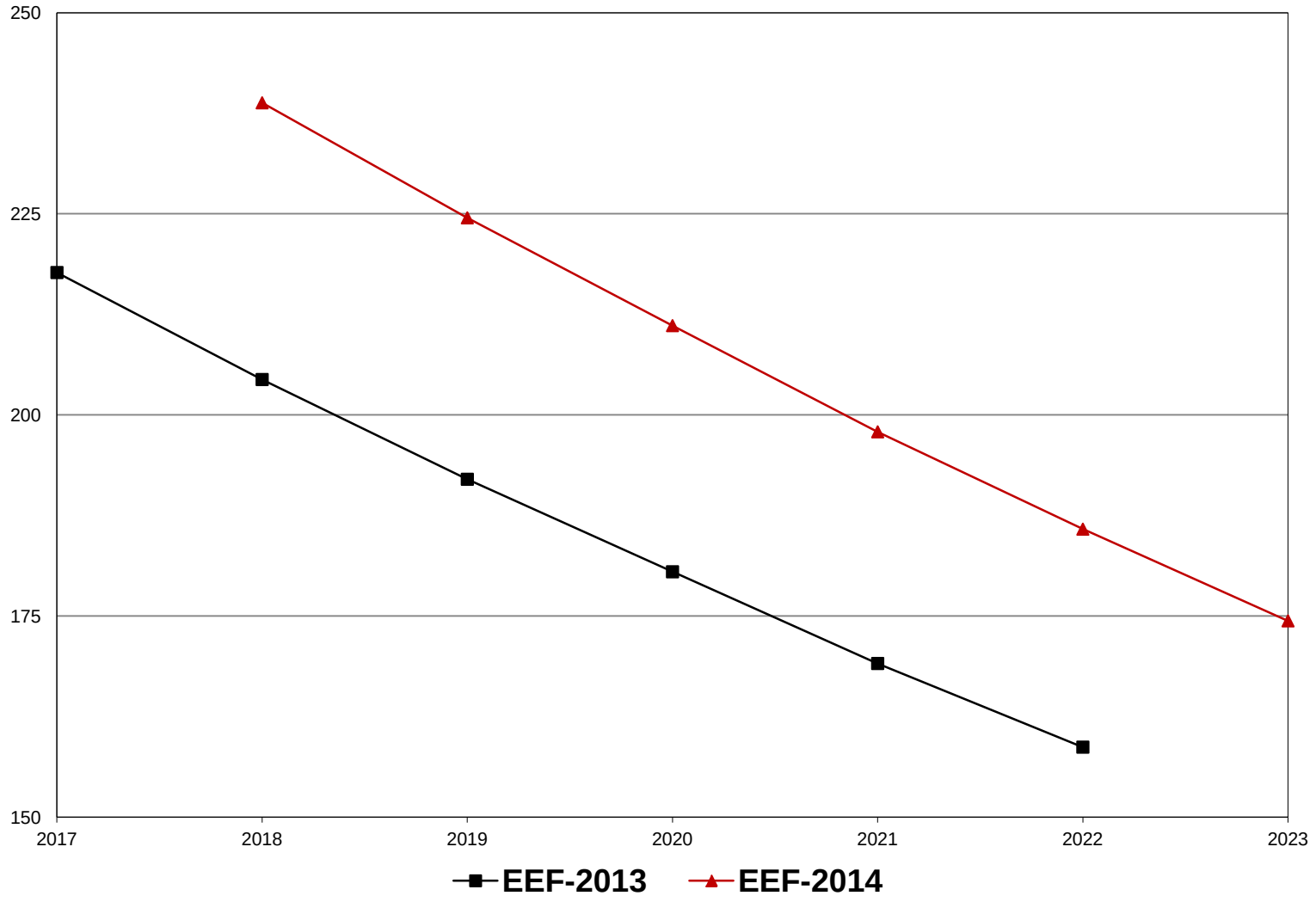
- Comparison of the 2013 and 2014 forecast for the 2022 production year is made to illustrate the forecast transitions from year to year
- The 2014 forecast extends to 2023, therefore the final numbers in the following table are only for the comparison of this years forecast to last years forecast
- See remaining slides starting on page 32 for the final 2014 forecast of 2023 period

Comparison of EE Forecasts

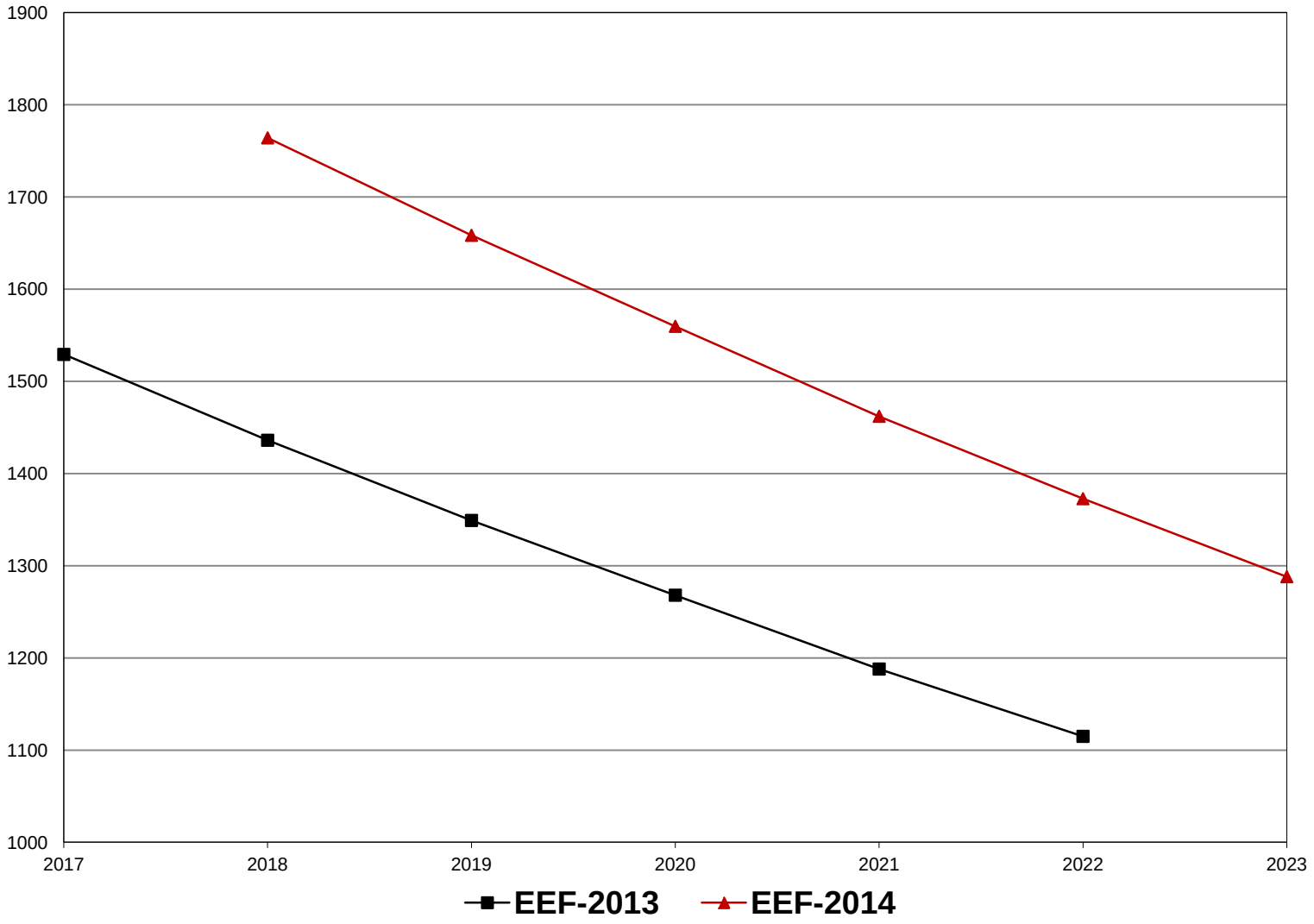
PA Average Production Costs ($/MWh)	ME	NH	VT	CT	RI	MA	
2013 EEF	190	306	324	335	349	399	
2014 EEF	337	320	317	353	380	394	
% Change	77.4	4.6	-2.2	5.4	8.9	-1.3	
PA Average Peak to Energy Ratio (MW/GWh)	ME	NH	VT	CT	RI	MA	
2013 EEF	0.1150	0.1660	0.1472	0.1259	0.1615	0.1443	
2014 EEF	0.1410	0.1622	0.1409	0.1215	0.1546	0.1346	
% Change	22.6	-2.3	-4.3	-3.5	-4.3	-6.7	
Total Dollars in 2022 ($1000s)	ME	NH	VT	CT	RI	MA	ISONE
2013 EEF	30,107	31,267	65,430	118,346	77,681	515,121	837,952
2014 EEF	52,000	39,235	65,430	218,839	78,598	514,989	969,092
Summer EE Peak Impacts 2018-2022 (MW)	ME	NH	VT	CT	RI	MA	ISONE
EE2013-TOTAL	49	46	78	121	99	511	904
EE2014-TOTAL	87	56	82	218	95	520	1,058
EE2013-Average	10	9	16	24	20	102	181
EE2014-Average	17	11	16	44	19	104	212
Annual EE Energy Impacts 2018-2022 (GWh)	ME	NH	VT	CT	RI	MA	ISONE
EE2013-TOTAL	431	275	526	963	613	3,544	6,353
EE2014-TOTAL	616	348	579	1,796	616	3,863	7,817
EE2013-Average	86	55	105	193	123	709	1,271
EE2014-Average	123	70	116	359	123	772	1,563

COMPARISON OF 2014 AND 2013 EE FORECAST ENERGY AND DEMAND PLOTS

ISONE Energy Efficiency on Summer Peak (MW)



ISONE Energy Efficiency on Annual Energy (GWh)



EE PROGRAM DATA SUMMARY

PA Data Summary

	Budget	Total Costs	Achieved Annual	Dollars	Achieved Summer	Dollars	% Energy	% Budget	% Peak	Peak to Energy Ratio
	$1000s	$1000s	Energy (MWh)	per MWh	Peak (MW)	per MW	Achieved	Spent	Achieved	MW/GWH
NE										
2009	357,939	352,374	933,803	377	150	2,352,612	83	98	94	0.160398
2010	524,416	500,978	1,371,179	365	191	2,616,499	103	96	95	0.139638
2011	665,087	518,865	1,575,303	329	200	2,588,875	90	78	75	0.127227
2012	745,761	648,848	1,723,357	377	223	2,912,977	98	87	86	0.129250
Aver2010-12	645,088	556,231	1,556,613	357	205	2,708,981	96	86	85	0.131907
CT										
2009	102,183	73,411	222,500	330	34	2,150,181	60	72	63	0.153447
2010	143,543	144,938	405,042	358	50	2,907,253	113	101	105	0.123083
2011	129,909	119,426	381,974	313	43	2,769,495	93	92	87	0.112892
2012	120,176	121,826	308,428	395	40	3,032,765	131	101	124	0.130241
Aver2010-12	131,210	128,730	365,148	353	44	2,900,482	109	98	103	0.121546
ME										
2009		13,806	55,176	250	6	2,127,537	662	0	472	0.117605
2010		16,846	74,180	227	8	2,198,392	101	0	102	0.103303
2011		22,817	152,663	149	18	1,248,348	117	0	100	0.119727
2012		23,712	143,531	165	12	1,904,462	101	0	114	0.086747
Aver2010-12		21,125	123,458	171	13	1,650,762	107	0	105	0.103657
MA										
2009	183,782	192,362	424,652	453	70	2,751,448	81	105	99	0.164636
2010	294,315	253,086	619,638	408	91	2,769,089	99	86	90	0.147501
2011	432,796	283,898	777,100	365	101	2,823,145	86	66	67	0.129405
2012	508,987	400,607	980,105	409	127	3,165,278	88	79	75	0.129132
Aver2010-12	412,033	312,531	792,281	394	107	2,931,156	90	76	76	0.134578
NH										
2009	18,286	17,988	59,691	301	10	1,889,281	139	98	137	0.159504
2010	21,866	21,763	73,710	295	12	1,759,778	121	100	117	0.167779
2011	17,667	18,904	58,042	326	10	1,910,830	123	107	121	0.170445
2012	19,673	18,703	53,973	347	8	2,376,142	106	95	101	0.145832
Aver2010-12	19,735	19,790	61,909	320	10	1,970,384	117	100	113	0.162234
RI										
2009	24,555	26,211	81,543	321	15	1,702,327	103	107	123	0.188820
2010	30,366	27,581	81,275	339	13	2,163,861	107	91	78	0.156826
2011	48,649	36,494	96,009	380	14	2,673,198	94	75	71	0.142195
2012	61,246	48,870	119,666	408	20	2,503,820	93	80	82	0.163104
Aver2010-12	46,754	37,648	98,983	380	15	2,459,809	97	81	77	0.154625
VT										
2009	29,134	28,597	90,240	317	14	1,997,246	92	98	104	0.158666
2010	34,326	36,764	117,334	313	17	2,107,775	88	107	93	0.148653
2011	36,066	37,325	109,514	341	15	2,502,506	72	103	69	0.136192
2012	35,678	35,130	117,653	299	16	2,172,426	119	98	109	0.137447
Aver2010-12	35,357	36,406	114,834	317	16	2,250,639	90	103	88	0.140865

EE FORECAST INPUT DATA

FCM and RGGI Dollars

RGGI Dollars ($1000s)							
	ME	NH	VT	CT	RI	MA	ISONE
Annual	9,070	12,112	2,210	17,646	4,984	48,062	94,084
Applied to EE	0	6,056	0	3,529	2,741	48,062	60,388
FCM MW							
	ME	NH	VT	CT	RI	MA	ISONE
2017	182	79	132	369	175	1,023	1,961
FCM Dollars ($1000s, $7.025/kW-month)							
	ME	NH	VT	CT	RI	MA	ISONE
2017	15,369	6,679	11,113	31,086	14,784	86,240	165,272
FCM Dollars for EE ($1000s)							
	ME	NH	VT	CT	RI	MA	ISONE
2018	0	6,679	0	31,086	14,784	86,240	138,789
2019	0	6,679	0	31,086	14,784	86,240	138,789
2020	0	6,679	0	31,086	14,784	86,240	138,789
2021	0	6,679	0	31,086	14,784	86,240	138,789
2022	0	6,679	0	31,086	14,784	86,240	138,789
2023	0	6,679	0	31,086	14,784	86,240	138,789

Energy Forecast

2013 RSP Energy Forecast (GWh)							
	ME	NH	VT	CT	RI	MA	ISO-NE
2018	12,815	13,255	6,930	36,250	9,175	67,515	145,940
2019	12,895	13,370	6,980	36,545	9,255	68,220	147,265
2020	12,970	13,490	7,020	36,835	9,320	68,900	148,535
2021	13,045	13,615	7,065	37,120	9,380	69,550	149,775
2022	13,125	13,740	7,110	37,400	9,435	70,195	151,005
2023	13,195	13,865	7,160	37,690	9,495	70,840	152,245
2013 RSP Energy Forecast - FCM Passive Demand Resources (GWh)							
	ME	NH	VT	CT	RI	MA	ISO-NE
2018	11,780	12,842	6,106	34,402	8,400	62,941	136,471
2019	11,860	12,957	6,156	34,697	8,480	63,646	137,796
2020	11,932	13,075	6,194	34,981	8,543	64,313	139,037
2021	12,010	13,202	6,241	35,272	8,605	64,976	140,306
2022	12,090	13,327	6,286	35,552	8,660	65,621	141,536
2023	12,160	13,452	6,336	35,842	8,720	66,266	142,776
SBC Eligibility	75%	100%	100%	94%	100%	86%	
SBC Eligible 2013 RSP Energy Forecast - FCM Passive Demand Resources (GWh)							
	ME	NH	VT	CT	RI	MA	ISO-NE
2018	8,835	12,842	6,106	32,200	8,400	54,130	122,512
2019	8,895	12,957	6,156	32,477	8,480	54,736	123,700
2020	8,949	13,075	6,194	32,743	8,543	55,309	124,812
2021	9,007	13,202	6,241	33,015	8,605	55,880	125,949
2022	9,067	13,327	6,286	33,277	8,660	56,434	127,051
2023	9,120	13,452	6,336	33,548	8,720	56,989	128,165

Energy Sales (GWh) and System Benefit Charge ($)

SALES (GWh)							
	ME	NH	VT	CT	RI	MA	ISO-NE
2018	8,335	12,115	5,760	30,378	7,925	51,066	115,578
2019	8,391	12,223	5,807	30,638	8,000	51,638	116,698
2020	8,442	12,335	5,843	30,889	8,059	52,178	117,747
2021	8,497	12,454	5,888	31,146	8,118	52,717	118,820
2022	8,554	12,572	5,930	31,393	8,170	53,240	119,860
2023	8,604	12,690	5,977	31,649	8,226	53,763	120,910
	ME	NH	VT	CT	RI	MA	
SBC Rate ($/kwh)	0.000	0.0018	0.0000	0.0030	0.0088	0.0025	
SBC Dollars ($1000s)							
	ME	NH	VT	CT	RI	MA	ISO-NE
2018	0	2,1807	0	91,133	68,880	12,7664	309,483
2019	0	22,002	0	91,915	68,664	129,094	311,674
2020	0	22,204	0	92,668	68,348	130,445	313,664
2021	0	22,418	0	93,438	68,086	131,792	315,734
2022	0	22,630	0	94,180	67,811	133,100	317,720
2023	0	22,842	0	94,948	67,632	134,408	319,830
Total	0	133,903	0	558,282	409,421	786,503	1,888,105

Impacts of New EE on Revenue Streams

Lost SBC Dollars ($1000s)							
	ME	NH	VT	CT	RI	MA	ISO-NE
2018	0	133	0	1,186	1,401	2,191	4,912
2019	0	258	0	2,294	2,715	4,234	9,501
2020	0	375	0	3,329	3,946	6,138	13,787
2021	0	484	0	4,294	5,098	7,913	17,790
2022	0	587	0	5,196	6,176	9,568	21,526
2023	0	682	0	6,038	7,185	11,110	25,016
Total	0	2,519	0	22,337	26,521	41,154	92,532
New FCM Dollars ($1000s)							
	ME	NH	VT	CT	RI	MA	ISO-NE
2018	0	1,014	0	4,051	1,854	9,944	16,862
2019	0	1,962	0	7,833	3,592	19,215	32,602
2020	0	2,849	0	11,364	5,221	27,858	47,292
2021	0	3,680	0	14,662	6,745	35,915	61,002
2022	0	4,457	0	17,740	8,171	43,425	73,794
2023	0	5,184	0	20,615	9,506	50,426	85,732
Total	0	19,146	0	76,265	35,089	186,783	317,284

Policy Dollars and Total Budgets

Policy Dollars ($1000s)							
	ME	NH	VT	CT	RI	MA	ISO-NE
2018	52,000	0	57,548	77,500	0	360,945	547,993
2019	52,000	0	59,638	77,500	0	355,831	544,969
2020	52,000	0	62,599	77,500	0	351,063	543,162
2021	52,000	0	63,196	77,500	0	346,619	539,315
2022	52,000	0	65,430	77,500	0	342,476	537,406
2023	52,000	0	67,513	77,500	0	338,615	535,628
Total	312,000	0	375,924	465,000	0	2,095,549	3,248,473
Total Budgets ($1000s)							
	ME	NH	VT	CT	RI	MA	ISO-NE
2018	52,000	35,422	57,548	206,112	78,172	504,531	933,785
2019	52,000	36,440	59,638	209,568	78,360	507,367	943,374
2020	52,000	37,413	62,599	212,819	78,433	510,025	953,288
2021	52,000	38,348	63,196	215,920	78,533	512,572	960,570
2022	52,000	39,235	65,430	218,839	78,598	514,989	969,092
2023	52,000	40,079	67,513	221,640	78,731	517,313	977,276
Total	312,000	226,937	375,924	1,284,898	470,827	3,066,797	5,737,385

Production Costs and Peak-to-Energy Ratio

Production Cost Multiplier (includes inflation)						
	ME	NH	VT	CT	RI	MA
2012	1.000	1.000	1.000	1.000	1.000	1.000
2013	1.000	1.075	1.075	1.075	1.075	1.075
2014	1.000	1.075	1.075	1.075	1.075	1.075
2015	1.000	1.075	1.075	1.075	1.075	1.075
2016	1.000	1.075	1.075	1.075	1.075	1.075
2017	1.075	1.075	1.075	1.075	1.075	1.075
2018	1.075	1.075	1.075	1.075	1.075	1.075
2019	1.075	1.075	1.075	1.075	1.075	1.075
2020	1.075	1.075	1.075	1.075	1.075	1.075
2021	1.075	1.075	1.075	1.075	1.075	1.075
2022	1.075	1.075	1.075	1.075	1.075	1.075
2023	1.075	1.075	1.075	1.075	1.075	1.075
Production Costs $/MWh						
	ME	NH	VT	CT	RI	MA
2012	337	320	317	353	380	394
2013	337	344	341	379	409	424
2014	337	370	366	408	439	455
2015	337	398	394	439	472	489
2016	337	427	423	471	507	526
2017	362	459	455	507	546	566
2018	389	494	489	545	586	608
2019	419	531	526	586	630	654
2020	450	571	565	630	678	703
2021	484	614	608	677	729	755
2022	520	660	653	728	783	812
2023	559	709	702	782	842	873
Peak-to-Energy Ratio (MW/GWh)						
	ME	NH	VT	CT	RI	MA
	0.1410	0.1622	0.1409	0.1215	0.1546	0.1346

EE FORECAST RESULTS TABLE

Energy and Summer Peak EE Forecast Data

GWh Savings							
	ME	NH	VT	CT	RI	MA	ISO-NE
2018	142	76	125	401	141	880	1,764
2019	132	73	120	379	132	823	1,658
2020	122	69	117	358	123	769	1,560
2021	114	66	110	338	114	719	1,462
2022	106	63	106	319	106	672	1,373
2023	99	60	102	300	99	628	1,288
Total	714	408	681	2,096	715	4,491	9,105
Average	119	68	113	349	119	749	1,518

MW Savings							
	ME	NH	VT	CT	RI	MA	ISO-NE
2018	20	12	18	49	22	118	239
2019	19	12	17	46	20	111	225
2020	17	11	17	44	19	104	211
2021	16	11	16	41	18	97	198
2022	15	10	15	39	16	90	186
2023	14	10	14	37	15	85	174
Total	101	66	96	255	111	605	1,233
Average	17	11	16	42	18	101	205

CHANGE IN REPRESENTATION OF EE IN FCM IMPLEMENTED IN 2014 FORECAST

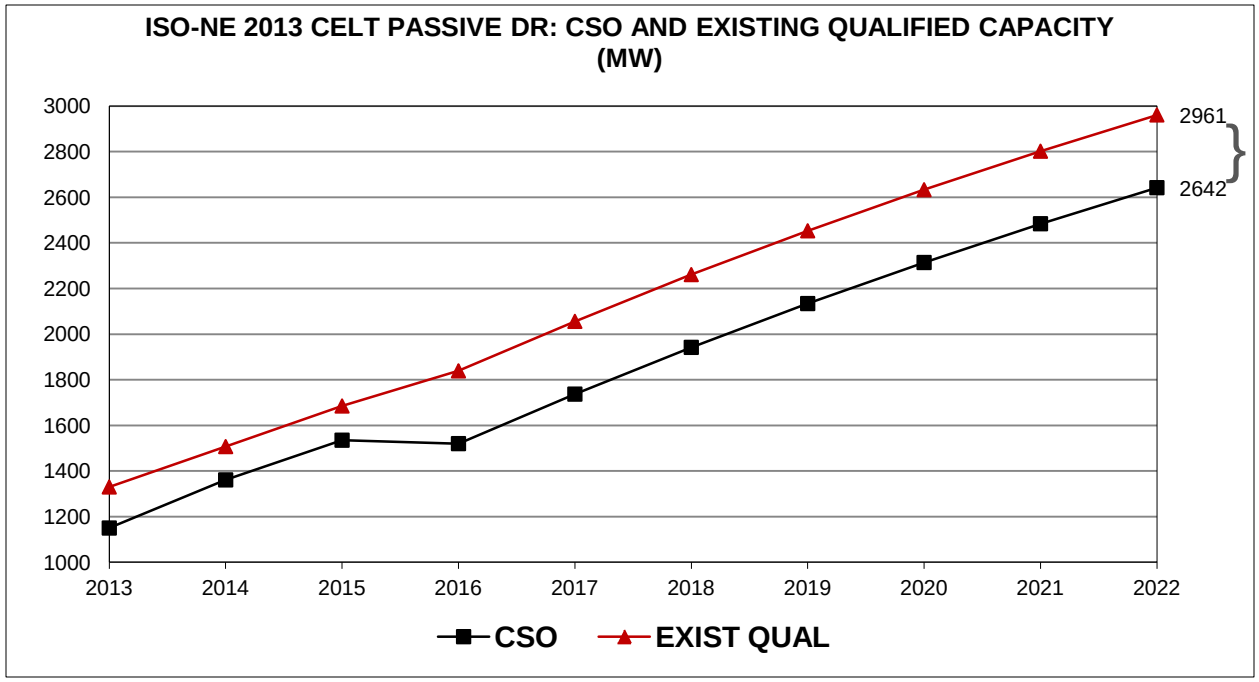
Appending the EE Forecast to the Last Year of FCM Passive Demand Resources

- In the representation of the total contribution of EE to the load forecast, the EE forecast is appended to the last year of FCM Passive Demand Resources (PDR)
  - The 2013 CELT forecast had FCM PDR from 2010-2016 and the 2013 EE forecast from 2017-2022
- The 2013 CELT report and Load Forecasting documentation use the current CSO values in calculating peaks and energy, net of FCM PDR
- Whereas, Transmission Planning uses existing qualified capacity in its long range planning process, a different measure of FCM PDR

Appending the EE Forecast to the Last Year of FCM Passive Demand Resources (cont.)

- Starting with the 2014 CELT, System Planning will be using the existing qualified capacity along with the EE forecast for the CELT report and Load Forecasting in calculating the peaks and energy net of FCM PDR
- The change to using FCM existing qualified capacity from CSOs in the representation of EE should eliminate dramatic changes in the forecast which are primarily due to market activity rather than physical system changes
  - Examples of market impacts include: EE expiring measures, static and dynamic delist bids, and proration
- Use of FCM existing qualified capacity has been determined to be more representative of physically installed measures
- FCM existing qualified capacity is consistent with the inputs to long range Transmission Planning processes
- The following graphs illustrate the impact to the forecast by changing to existing qualified capacity

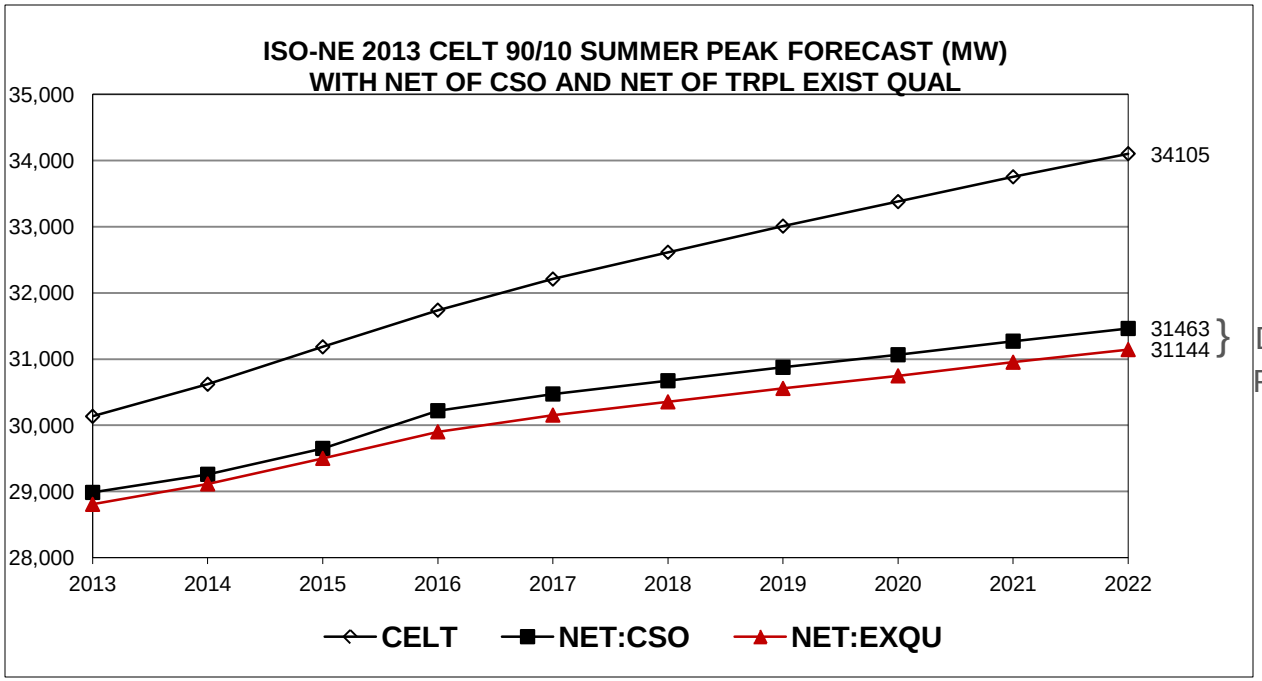
Comparison of 2013 Forecast Using Existing Qualified Capacity Versus CSO Reflected in EE Contribution



Difference of 319 MW
Projected EE contribution

- Flat area in the CSO line between 2015 and 2016 resulted from static delist bids due to low winter qualification
- Using existing qualified capacity eliminates depression due to market effects and more accurately reflects the physical delivery of EE

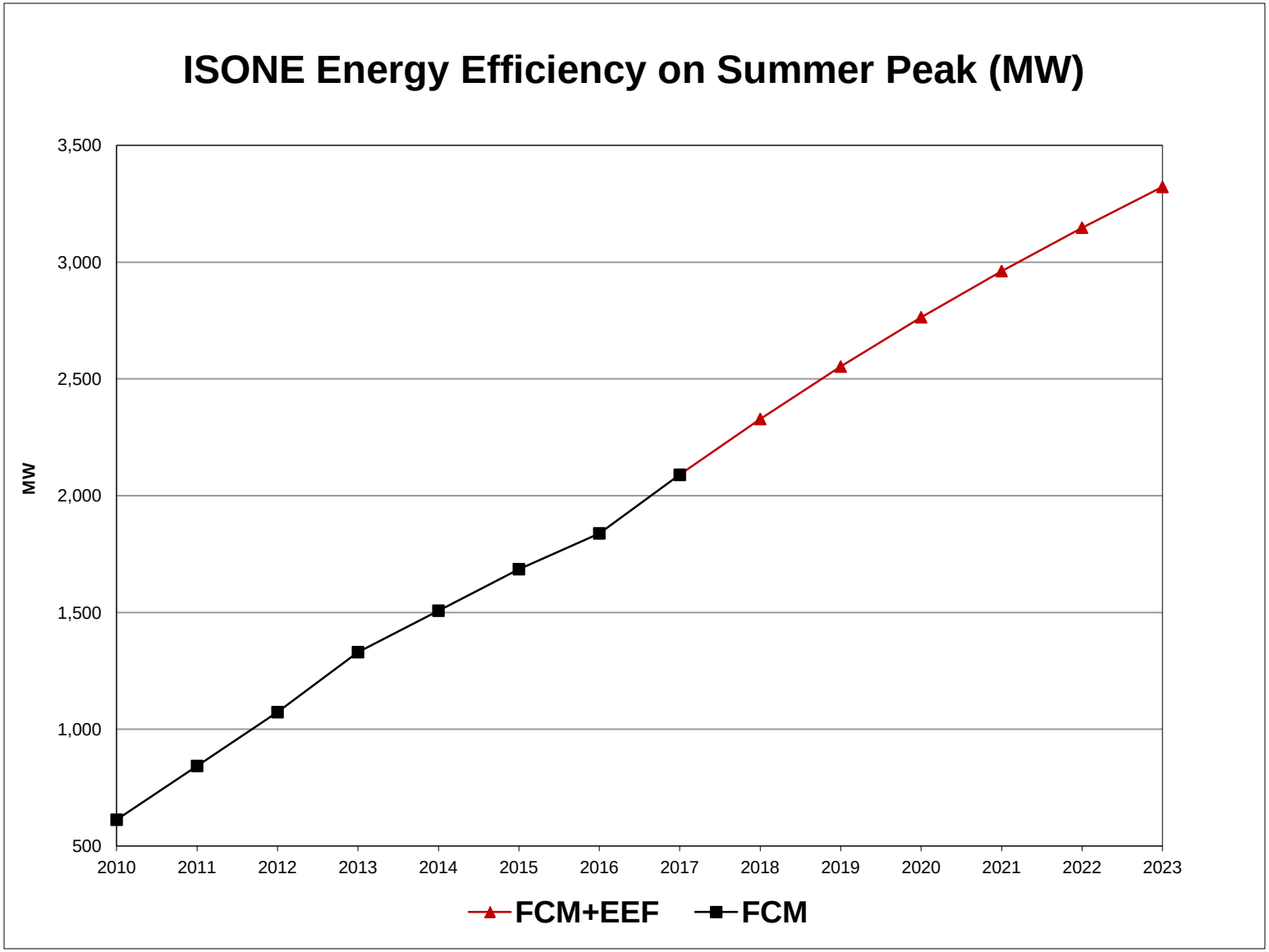
Comparison of 2017-2022 Forecast Using Existing Qualified Capacity Versus CSO Reflected in Load Forecast



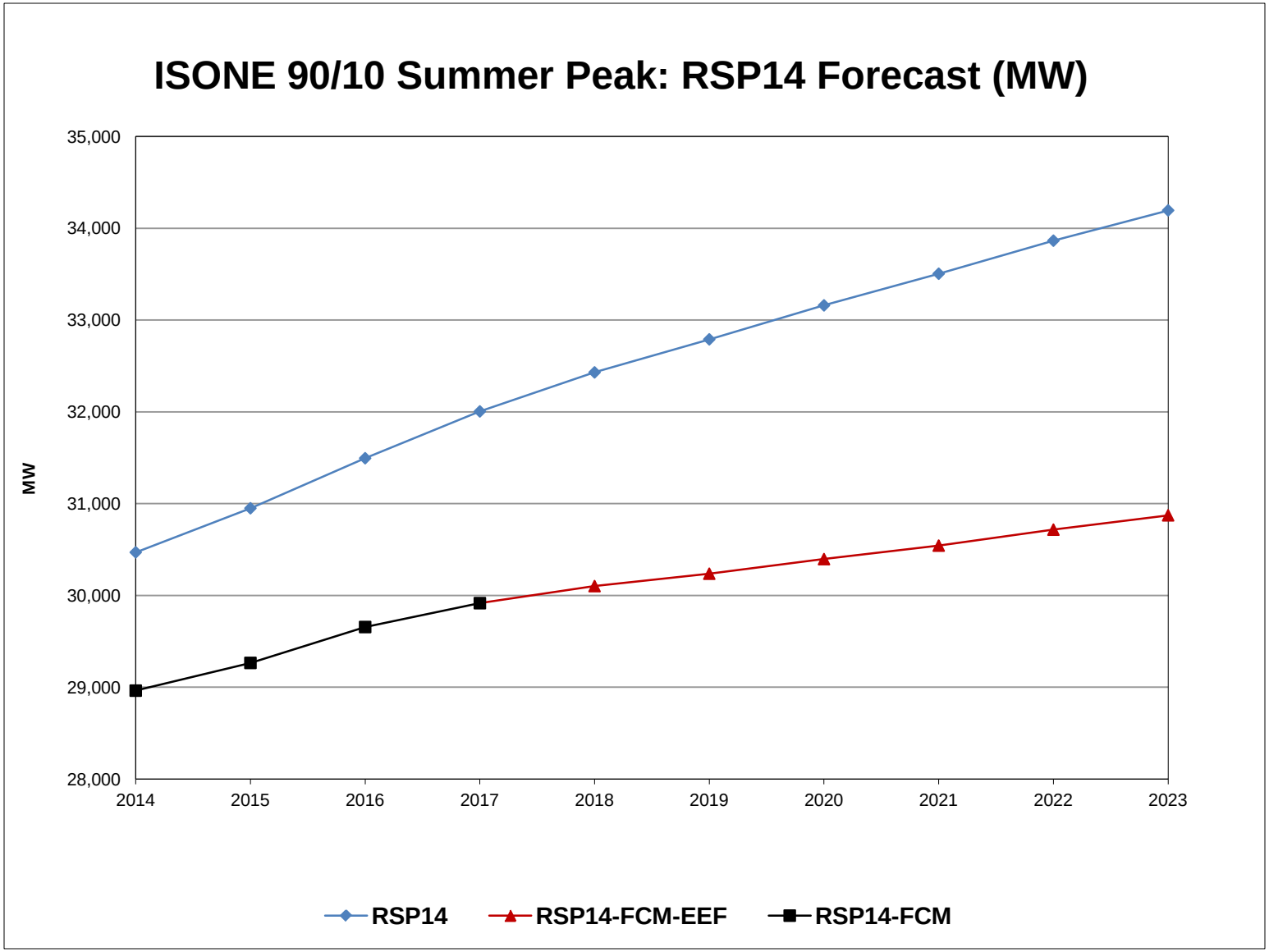
Difference of 319 MW
Projected EE contribution

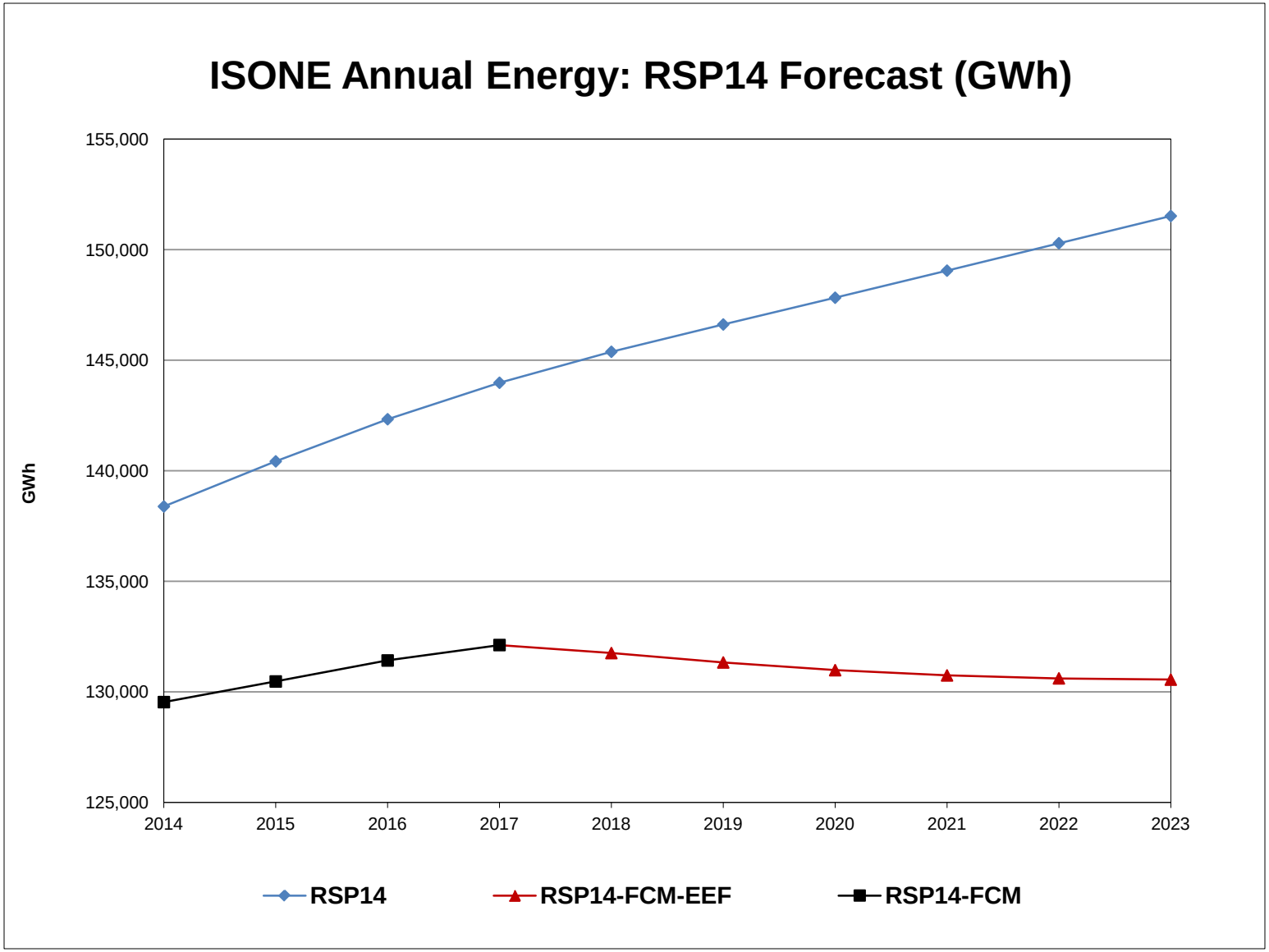
- Uptick in CSO line between 2015 and 2016 resulted from static delist bids due to low winter qualification
- Using existing qualified capacity eliminates depression due to market effects and more accurately reflects the physical delivery of EE

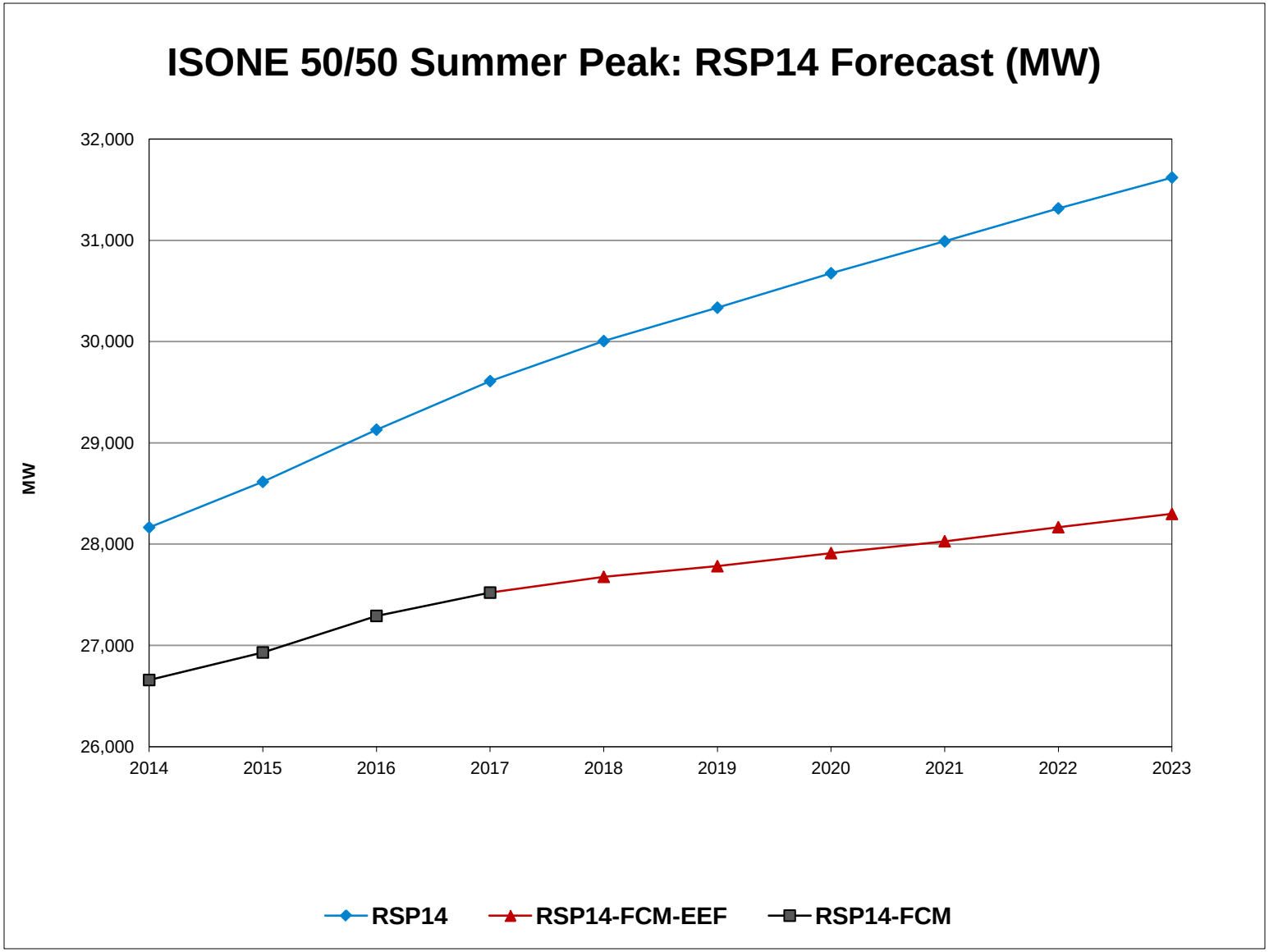
EE FORECAST DEMAND PLOTS


ISONE Energy Efficiency on Summer Peak (MW)
3,500
3,000
2,500
2,000
1,500
1,000
500
MW
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
FCM+EEF
FCM

IMPACT OF EE FORECAST ON ENERGY AND SUMMER PEAK LOAD FORECAST


ISONE 90/10 Summer Peak: RSP14 Forecast (MW)
MW
35,000
34,000
33,000
32,000
31,000
30,000
29,000
28,000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
RSP14
RSP14-FCM-EEF
RSP14-FCM

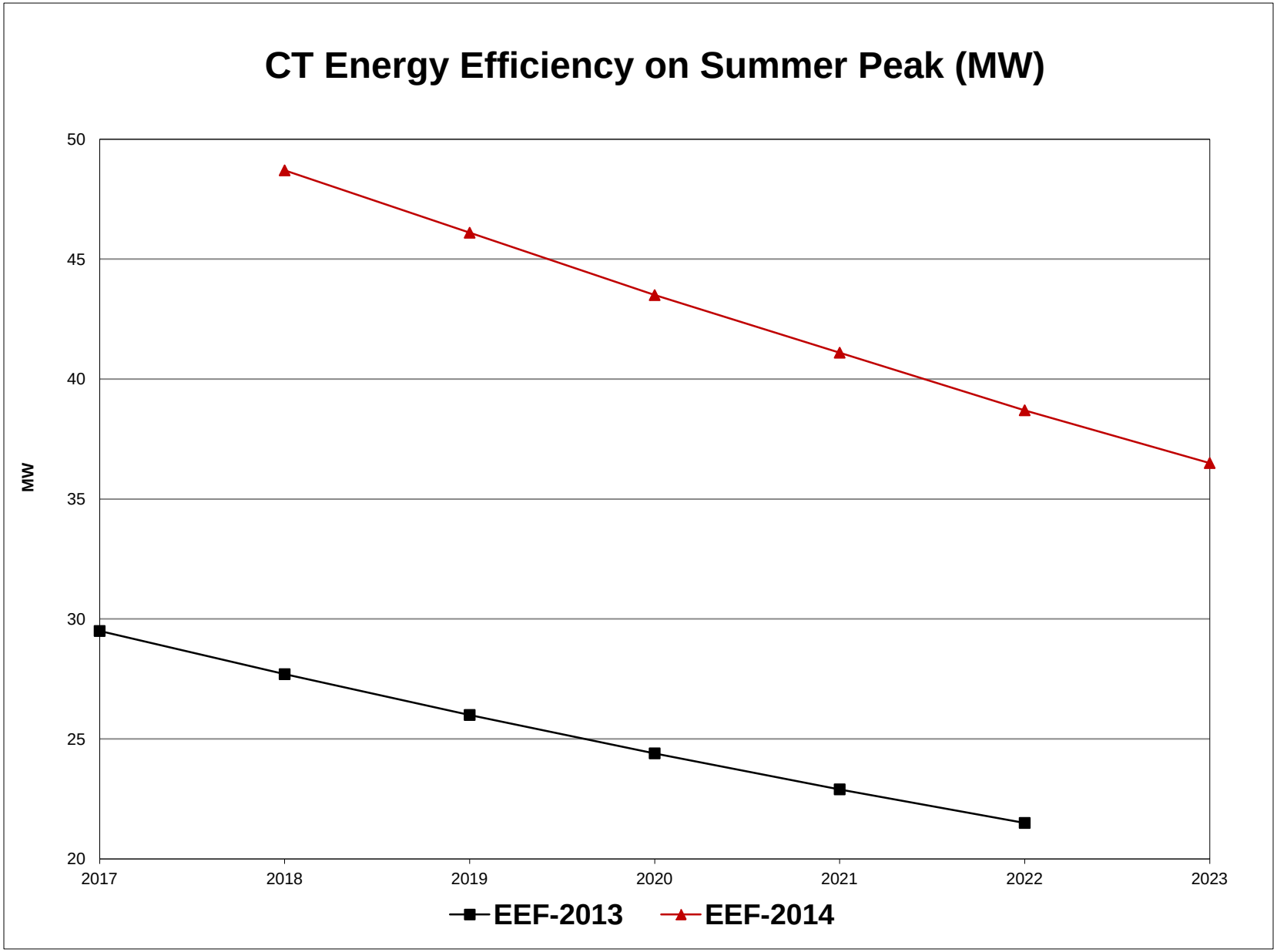

ISONE Annual Energy: RSP14 Forecast (GWh)
GWh
155,000
150,000
145,000
140,000
135,000
130,000
125,000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
RSP14
RSP14-FCM-EEF
RSP14-FCM

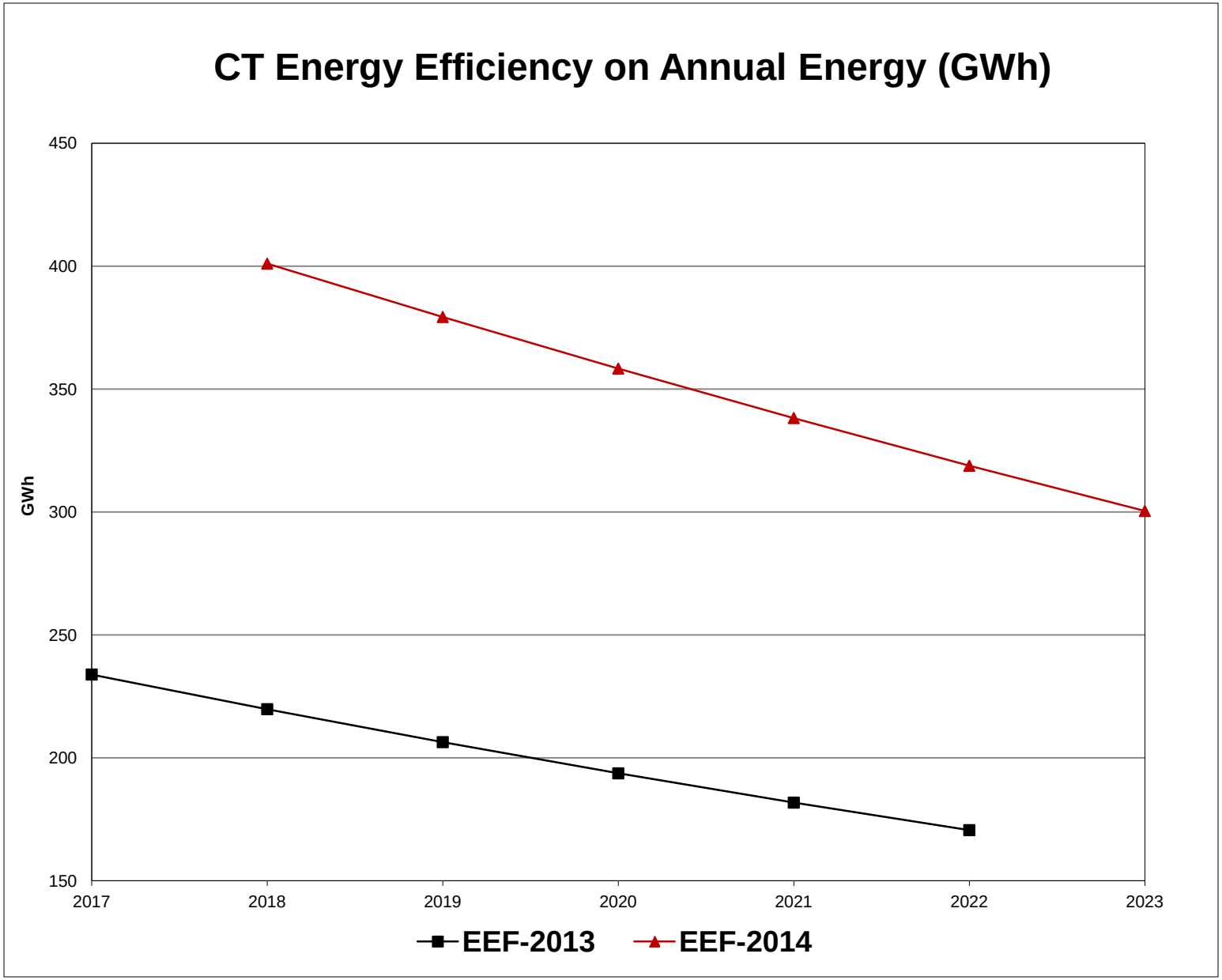

ISONE 50/50 Summer Peak: RSP14 Forecast (MW)
MW
32,000
31,000
30,000
29,000
28,000
27,000
26,000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
RSP14
RSP14-FCM-EEF
RSP14-FCM

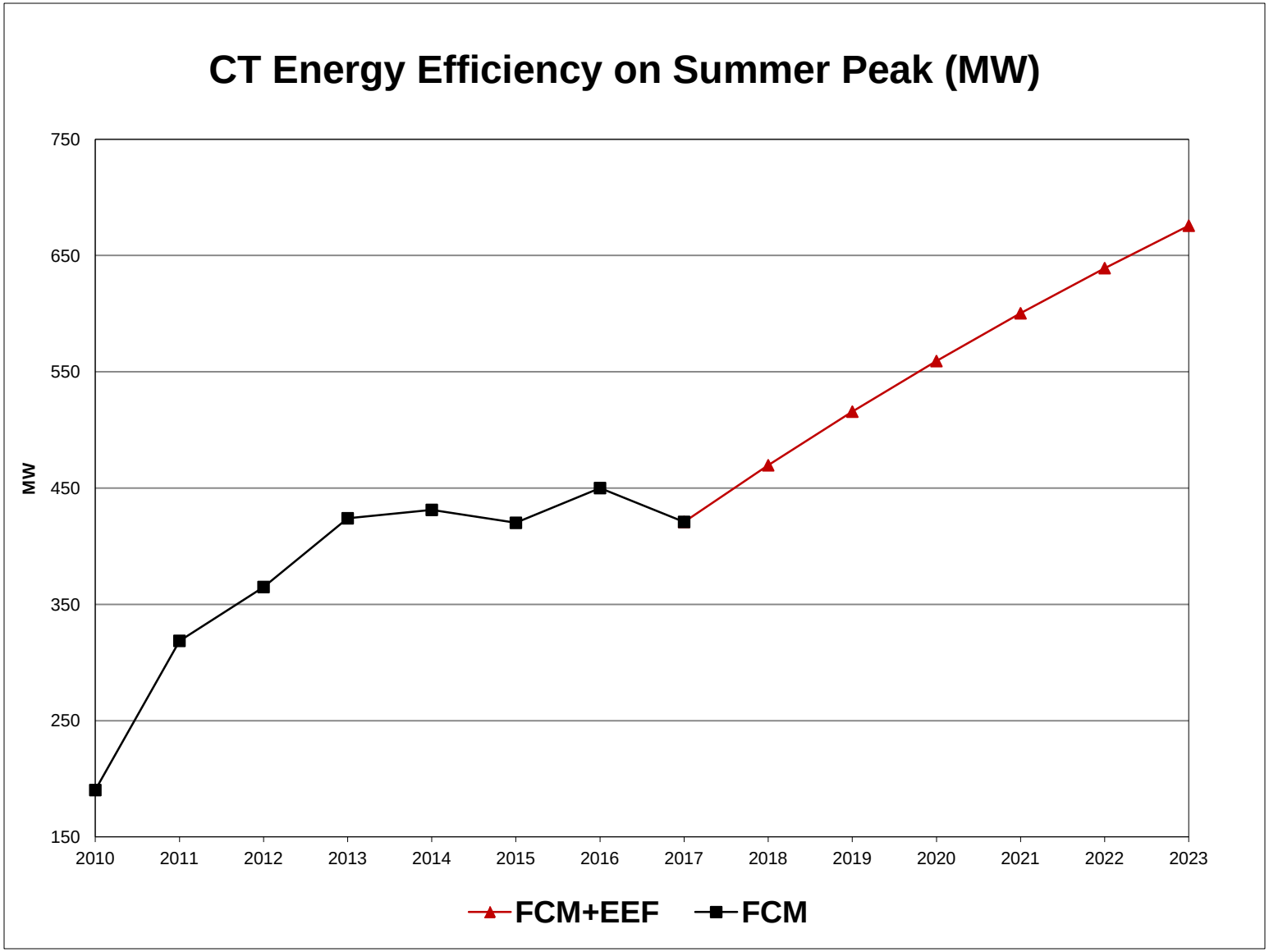
STATE FORECASTS

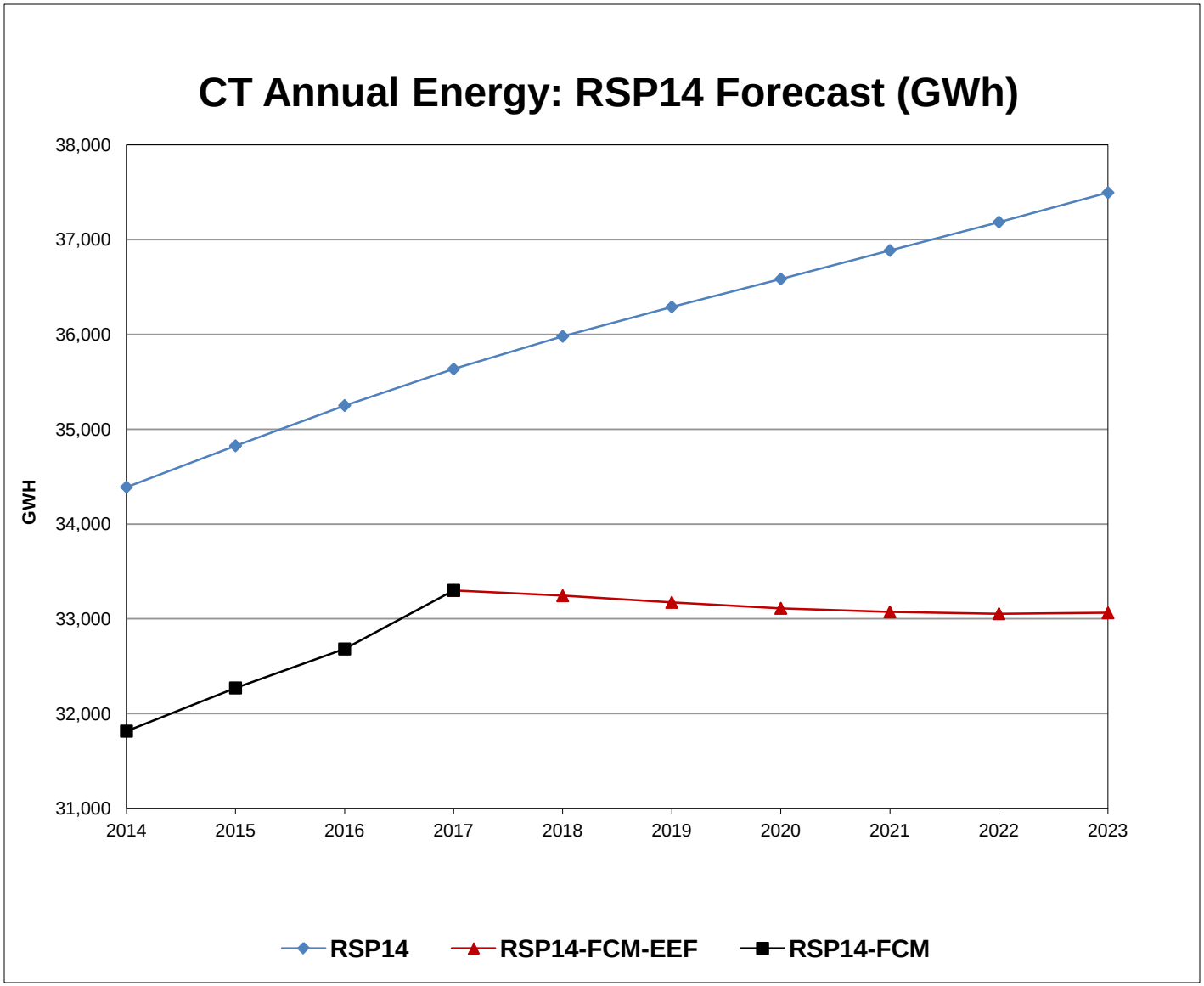
State-Level Assumptions – Connecticut

- Budget: Based on commission approved 2013 budget
  - Increase in FCM dollars due to increase in clearing price
- Budget Uncertainty Rate: none
- Production Cost: Based on average of 2010-2012 PA data
- Production Cost Escalation Rate: 5% + 2.5% inflation
- Peak to Energy Ratio: Based on average of 2010 -2012 PA data
- Increased budget dollars due to an all cost effective policy

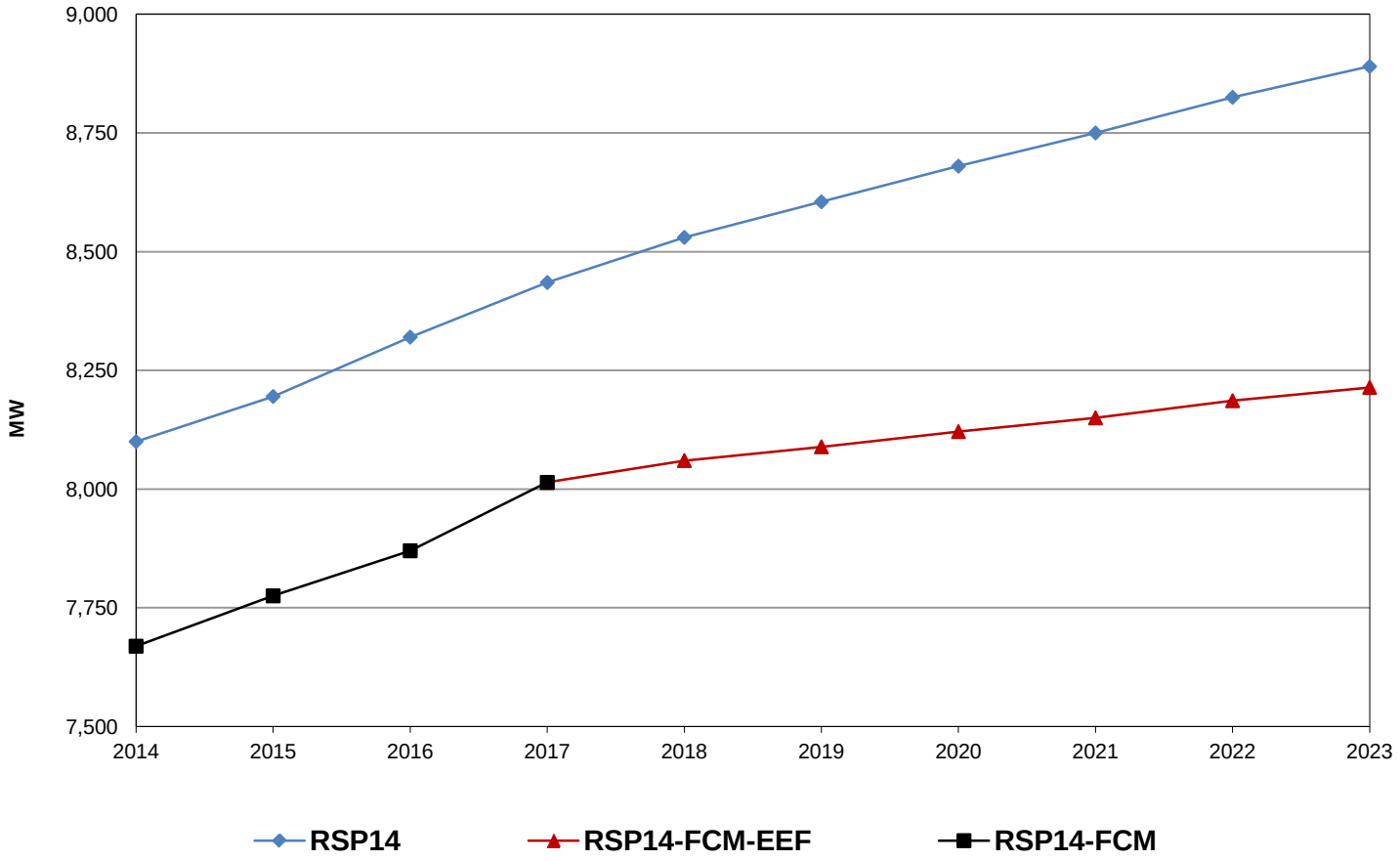

CT Energy Efficiency on Summer Peak (MW)
MW
50
45
40
35
30
25
20
2017
2018
2019
2020
2021
2022
2023
EEF-2013
EEF-2014


CT Energy Efficiency on Annual Energy (GWh)
450
400
350
300
250
200
150
GWh
2017
2018
2019
2020
2021
2022
2023
EEF-2013
EEF-2014


CT Energy Efficiency on Summer Peak (MW)
MW
750
650
550
450
350
250
150
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
FCM+EEF
FCM

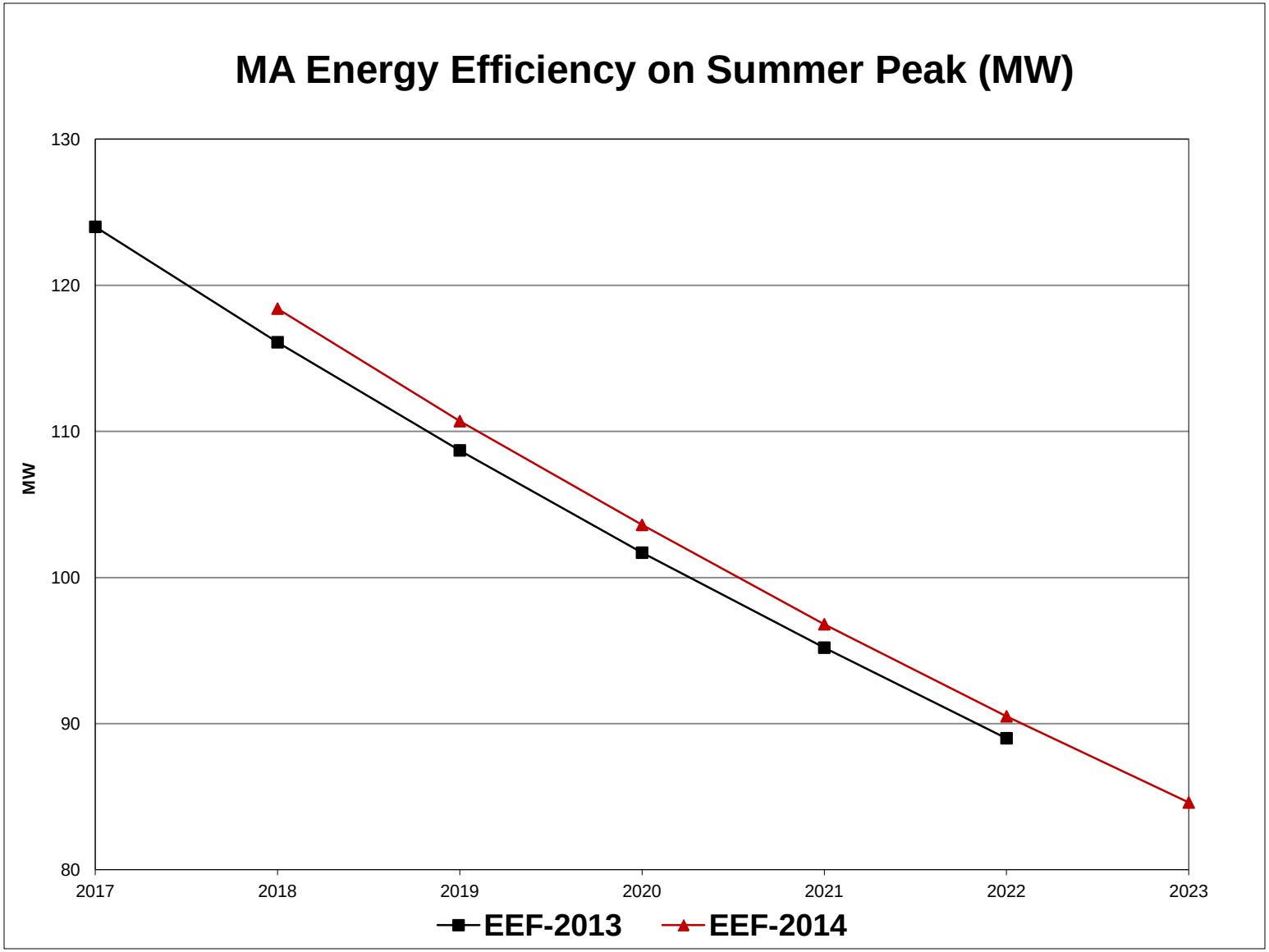

CT Annual Energy: RSP14 Forecast (GWh)
GWH
38,000
37,000
36,000
35,000
34,000
33,000
32,000
31,000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
RSP14
RSP14-FCM-EEF
RSP14-FCM

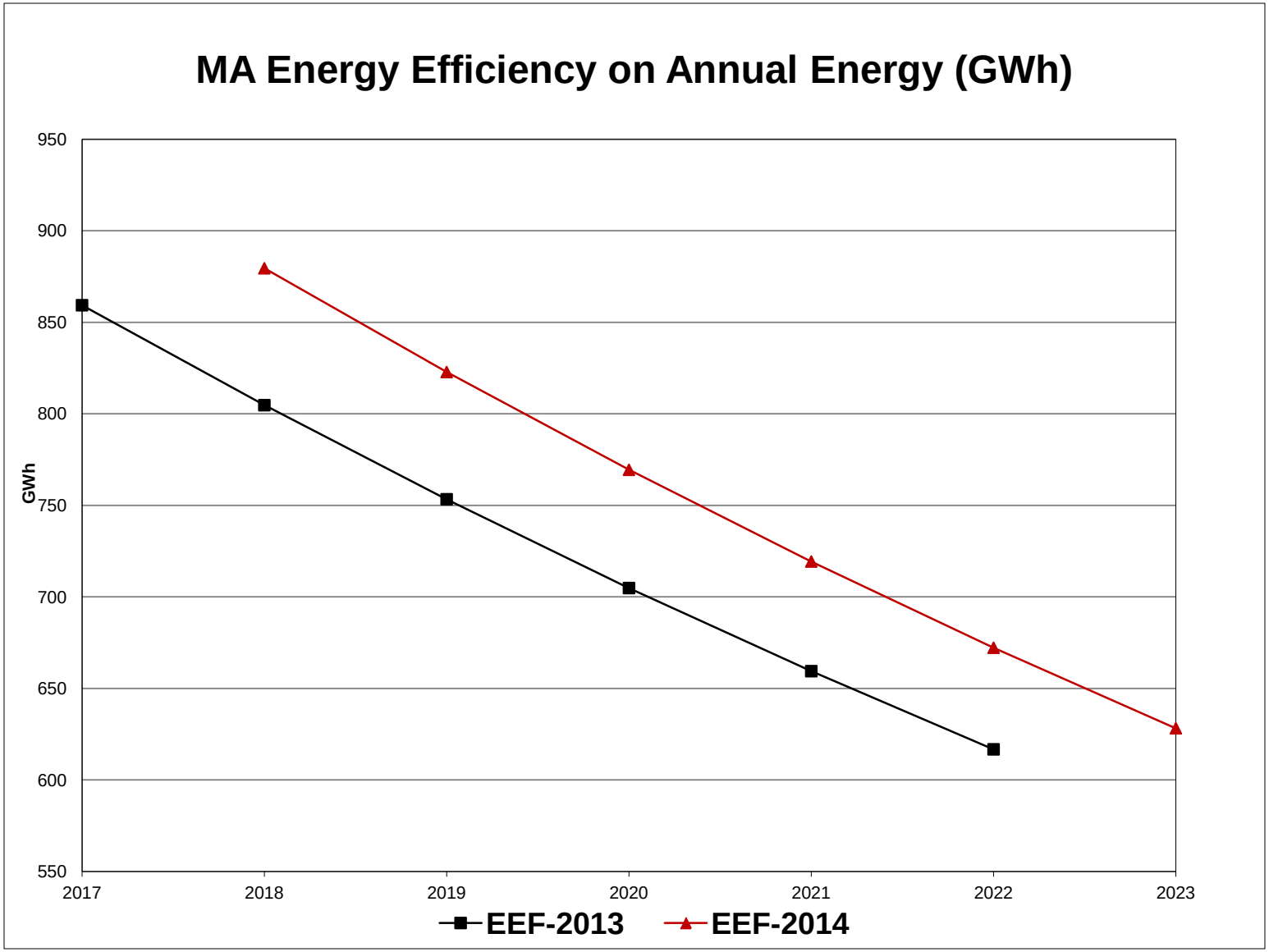
CT 90/10 Summer Peak: RSP14 Forecast (MW)



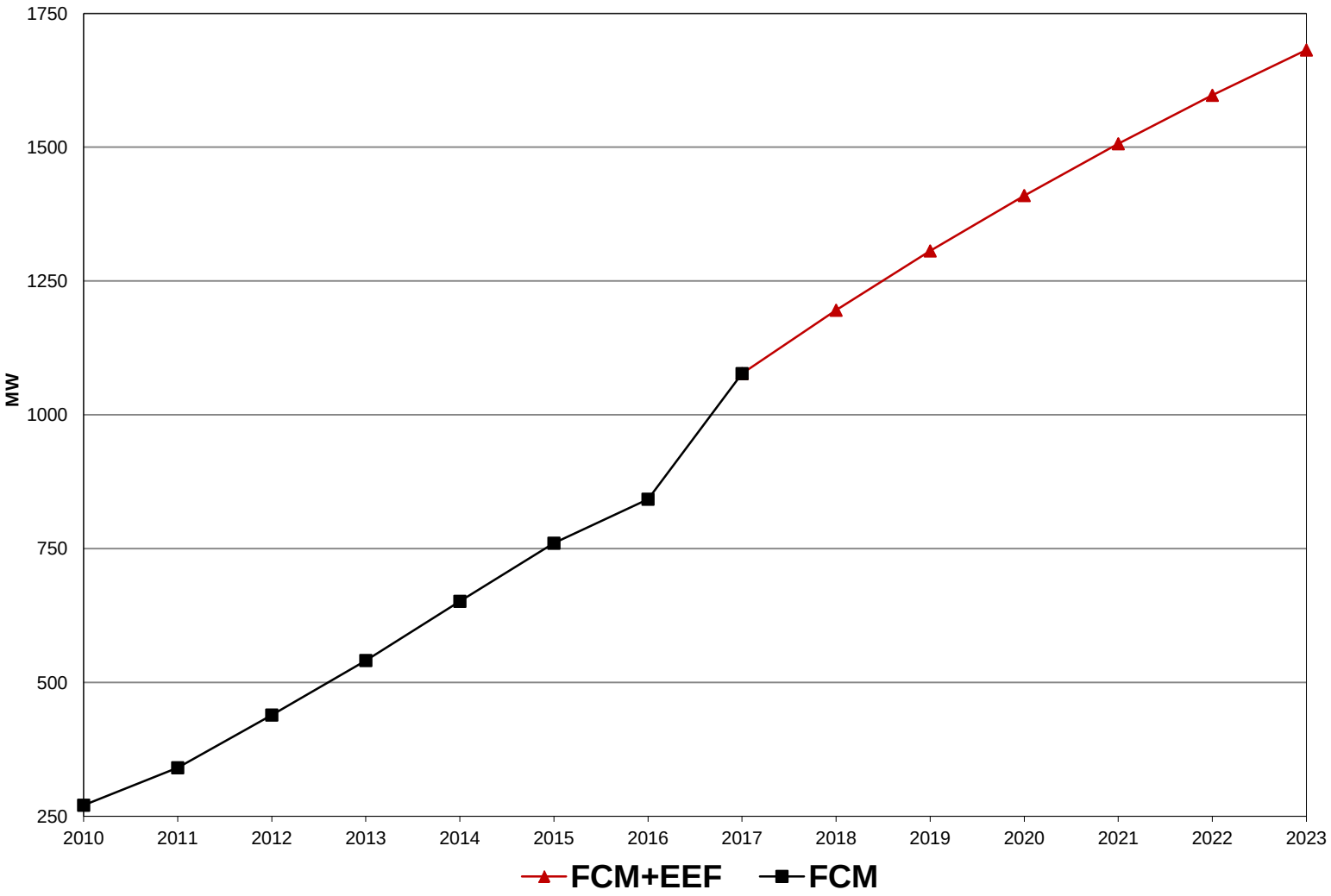
State-Level Assumptions – Massachusetts

- Budget: Based on commission approved 2013 budget
  - Increase in FCM dollars due to increase in clearing price is offset by reductions in Policy dollars
- Budget Uncertainty Rate: 20%
- Production Cost: Based on average of 2010 -2012 PA data
- Production Cost Escalation Rate: 5% + 2.5% inflation
- Peak to Energy Ratio: Based on average of 2010-2012 PA data

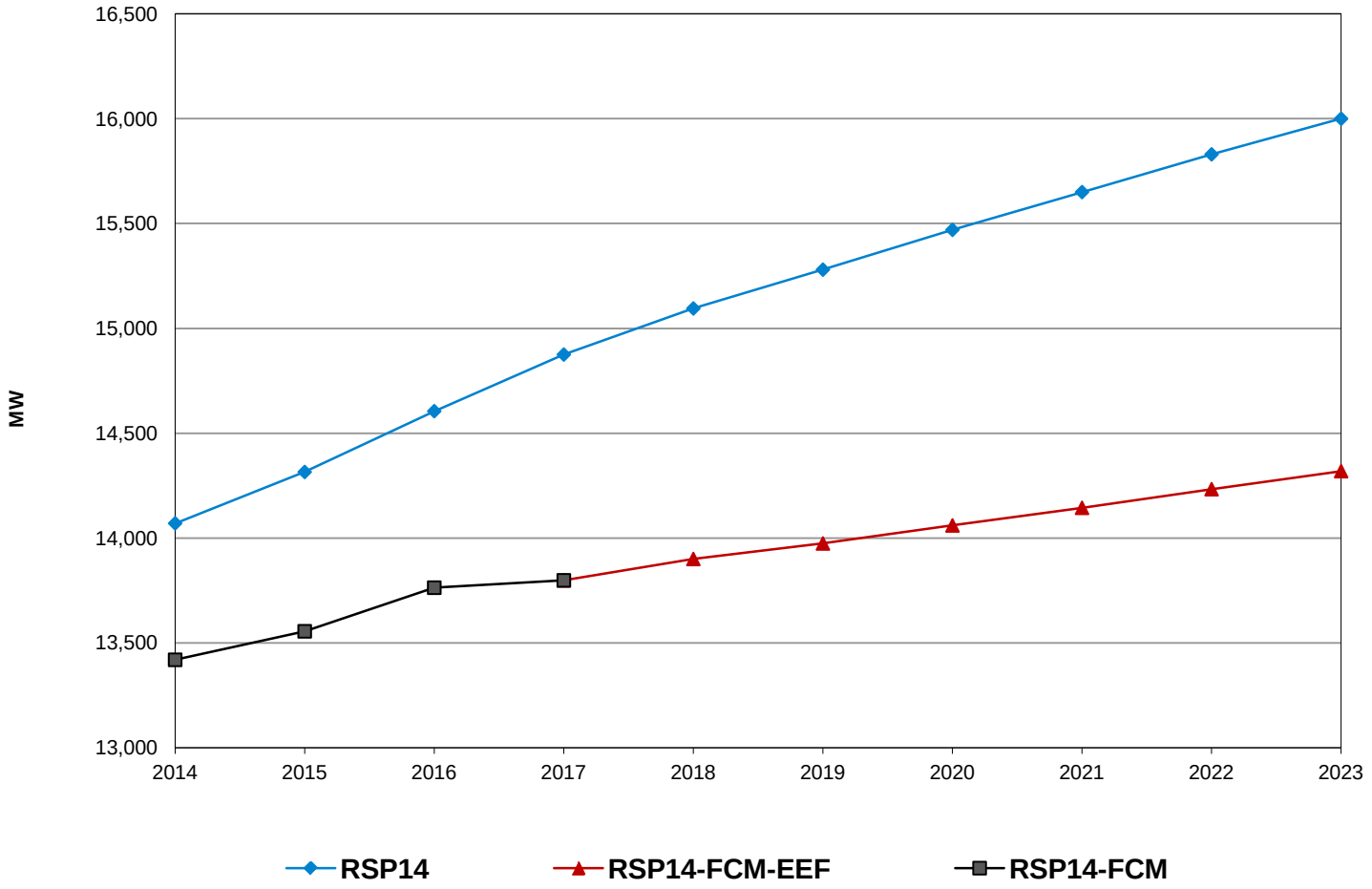

MA Energy Efficiency on Summer Peak (MW)
130
120
110
100
90
80
MW
2017
2018
2019
2020
2021
2022
2023
EEF-2013
EEF-2014

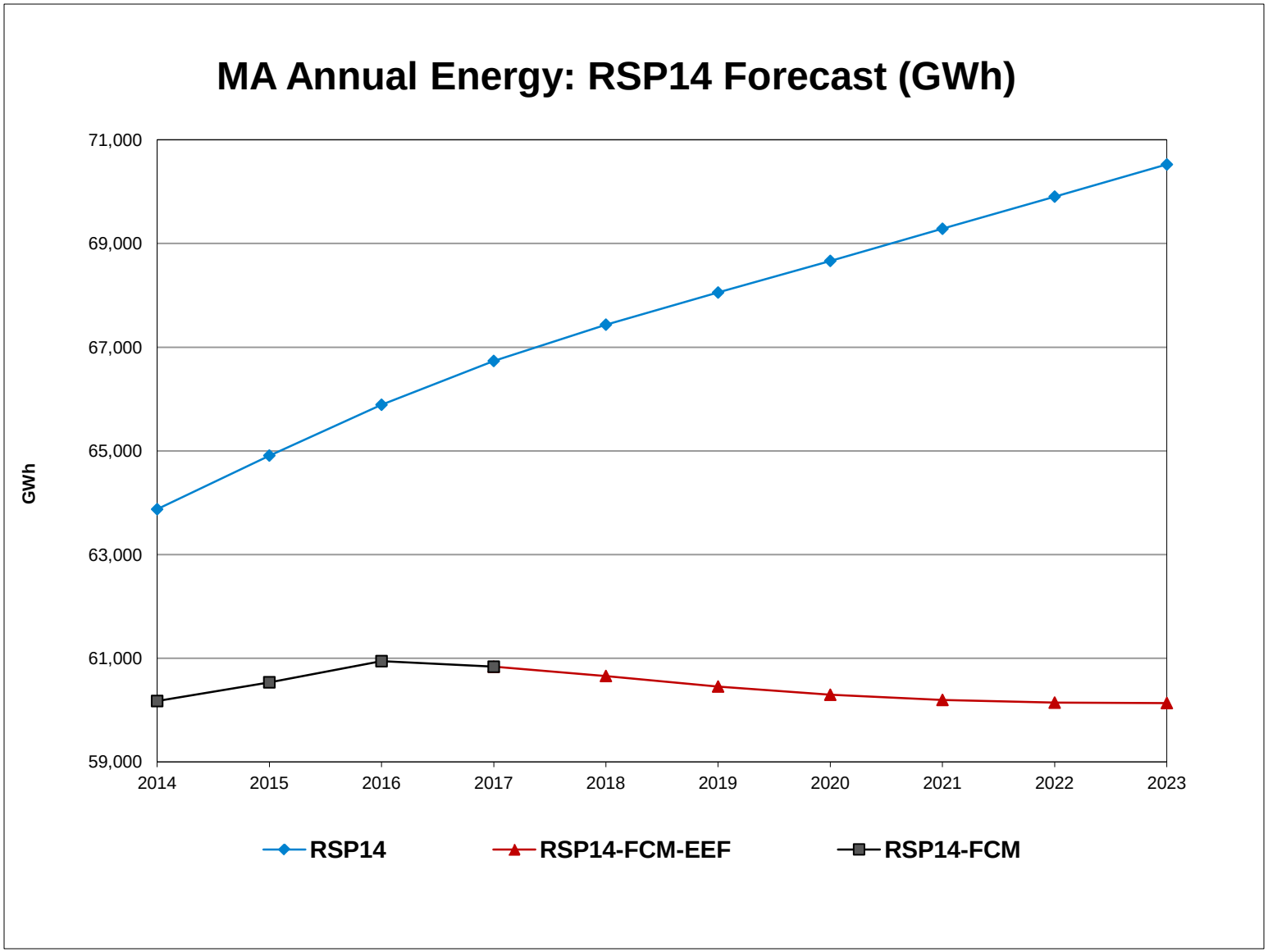

MA Energy Efficiency on Annual Energy (GWh)
950
900
850
800
750
700
650
600
550
GWh
2017
2018
2019
2020
2021
2022
2023
EEF-2013
EEF-2014

MA Energy Efficiency on Summer Peak (MW)



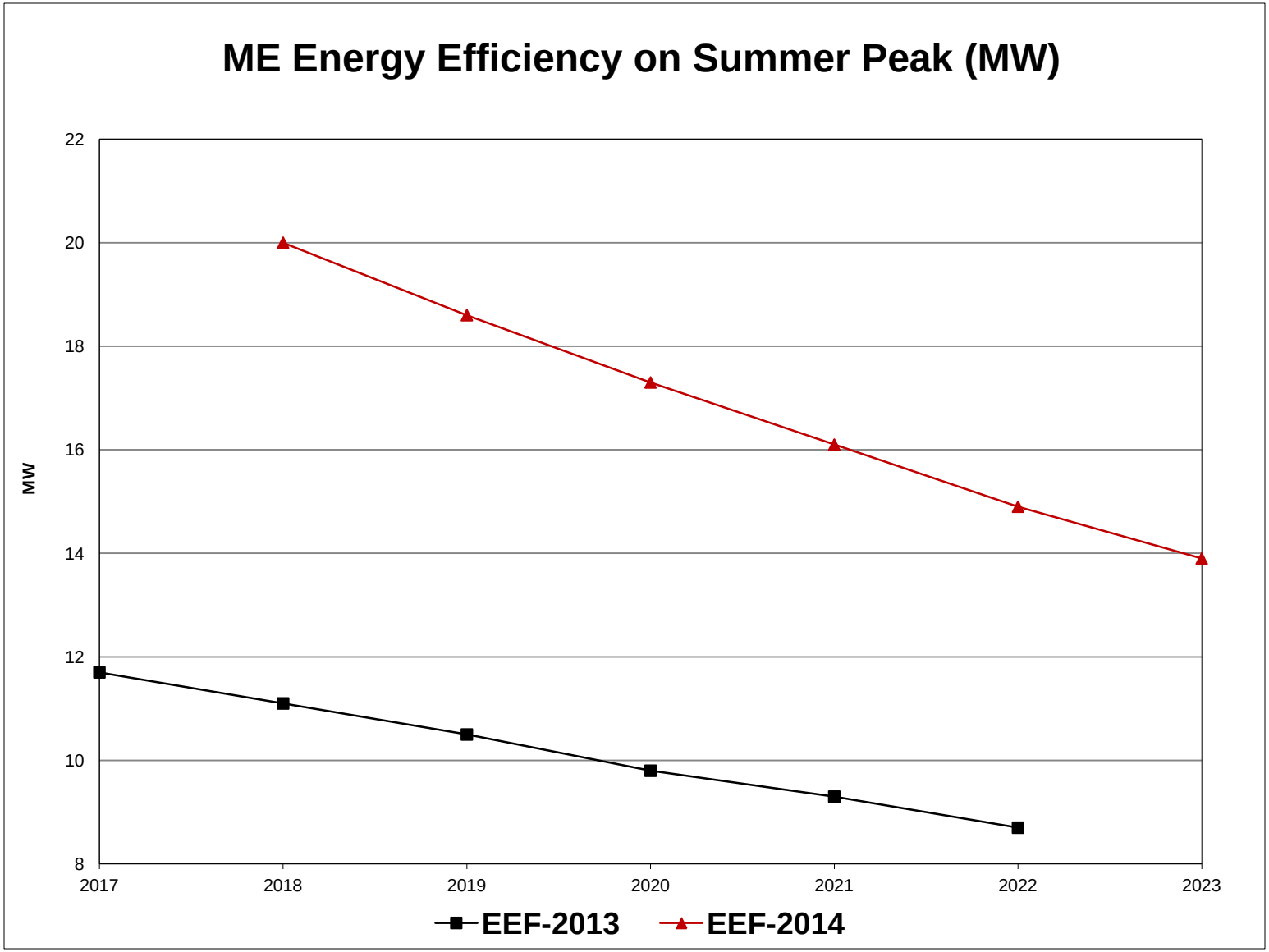
MA 90/10 Summer Peak: RSP14 Forecast (MW)

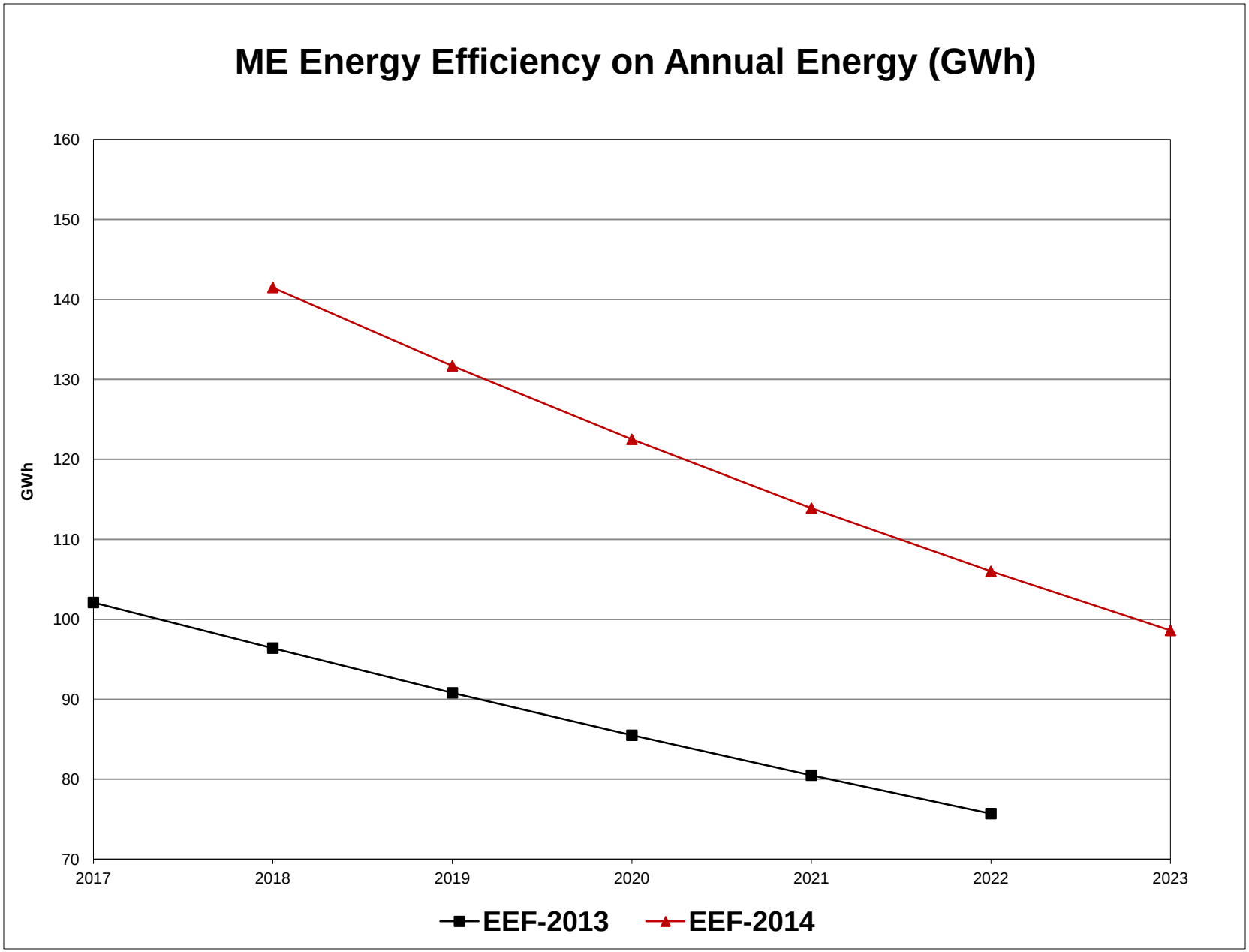


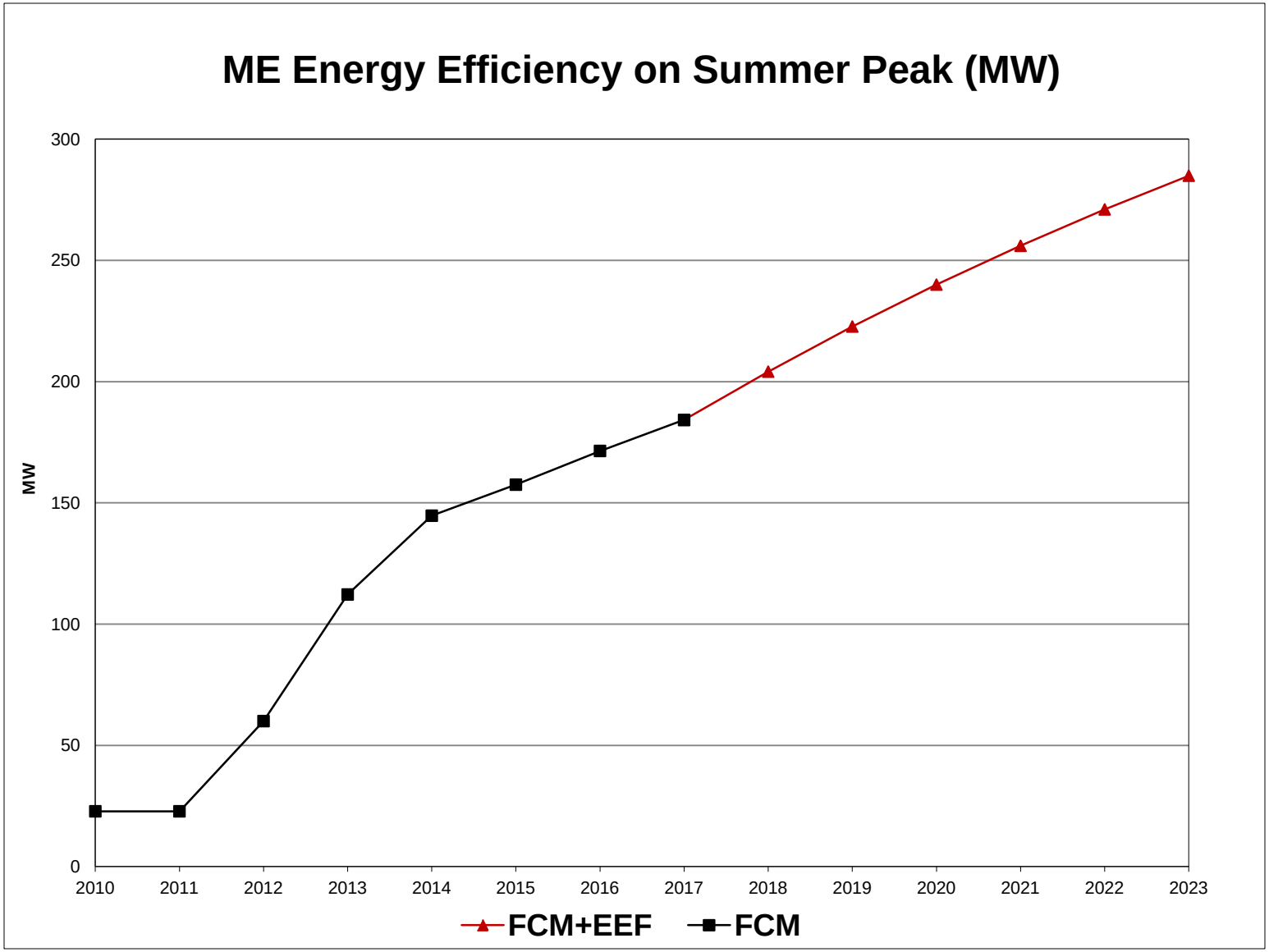

MA Annual Energy: RSP14 Forecast (GWh)
GWh
71,000
69,000
67,000
65,000
63,000
61,000
59,000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
RSP14
RSP14-FCM-EEF
RSP14-FCM

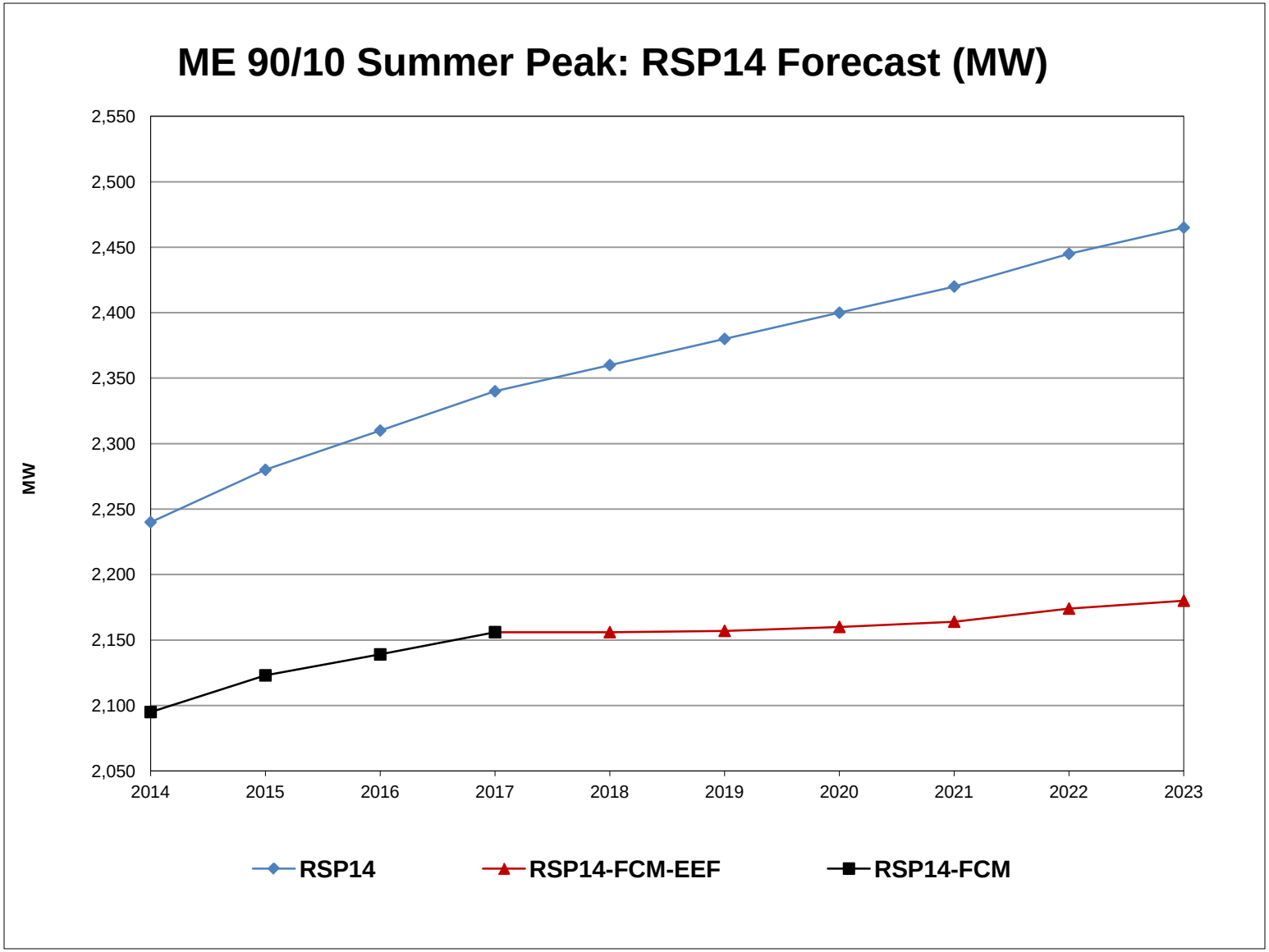
State Level Assumptions – Maine

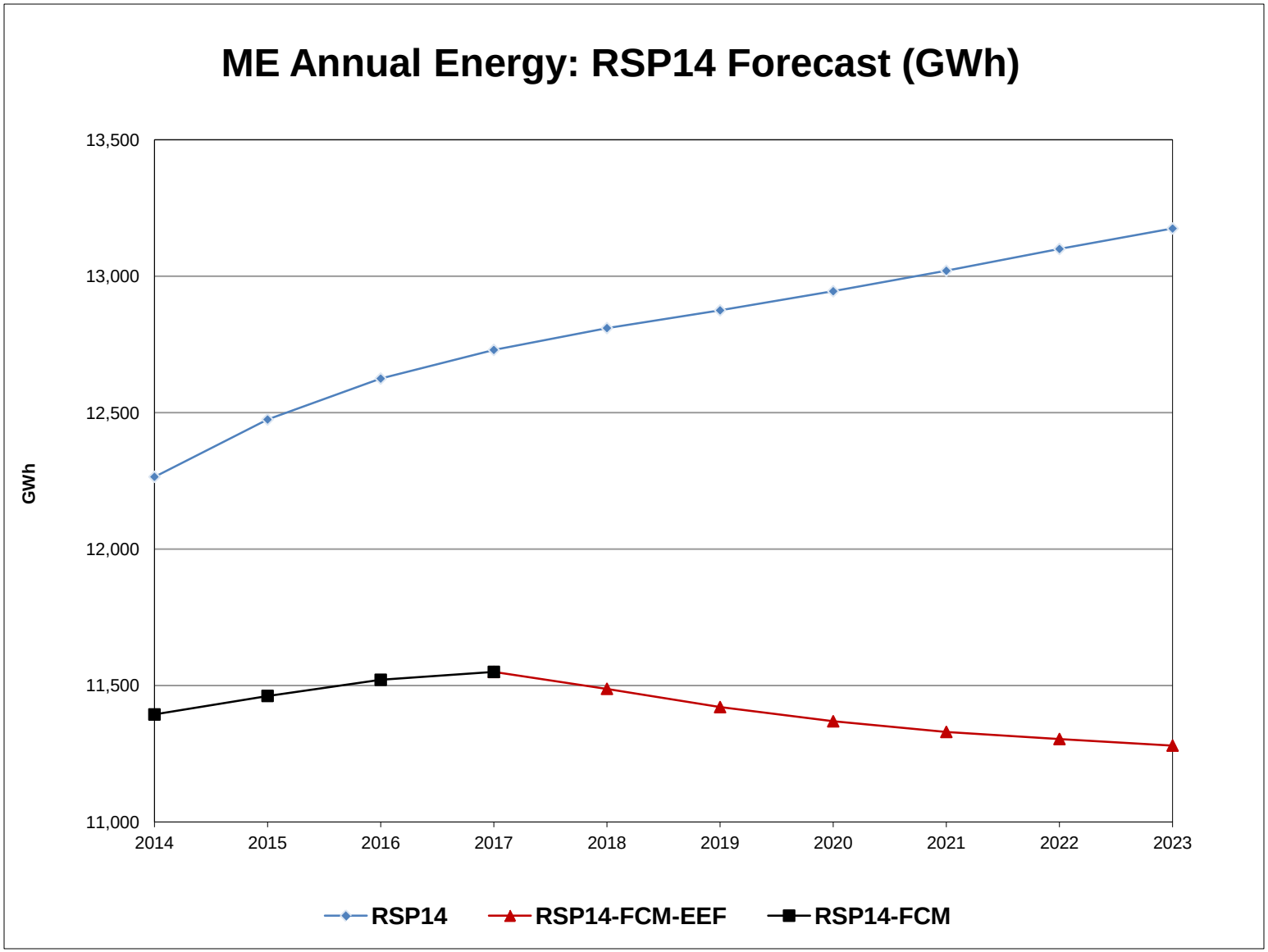
- Budget: Based on commission approved 2014-2016 budget
  - FCM revenue not used in budget
- Budget Uncertainty Rate: none
- Production Cost: Based on average of 2014-2016 budget
- Production Cost Escalation Rate: 5% + 2.5% inflation
- Peak to Energy Ratio: Based on average of 2014-2016 budget


ME Energy Efficiency on Summer Peak (MW)
MW
22
20
18
16
14
12
10
8
2017
2018
2019
2020
2021
2022
2023
EEF-2013
EEF-2014


ME Energy Efficiency on Annual Energy (GWh)
GWh
160
150
140
130
120
110
100
90
80
70
2017
2018
2019
2020
2021
2022
2023
EEF-2013
EEF-2014

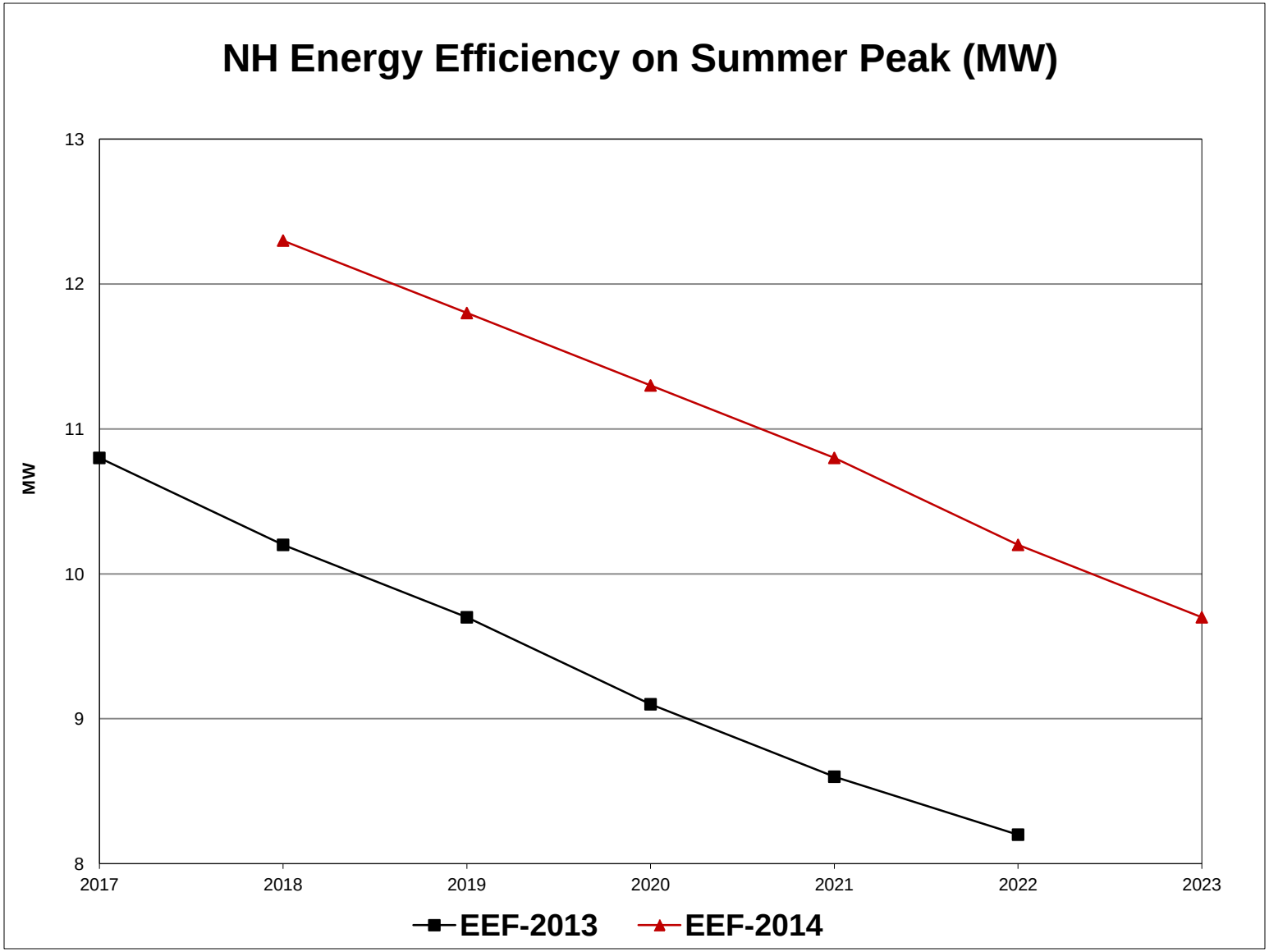

ME Energy Efficiency on Summer Peak (MW)
MW
300
250
200
150
100
50
0
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
FCM+EEF
FCM

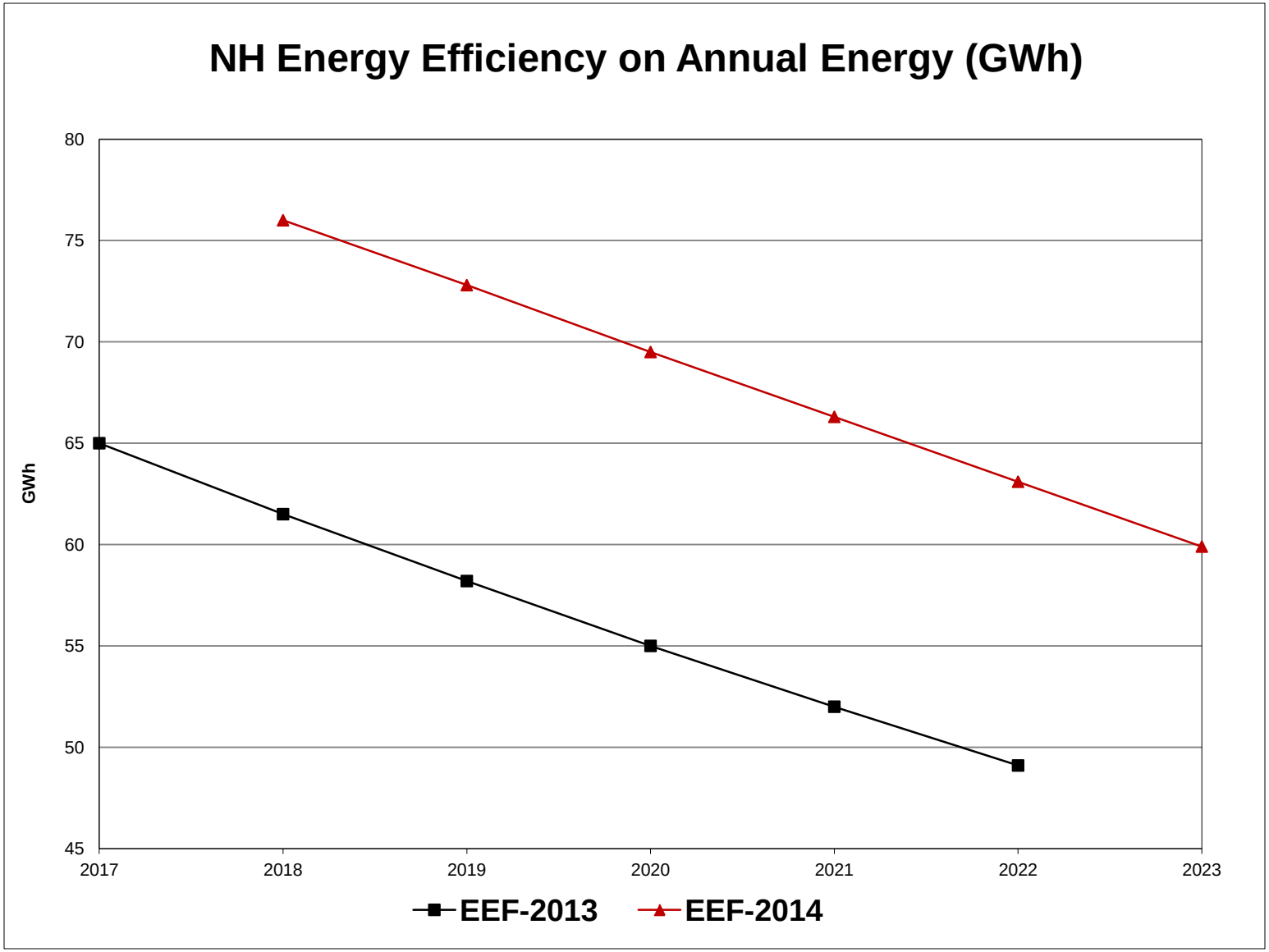

ME 90/10 Summer Peak: RSP14 Forecast (MW)
MW
2,550
2,500
2,450
2,400
2,350
2,300
2,250
2,200
2,150
2,100
2,050
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
RSP14
RSP14-FCM-EEF
RSP14-FCM

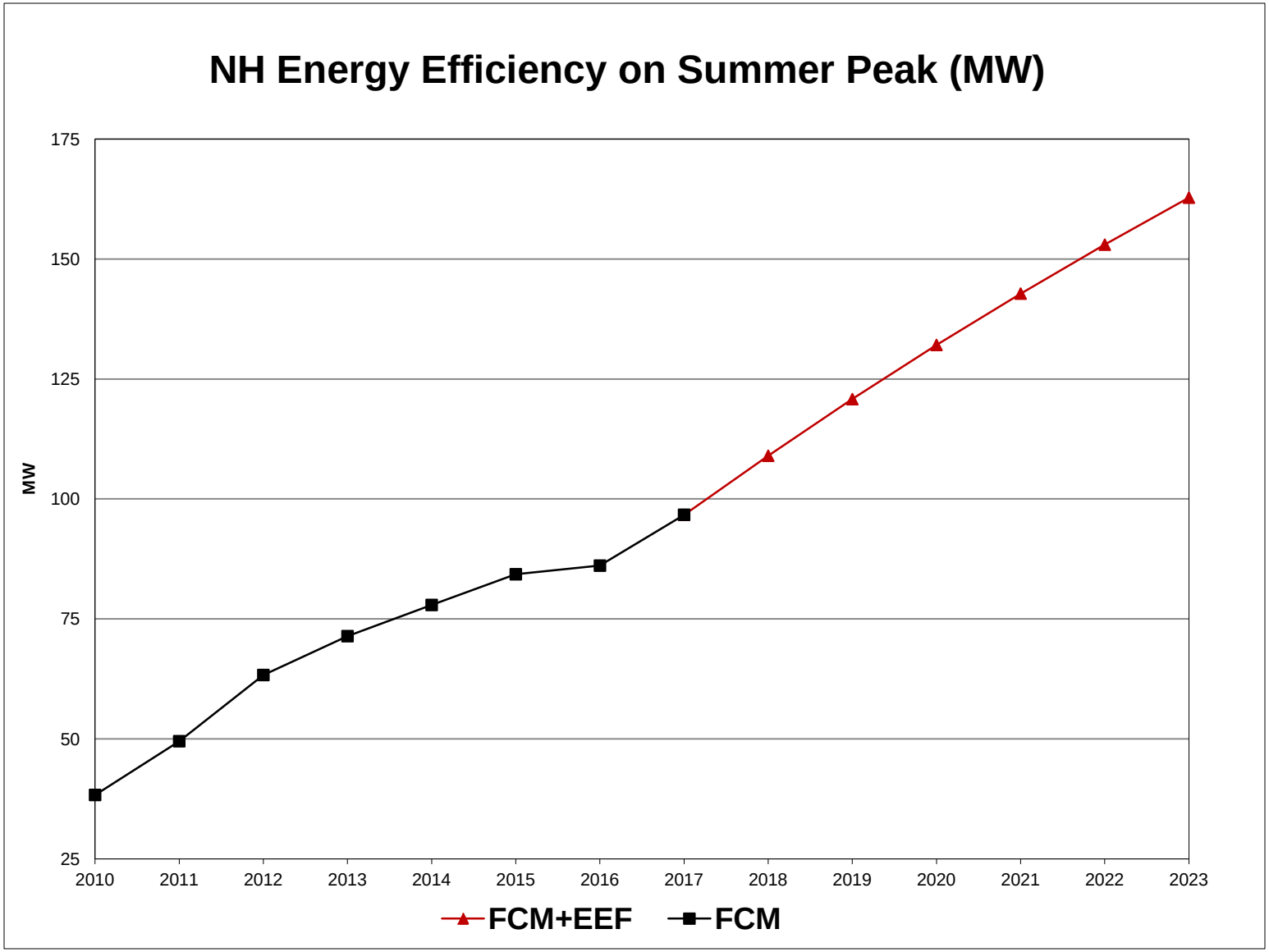

ME Annual Energy: RSP14 Forecast (GWh)
GWh
13,500
13,000
12,500
12,000
11,500
11,000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
RSP14
RSP14-FCM-EEF
RSP14-FCM

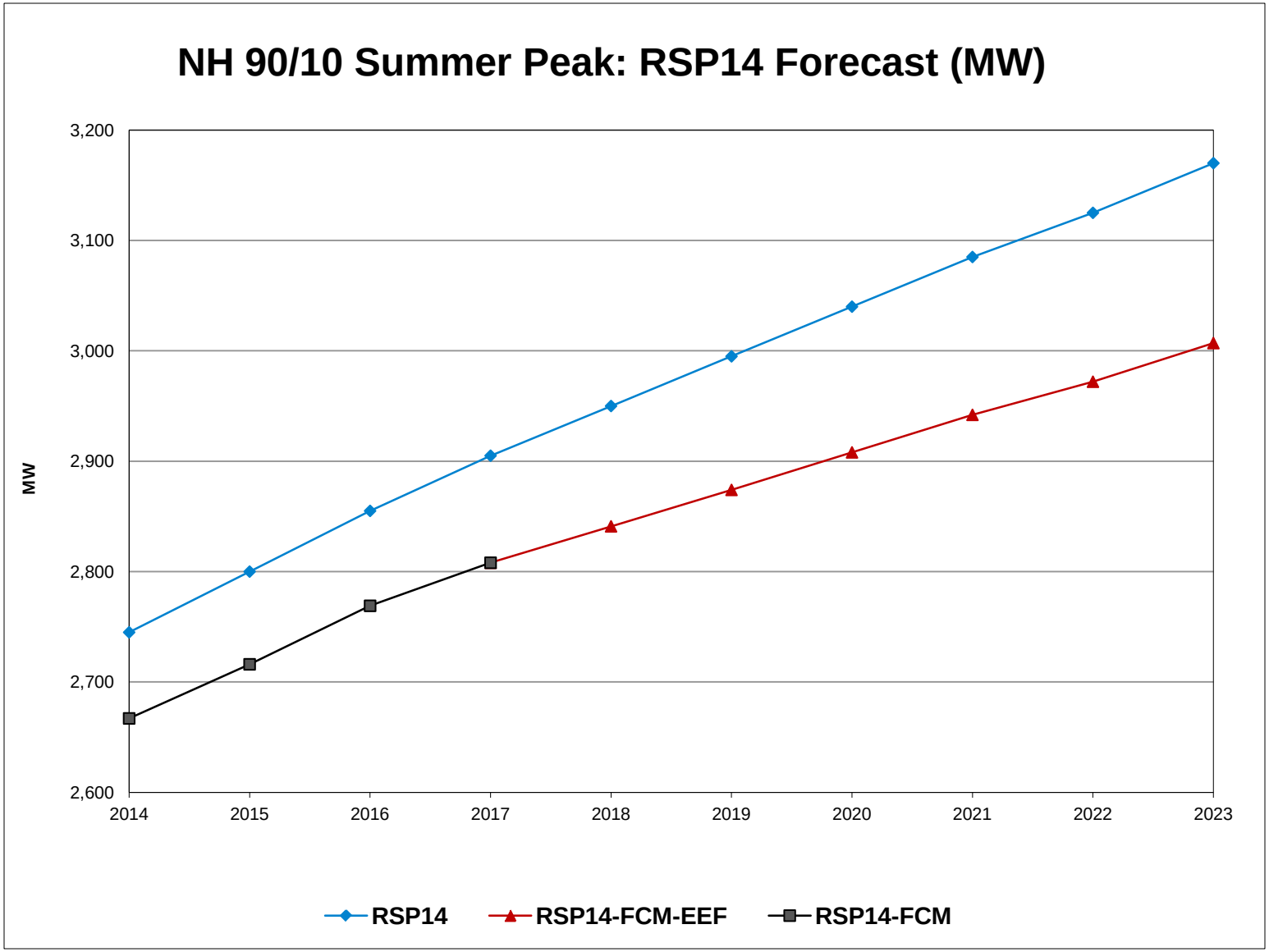
State-Level Assumptions – New Hampshire

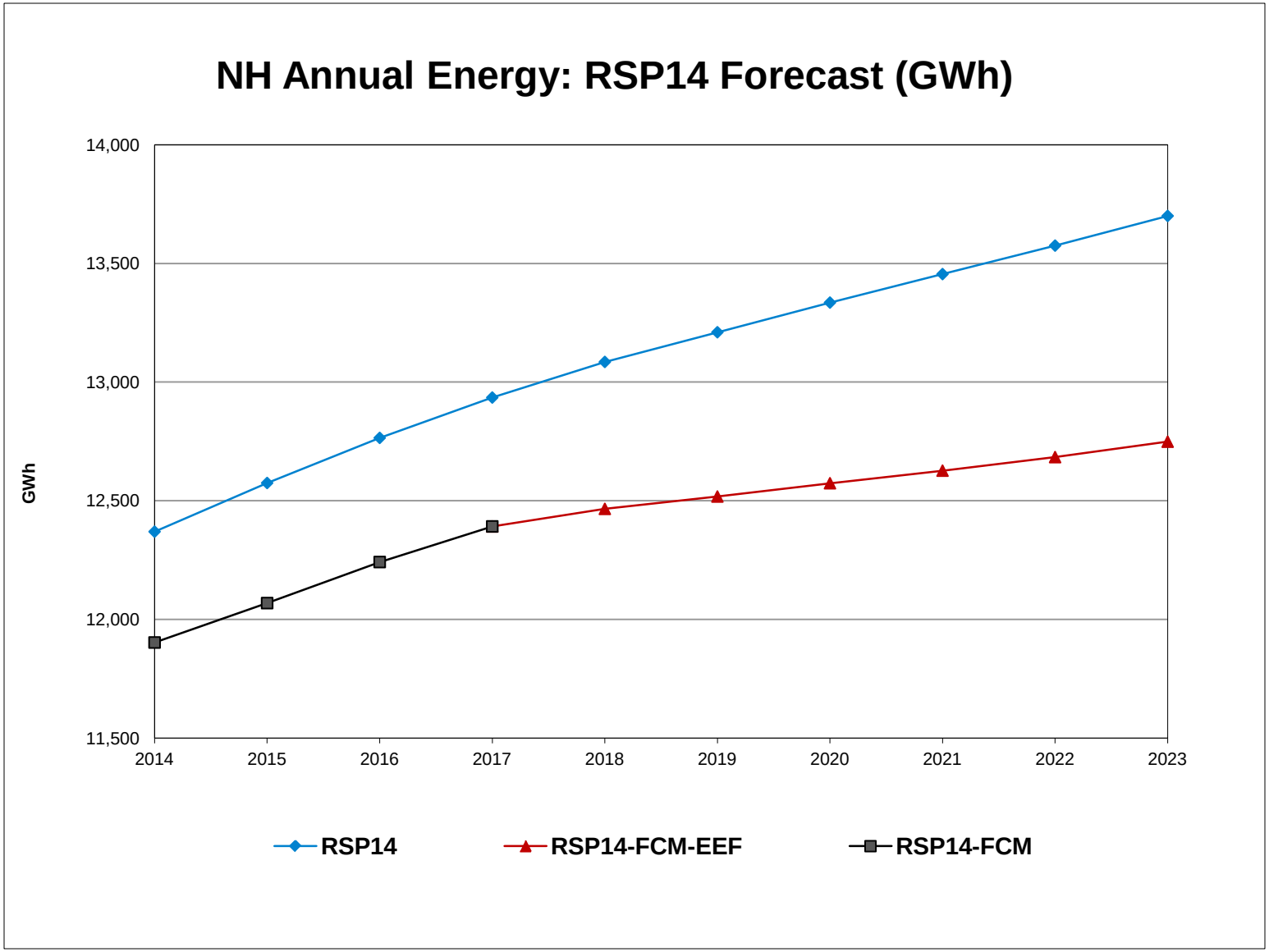
- Budget: Based on commission approved 2013 budget
  - Increase in FCM dollars due to increase in clearing price
- Budget Uncertainty Rate: none
- Production Cost: Based on average of 2010-2012 PA data
- Production Cost Escalation Rate: 5% + 2.5% inflation
- Peak to Energy Ratio: Based on average of 2010-2012 PA data


NH Energy Efficiency on Summer Peak (MW)
MW
13
12
11
10
9
8
2017
2018
2019
2020
2021
2022
2023
EEF-2013
EEF-2014


NH Energy Efficiency on Annual Energy (GWh)
GWh
80
75
70
65
60
55
50
45
2017
2018
2019
2020
2021
2022
2023
EEF-2013
EEF-2014

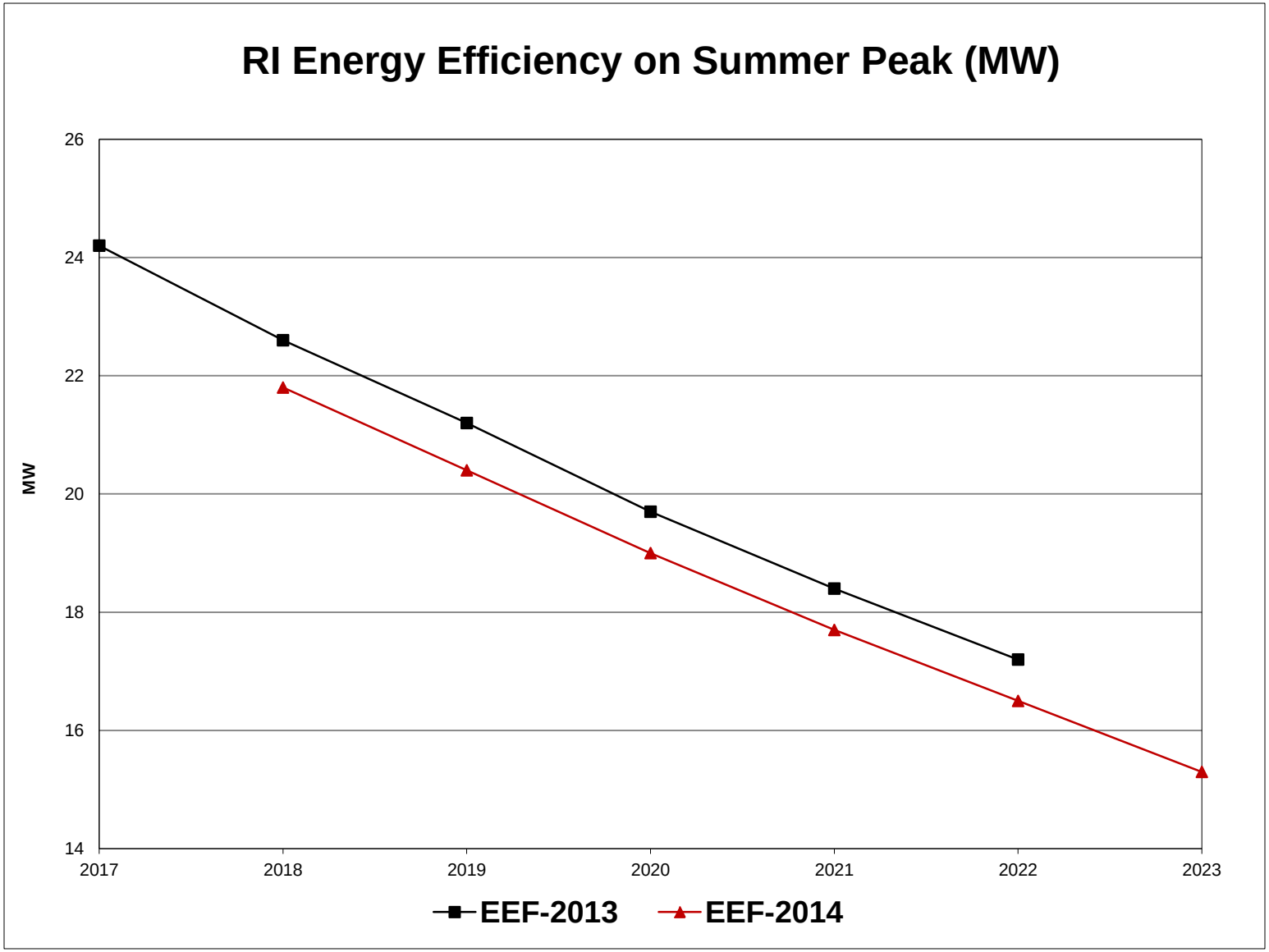

NH Energy Efficiency on Summer Peak (MW)
175
150
125
100
75
50
25
MW
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
FCM+EEF
FCM

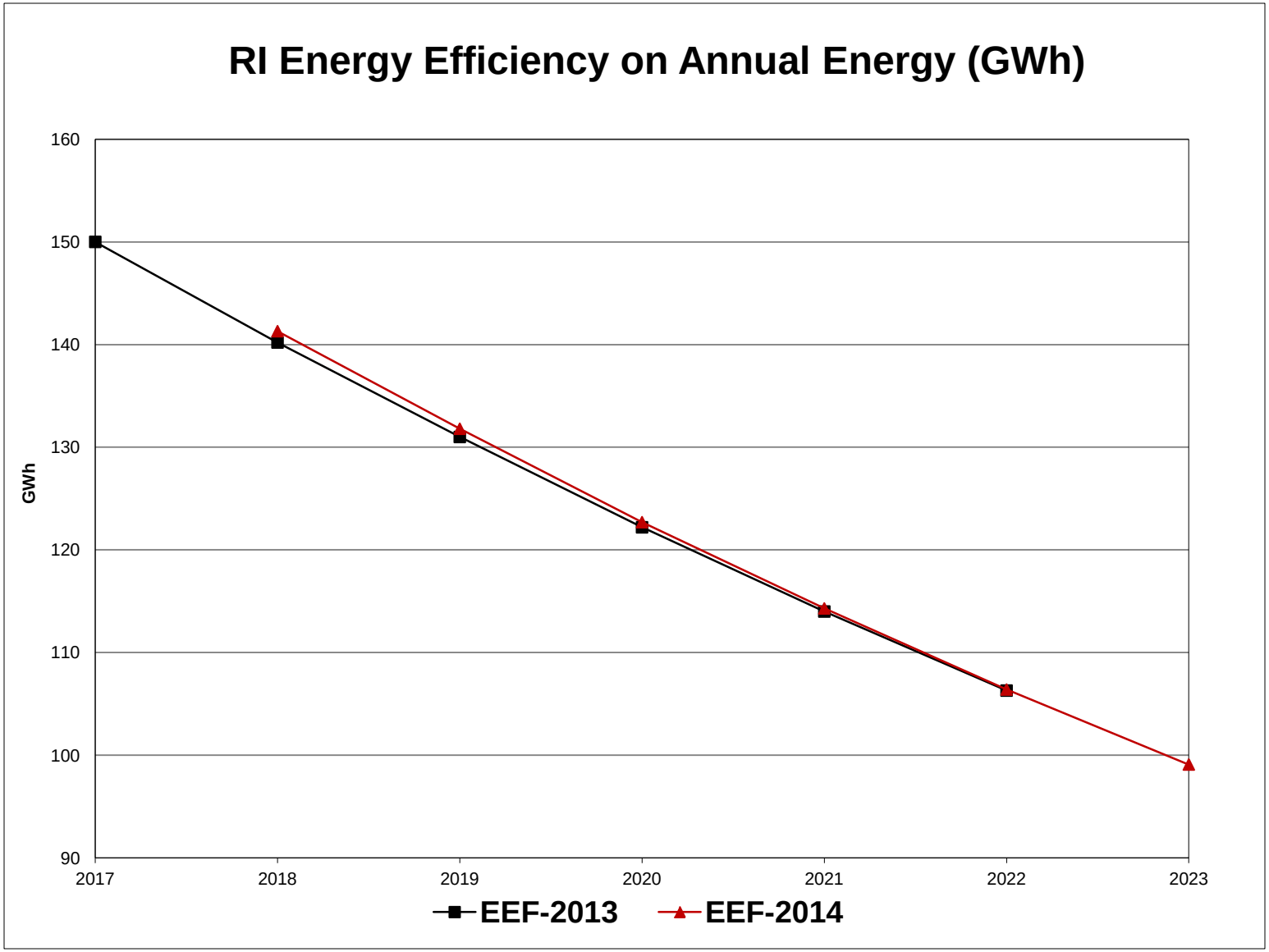

NH 90/10 Summer Peak: RSP14 Forecast (MW)
MW
3,200
3,100
3,000
2,900
2,800
2,700
2,600
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
RSP14
RSP14-FCM-EEF
RSP14-FCM

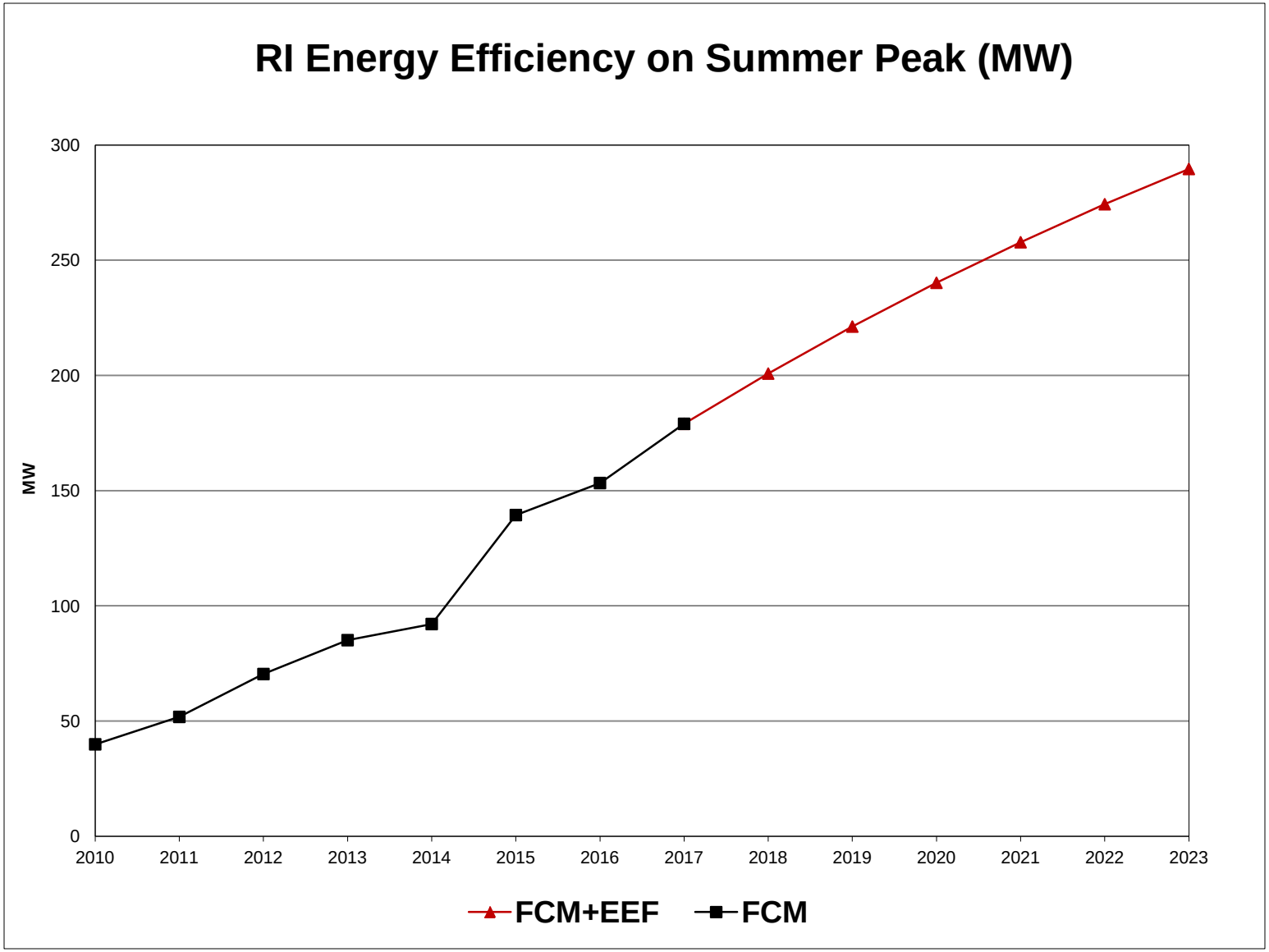

NH Annual Energy: RSP14 Forecast (GWh)
GWh
14,000
13,500
13,000
12,500
12,000
11,500
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
RSP14
RSP14-FCM-EEF
RSP14-FCM

State-Level Assumptions – Rhode Island

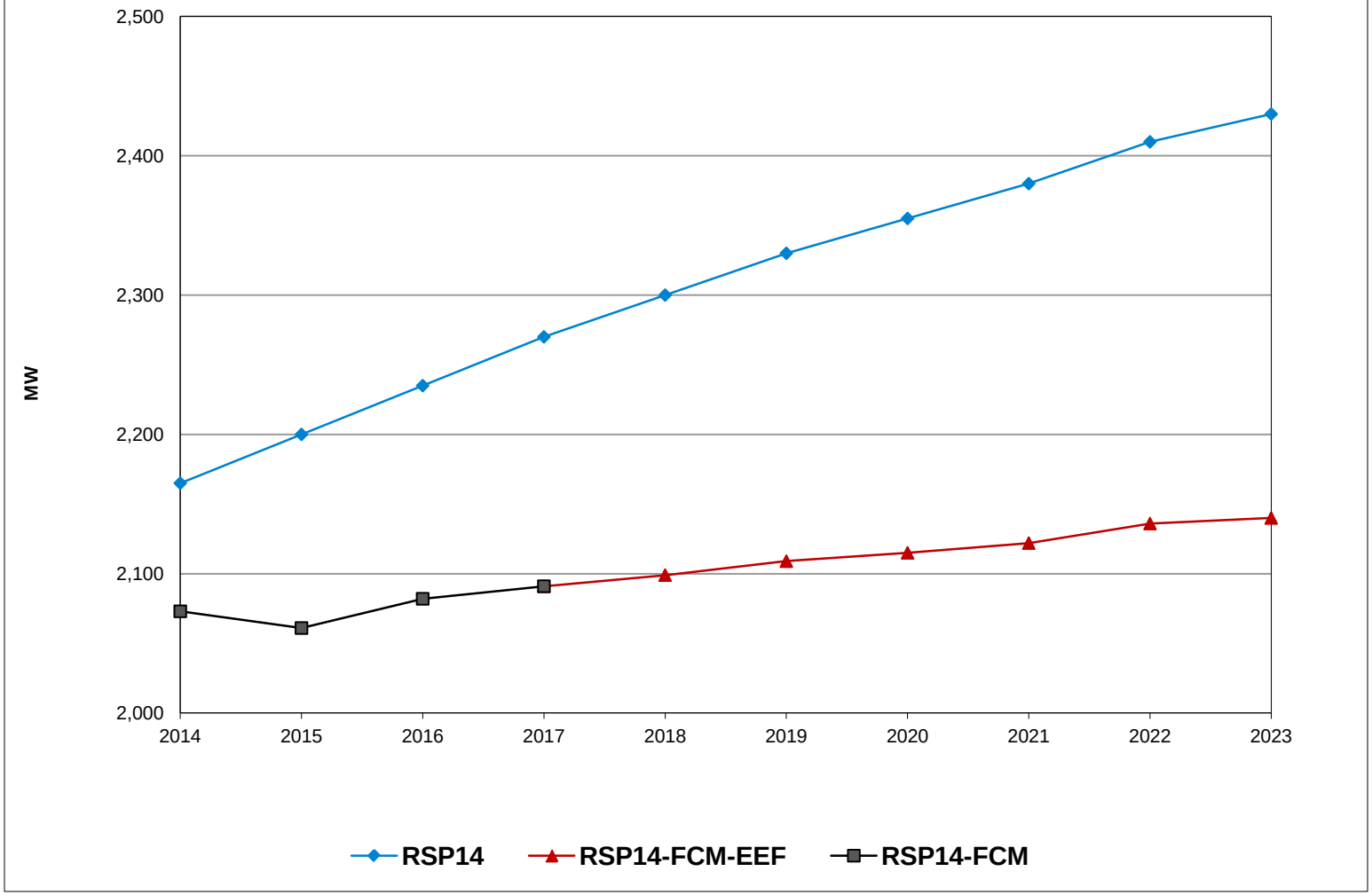
- Budget: Based on commission approved 2012-2014 budget
  - Increase in FCM dollars due to increase in clearing price is offset by reductions in System Benefit dollars
- Budget Uncertainty Rate: 10%
- Production Cost: Based on average of 2010-2012 PA data
- Production Cost Escalation Rate: 5% + 2.5% inflation
- Peak to Energy Ratio: Based on average of 2010-2012 PA data

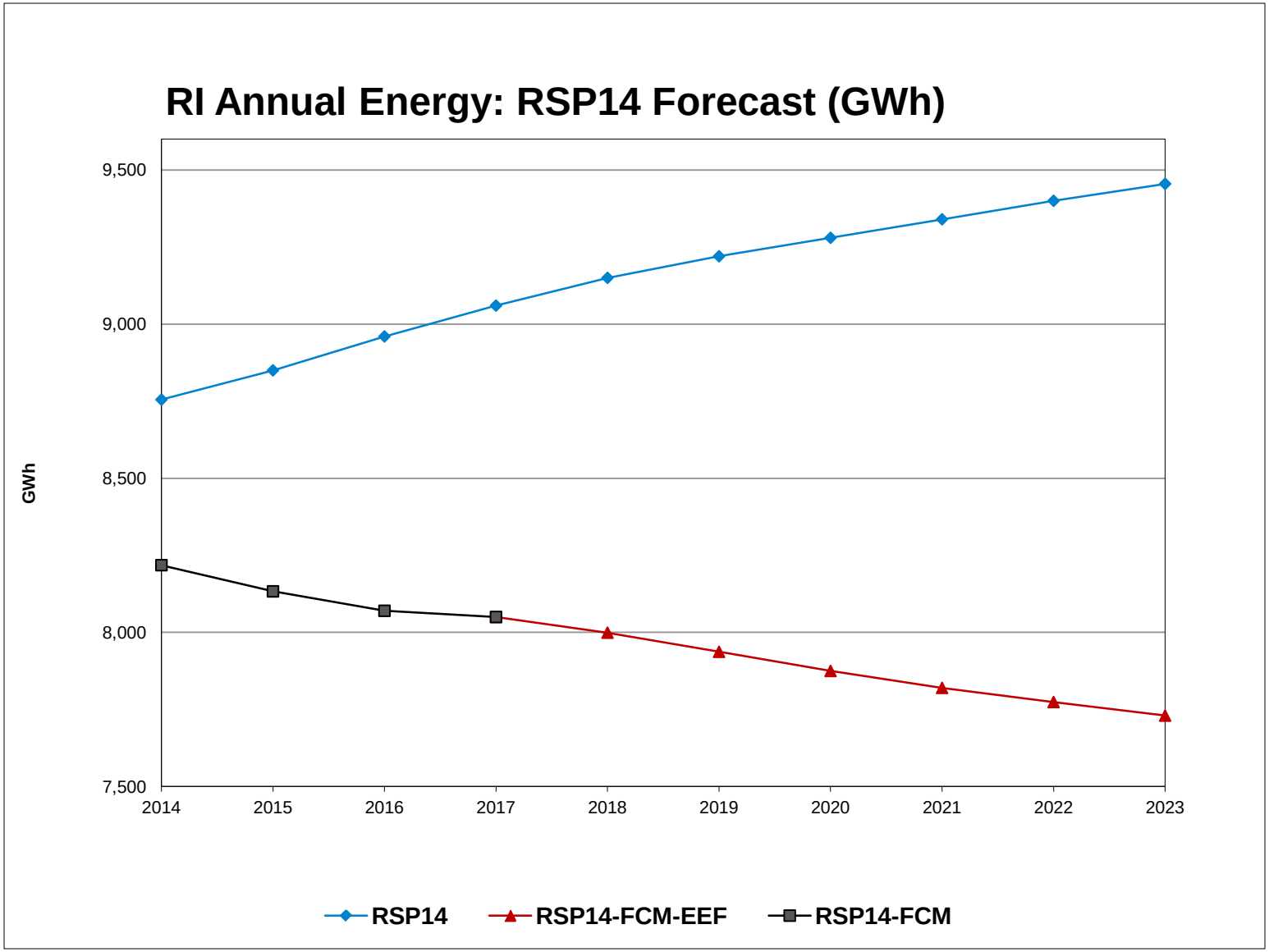

RI Energy Efficiency on Summer Peak (MW)
MW
26
24
22
20
18
16
14
2017
2018
2019
2020
2021
2022
2023
EEF-2013
EEF-2014


RI Energy Efficiency on Annual Energy (GWh)
GWh
160
150
140
130
120
110
100
90
2017
2018
2019
2020
2021
2022
2023
EEF-2013
EEF-2014


RI Energy Efficiency on Summer Peak (MW)
MW
300
250
200
150
100
50
0
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
FCM+EEF
FCM

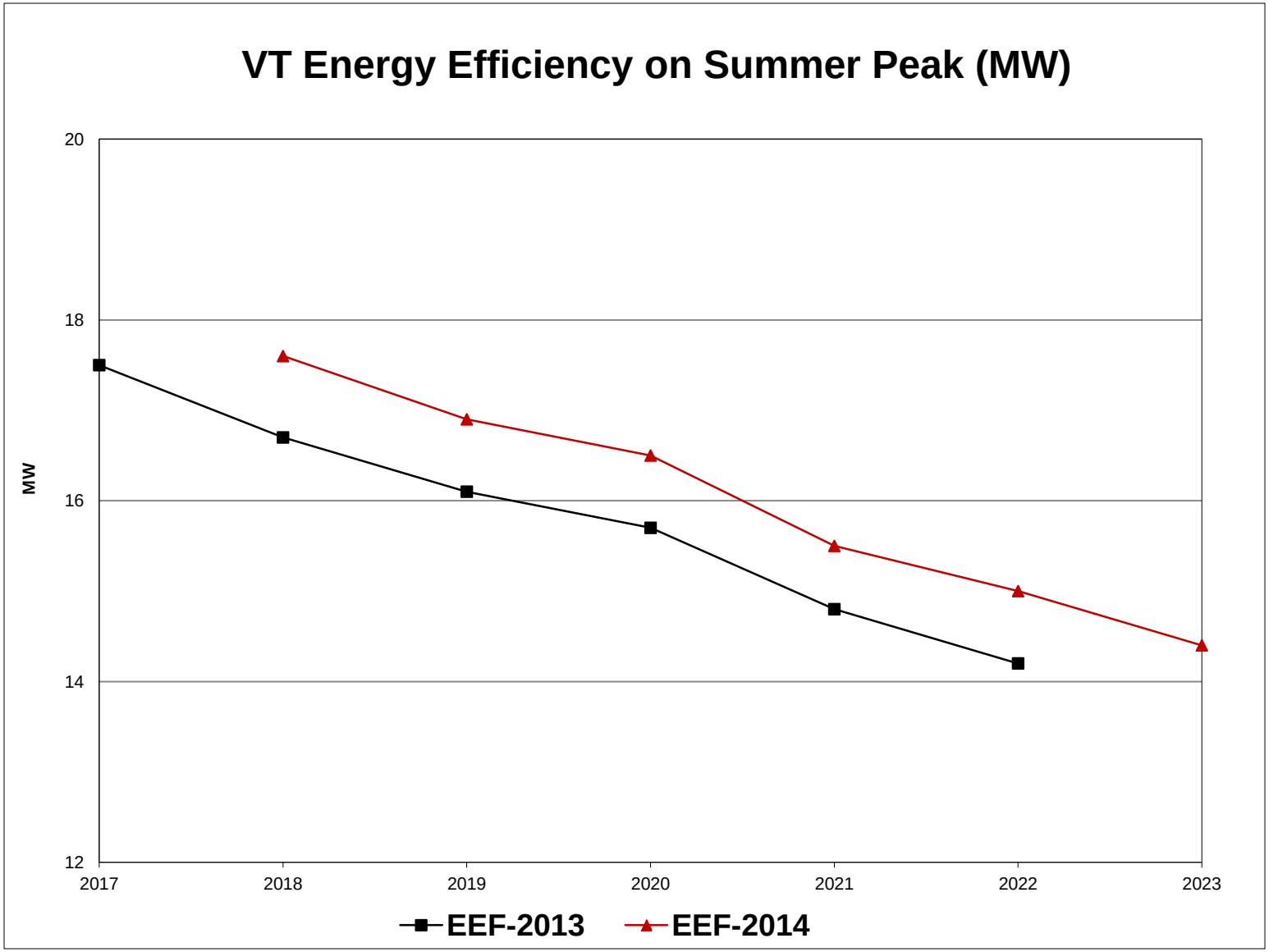
RI 90/10 Summer Peak: RSP14 Forecast (MW)

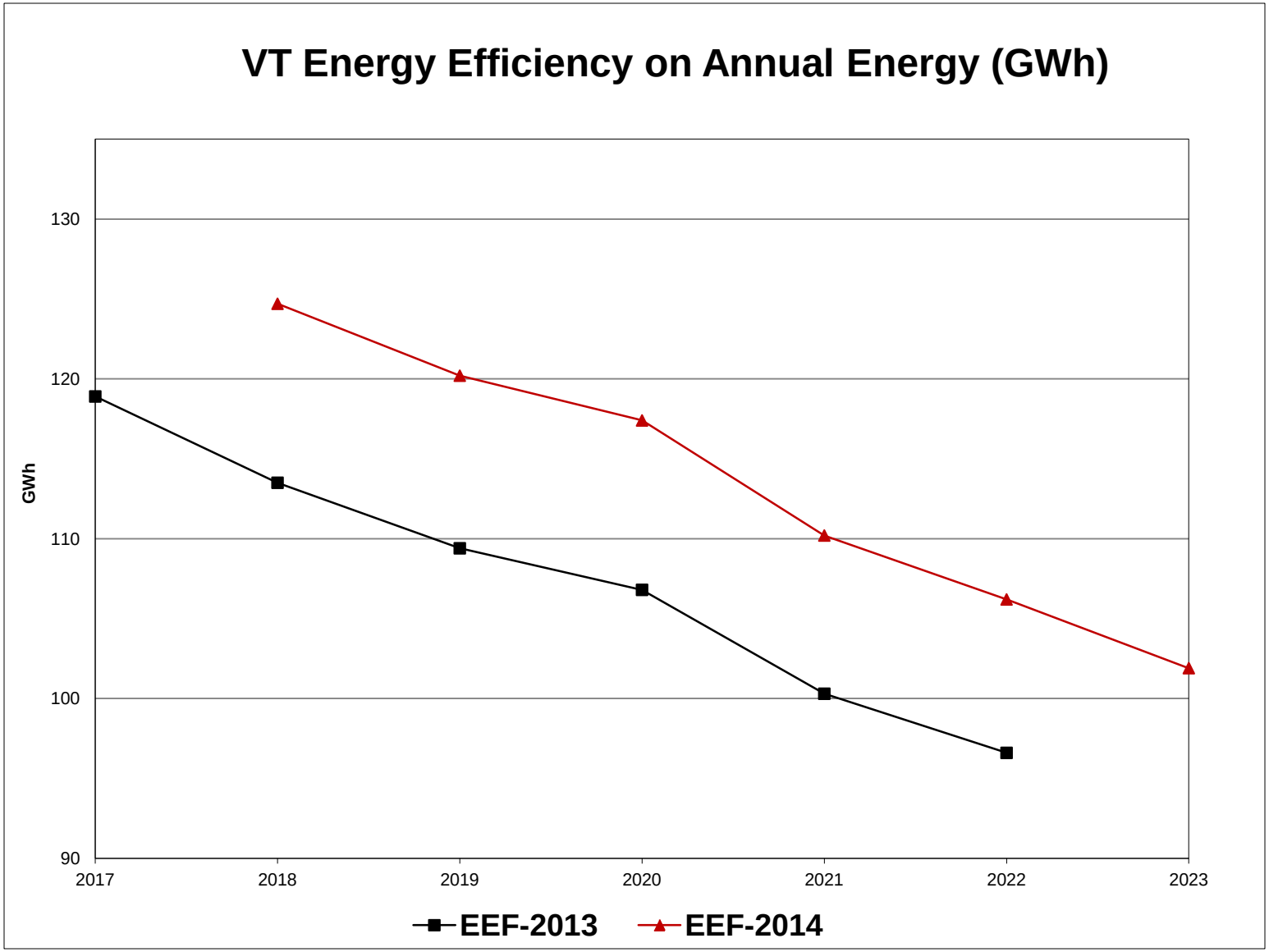


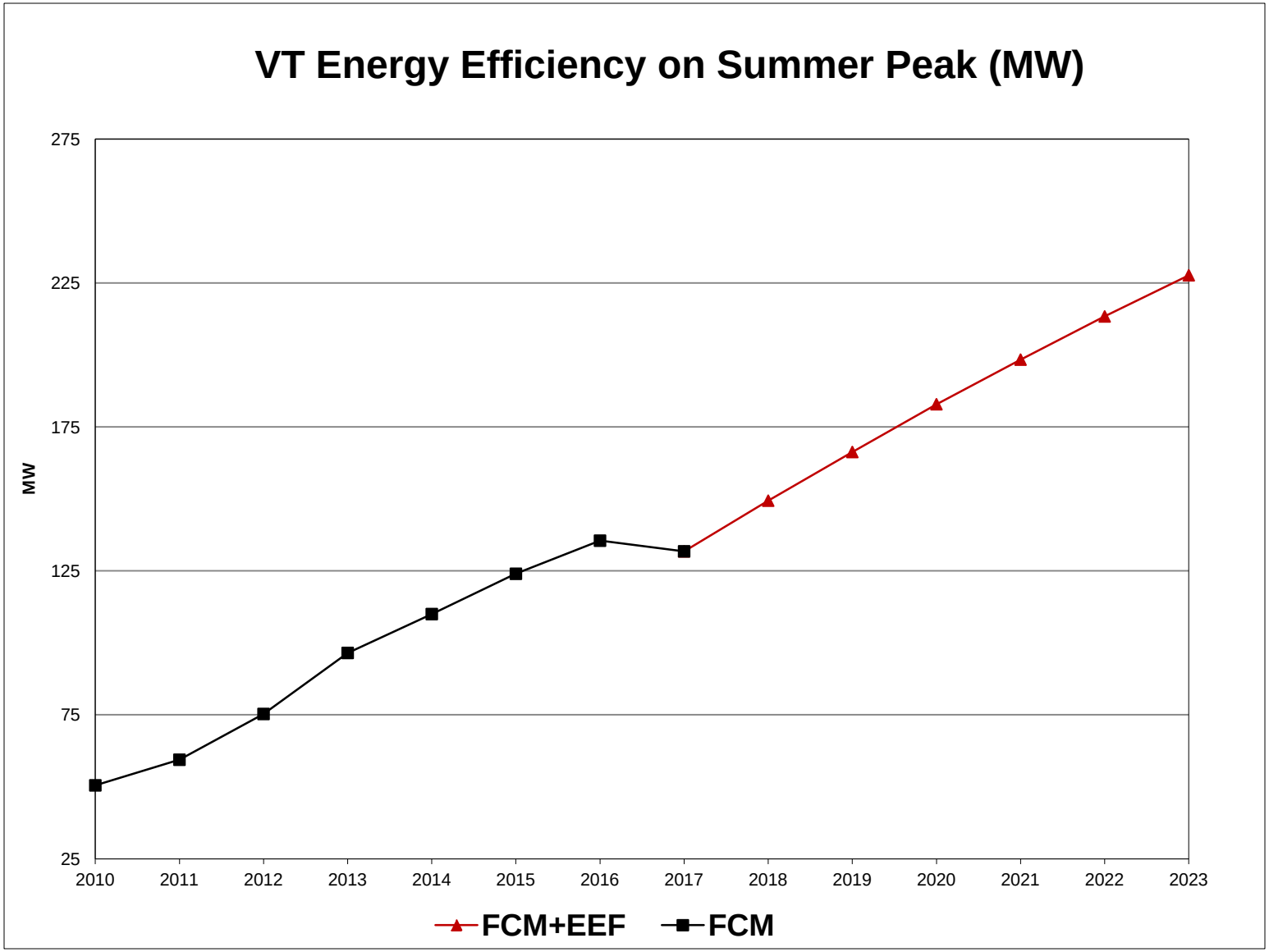

RI Annual Energy: RSP14 Forecast (GWh)
GWh
9,500
9,000
8,500
8,000
7,500
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
RSP14
RSP14-FCM-EEF
RSP14-FCM

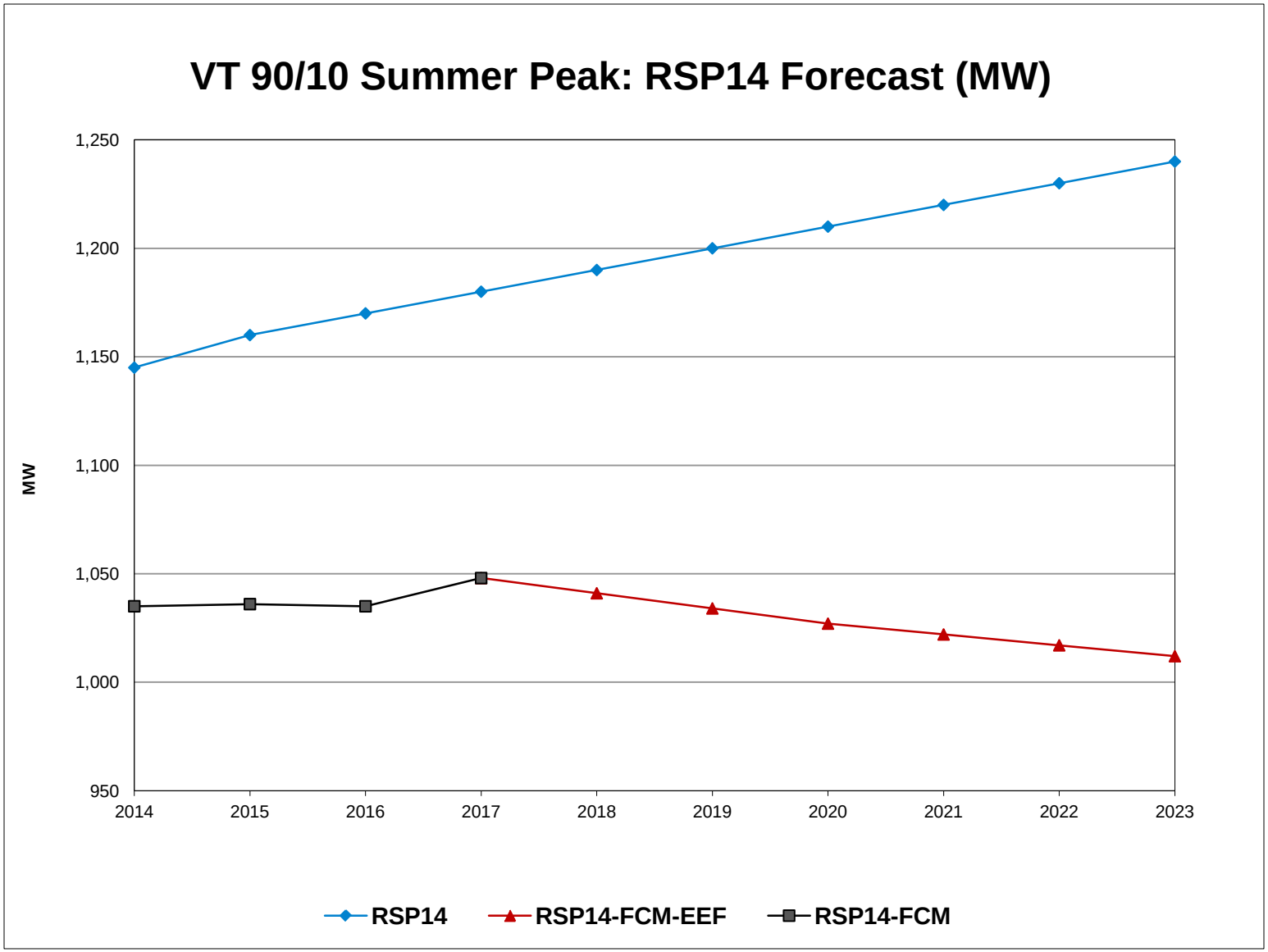
State-Level Assumptions – Vermont

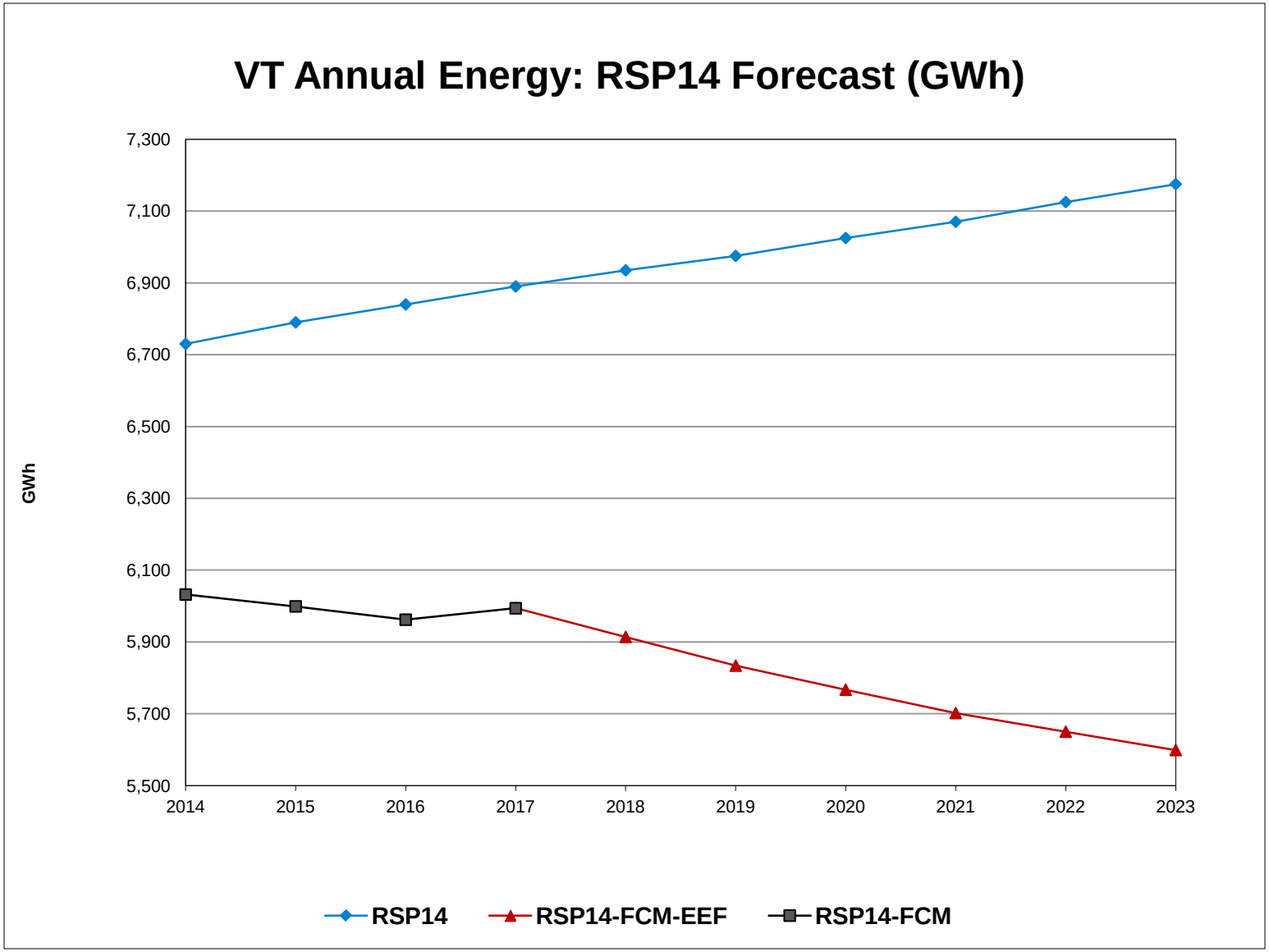
- Budget: Based on commission approved 2013-2023 budget
  - FCM revenue not used in budget
- Budget Uncertainty Rate: none
- Production Cost: Based on average of 2010-2012 PA data
- Production Cost Escalation Rate: 5% + 2.5% inflation
- Peak to Energy Ratio: Based on average of 2010-2012 PA data


VT Energy Efficiency on Summer Peak (MW)
MW
20
18
16
14
12
2017
2018
2019
2020
2021
2022
2023
EEF-2013
EEF-2014


VT Energy Efficiency on Annual Energy (GWh)
GWh
130
120
110
100
90
2017
2018
2019
2020
2021
2022
2023
EEF-2013
EEF-2014


VT Energy Efficiency on Summer Peak (MW)
275
225
175
125
75
25
MW
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
FCM+EEF
FCM


VT 90/10 Summer Peak: RSP14 Forecast (MW)
MW
1,250
1,200
1,150
1,100
1,050
1,000
950
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
RSP14
RSP14-FCM-EEF
RSP14-FCM


VT Annual Energy: RSP14 Forecast (GWh)
GWh
7,300
7,100
6,900
6,700
6,500
6,300
6,100
5,900
5,700
5,500
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
RSP14
RSP14-FCM-EEF
RSP14-FCM

2014 EE Forecast Timeline