

2020 Long Term Forecast

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DEMAND FORECASTING & ANALYSIS

ESPWG

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Forecast Components

- Statistically Adjusted End-Use (SAE) models – produce monthly energy and peak forecasts driven by historical load growth, economic variables, end-use or appliance saturations, efficiency improvement trends in appliances and building shells, and trended weather normals from the 2019 Climate Study.

Exogenous load reducing modifiers:

- New energy efficiency gains
- BTM solar impacts
- BTM distributed generation
- BTM storage peak reductions

Exogenous load increasing modifiers:

- Electric vehicle impacts
- Other electrification
- Energy storage losses

- **Energy Forecast = SAE Model – EE – BTM PV – BTM DG + Storage + EV + Electrification**
- **Peak Forecast = SAE Model – EE – BTM PV – BTM DG – BTM Storage + EV + Electrification**

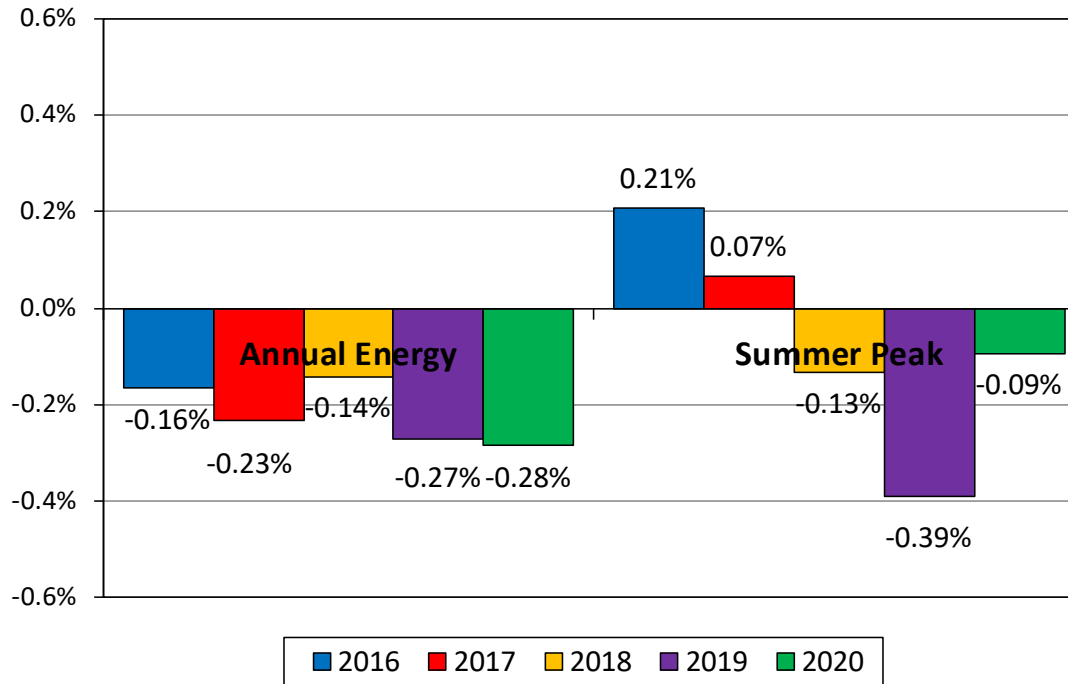
Key Forecast Drivers

- **Policy driven energy efficiency impacts and BTM solar growth drive load declines over the early years.**
- **Electric vehicle adoption and other electrification generate significant load growth in the 2030s and 2040s.**
 - Winter peak impacts are most significant due to increasing penetration of electric heating mainly through heat pumps.
 - NYCA becomes winter peaking in the baseline forecast by 2040.

2020 Preliminary NYCA Baseline Forecast

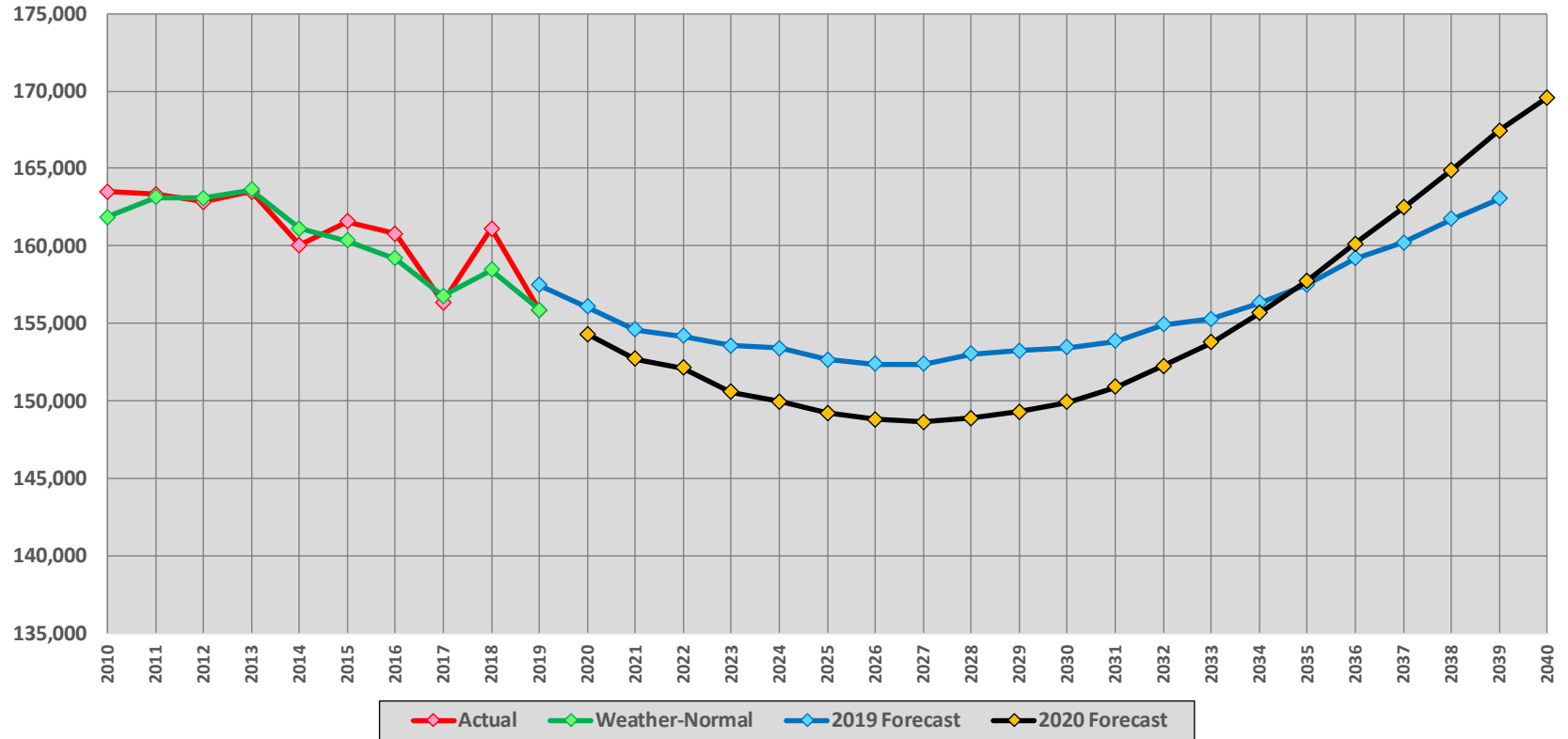
Baseline Growth Rates

Ten-Year Annual Average Growth Rates
Annual Energy & Summer Peak

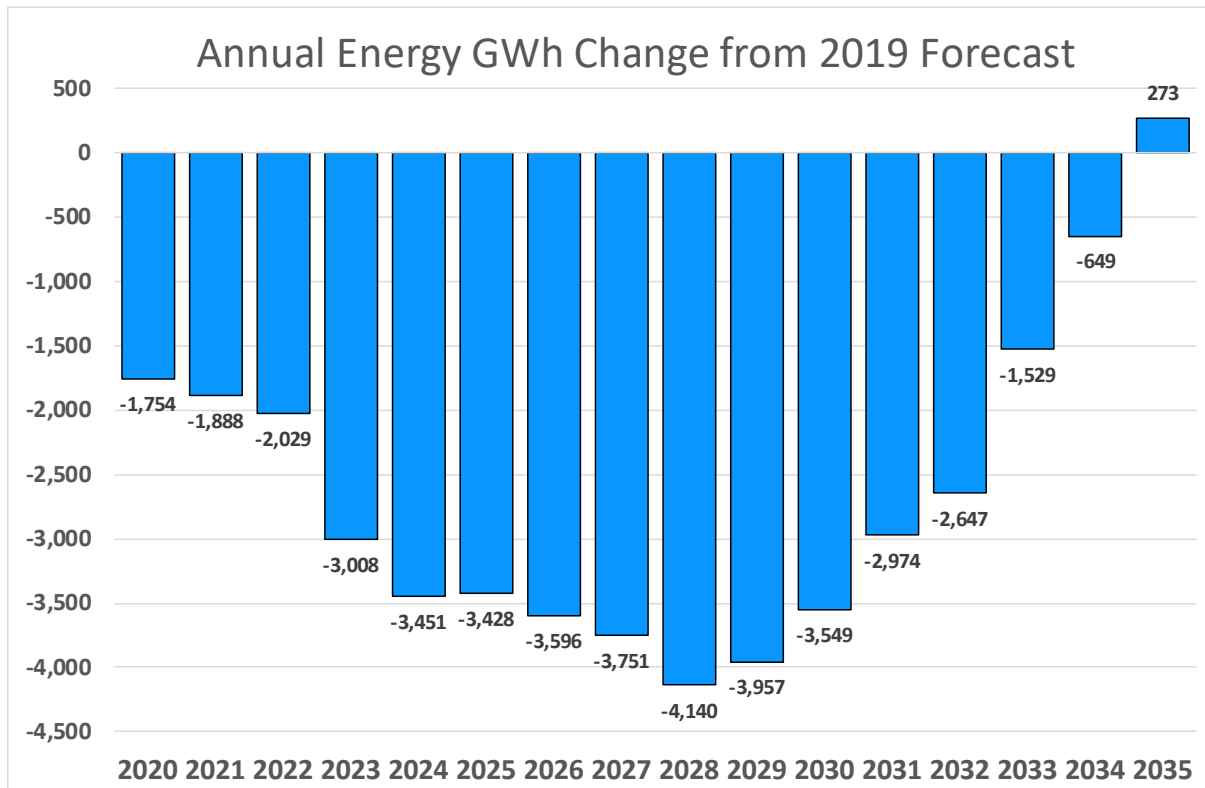


NYCA Baseline - Annual Energy (GWh)

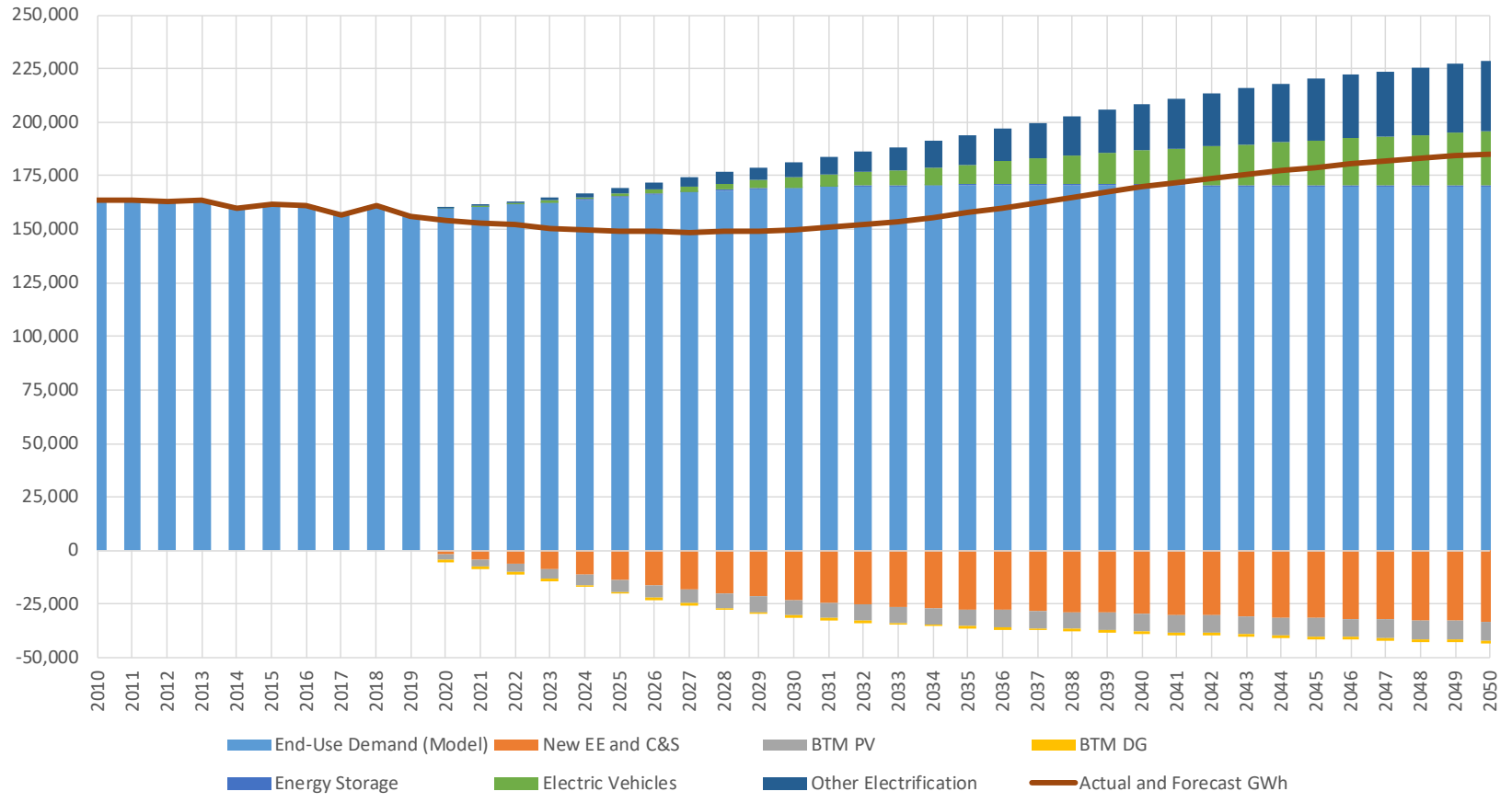
Actual, Normal and Forecast - With Demand-Side Impacts



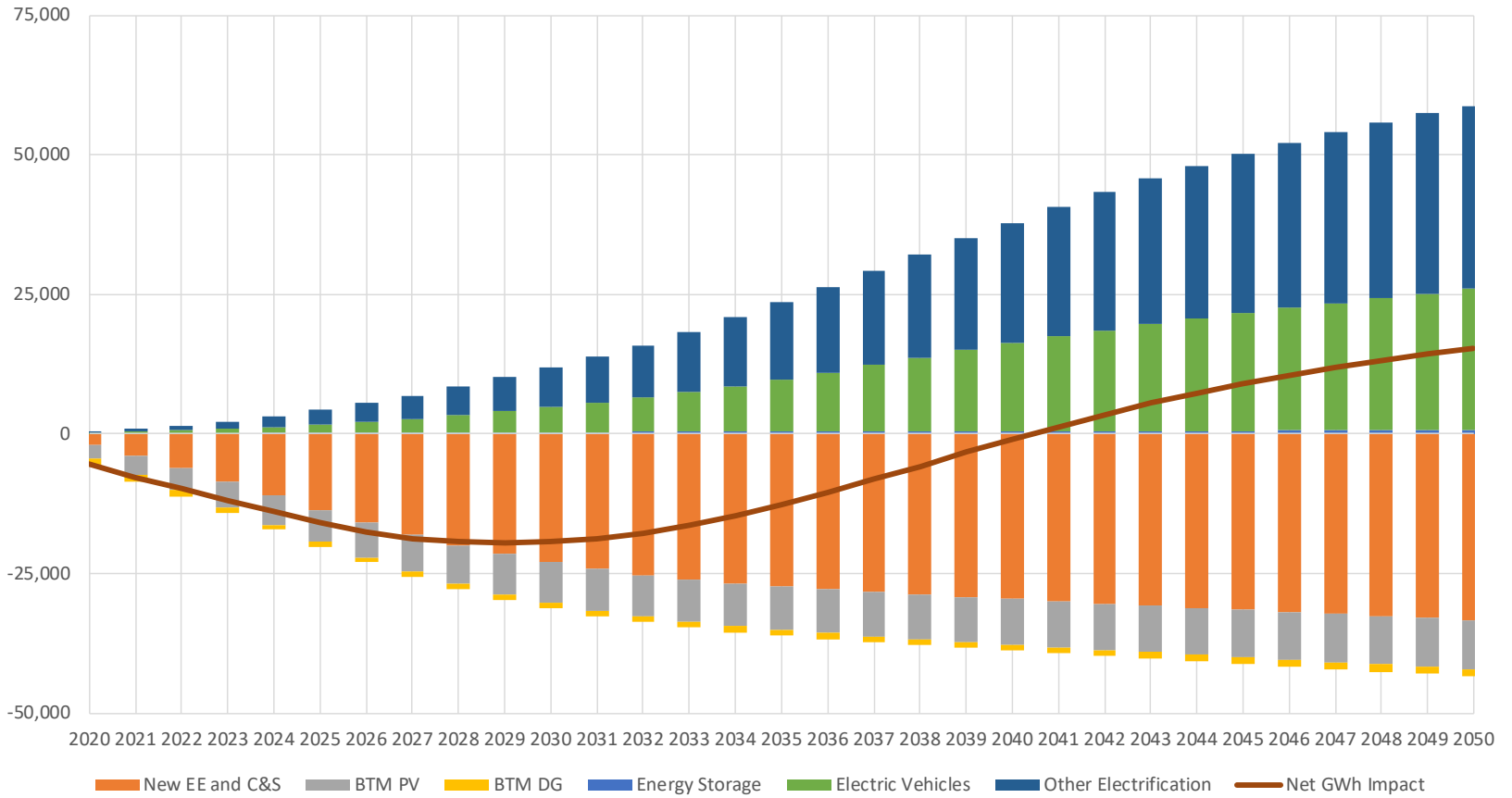
Change in 2020 Baseline Annual Energy Forecast From 2019 Forecast



NYCA Baseline Energy Forecast (GWh)



NYCA Baseline Energy Forecast Load Modifying Impacts (GWh)

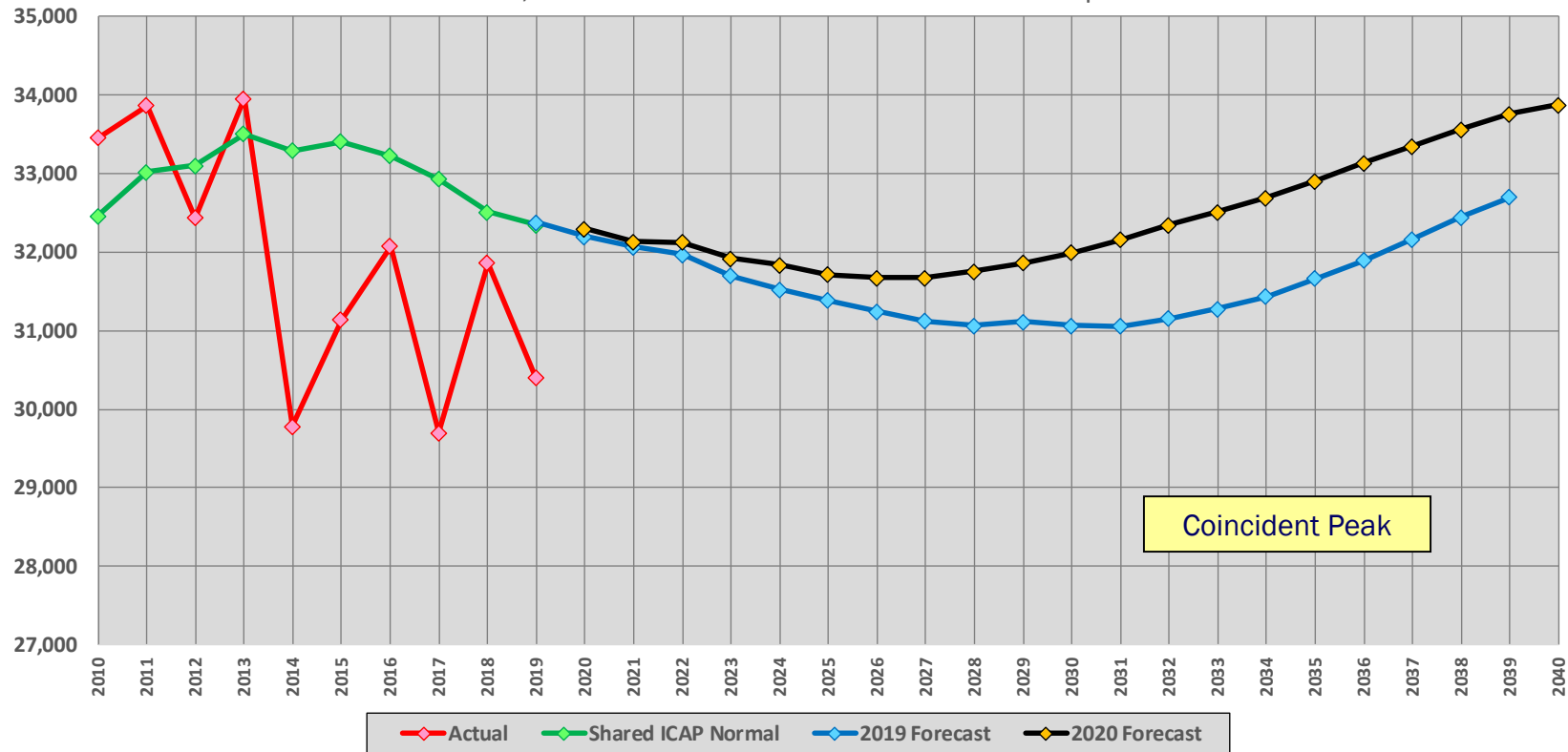


NYCA Preliminary Baseline Energy Forecast Summary - GWh

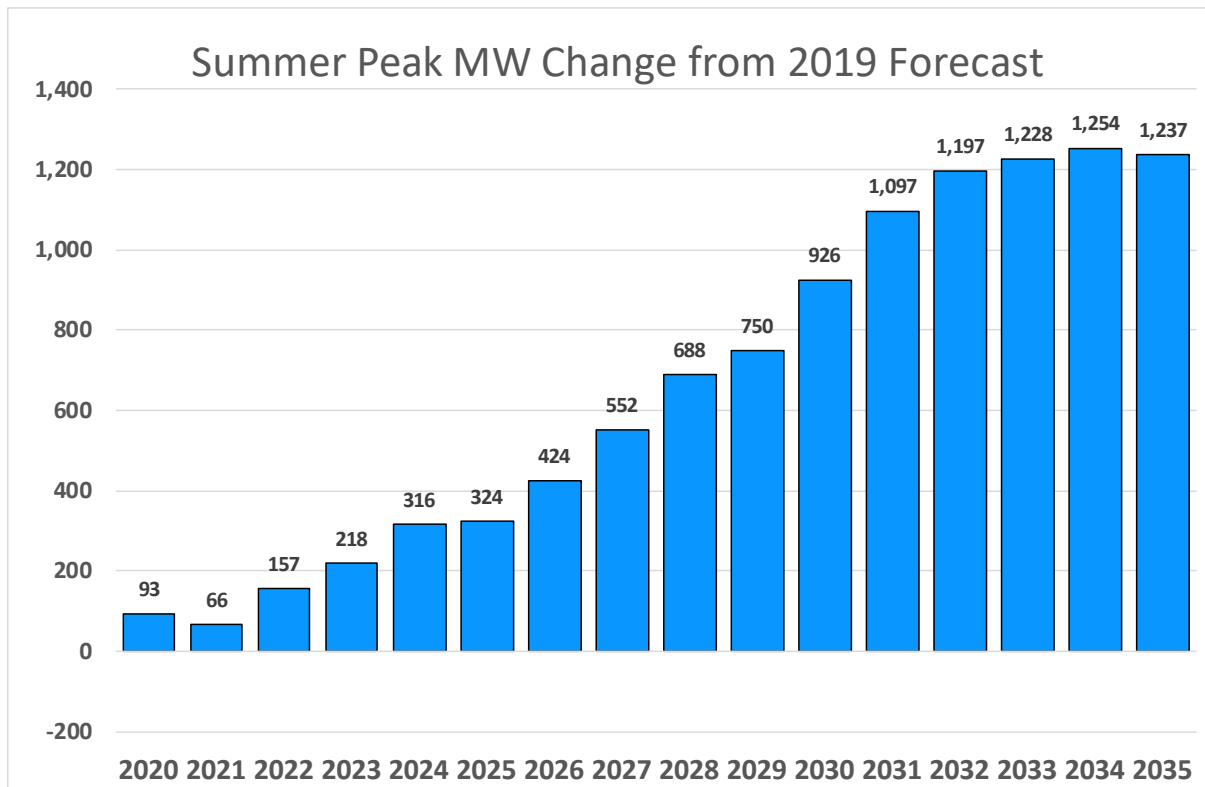
Year	End-Use Demand (Model)	New EE and C&S	BTM PV	BTM DG	Total Energy Storage Losses	Electric Vehicles	Other Electrification	Baseline Annual Energy Forecast
2020	159,636	-1,885	-2,621	-1,252	19	199	194	154,290
2021	160,497	-3,959	-3,264	-1,416	43	345	466	152,712
2022	161,838	-6,200	-3,889	-1,059	67	538	831	152,126
2023	162,463	-8,599	-4,553	-940	99	781	1,313	150,564
2024	163,883	-11,081	-5,183	-818	130	1,085	1,919	149,935
2025	165,118	-13,582	-5,728	-852	160	1,456	2,639	149,211
2026	166,317	-15,937	-6,195	-877	189	1,889	3,398	148,784
2027	167,291	-18,057	-6,581	-900	221	2,407	4,239	148,620
2028	168,174	-19,921	-6,883	-931	254	3,031	5,148	148,872
2029	168,775	-21,563	-7,120	-956	281	3,765	6,108	149,290
2030	169,235	-23,016	-7,279	-973	309	4,506	7,118	149,900
2031	169,692	-24,224	-7,400	-999	339	5,310	8,165	150,883
2032	170,082	-25,225	-7,505	-1,016	367	6,184	9,365	152,252
2033	170,190	-26,052	-7,589	-1,033	395	7,143	10,719	153,773
2034	170,300	-26,754	-7,665	-1,058	423	8,180	12,218	155,644
2035	170,427	-27,360	-7,736	-1,073	450	9,312	13,739	157,759
2036	170,589	-27,871	-7,810	-1,088	474	10,548	15,276	160,118
2037	170,591	-28,325	-7,885	-1,110	491	11,893	16,821	162,476
2038	170,670	-28,759	-7,957	-1,123	508	13,184	18,368	164,891
2039	170,711	-29,180	-8,029	-1,134	523	14,650	19,904	167,445
2040	170,684	-29,597	-8,103	-1,146	539	15,785	21,433	169,595
2041	170,358	-30,001	-8,170	-1,158	553	16,908	23,156	171,646
2042	170,121	-30,401	-8,244	-1,169	565	18,001	24,750	173,623
2043	169,995	-30,790	-8,313	-1,181	574	19,048	26,181	175,514
2044	170,003	-31,170	-8,389	-1,193	584	20,051	27,422	177,308
2045	169,892	-31,538	-8,462	-1,204	594	21,012	28,587	178,881
2046	169,855	-31,902	-8,533	-1,215	601	21,932	29,654	180,392
2047	169,804	-32,253	-8,610	-1,226	609	22,817	30,619	181,760
2048	169,817	-32,602	-8,683	-1,236	613	23,671	31,466	183,046
2049	169,731	-32,937	-8,758	-1,247	619	24,530	32,226	184,164
2050	169,684	-33,270	-8,832	-1,258	622	25,324	32,855	185,125

NYCA Baseline - Summer Peak (MW)

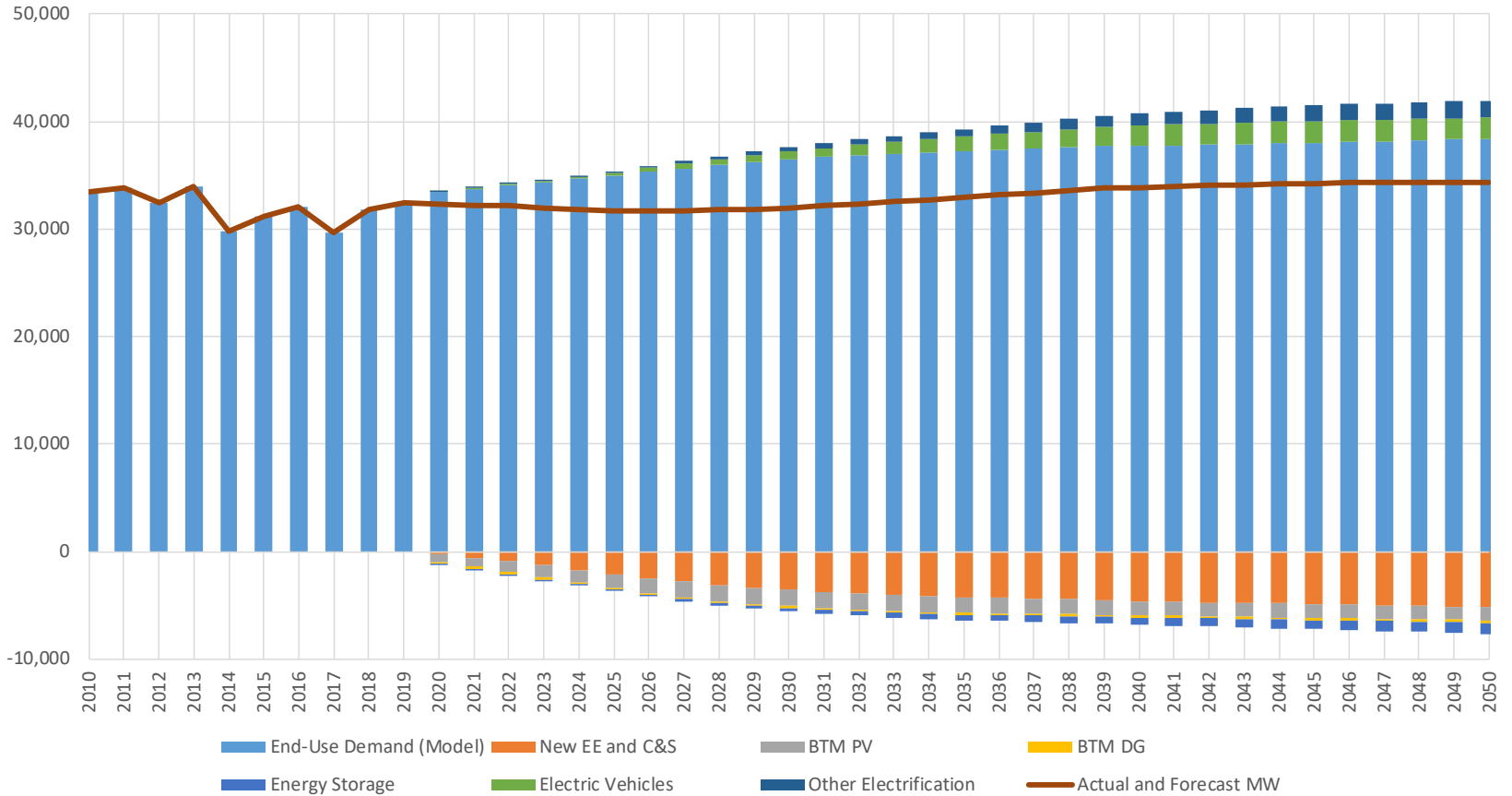
Actual, Normal and Forecast - With Demand-Side Impacts



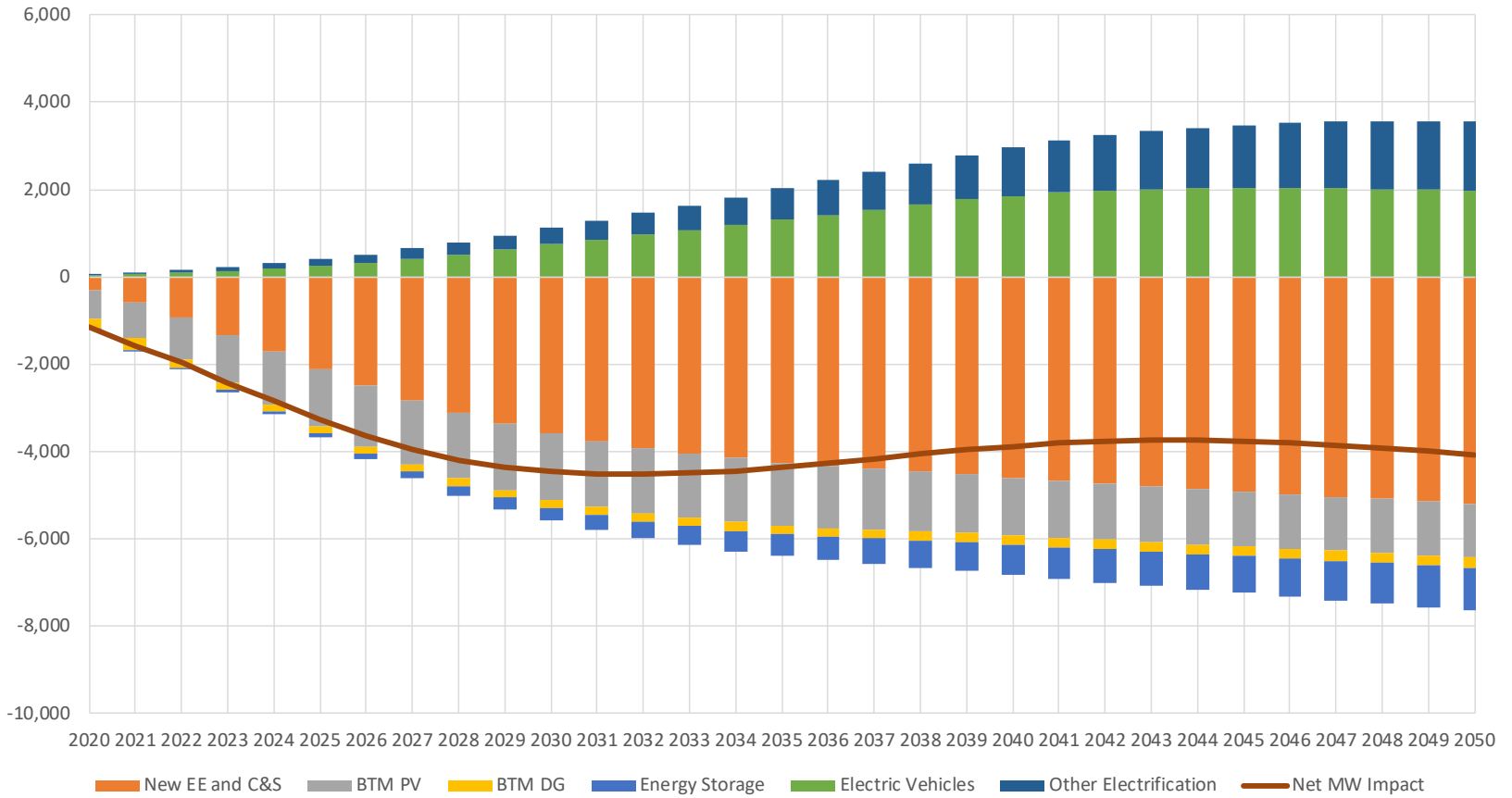
Change in 2020 Baseline Summer Coincident Peak Forecast From 2019 Forecast



NYCA Baseline Summer Peak Forecast (MW)



NYCA Baseline Summer Peak Forecast Load Modifying Impacts (MW)

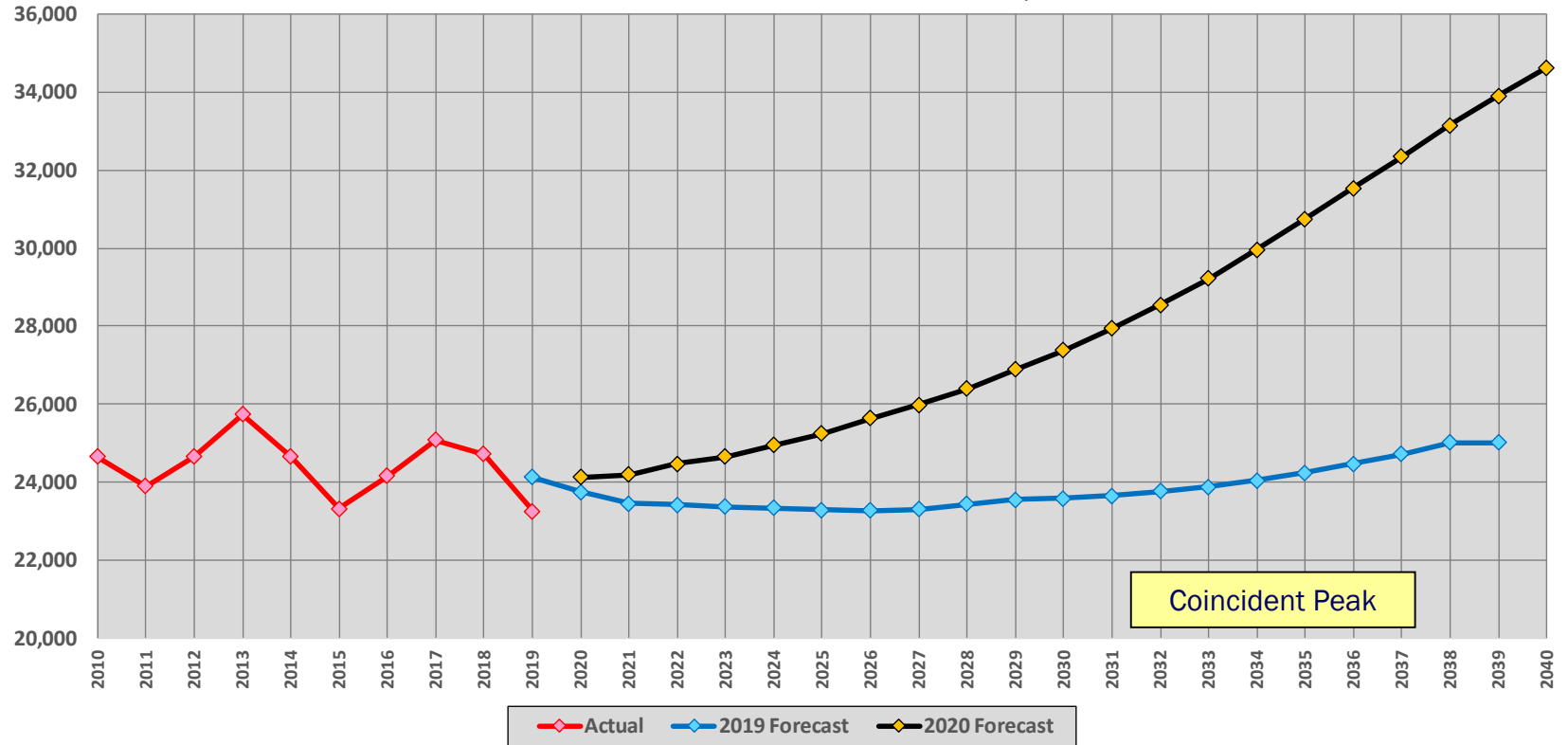


NYCA Preliminary Baseline Summer Coincident Peak Forecast Summary - MW

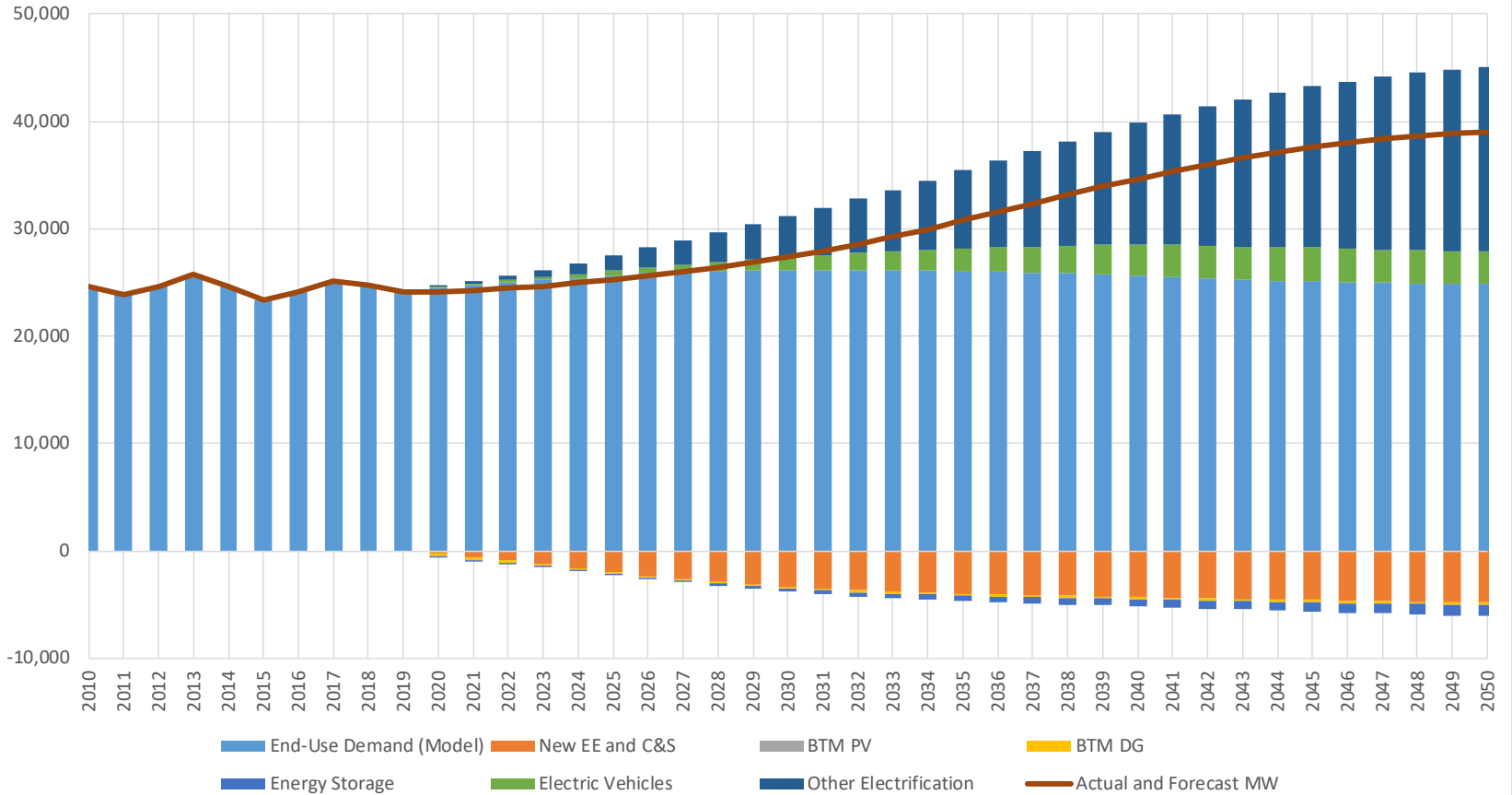
Year	End-Use Demand (Model)	New EE and C&S	BTM PV	BTM DG	BTM Energy Storage	Electric Vehicles	Other Electrification	Baseline Summer Peak Forecast
2020	33,431	-296	-668	-218	-5	40	11	32,295
2021	33,712	-591	-820	-251	-14	68	25	32,129
2022	34,091	-943	-954	-189	-26	103	46	32,128
2023	34,333	-1,322	-1,099	-169	-44	147	72	31,918
2024	34,668	-1,709	-1,215	-148	-63	201	104	31,838
2025	34,974	-2,108	-1,317	-154	-91	261	146	31,711
2026	35,321	-2,488	-1,400	-158	-125	333	187	31,670
2027	35,637	-2,825	-1,464	-164	-159	418	230	31,673
2028	35,961	-3,116	-1,505	-170	-206	513	279	31,756
2029	36,222	-3,360	-1,524	-174	-251	625	327	31,865
2030	36,442	-3,579	-1,524	-177	-297	748	379	31,992
2031	36,663	-3,760	-1,512	-182	-344	857	433	32,155
2032	36,876	-3,915	-1,500	-185	-386	966	493	32,349
2033	37,005	-4,039	-1,483	-189	-428	1,077	566	32,509
2034	37,137	-4,152	-1,464	-193	-469	1,191	640	32,690
2035	37,276	-4,252	-1,441	-195	-509	1,306	718	32,903
2036	37,408	-4,328	-1,418	-198	-547	1,426	795	33,138
2037	37,514	-4,397	-1,393	-202	-587	1,546	871	33,352
2038	37,611	-4,466	-1,366	-206	-624	1,662	949	33,560
2039	37,699	-4,528	-1,341	-208	-659	1,774	1,024	33,761
2040	37,753	-4,610	-1,318	-210	-693	1,857	1,098	33,877
2041	37,781	-4,672	-1,300	-213	-724	1,928	1,183	33,983
2042	37,818	-4,735	-1,287	-215	-757	1,980	1,259	34,063
2043	37,877	-4,797	-1,274	-217	-787	2,012	1,323	34,137
2044	37,939	-4,857	-1,264	-219	-815	2,032	1,379	34,195
2045	37,999	-4,918	-1,255	-221	-845	2,041	1,431	34,232
2046	38,073	-4,974	-1,247	-223	-878	2,041	1,476	34,268
2047	38,138	-5,031	-1,240	-226	-911	2,033	1,518	34,281
2048	38,221	-5,085	-1,233	-228	-939	2,015	1,550	34,301
2049	38,307	-5,141	-1,229	-230	-966	1,995	1,581	34,317
2050	38,381	-5,194	-1,228	-232	-982	1,973	1,600	34,318

NYCA Baseline - Winter Peak (MW)

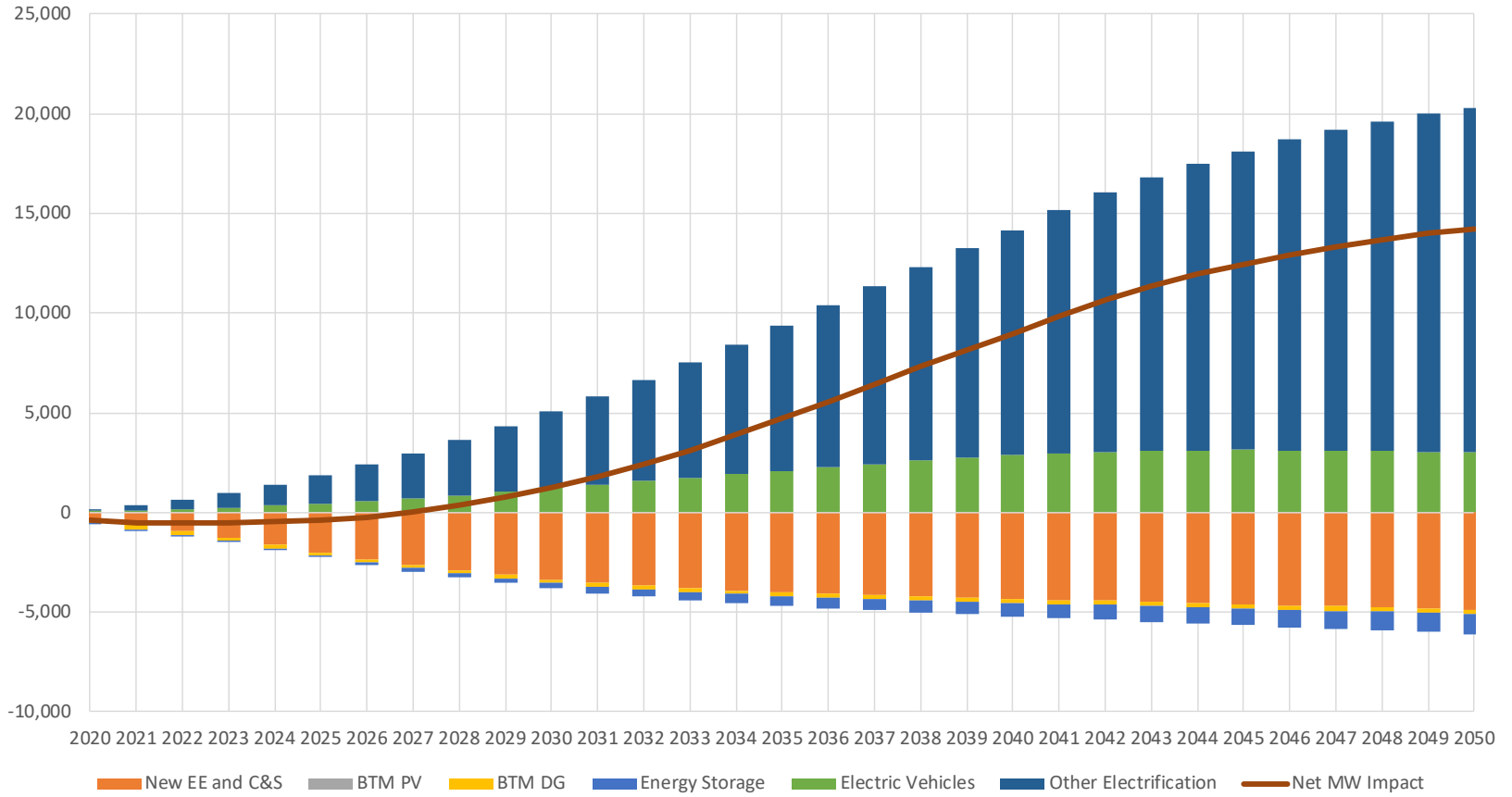
Actual and Forecast - With Demand-Side Impacts



NYCA Baseline Winter Peak Forecast (MW)



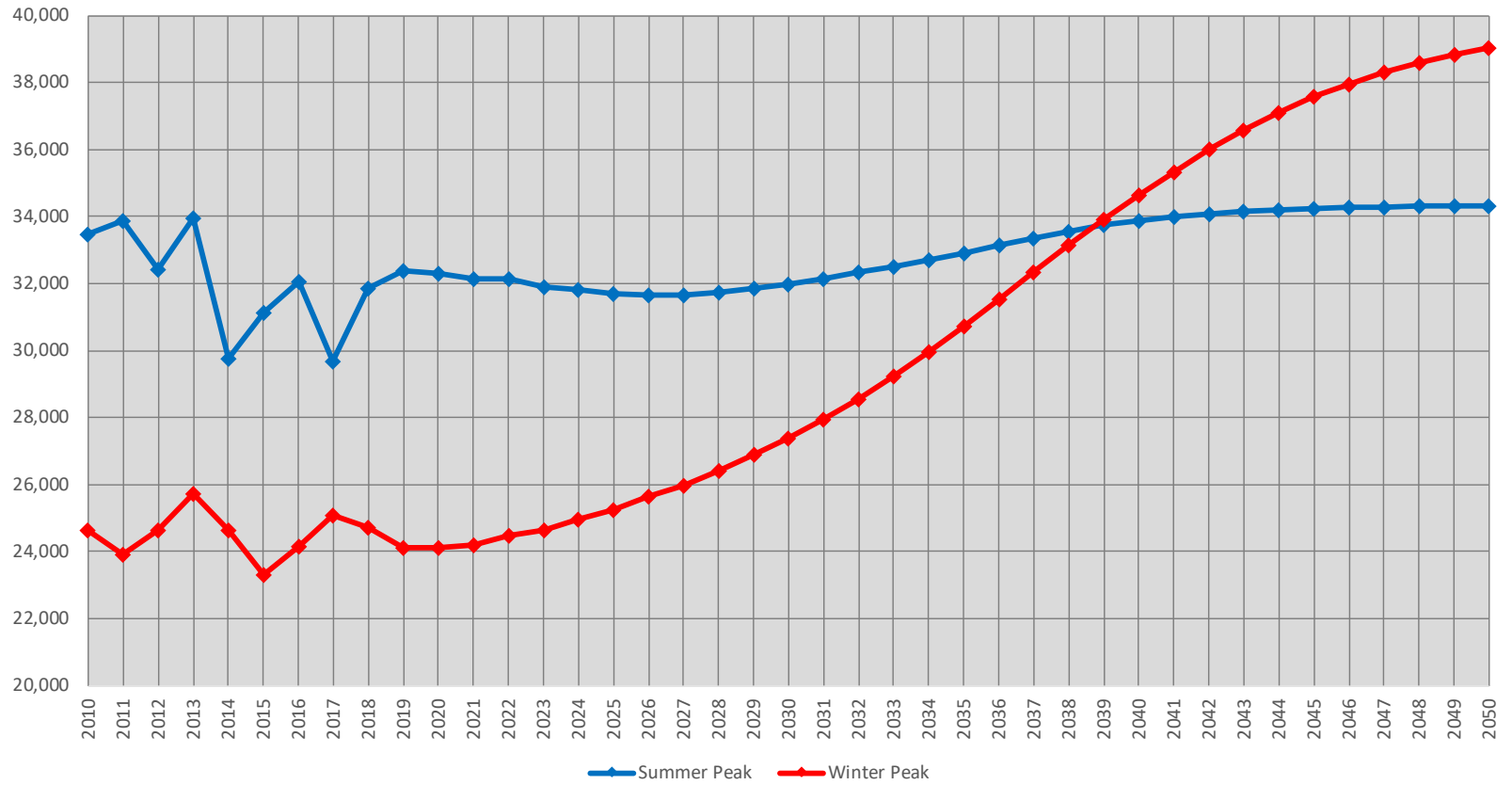
NYCA Baseline Winter Peak Forecast Load Modifying Impacts (MW)



NYCA Preliminary Baseline Winter Coincident Peak Forecast Summary - MW

Year	End-Use Demand (Model)	New EE and C&S	BTM PV	BTM DG	BTM Energy Storage	Electric Vehicles	Other Electrification	Baseline Winter Peak Forecast
2020-21	24,523	-299	0	-218	-8	66	66	24,130
2021-22	24,733	-600	0	-251	-13	113	221	24,203
2022-23	25,009	-926	0	-189	-27	173	434	24,474
2023-24	25,187	-1,270	0	-169	-45	246	701	24,650
2024-25	25,428	-1,638	0	-148	-61	332	1,031	24,944
2025-26	25,641	-2,001	0	-154	-90	432	1,423	25,251
2026-27	25,855	-2,335	0	-158	-119	554	1,838	25,635
2027-28	25,952	-2,633	0	-164	-152	691	2,294	25,988
2028-29	26,033	-2,899	0	-170	-195	848	2,787	26,404
2029-30	26,105	-3,137	0	-174	-240	1,026	3,308	26,888
2030-31	26,126	-3,355	0	-177	-285	1,221	3,858	27,388
2031-32	26,161	-3,528	0	-182	-330	1,391	4,427	27,939
2032-33	26,154	-3,675	0	-185	-370	1,562	5,064	28,550
2033-34	26,122	-3,795	0	-189	-409	1,733	5,768	29,230
2034-35	26,064	-3,900	0	-193	-452	1,904	6,536	29,959
2035-36	26,026	-3,989	0	-195	-492	2,080	7,318	30,748
2036-37	25,967	-4,062	0	-198	-531	2,258	8,113	31,547
2037-38	25,908	-4,129	0	-202	-570	2,425	8,912	32,344
2038-39	25,853	-4,195	0	-206	-607	2,599	9,712	33,156
2039-40	25,765	-4,254	0	-208	-643	2,736	10,504	33,900
2040-41	25,665	-4,314	0	-210	-678	2,859	11,301	34,623
2041-42	25,499	-4,376	0	-213	-707	2,961	12,179	35,343
2042-43	25,349	-4,432	0	-215	-744	3,039	12,998	35,995
2043-44	25,244	-4,487	0	-217	-778	3,084	13,742	36,588
2044-45	25,177	-4,546	0	-219	-813	3,115	14,392	37,106
2045-46	25,106	-4,600	0	-221	-844	3,130	15,000	37,571
2046-47	25,031	-4,651	0	-223	-878	3,124	15,560	37,963
2047-48	24,959	-4,702	0	-226	-910	3,109	16,075	38,305
2048-49	24,898	-4,755	0	-228	-944	3,080	16,532	38,583
2049-50	24,848	-4,804	0	-230	-976	3,050	16,945	38,833
2050-51	24,821	-4,854	0	-232	-997	3,012	17,280	39,030

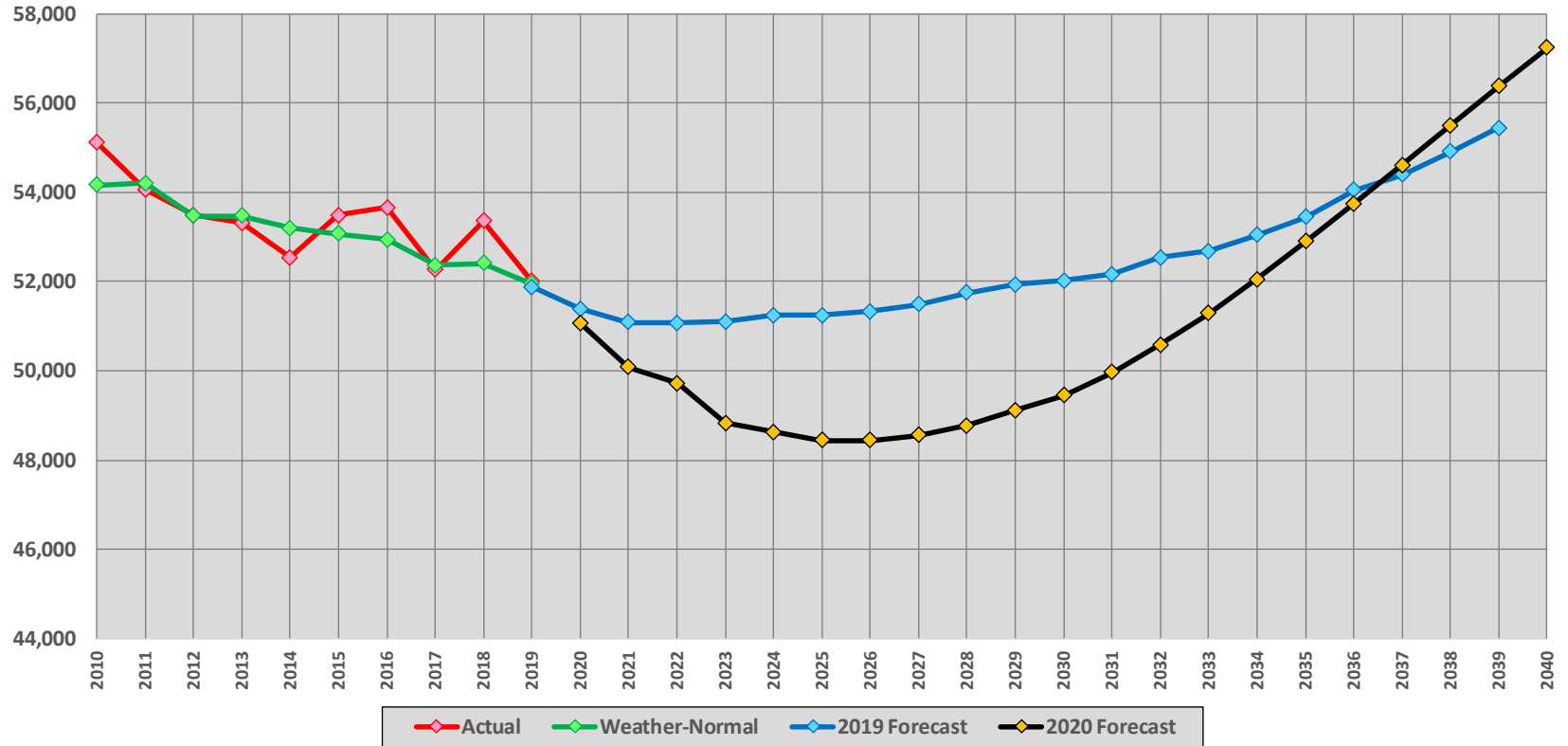
NYCA Actual Coincident Peaks and Preliminary Baseline Coincident Peak Forecasts (MW)



2020 Regional Preliminary Baseline Forecasts

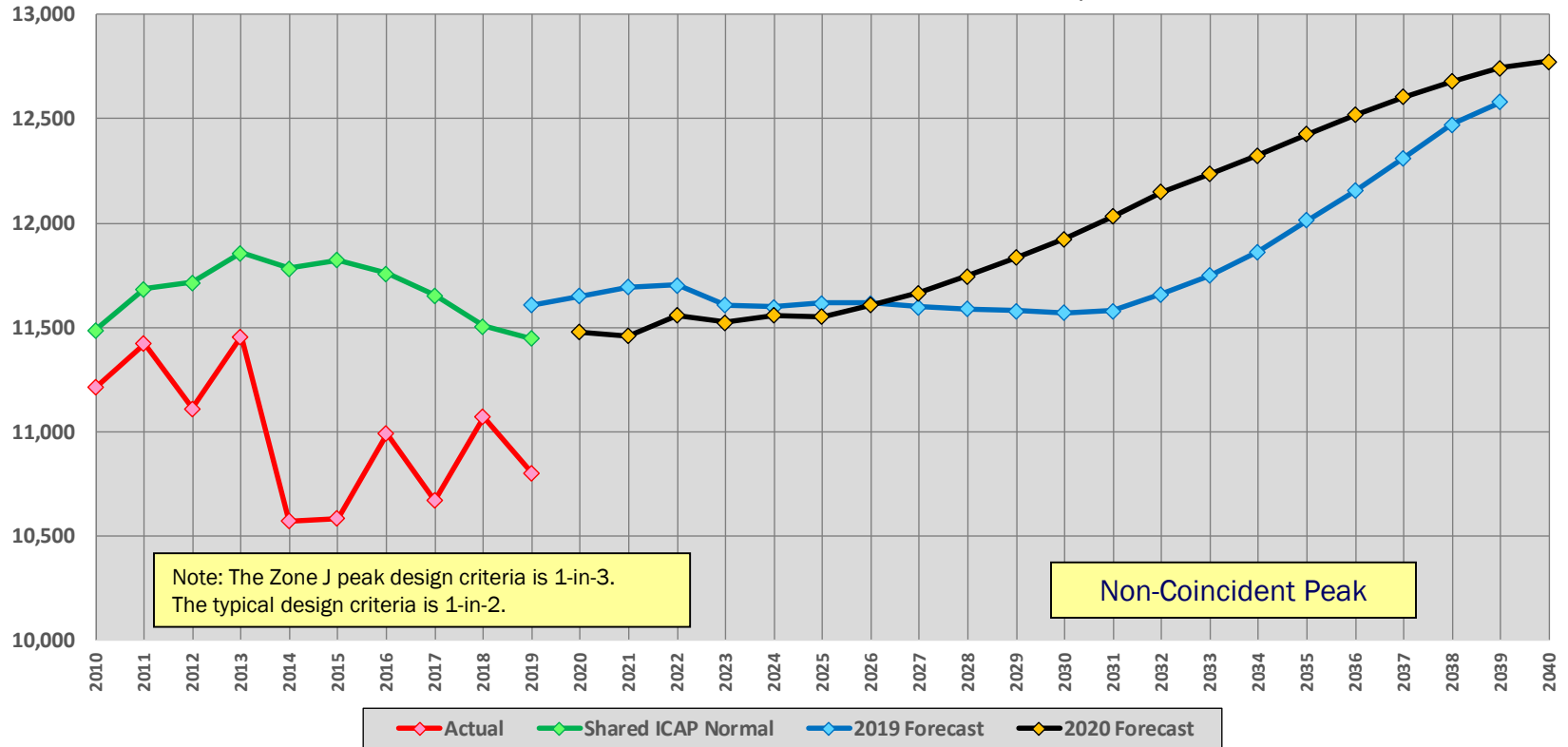
Zone J Baseline - Annual Energy (GWh)

Actual, Normal and Forecast - With Demand-Side Impacts



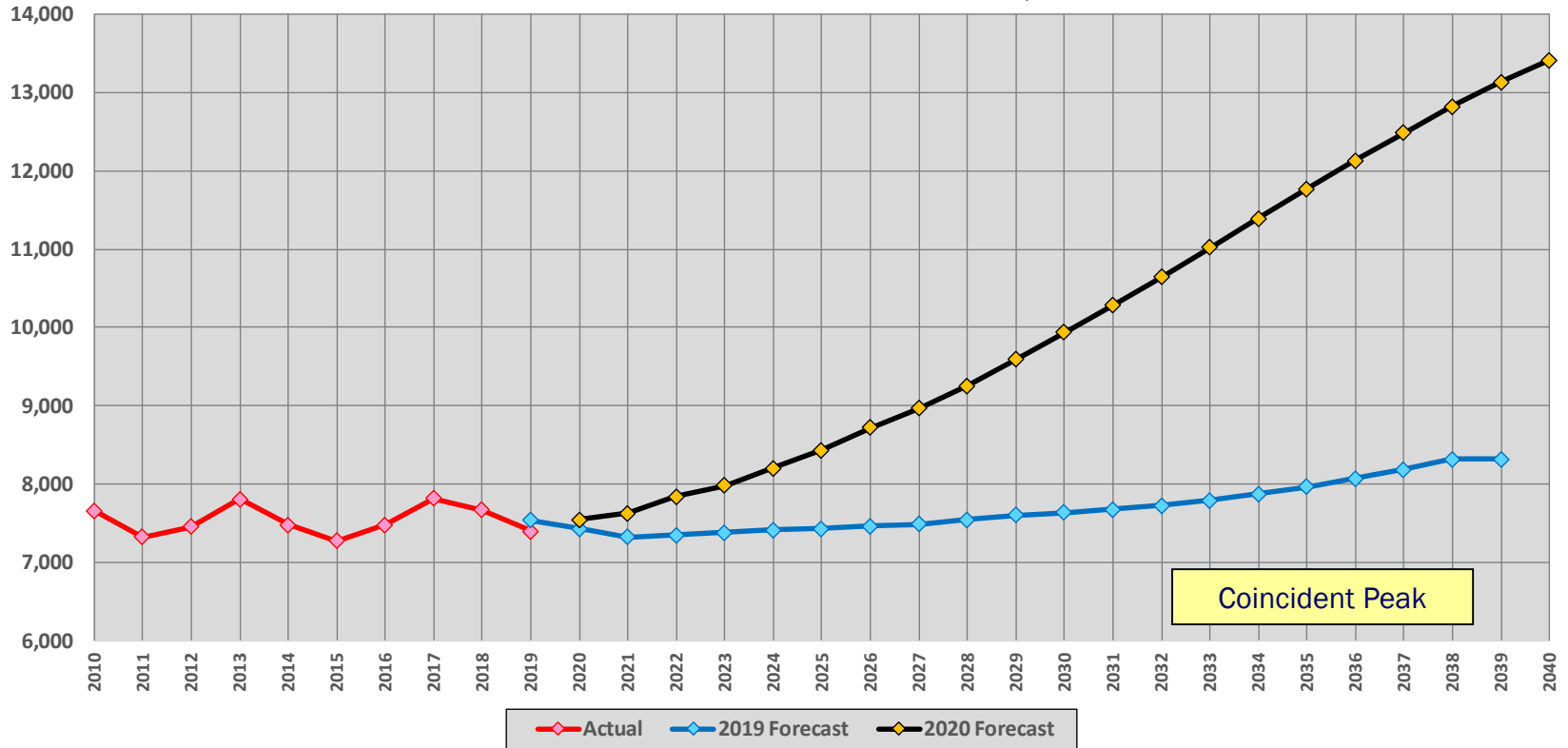
Zone J Baseline - Summer Peak (MW)

Actual, Normal and Forecast - With Demand-Side Impacts



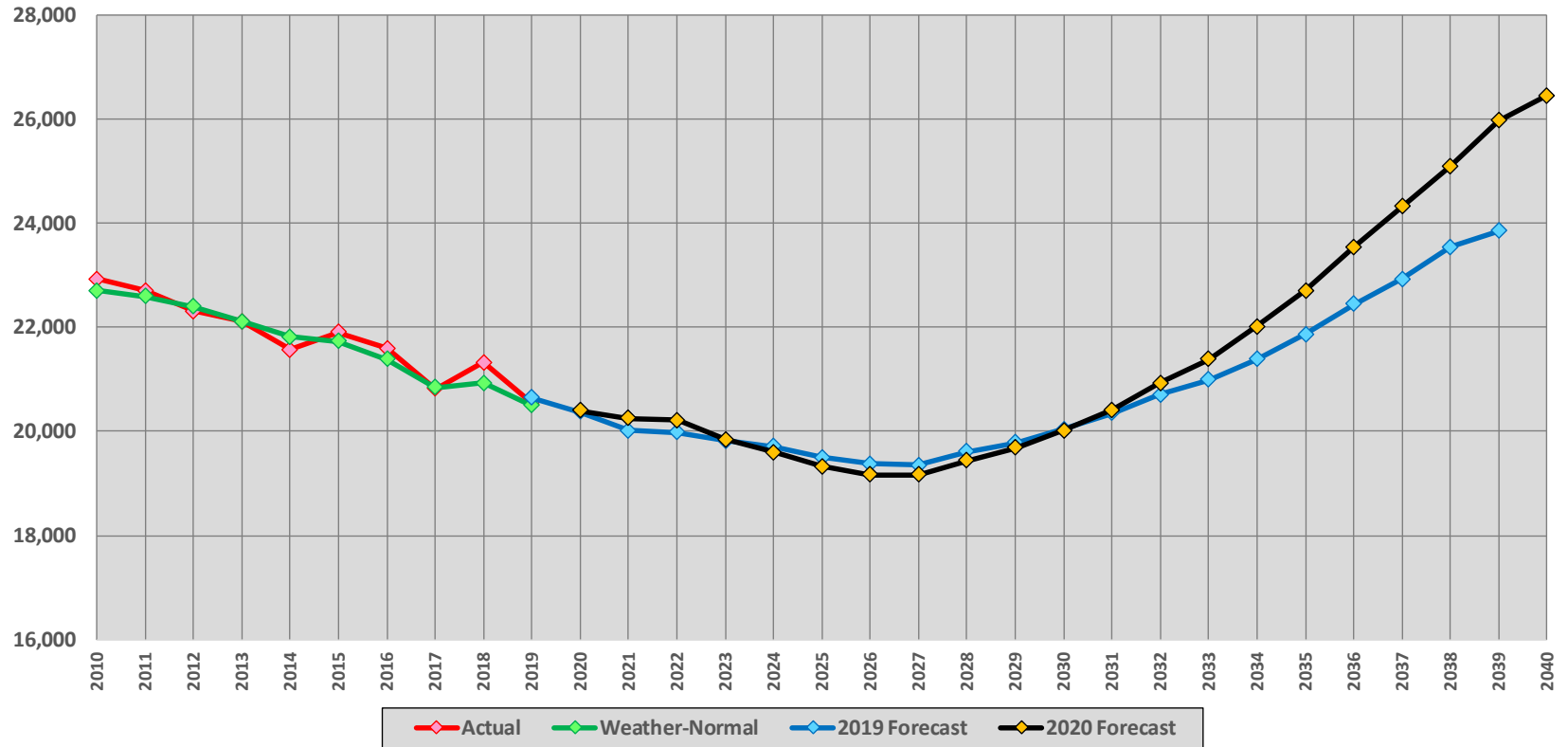
Zone J Baseline - Winter Peak (MW)

Actual and Forecast - With Demand-Side Impacts



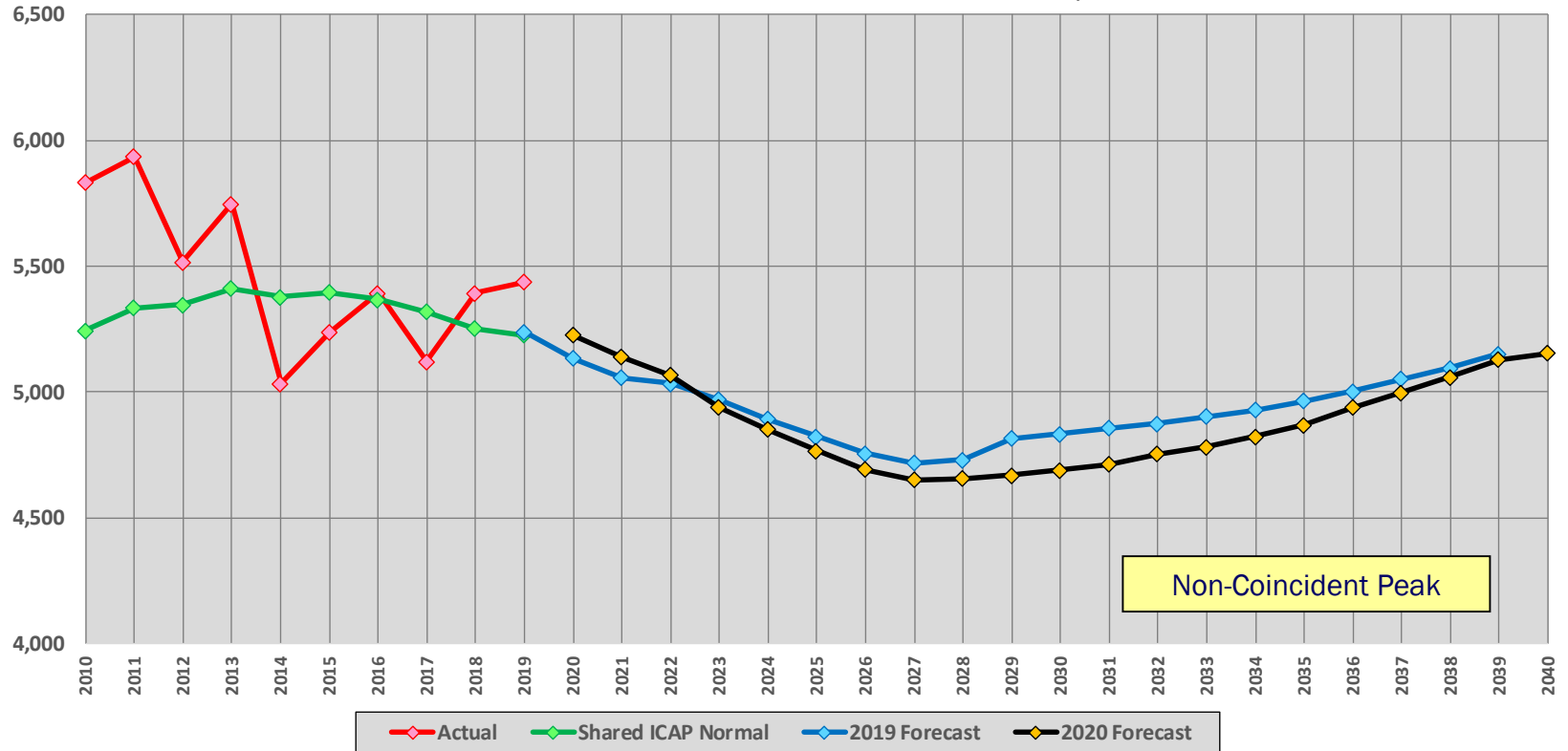
Zone K Baseline - Annual Energy (GWh)

Actual, Normal and Forecast - With Demand-Side Impacts



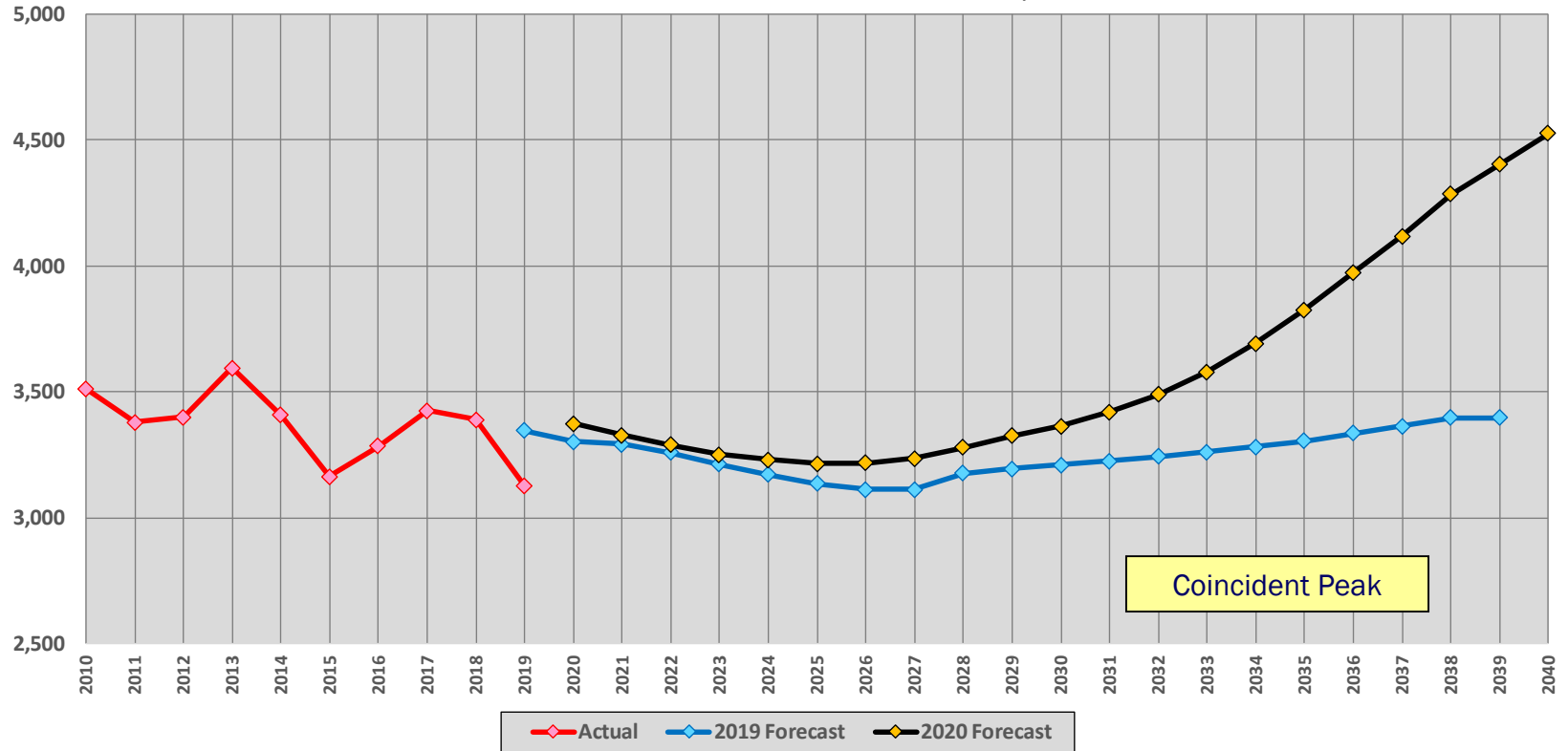
Zone K Baseline - Summer Peak (MW)

Actual, Normal and Forecast - With Demand-Side Impacts



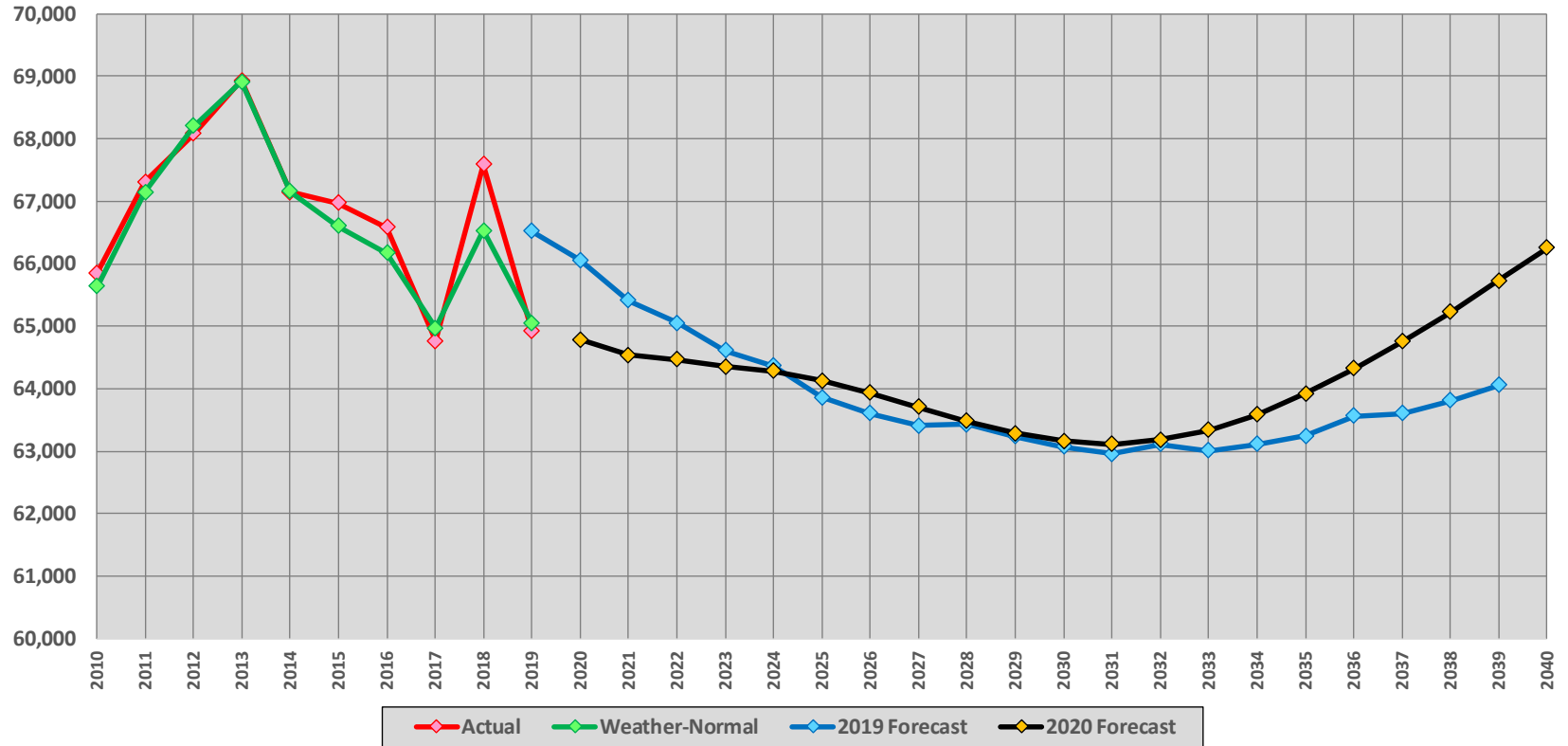
Zone K Baseline - Winter Peak (MW)

Actual and Forecast - With Demand-Side Impacts



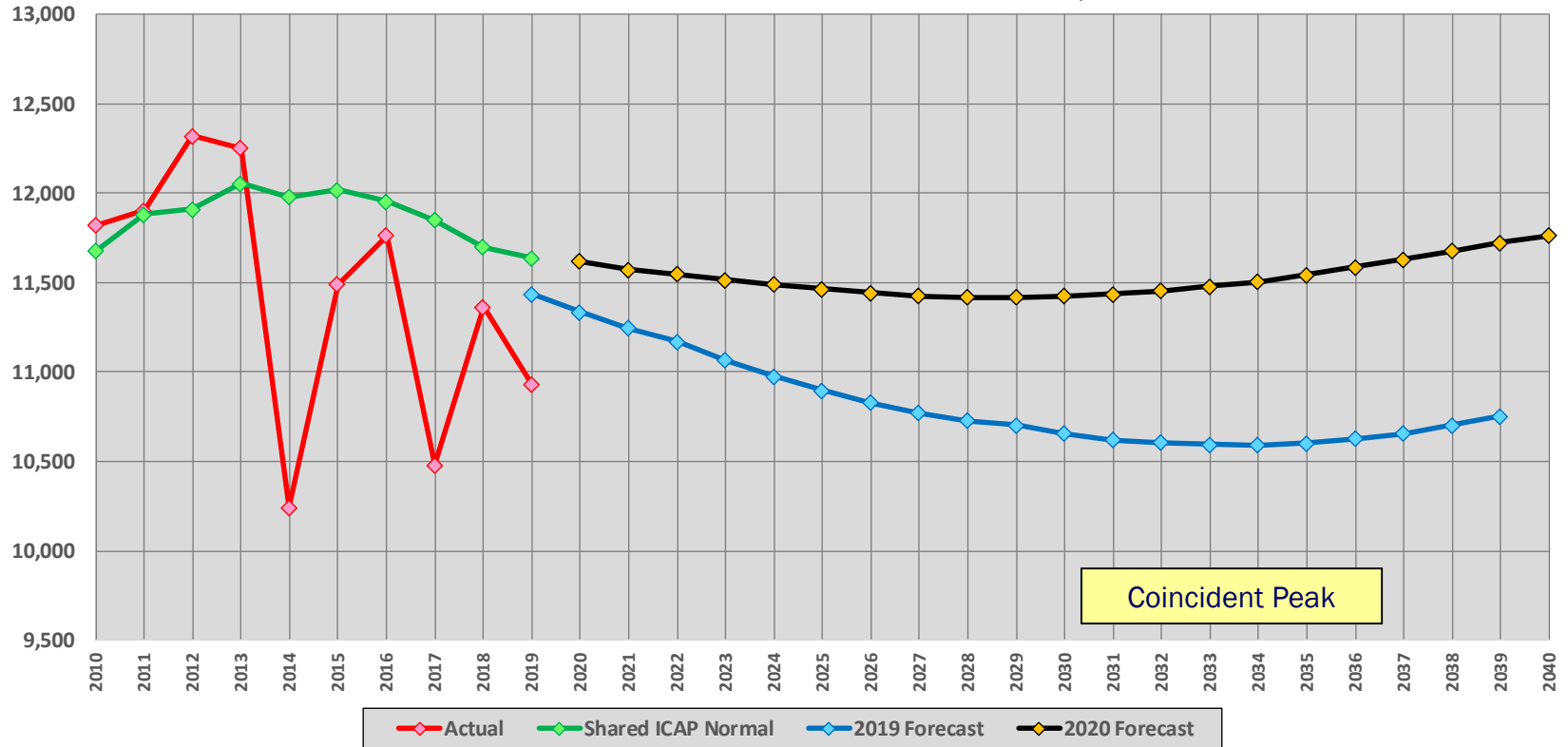
Zones A to F Baseline - Annual Energy (GWh)

Actual, Normal and Forecast - With Demand-Side Impacts



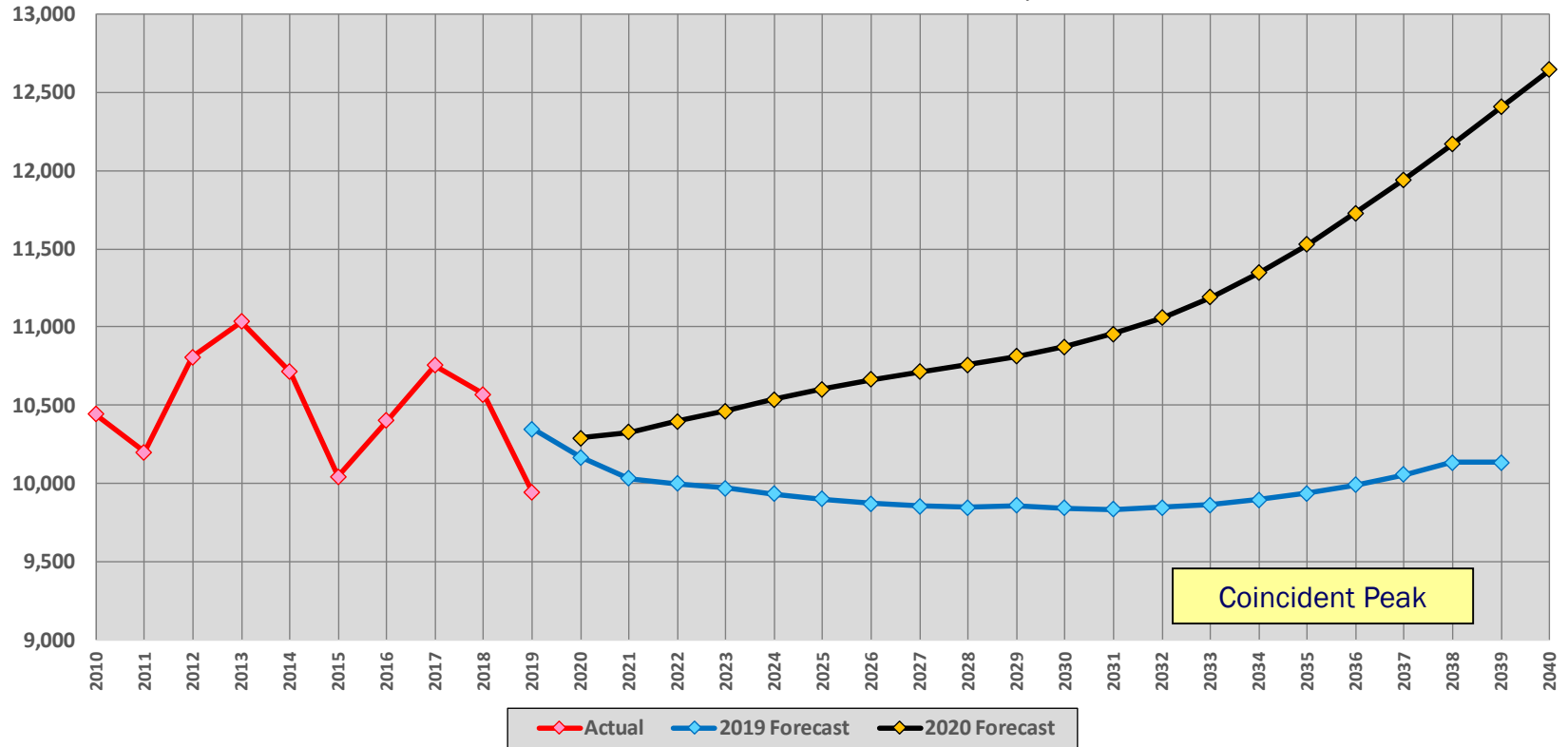
Zones A to F Baseline - Summer Peak

Actual, Normal and Forecast - With Demand-Side Impacts



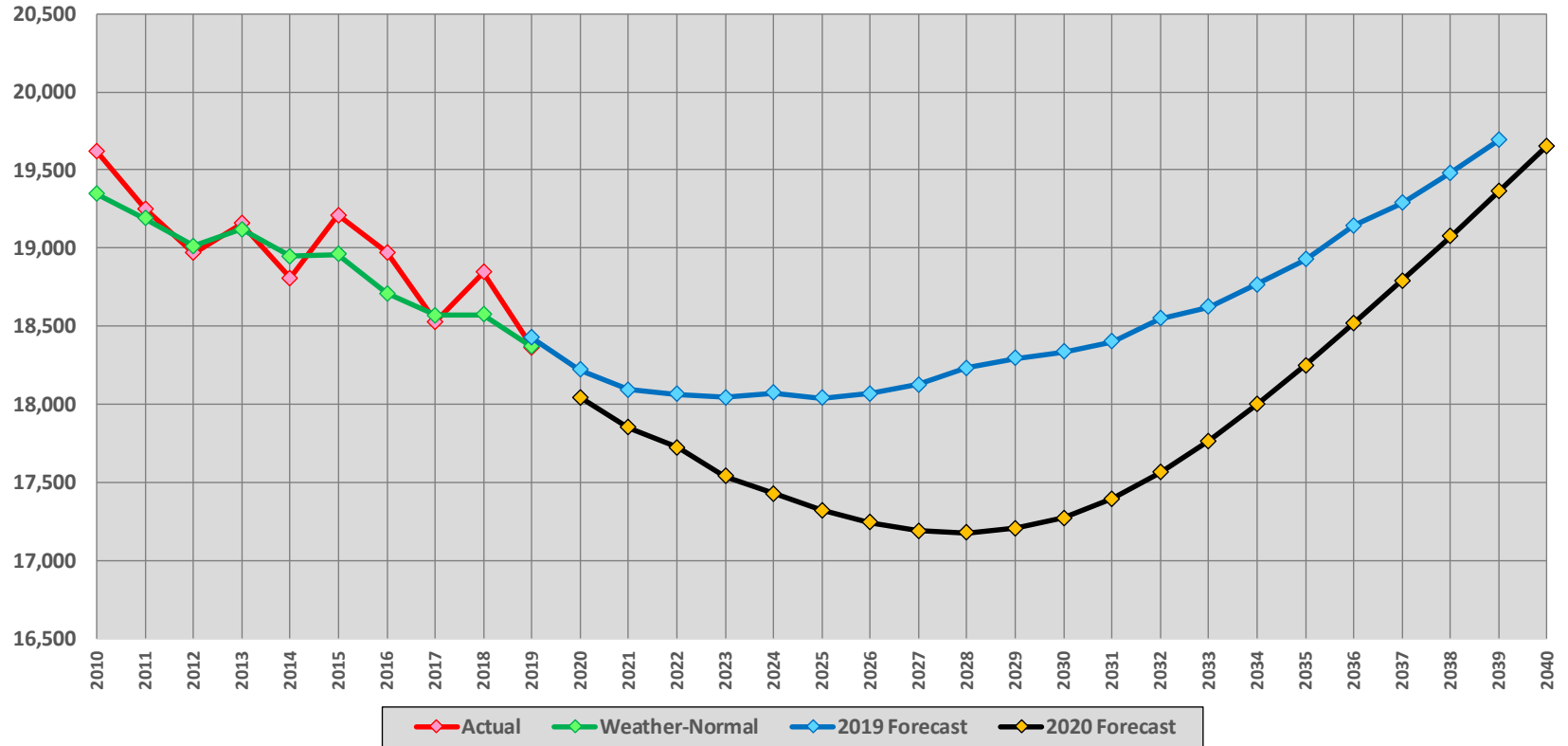
Zones A to F Baseline - Winter Peak

Actual and Forecast - With Demand-Side Impacts



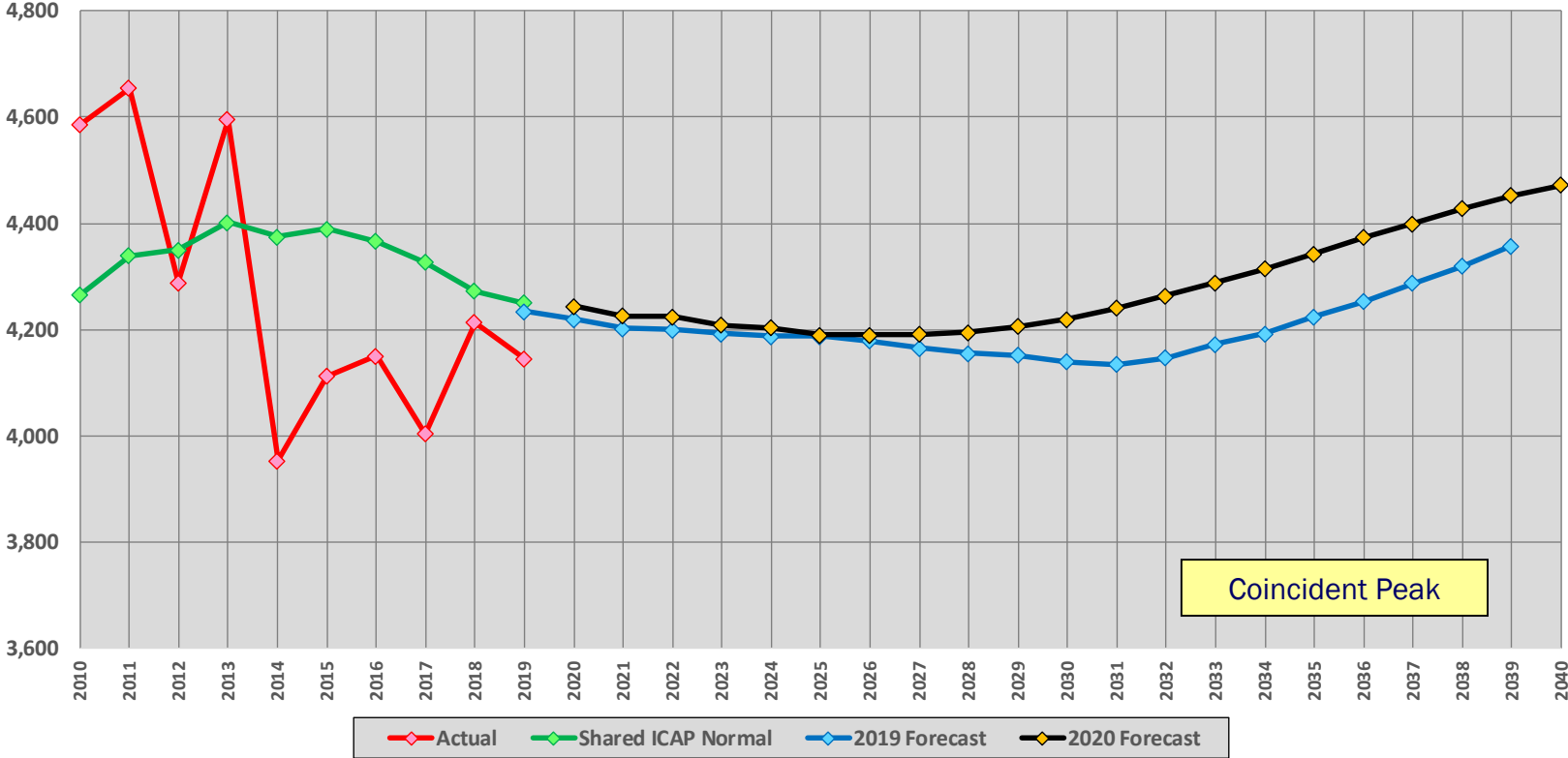
Zones G to I Baseline - Annual Energy (GWh)

Actual, Normal and Forecast - With Demand-Side Impacts



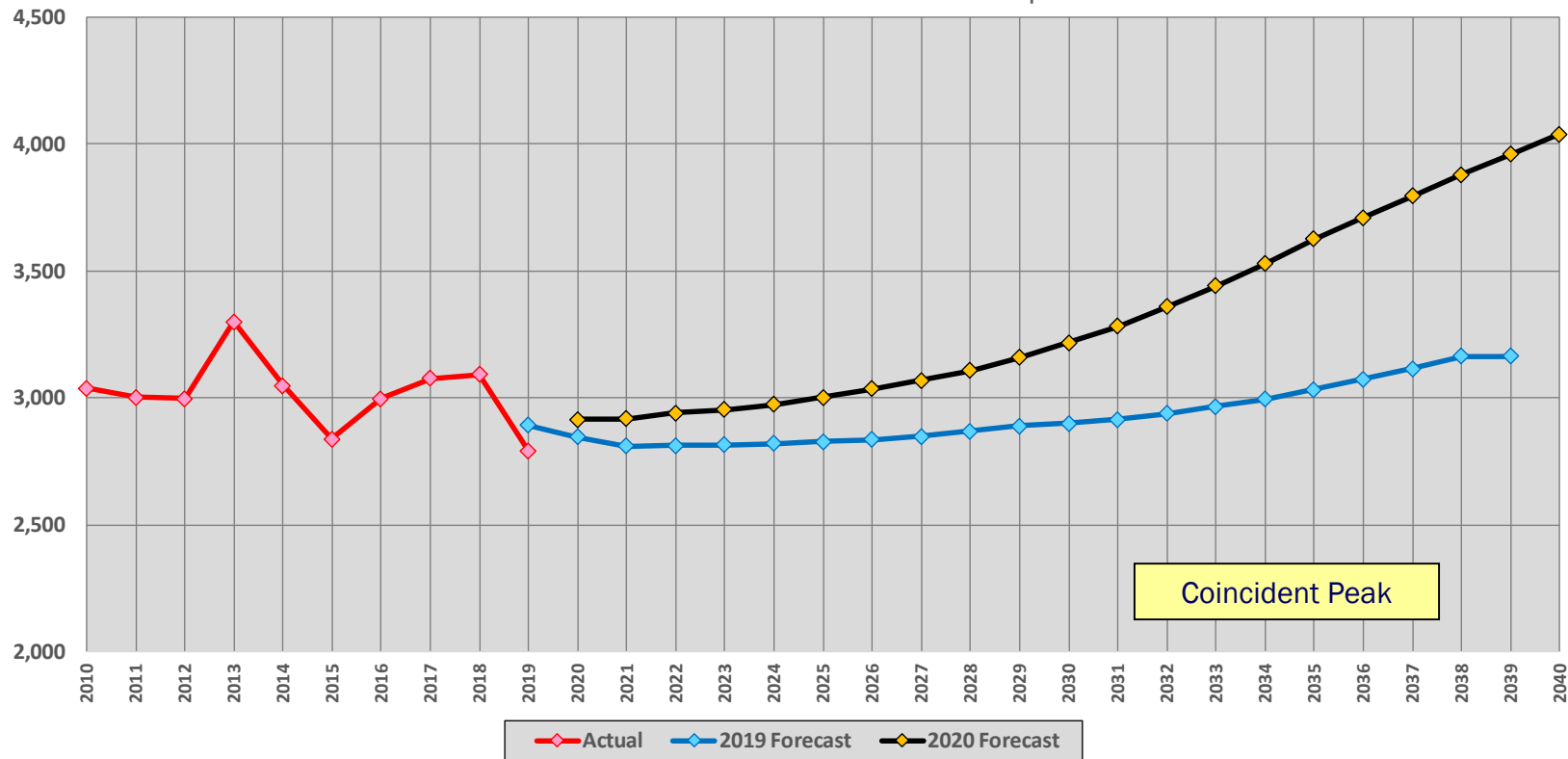
Zones G to I Baseline - Summer Peak

Actual, Normal and Forecast - With Demand-Side Impacts



Zones G to I Baseline - Winter Peak

Actual and Forecast - With Demand-Side Impacts

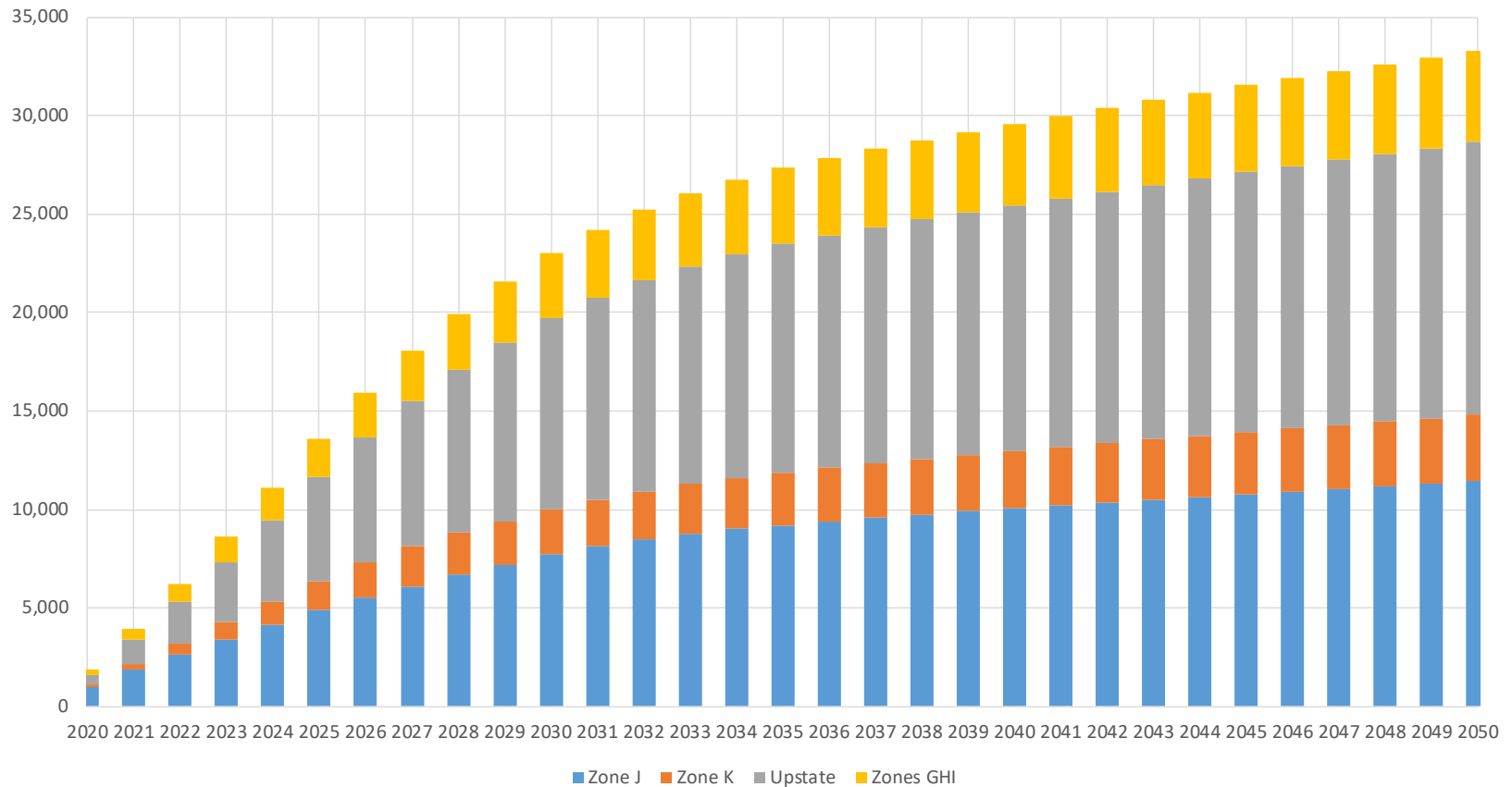


Baseline Forecast Demand-Side Impacts

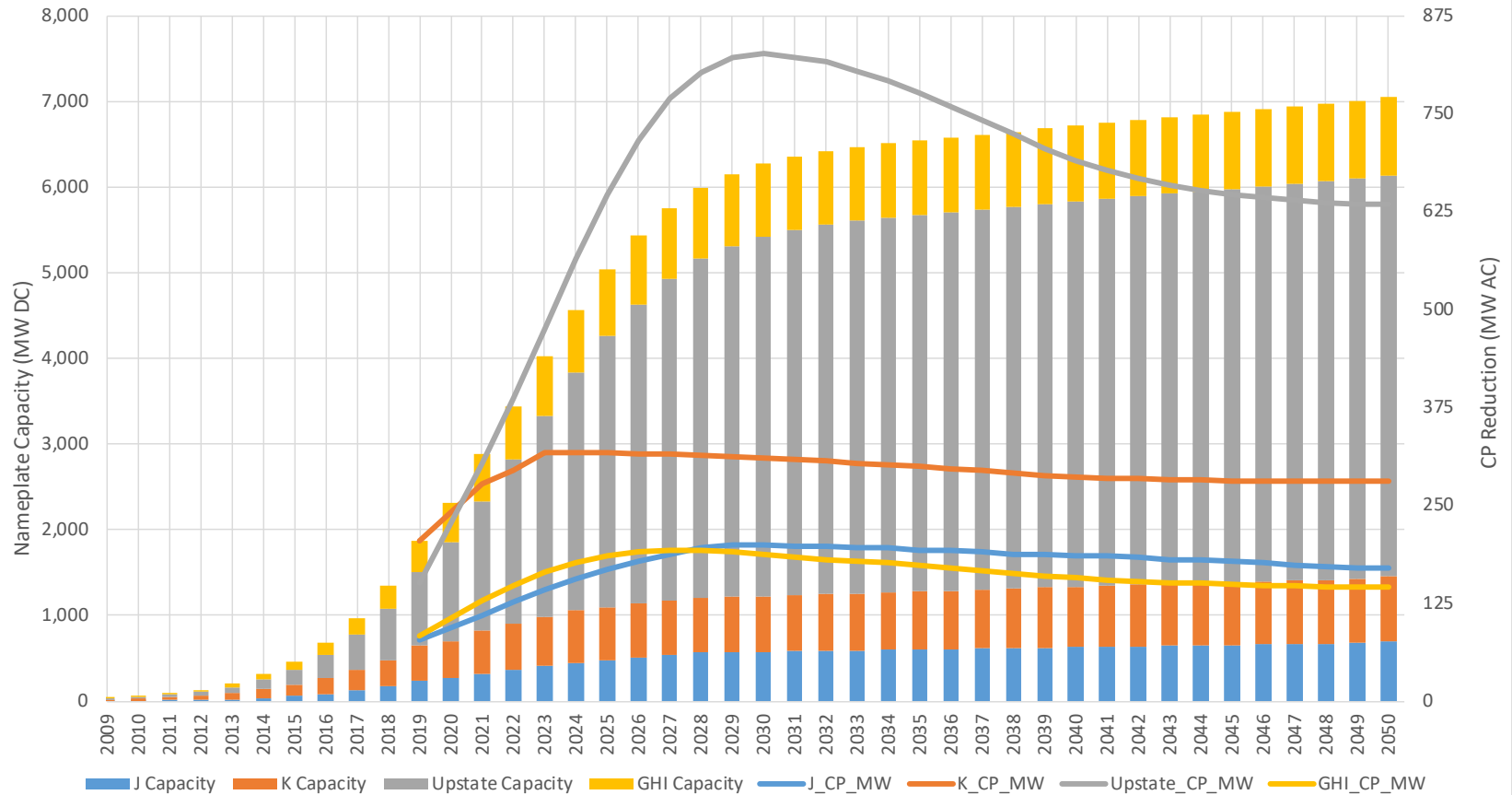
Demand-Side Impacts

- **New Energy Efficiency and Codes & Standards**
- **Behind-the-Meter Solar PV**
- **Behind-the-Meter Non-Solar Distributed Generation**
- **Energy Storage**
- **Electric Vehicles**
- **Other Electrification**

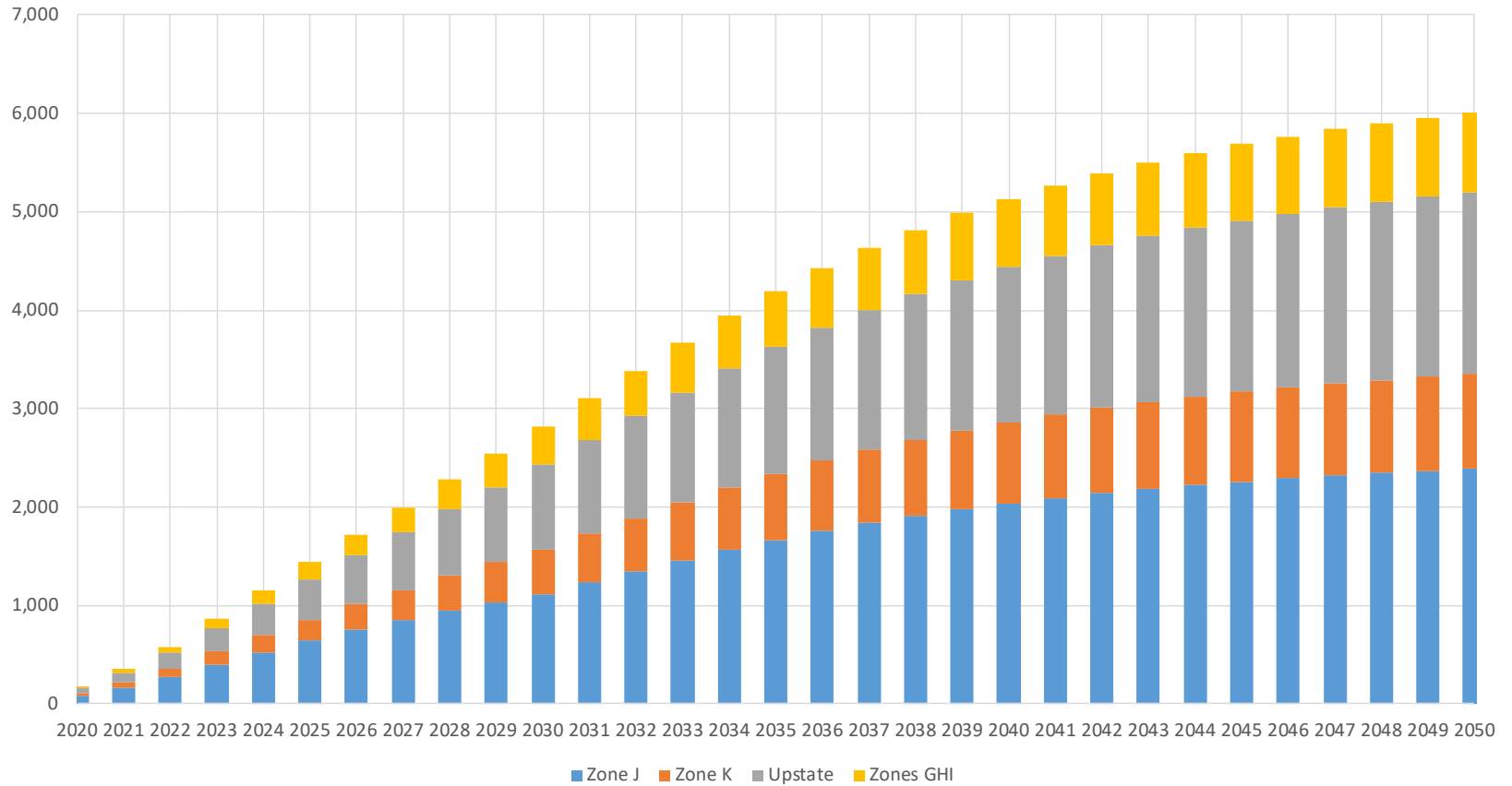
Total New Energy Efficiency and Codes & Standards GWh Reductions (Relative to 2019)



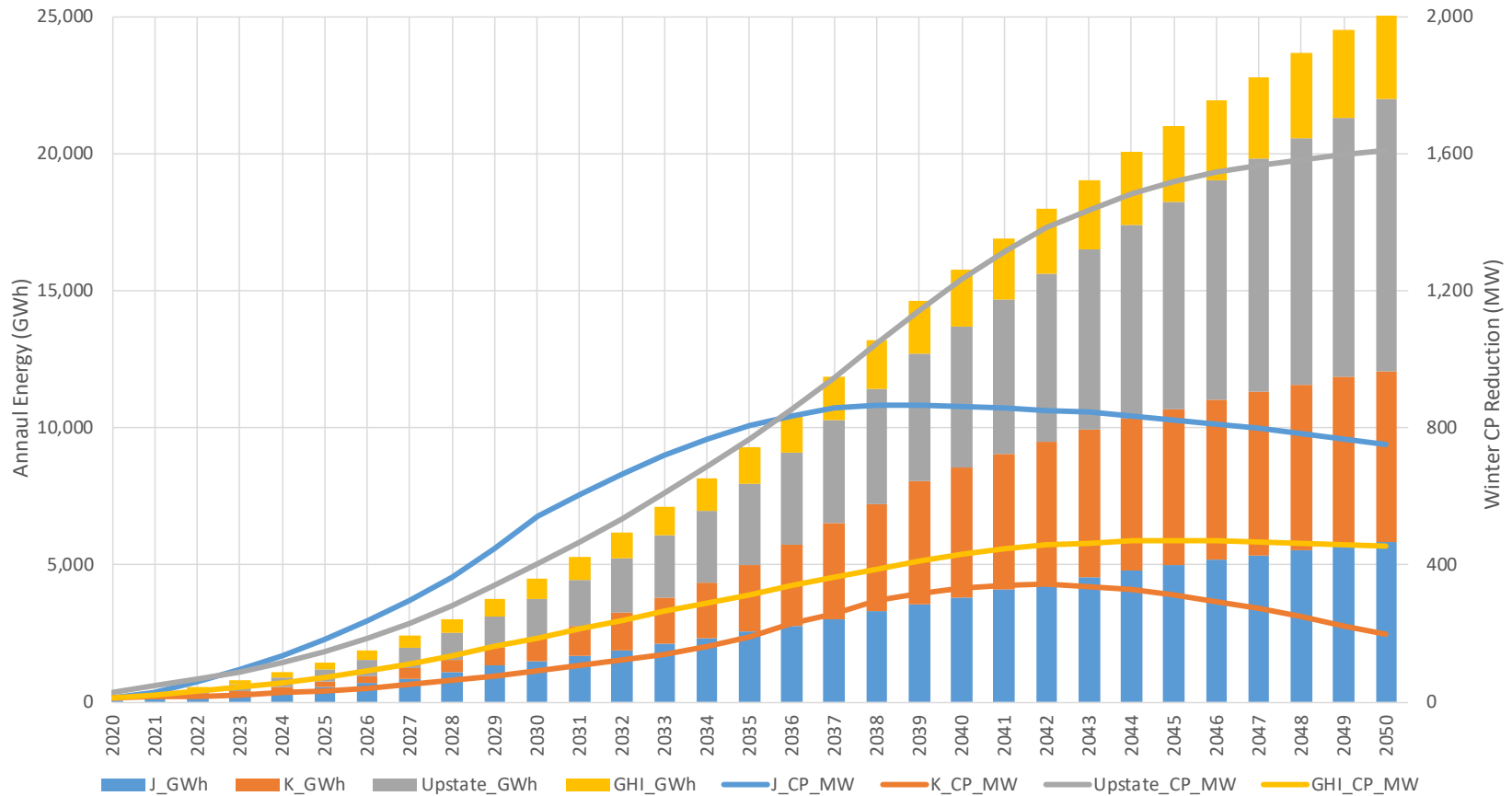
BTM Solar Nameplate Capacity (MW DC) and Summer Coincident Peak Impact (MW AC)



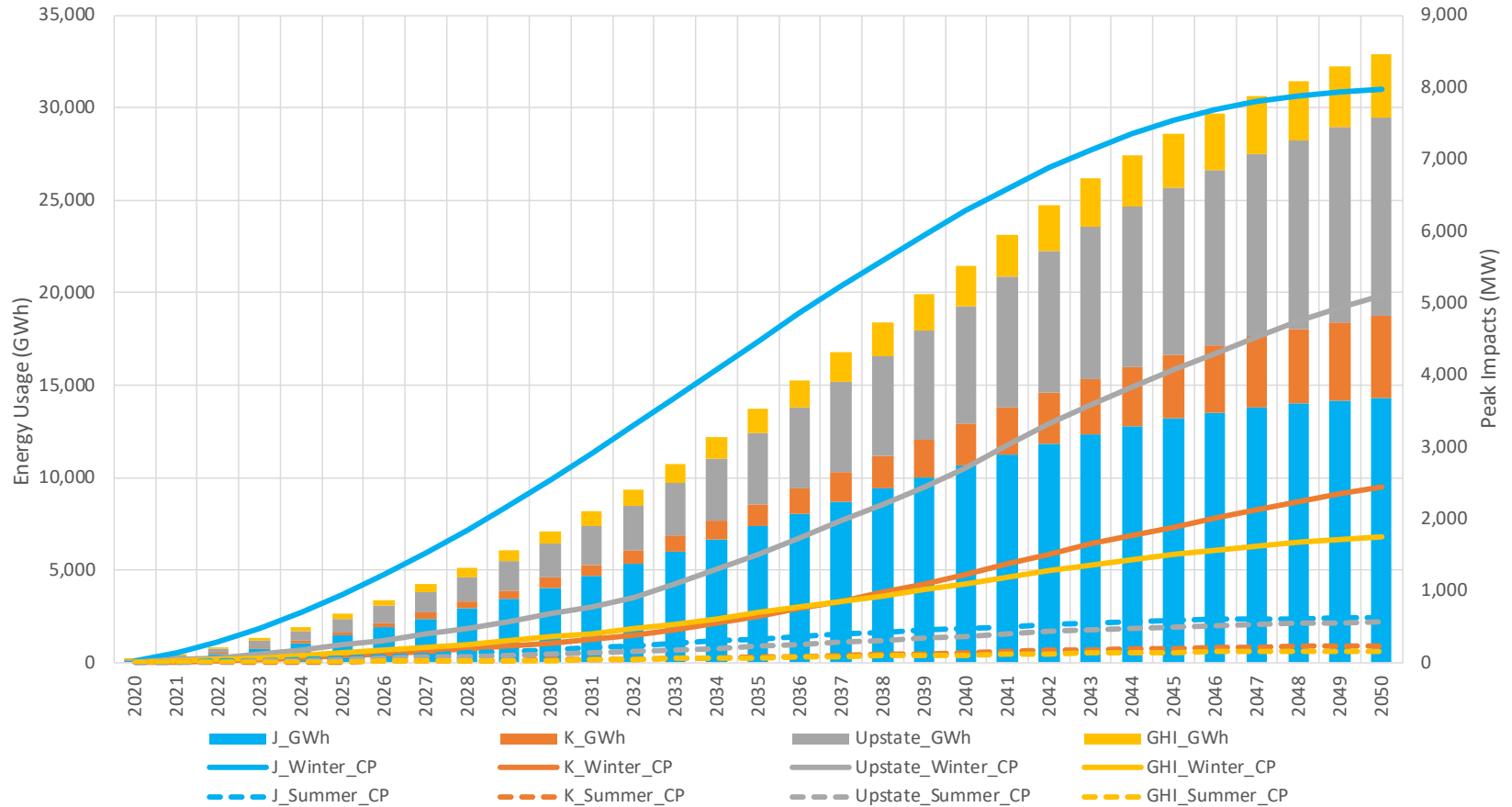
Energy Storage Nameplate Capacity (MW, Total Wholesale plus BTM)



Electric Vehicle Annual Energy Consumption (GWh) and Winter Coincident Peak Impact (MW)



Other Electrification Annual Energy Usage (GWh) and Peak Impacts (MW)



2020 Preliminary Zonal Baseline Forecast

2020 Preliminary Baseline Forecast: Annual Energy

Includes Demand-Side Impacts

Annual Energy by Zone - GWh

Year	A	B	C	D	E	F	G	H	I	J	K	NYCA
2020	14,756	9,784	15,656	4,976	7,789	11,818	9,502	2,774	5,766	51,073	20,396	154,290
2021	14,628	9,727	15,587	5,216	7,688	11,688	9,384	2,816	5,652	50,074	20,252	152,712
2022	14,540	9,697	15,578	5,431	7,610	11,612	9,275	2,847	5,603	49,715	20,218	152,126
2023	14,446	9,665	15,557	5,622	7,531	11,531	9,163	2,876	5,500	48,835	19,838	150,564
2024	14,367	9,643	15,558	5,777	7,463	11,475	9,057	2,899	5,473	48,628	19,595	149,935
2025	14,280	9,616	15,538	5,875	7,396	11,420	8,951	2,919	5,452	48,433	19,331	149,211
2026	14,196	9,585	15,514	5,930	7,336	11,375	8,855	2,935	5,453	48,444	19,161	148,784
2027	14,111	9,547	15,478	5,950	7,282	11,337	8,776	2,949	5,466	48,562	19,162	148,620
2028	14,038	9,510	15,438	5,948	7,236	11,312	8,724	2,963	5,490	48,777	19,436	148,872
2029	13,976	9,479	15,399	5,935	7,201	11,296	8,701	2,977	5,528	49,115	19,683	149,290
2030	13,931	9,461	15,371	5,925	7,176	11,293	8,713	2,994	5,566	49,450	20,020	149,900
2031	13,906	9,464	15,360	5,919	7,165	11,300	8,757	3,013	5,625	49,965	20,409	150,883
2032	13,906	9,492	15,375	5,919	7,167	11,320	8,830	3,038	5,695	50,588	20,922	152,252
2033	13,926	9,540	15,411	5,924	7,181	11,352	8,924	3,067	5,775	51,291	21,382	153,773
2034	13,969	9,607	15,469	5,936	7,206	11,397	9,035	3,101	5,862	52,053	22,009	155,644
2035	14,033	9,687	15,547	5,954	7,242	11,456	9,158	3,137	5,956	52,891	22,698	157,759
2036	14,114	9,778	15,640	5,976	7,286	11,528	9,292	3,174	6,053	53,740	23,537	160,118
2037	14,204	9,872	15,737	5,999	7,334	11,607	9,430	3,211	6,152	54,611	24,319	162,476
2038	14,306	9,973	15,844	6,023	7,388	11,693	9,576	3,247	6,253	55,502	25,086	164,891
2039	14,416	10,078	15,957	6,047	7,446	11,786	9,729	3,282	6,353	56,382	25,969	167,445
2040	14,534	10,186	16,074	6,070	7,507	11,881	9,888	3,315	6,451	57,242	26,447	169,595

2020 Preliminary Baseline Forecast: Summer Peak

Includes Demand-Side Impacts

Coincident Summer Peak Demand by Zone - MW

Year	A	B	C	D	E	F	G	H	I	J	K	NYCA
2020	2,661	1,948	2,728	583	1,348	2,352	2,167	647	1,430	11,316	5,115	32,295
2021	2,641	1,943	2,719	613	1,329	2,329	2,153	646	1,427	11,300	5,029	32,129
2022	2,626	1,941	2,715	640	1,313	2,313	2,144	646	1,435	11,397	4,958	32,128
2023	2,610	1,938	2,711	663	1,297	2,297	2,134	646	1,428	11,362	4,832	31,918
2024	2,597	1,936	2,708	682	1,283	2,285	2,127	647	1,429	11,395	4,749	31,838
2025	2,585	1,935	2,705	693	1,271	2,276	2,118	647	1,425	11,390	4,666	31,711
2026	2,575	1,933	2,702	699	1,263	2,271	2,111	648	1,431	11,446	4,591	31,670
2027	2,569	1,932	2,700	700	1,257	2,269	2,104	648	1,439	11,504	4,551	31,673
2028	2,567	1,930	2,698	699	1,255	2,271	2,100	649	1,446	11,583	4,558	31,756
2029	2,569	1,928	2,697	696	1,255	2,274	2,099	649	1,458	11,670	4,570	31,865
2030	2,572	1,927	2,696	694	1,258	2,279	2,102	649	1,469	11,757	4,589	31,992
2031	2,578	1,927	2,695	692	1,262	2,283	2,109	650	1,481	11,865	4,613	32,155
2032	2,585	1,929	2,695	691	1,266	2,287	2,119	650	1,495	11,980	4,652	32,349
2033	2,594	1,934	2,696	691	1,271	2,292	2,131	651	1,506	12,064	4,679	32,509
2034	2,604	1,940	2,698	690	1,276	2,296	2,145	653	1,517	12,151	4,720	32,690
2035	2,616	1,948	2,703	691	1,282	2,303	2,160	654	1,529	12,253	4,764	32,903
2036	2,630	1,957	2,708	691	1,289	2,311	2,176	656	1,541	12,345	4,834	33,138
2037	2,644	1,966	2,714	692	1,296	2,320	2,192	657	1,551	12,429	4,891	33,352
2038	2,659	1,975	2,720	693	1,303	2,329	2,209	659	1,560	12,501	4,952	33,560
2039	2,673	1,984	2,726	693	1,310	2,338	2,225	659	1,568	12,565	5,020	33,761
2040	2,686	1,992	2,731	694	1,316	2,346	2,241	659	1,572	12,595	5,045	33,877

2020 Preliminary Baseline Forecast: Winter Peak

Includes Demand-Side Impacts

Coincident Winter Peak Demand by Zone - MW

Year	A	B	C	D	E	F	G	H	I	J	K	NYCA
2020-21	2,227	1,559	2,525	751	1,330	1,899	1,563	493	858	7,551	3,374	24,130
2021-22	2,229	1,556	2,531	782	1,331	1,899	1,558	494	866	7,630	3,327	24,203
2022-23	2,240	1,557	2,547	810	1,336	1,907	1,555	498	887	7,847	3,290	24,474
2023-24	2,251	1,559	2,561	836	1,342	1,914	1,551	501	900	7,984	3,251	24,650
2024-25	2,266	1,564	2,576	858	1,349	1,925	1,548	505	922	8,202	3,229	24,944
2025-26	2,281	1,569	2,588	873	1,356	1,936	1,545	509	947	8,432	3,215	25,251
2026-27	2,296	1,575	2,598	883	1,363	1,948	1,543	513	979	8,720	3,217	25,635
2027-28	2,310	1,581	2,605	890	1,368	1,959	1,543	517	1,008	8,971	3,236	25,988
2028-29	2,325	1,587	2,610	893	1,374	1,971	1,547	522	1,038	9,259	3,278	26,404
2029-30	2,342	1,594	2,616	897	1,381	1,984	1,555	527	1,076	9,591	3,325	26,888
2030-31	2,360	1,602	2,624	901	1,388	1,999	1,570	532	1,115	9,934	3,363	27,388
2031-32	2,384	1,614	2,637	907	1,398	2,016	1,590	538	1,153	10,282	3,420	27,939
2032-33	2,413	1,630	2,655	914	1,411	2,037	1,617	546	1,195	10,643	3,489	28,550
2033-34	2,448	1,651	2,680	924	1,427	2,062	1,649	554	1,237	11,018	3,580	29,230
2034-35	2,489	1,675	2,711	935	1,446	2,090	1,686	564	1,278	11,392	3,693	29,959
2035-36	2,537	1,704	2,749	947	1,469	2,123	1,728	576	1,321	11,769	3,825	30,748
2036-37	2,589	1,735	2,790	961	1,494	2,160	1,772	587	1,351	12,134	3,974	31,547
2037-38	2,644	1,769	2,835	975	1,520	2,199	1,820	599	1,376	12,488	4,119	32,344
2038-39	2,702	1,805	2,883	991	1,549	2,240	1,869	611	1,399	12,822	4,285	33,156
2039-40	2,763	1,842	2,933	1,007	1,578	2,283	1,919	623	1,418	13,131	4,403	33,900
2040-41	2,825	1,880	2,985	1,023	1,608	2,325	1,970	634	1,435	13,413	4,525	34,623

Gold Book Forecast Scenarios

Forecast Component	Baseline Forecast	High Scenario	Low Scenario	CLCPA Scenario
Energy Efficiency	Medium Energy Efficiency gains - Efficiency trends from EIA (Mid-Atlantic) plus partial attainment of Comprehensive Energy Efficiency Initiative.	Low Energy Efficiency gains - only SAE model-based impacts on efficiency.	High Energy Efficiency gains - All model-based EE impacts plus additional gains to meet new the Comprehensive Energy Efficiency Initiative order.	EE impacts from 2019 Climate Study. This was produced prior to PSC order on Comprehensive Energy Efficiency Initiative (Jan 2020).
BTM Solar	Medium BTM Solar – new 6,000 MW goal met with a two year lag.	Medium BTM Solar – new 6,000 MW goal met with a four year lag.	High BTM Solar – over 9,000 MW installed with 6,000 MW target met by 2025.	High BTM Solar – over 9,000 MW installed with 6,000 MW target met by 2025.
Electric Vehicles	High scenario EV adoption – majority of cars are EV by 2050; increasing penetration of managed charging rates.	Same as baseline scenario, but without managed charging.	Low scenario EV adoption – about half of cars will be EV 2050; increasing penetration of managed charging rates.	Increased EV adoptions as needed to meet CLCPA target for EV.
Electrification	Medium electrification – partial electrification from Climate Study's CLCPA scenario.	High electrification – Significant electrification of fossil-based end uses from Climate Study's CLCPA scenario.	Low electrification – modest electrification based on anticipated short term trend.	High electrification – Sufficient electrification to meet CLCPA emissions targets in energy & EV.
BTM Distributed Generation	450 MW installed BTM DG by 2050.	Same as baseline.	Same as baseline.	Same as baseline.
Energy Storage	3,000 MW installed total energy storage by 2030, with additional MW added through 2050.	Same as baseline.	Same as baseline.	Same as baseline.

Our mission, in collaboration with our stakeholders, is to serve the public interest and provide benefit to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policymakers, stakeholders and investors in the power system



Questions?