

# 2021 Long Term Baseline Forecast

---

Max Schuler, Arvind Jaggi, Arthur Maniaci, Chuck Alonge

Demand Forecasting & Analysis

**ESPWG / LFTF**

March 24, 2021

# Agenda

- **Summary**
- **Baseline Energy Forecast**
- **Baseline Summer Peak Forecast**
- **Baseline Winter Peak Forecast**
- **DER Forecast Summaries**

# Forecast Components

- Statistically Adjusted End-Use (SAE) models – produce monthly energy and peak forecasts 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:

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

## Exogenous load increasing modifiers:

- Electric vehicle impacts
- Heating and base load electrification
- Energy storage net energy usage

- **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**

# Long Term Forecast Drivers

- In the near term, the economy is one of the major drivers in the energy forecast. The regional SAE models typically include either population or households, and one or two of employment, real income, and GDP. The models utilize the January 2021 Moody's economic forecast.
- In the long term, economic trends remain a forecast input. However, over the longer horizon, the impacts due to the economy tend to be outweighed by the significant effects of other drivers. These include the effects of policy driven energy efficiency (EE) and Codes & Standards impacts, and growing penetration of electric heating and electric vehicles (EV).
- Other long-term energy and peak forecast drivers include end-use technology saturation and efficiency trends, behind-the-meter solar PV impacts, behind-the-meter energy storage and distributed generation impacts, and the assumed climate trend.
- The impacts of the economy on energy usage are not always direct and one-to-one. For example, the vast majority of the 2020 summer peak impact due to COVID was localized in New York City, as the rest of the state remained relatively close to expected peak load levels. Recent energy trends through the fall and winter show continued negative impacts in Zone J, while other areas have been generally at or above expected energy levels.

# DER Impact Summary

## ■ Energy Efficiency and Codes & Standards

- Assumed policy driven energy efficiency impacts have increased relative to last year's forecast, generally resulting in lower forecast levels over the near term horizon.

## ■ Behind-the-Meter Solar PV

- The forecasted BTM PV installed capacity is similar to last year's forecast with the state policy 6,000 MW DC being attained in the first half of 2026. Forecast energy reductions have been calibrated to recent inverter sample data. Coincident peak reductions decline over time as the assumed hour of the NYCA summer peak shifts out into the evening.

## ■ Energy Storage

- The forecast reflects the state policy 3,000 MW capacity target on time by 2030. The long term trend of installed nameplate storage capacity exceeds last year's forecast, reaching over 10,000 MW by 2050. Combined, there is currently over 12,000 MW of storage across the NYISO and Standard Interconnection Requirement (SIR) interconnection queues. Only BTM storage resources contribute to coincident peak reductions in the forecast, as wholesale market storage is assumed to be dispatched as generation.

# DER Impact Summary

## ■ Electric Vehicles

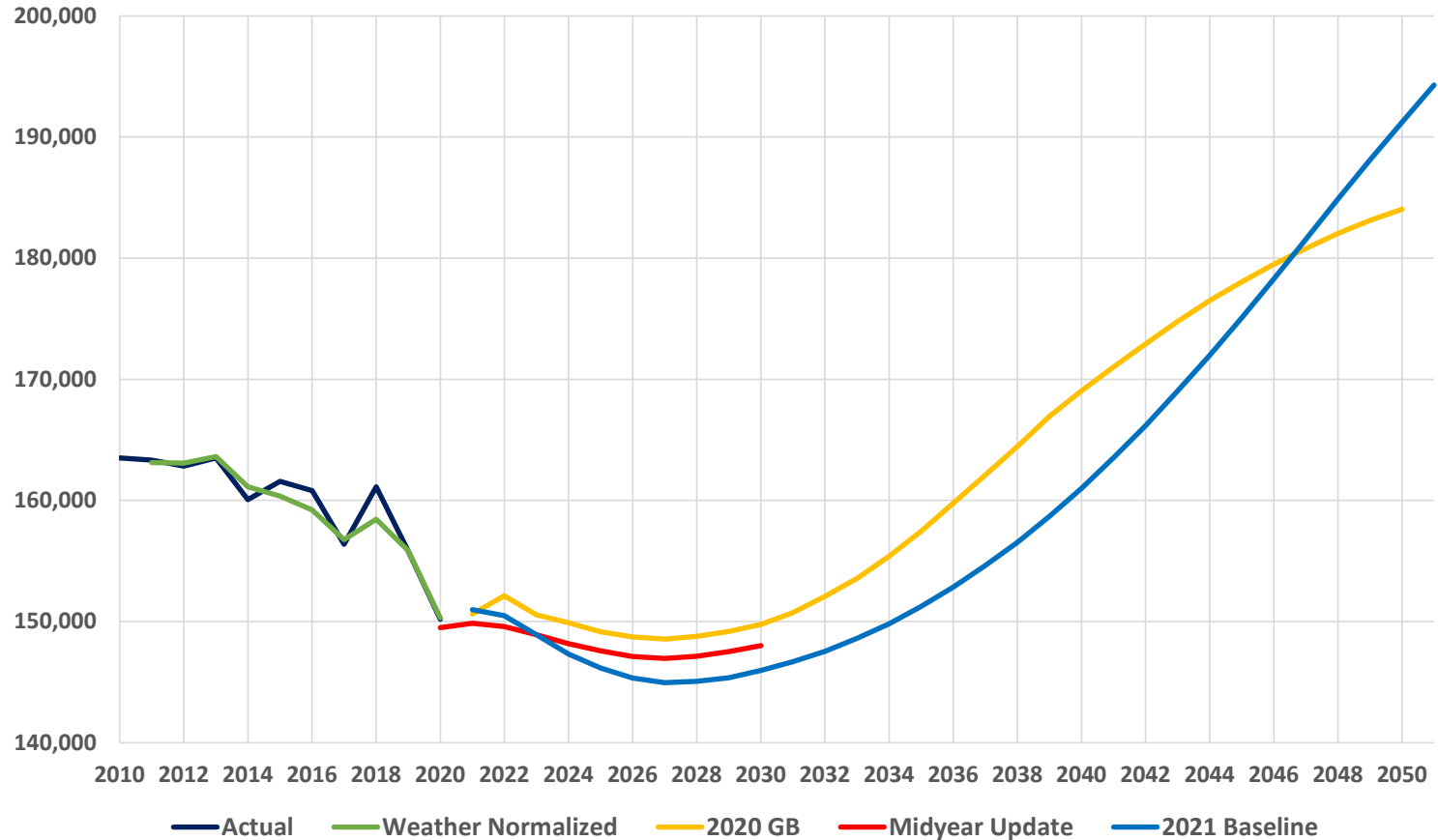
- The EV forecast is generally similar to last year's forecast. Forecasts were developed for light duty vehicles; light, medium and heavy duty trucks; and school and transit buses. The total EV stock is about 1.4 million vehicles in 2030, over 4 million vehicles in 2040, and over 6 million vehicles in 2050. EV charging impacts are a significant driver of the long term forecast level in the outer years.

## ■ Other Electrification

- Other electrification, primarily through heating electrification via heat pumps, is a major driver in the outer years. Electrification impacts are relatively lower than last year's forecast in the early years, and higher during the outer forecast years.
- Led primarily by electrification, the NYISO is forecast to switch to a winter peaking system by around 2040.

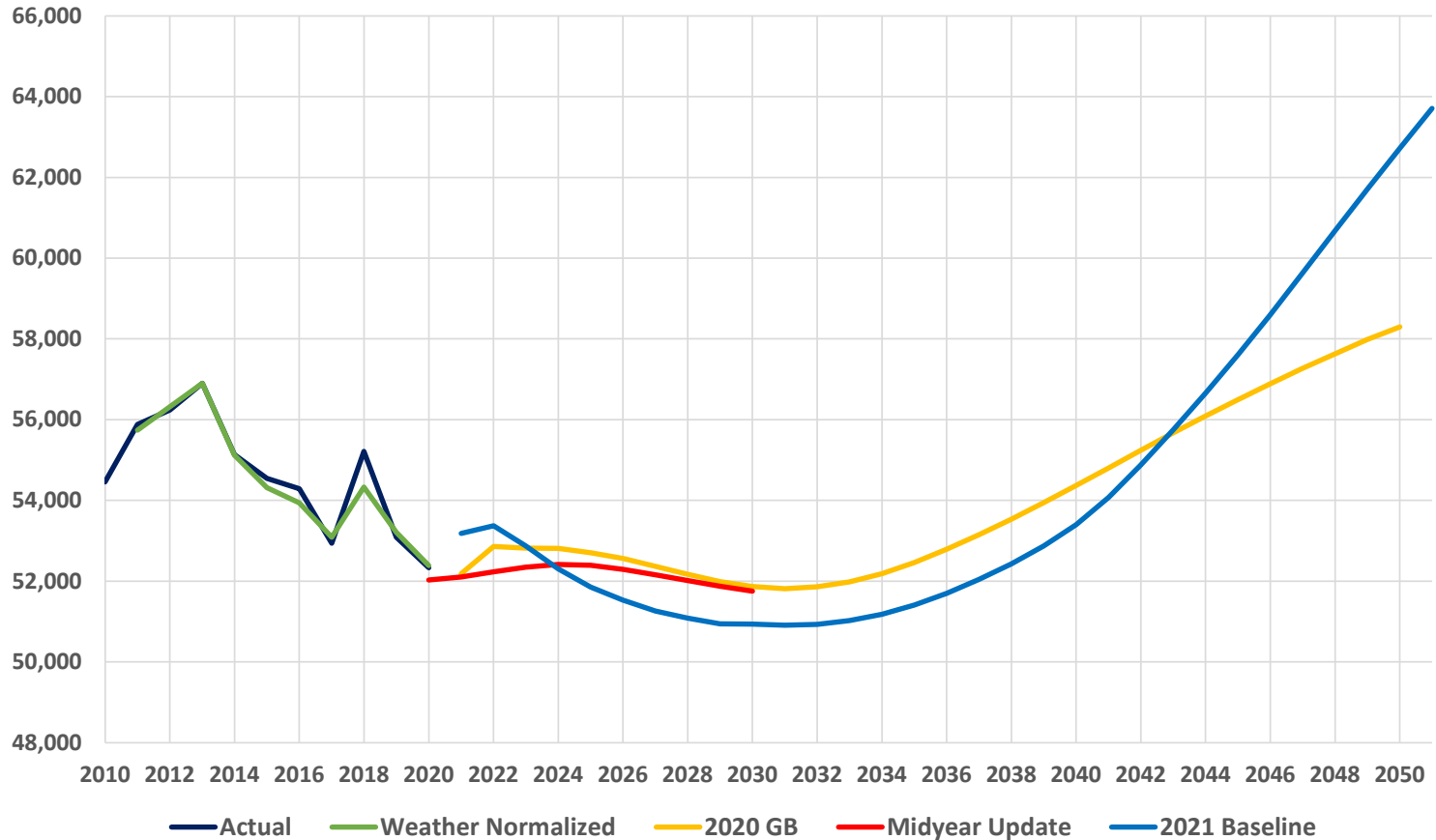
# Baseline Energy Forecast

# NYCA Baseline Annual Energy (GWh)

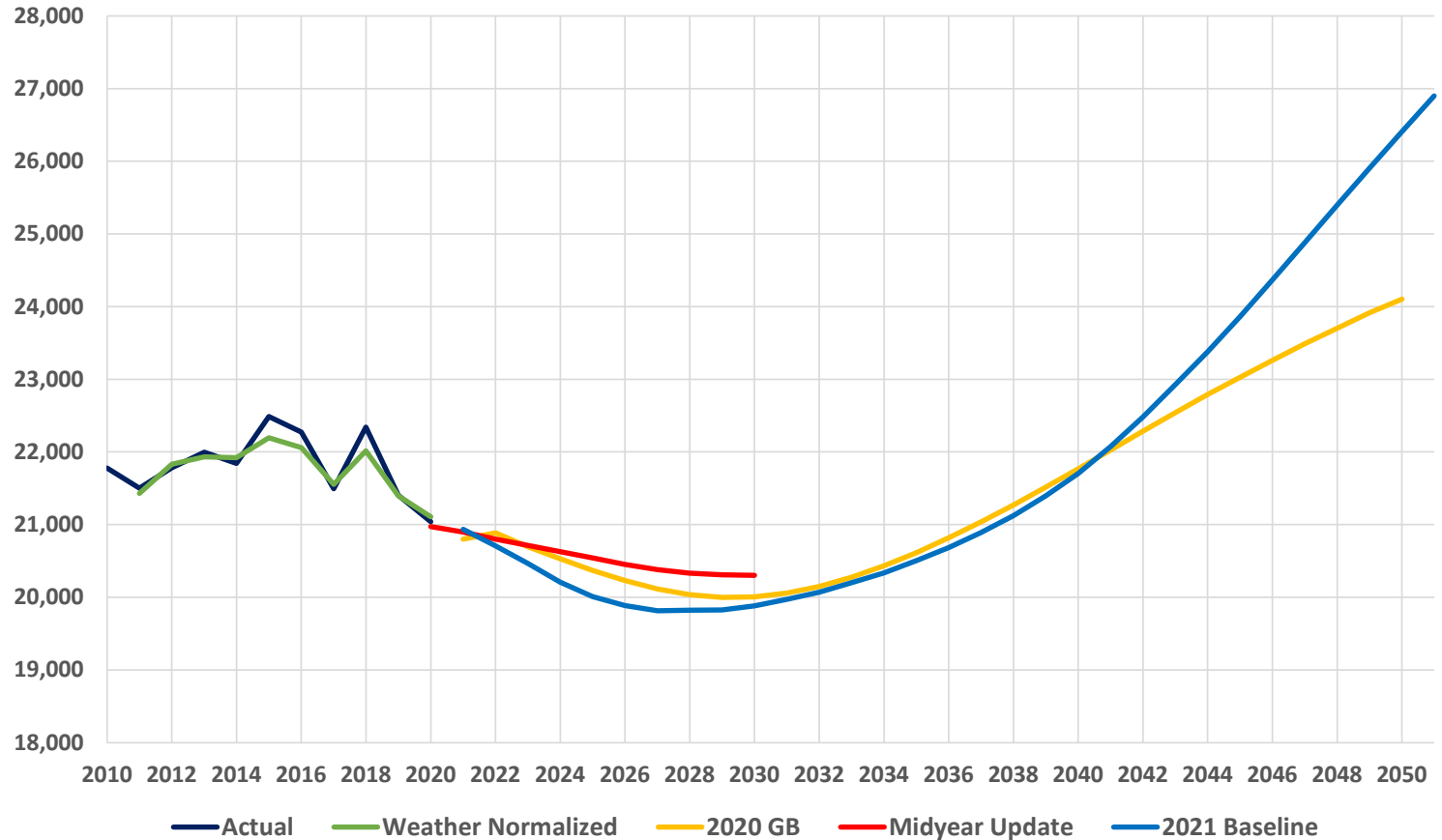




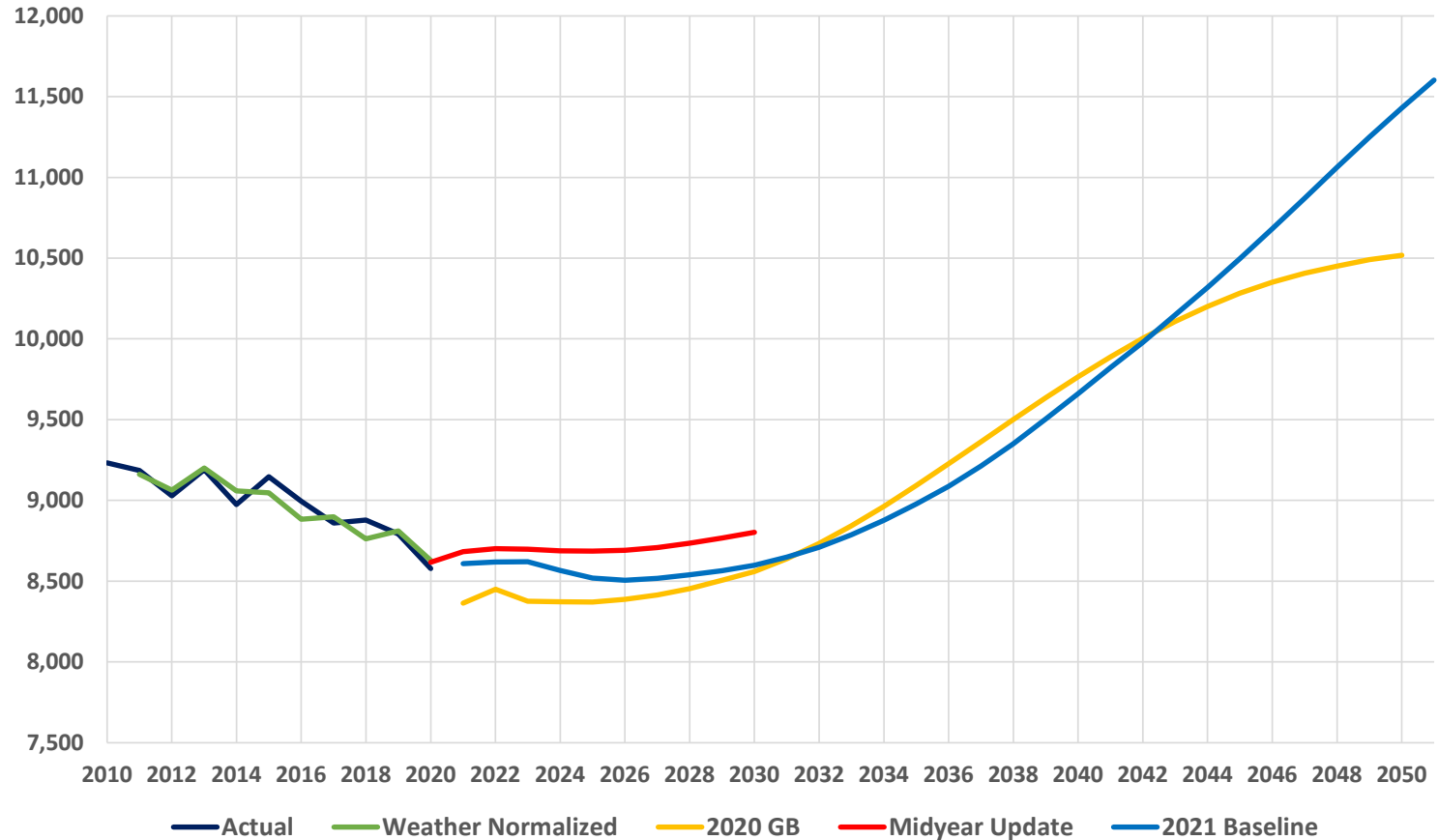
# Zones A to E Baseline Annual Energy (GWh)



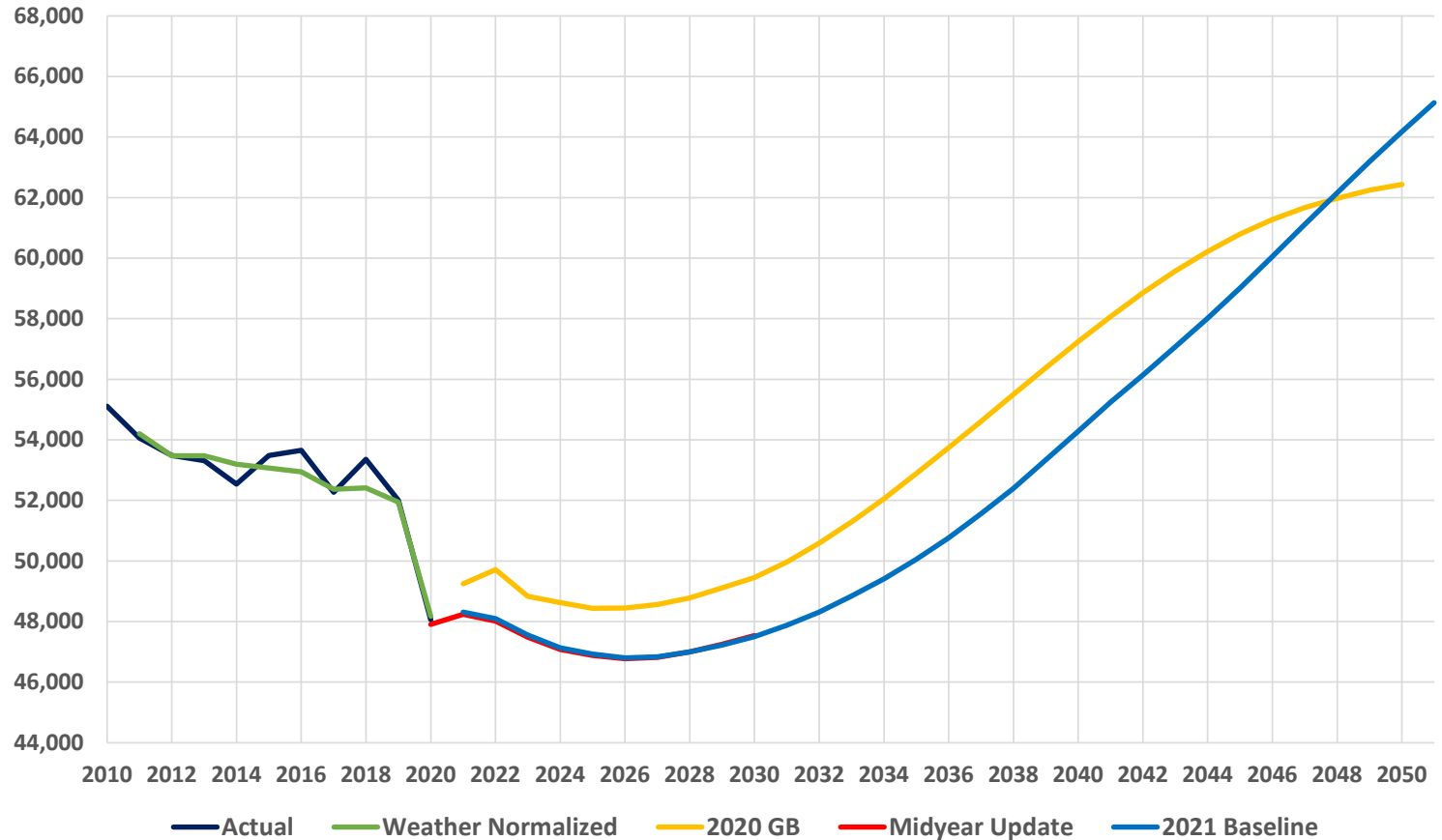
# Zones F&G Baseline Annual Energy (GWh)



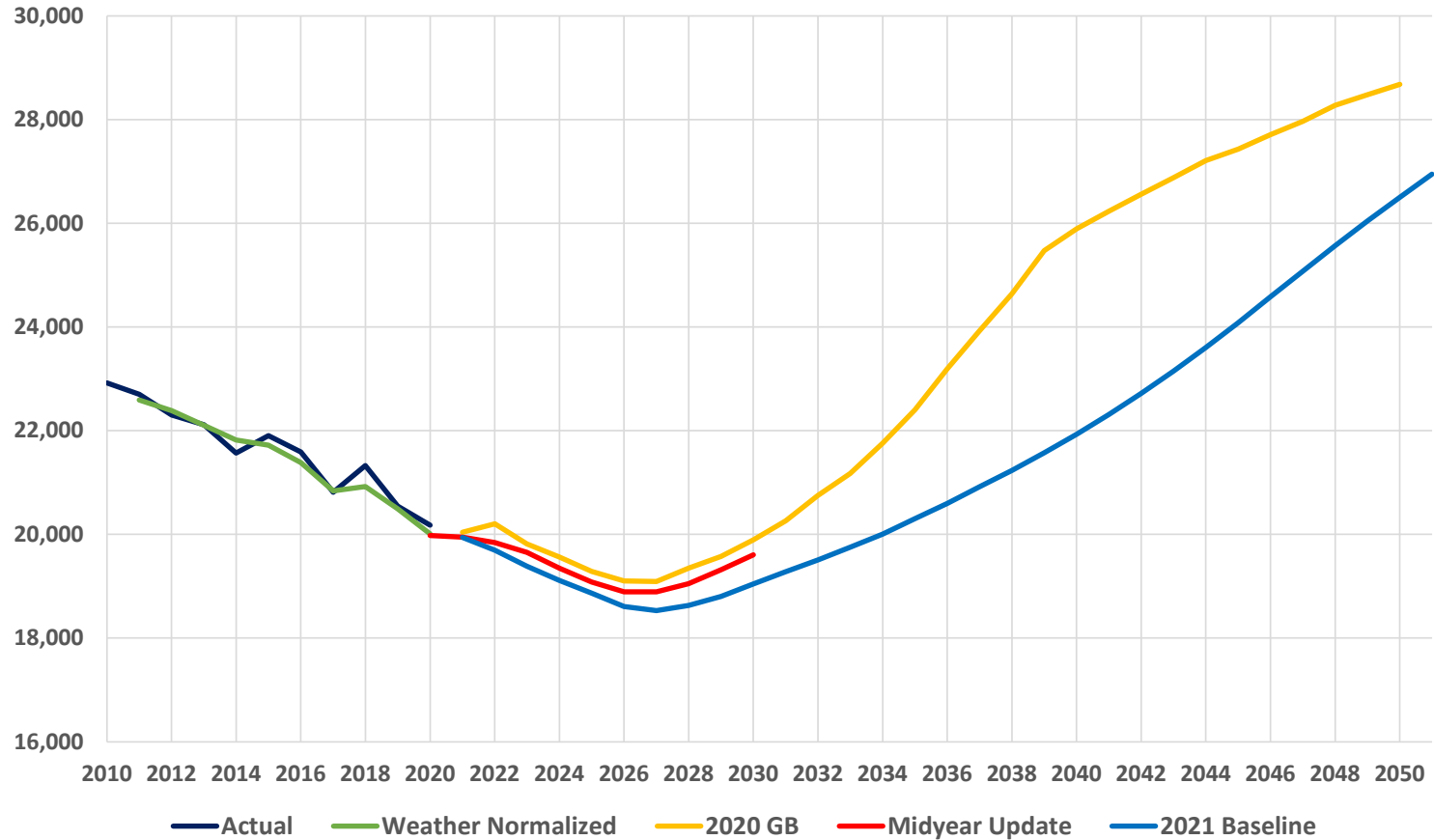
# Zones H&I Baseline Annual Energy (GWh)



# Zone J Baseline Annual Energy (GWh)



# Zone K Baseline Annual Energy (GWh)



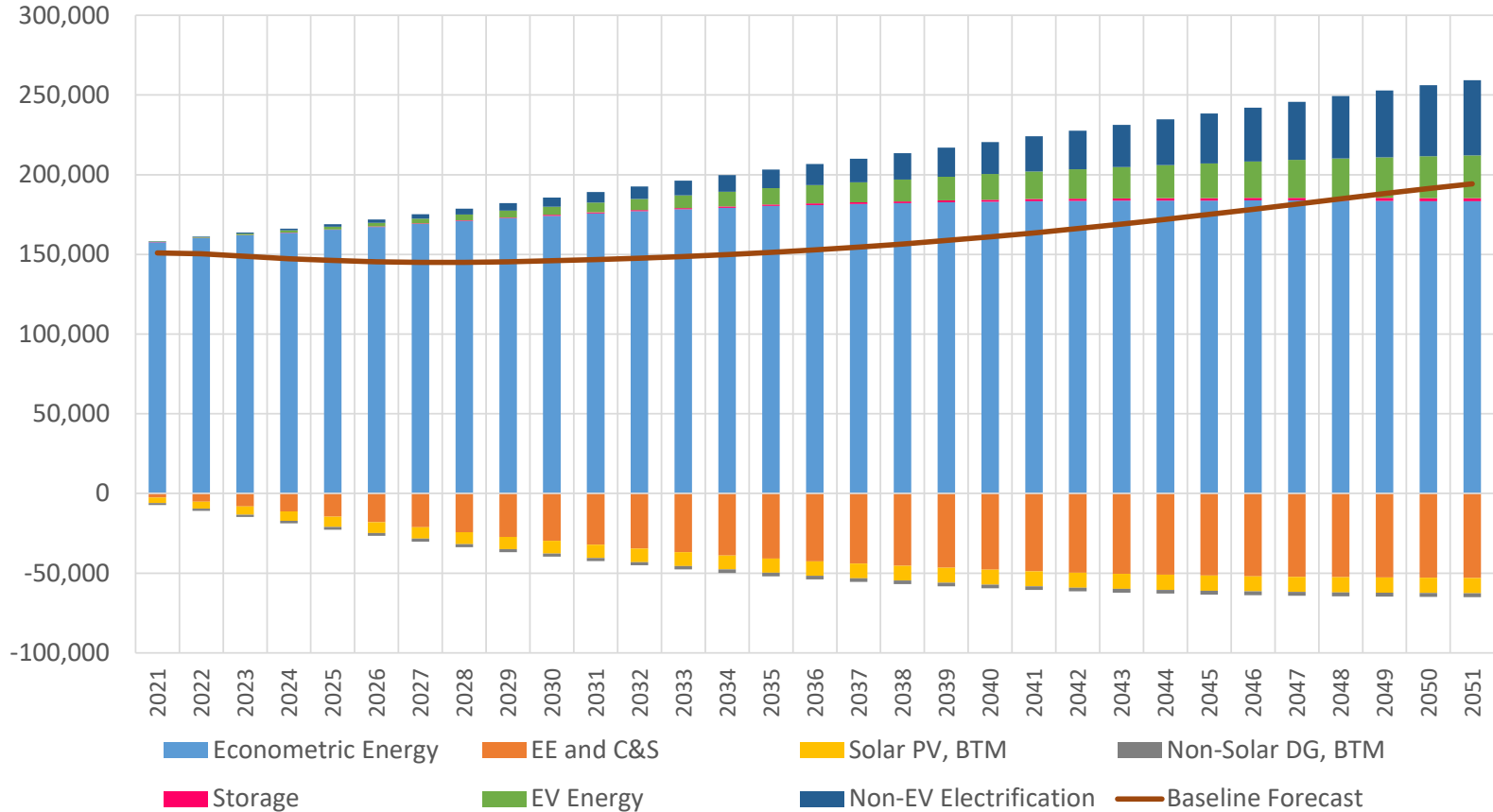
## Baseline Annual Energy Forecast by Zone - GWh

Year	A	B	C	D	E	F	G	H	I	J	K	NYCA
2021	14,604	9,799	15,541	5,514	7,727	11,795	9,142	2,860	5,749	48,310	19,939	150,980
2022	14,557	9,791	15,425	5,991	7,608	11,738	8,967	2,861	5,758	48,091	19,693	150,480
2023	14,361	9,736	15,252	6,068	7,455	11,638	8,829	2,861	5,760	47,554	19,386	148,900
2024	14,100	9,671	15,134	6,061	7,336	11,511	8,697	2,855	5,711	47,130	19,114	147,320
2025	13,936	9,540	15,023	6,058	7,298	11,352	8,657	2,852	5,667	46,922	18,865	146,170
2026	13,765	9,463	14,988	6,035	7,276	11,272	8,613	2,858	5,647	46,803	18,610	145,330
2027	13,674	9,388	14,930	6,018	7,252	11,223	8,590	2,865	5,653	46,835	18,532	144,960
2028	13,637	9,348	14,866	6,012	7,219	11,252	8,570	2,873	5,667	46,995	18,631	145,070
2029	13,629	9,326	14,794	6,005	7,189	11,277	8,547	2,877	5,687	47,225	18,804	145,360
2030	13,679	9,319	14,751	6,004	7,182	11,307	8,576	2,885	5,713	47,498	19,046	145,960
2031	13,713	9,339	14,675	6,007	7,177	11,377	8,595	2,896	5,753	47,878	19,280	146,690
2032	13,757	9,362	14,622	6,009	7,178	11,448	8,623	2,910	5,799	48,314	19,508	147,530
2033	13,832	9,395	14,599	6,016	7,184	11,526	8,673	2,929	5,859	48,844	19,753	148,610
2034	13,925	9,433	14,600	6,022	7,199	11,607	8,730	2,954	5,922	49,412	20,006	149,810
2035	14,037	9,484	14,636	6,032	7,221	11,693	8,811	2,982	5,995	50,057	20,302	151,250
2036	14,153	9,541	14,710	6,044	7,251	11,787	8,899	3,013	6,075	50,769	20,598	152,840
2037	14,271	9,610	14,815	6,057	7,288	11,889	9,002	3,050	6,162	51,560	20,916	154,620
2038	14,403	9,683	14,941	6,070	7,333	12,005	9,118	3,094	6,257	52,391	21,235	156,530
2039	14,543	9,768	15,085	6,090	7,385	12,130	9,266	3,137	6,367	53,343	21,576	158,690
2040	14,701	9,875	15,263	6,109	7,451	12,275	9,429	3,185	6,476	54,283	21,933	160,980
2041	14,897	10,021	15,496	6,128	7,533	12,448	9,626	3,237	6,585	55,247	22,312	163,530
2042	15,127	10,196	15,764	6,150	7,636	12,647	9,834	3,292	6,686	56,133	22,715	166,180
2043	15,377	10,388	16,058	6,176	7,749	12,862	10,063	3,356	6,792	57,071	23,148	169,040
2044	15,636	10,590	16,354	6,202	7,873	13,086	10,294	3,419	6,899	58,021	23,606	171,980
2045	15,912	10,801	16,665	6,229	8,004	13,328	10,533	3,485	7,013	59,018	24,082	175,070
2046	16,205	11,024	16,964	6,255	8,146	13,586	10,778	3,555	7,127	60,049	24,581	178,270
2047	16,506	11,257	17,287	6,285	8,295	13,850	11,030	3,626	7,245	61,113	25,076	181,570
2048	16,801	11,491	17,625	6,316	8,443	14,116	11,279	3,700	7,363	62,158	25,568	184,860
2049	17,102	11,728	17,946	6,345	8,592	14,381	11,525	3,772	7,477	63,186	26,046	188,100
2050	17,394	11,959	18,260	6,372	8,738	14,640	11,767	3,841	7,589	64,177	26,503	191,240
2051	17,679	12,187	18,563	6,400	8,880	14,890	12,008	3,907	7,696	65,133	26,947	194,290

**Table I-1b: Summary of NYCA Baseline Annual Energy Forecasts - GWh**

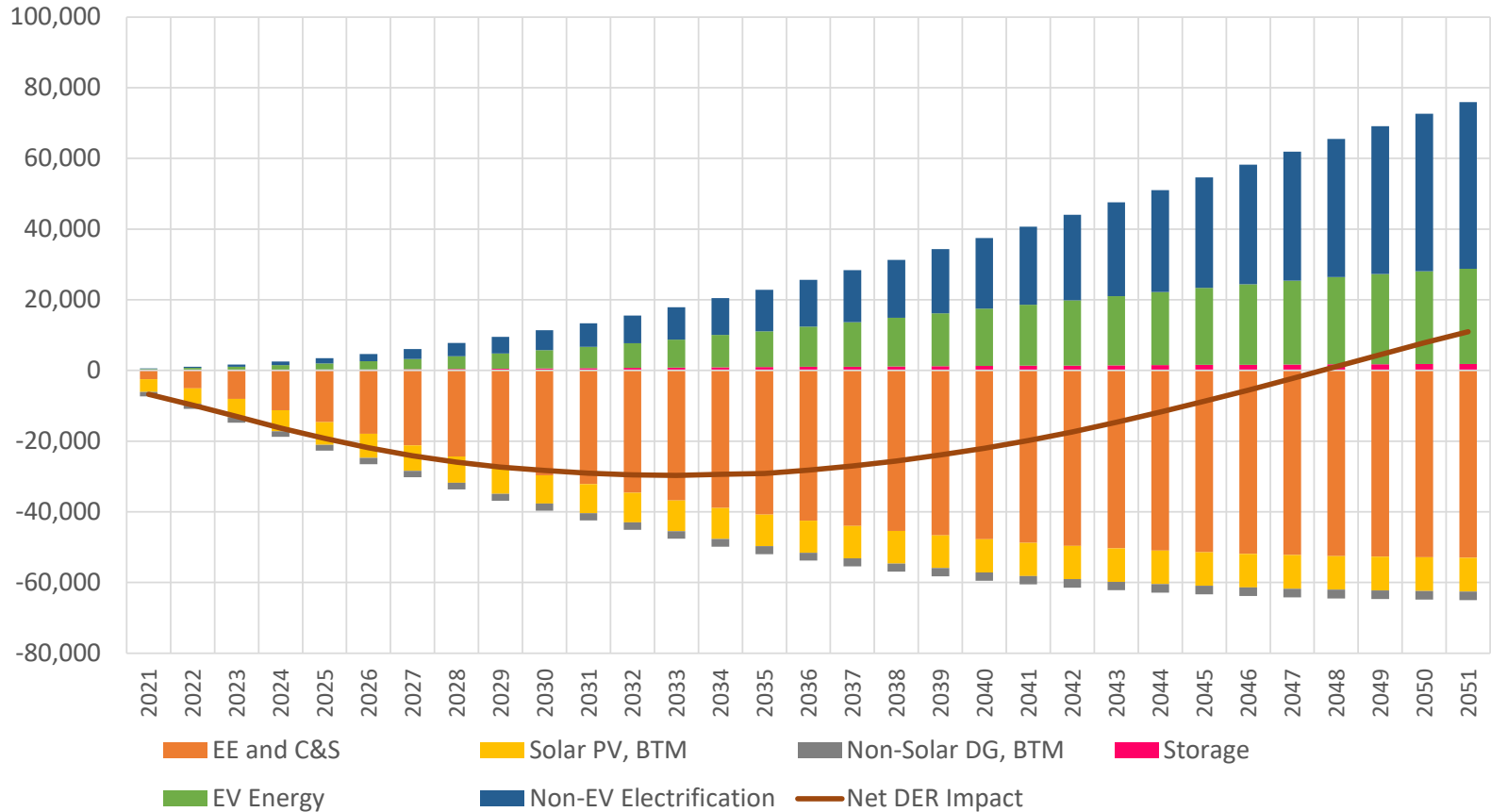
Year	(a) Econometric Energy	(b) (-) EE and C&S	(c) = a - b End-Use Energy	(d) (-) Solar PV, BTM	(e) (-) Non-Solar DG, BTM	(f) (+) Storage Net Energy Consumption	(g) (+) EV Energy	(h) (+) Non-EV Electrification	(i) = c-d-e+f+g+h Baseline Annual Energy Forecast
2021	157,704	2,495	155,209	3,545	1,267	50	371	162	150,980
2022	160,272	5,096	155,176	4,377	1,396	84	627	366	150,480
2023	161,941	8,063	153,878	5,169	1,501	127	933	632	148,900
2024	163,591	11,210	152,381	5,978	1,592	181	1,311	1,017	147,320
2025	165,404	14,593	150,811	6,439	1,678	241	1,784	1,451	146,170
2026	167,194	17,934	149,260	6,817	1,745	308	2,299	2,025	145,330
2027	169,067	21,200	147,867	7,162	1,809	375	2,906	2,783	144,960
2028	170,973	24,314	146,659	7,476	1,866	446	3,583	3,724	145,070
2029	172,683	27,178	145,505	7,760	1,922	518	4,323	4,696	145,360
2030	174,239	29,659	144,580	8,013	1,975	590	5,132	5,646	145,960
2031	175,773	32,145	143,628	8,243	2,027	661	6,010	6,661	146,690
2032	177,037	34,556	142,481	8,450	2,076	735	6,941	7,899	147,530
2033	178,271	36,815	141,456	8,637	2,123	808	7,945	9,161	148,610
2034	179,225	38,884	140,341	8,812	2,162	879	9,157	10,407	149,810
2035	180,377	40,773	139,604	8,969	2,198	946	10,170	11,697	151,250
2036	181,009	42,478	138,531	9,086	2,233	1,016	11,421	13,191	152,840
2037	181,638	44,004	137,634	9,178	2,262	1,080	12,576	14,770	154,620
2038	182,123	45,377	136,746	9,252	2,288	1,147	13,742	16,435	156,530
2039	182,612	46,623	135,989	9,304	2,314	1,210	14,933	18,176	158,690
2040	182,962	47,768	135,194	9,354	2,339	1,273	16,223	19,983	160,980
2041	183,388	48,774	134,614	9,387	2,362	1,336	17,284	22,045	163,530
2042	183,539	49,644	133,895	9,414	2,380	1,394	18,447	24,238	166,180
2043	183,670	50,363	133,307	9,439	2,395	1,452	19,593	26,522	169,040
2044	183,761	50,966	132,795	9,457	2,409	1,508	20,706	28,837	171,980
2045	183,789	51,468	132,321	9,477	2,421	1,568	21,789	31,290	175,070
2046	183,826	51,895	131,931	9,492	2,432	1,619	22,804	33,840	178,270
2047	183,841	52,241	131,600	9,507	2,439	1,672	23,777	36,467	181,570
2048	183,796	52,512	131,284	9,522	2,446	1,725	24,693	39,126	184,860
2049	183,629	52,702	130,927	9,533	2,450	1,772	25,530	41,854	188,100
2050	183,444	52,851	130,593	9,543	2,454	1,824	26,274	44,546	191,240
2051	183,348	53,000	130,348	9,552	2,458	1,873	26,905	47,174	194,290

# Baseline Annual Energy Forecast Components - GWh



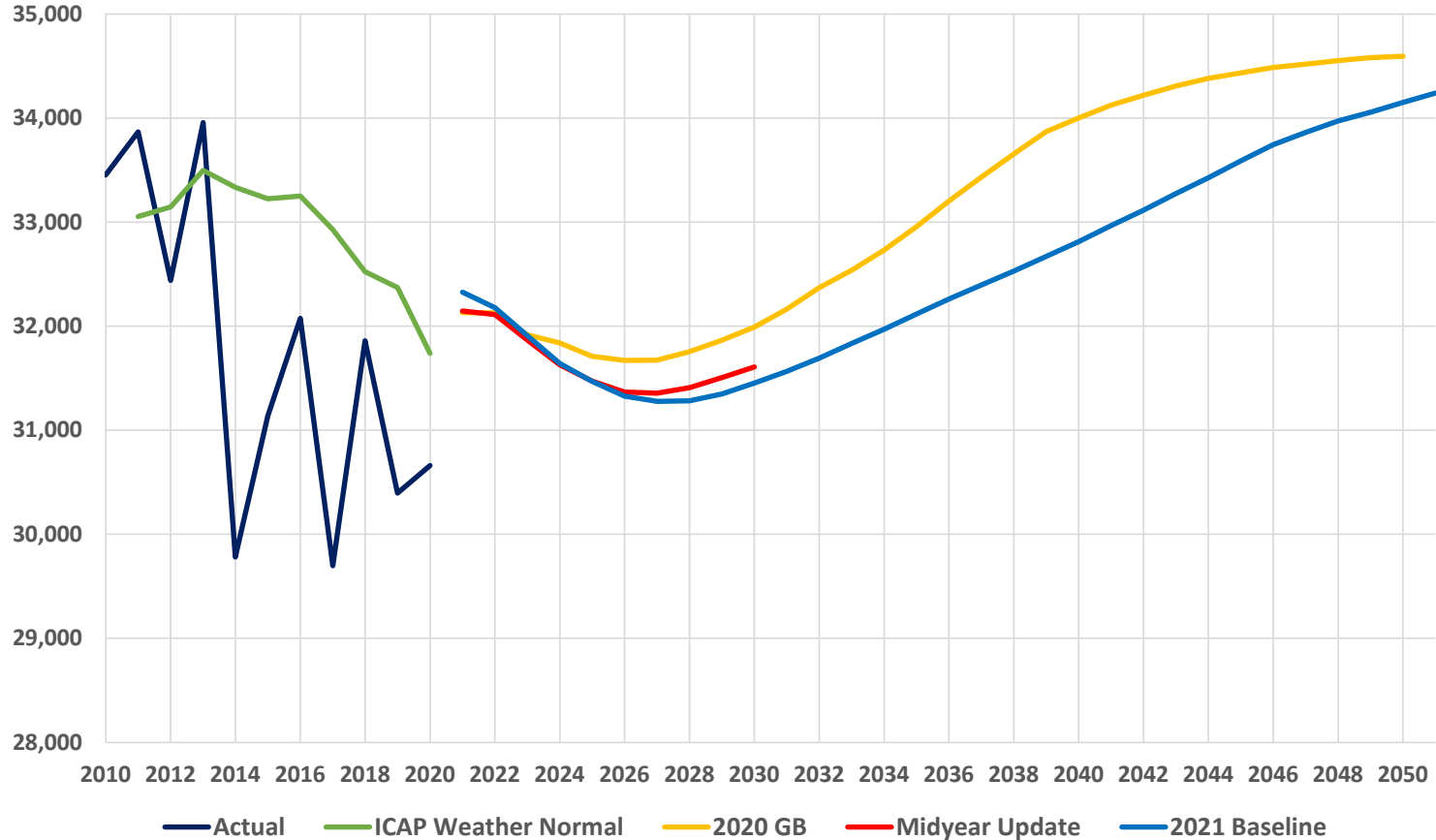


# Baseline Annual Energy Forecast Net DER Impacts - GWh



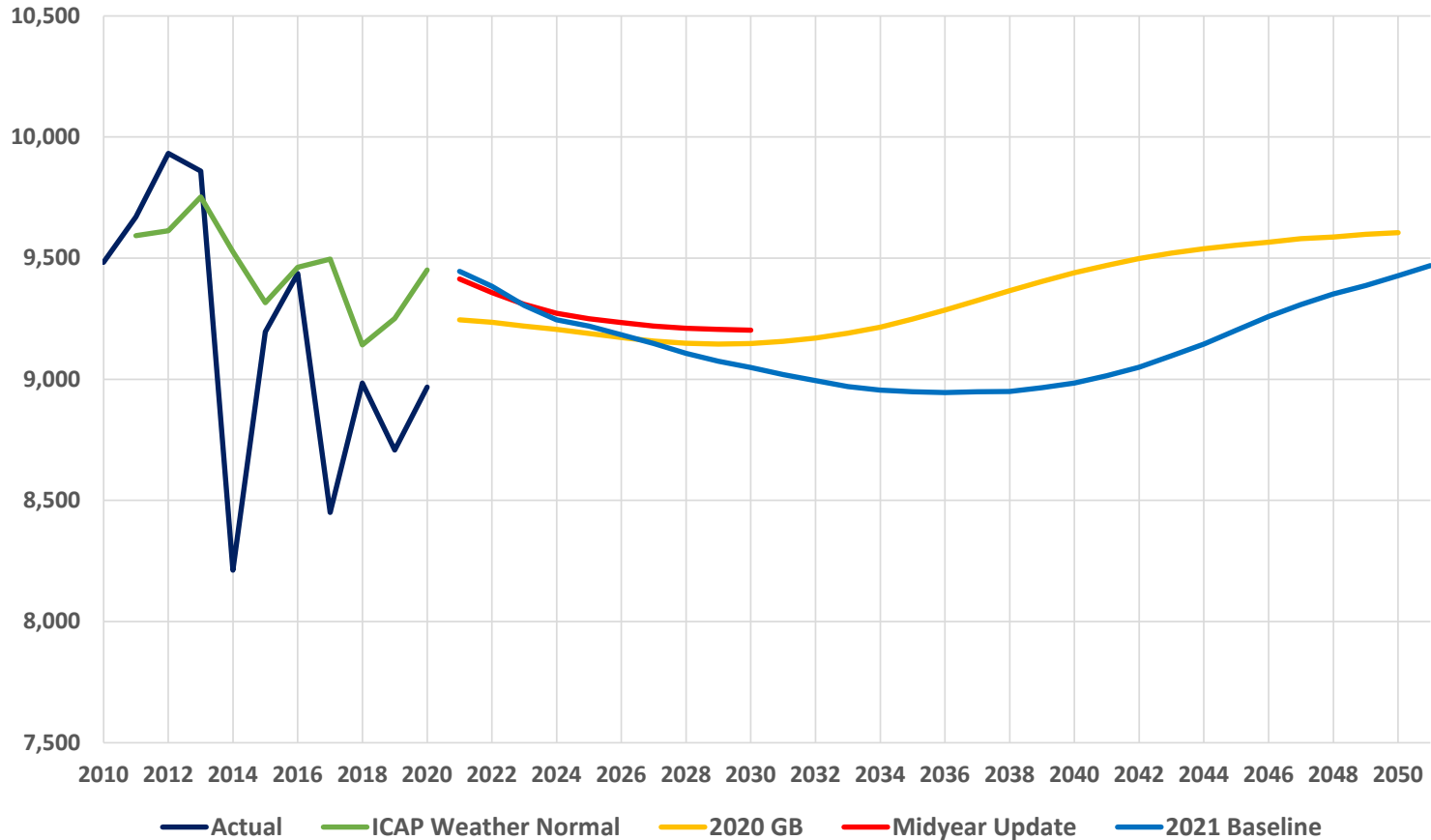
# Baseline Summer Peak Forecast

# NYCA Baseline Summer Coincident Peak (MW)



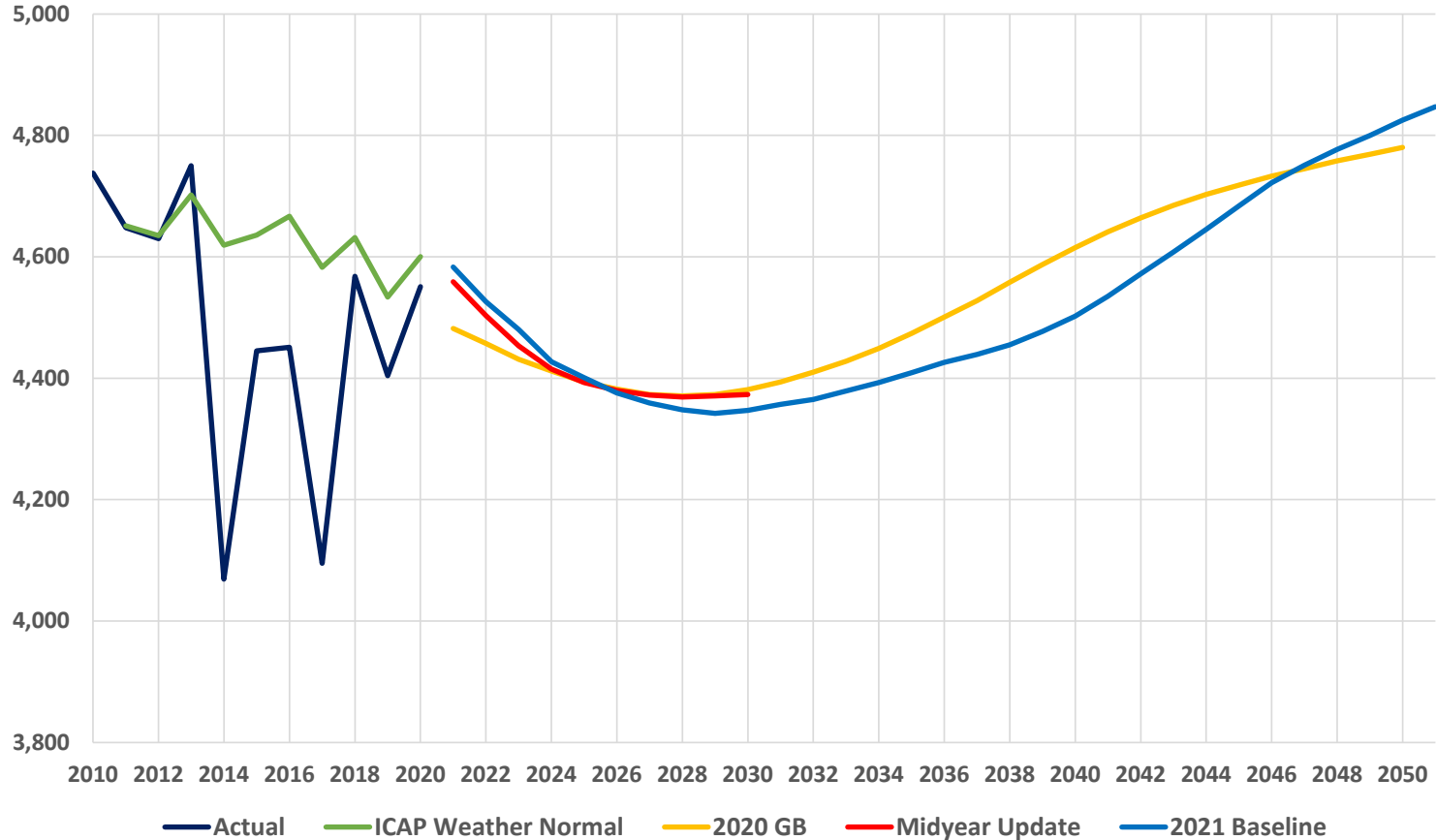
- Actual historical values reflect metered load.
- ICAP weather normal values include demand response added back onto the load, and reflect the adjusted load at design weather conditions. The NYCA aggregate design condition is the 57<sup>th</sup> percentile.
- Forecast values assume no reductions due to demand response and assume trended 57<sup>th</sup> percentile weather.

## Zones A to E Baseline Summer Coincident Peak (MW)



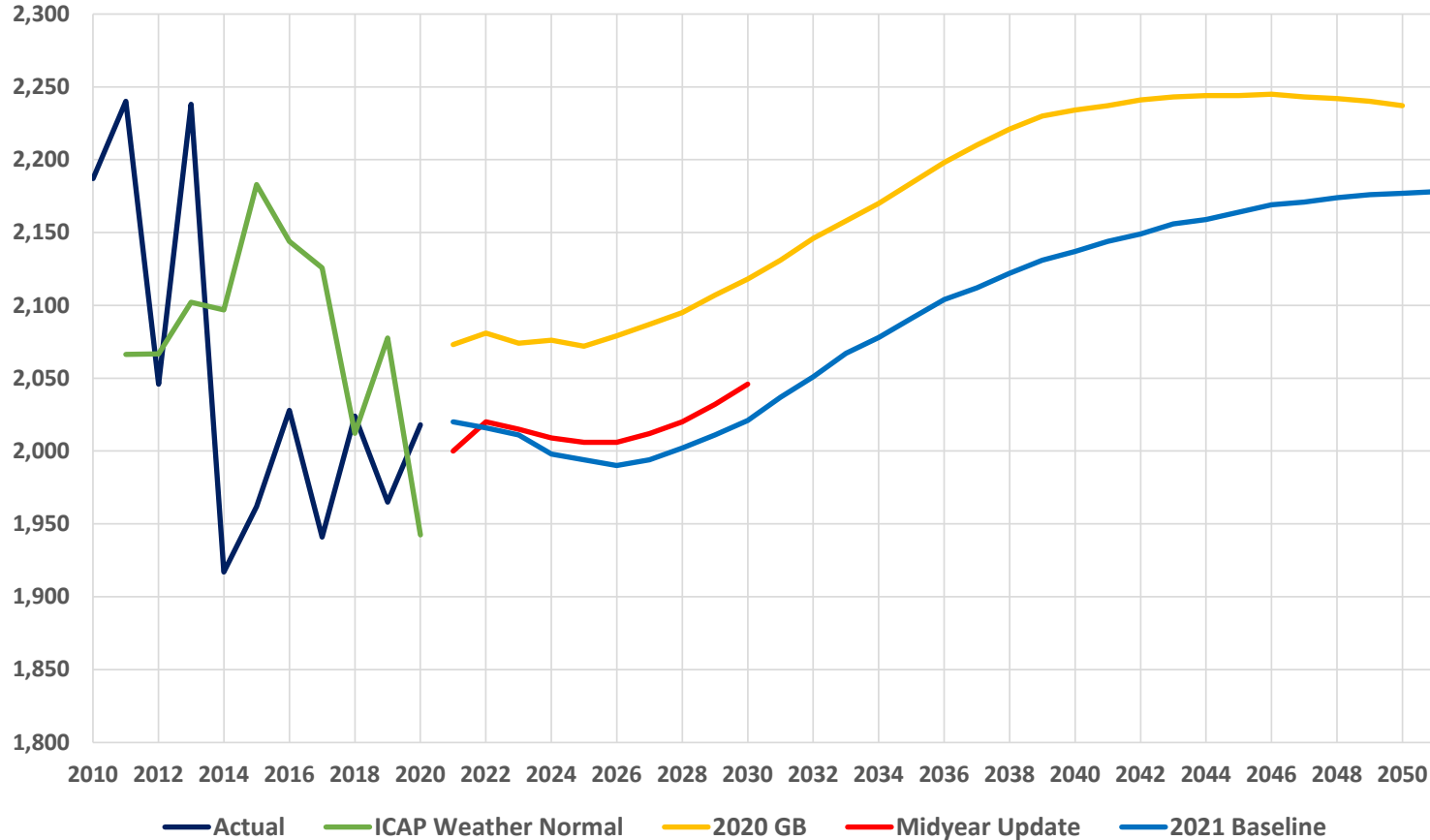
- Actual historical values reflect metered load.
- ICAP weather normal values include demand response added back onto the load, and reflect the adjusted load at design weather conditions. The Zones A to E design condition is the 50<sup>th</sup> percentile.
- Forecast values assume no reductions due to demand response and assume trended 50<sup>th</sup> percentile weather.

## Zones F&G Baseline Summer Coincident Peak (MW)



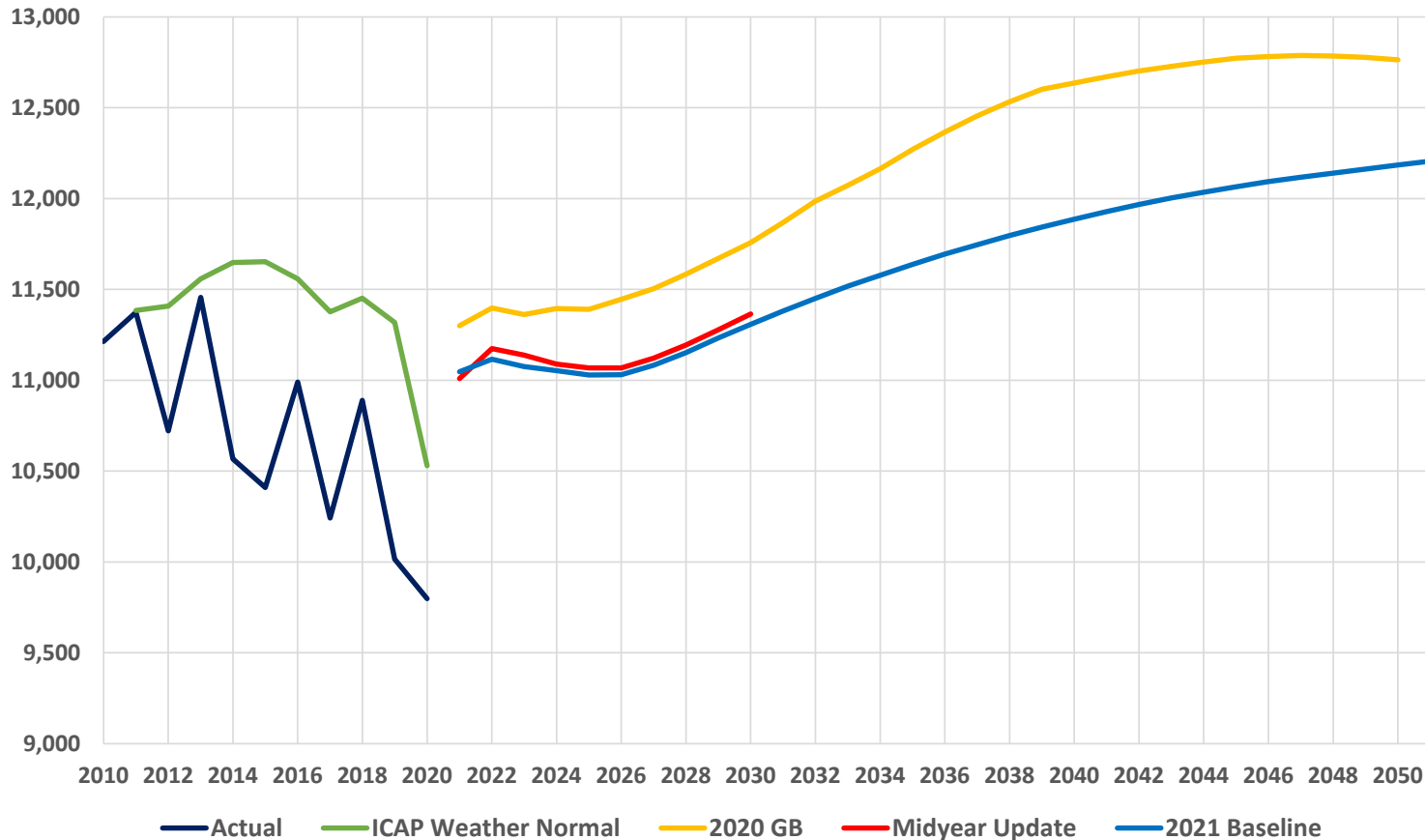
- Actual historical values reflect metered load.
- ICAP weather normal values include demand response added back onto the load, and reflect the adjusted load at design weather conditions. The Zones F&G aggregate design condition is the 54<sup>th</sup> percentile.
- Forecast values assume no reductions due to demand response and assume trended 54<sup>th</sup> percentile weather.

## Zones H&I Baseline Summer Coincident Peak (MW)



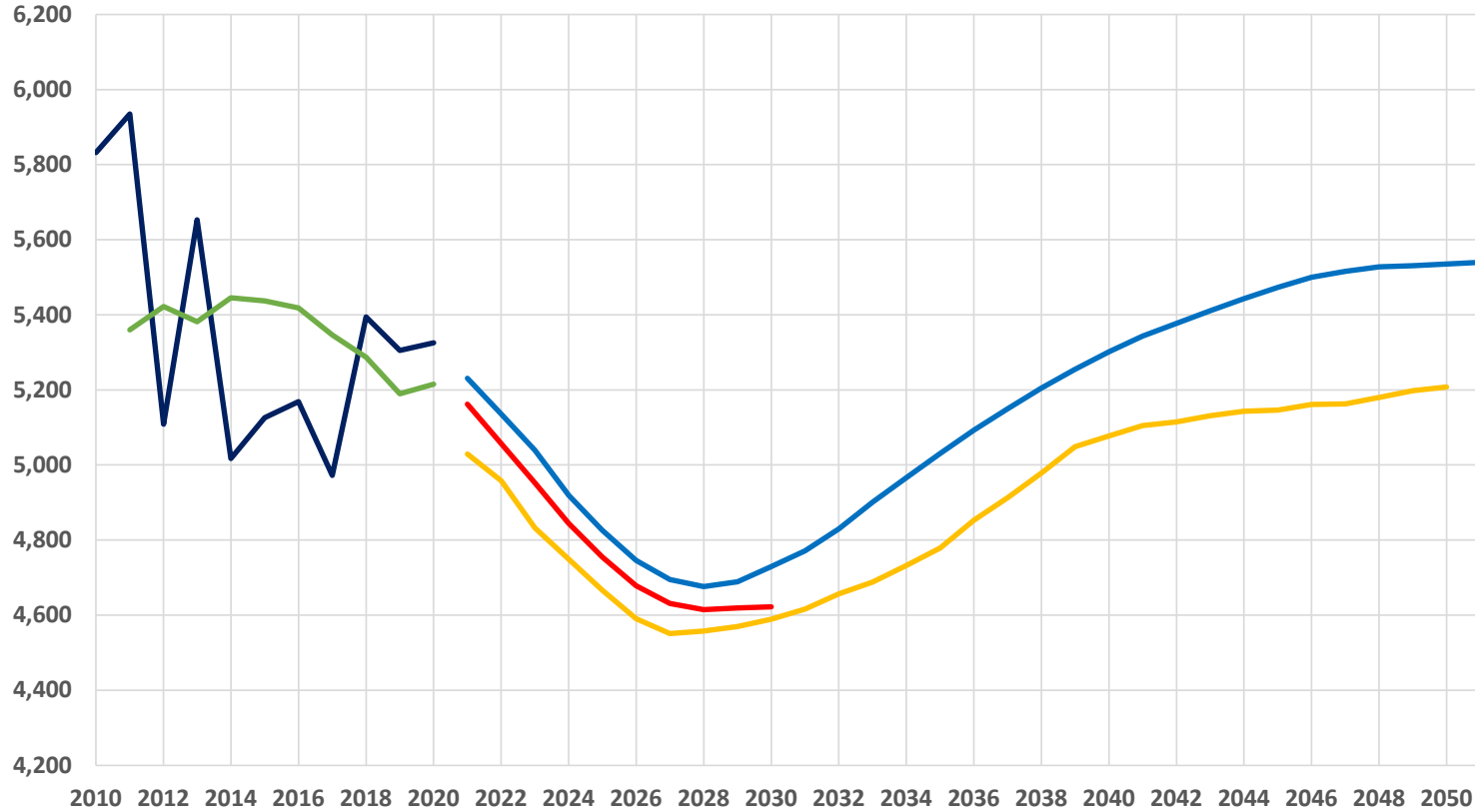
- Actual historical values reflect metered load.
- ICAP weather normal values include demand response added back onto the load, and reflect the adjusted load at design weather conditions. The Zones H&I aggregate design condition is the 64<sup>th</sup> percentile.
- Forecast values assume no reductions due to demand response and assume trended 64<sup>th</sup> percentile weather.

## Zone J Baseline Summer Coincident Peak (MW)



- Actual historical values reflect metered load.
- ICAP weather normal values include demand response added back onto the load, and reflect the adjusted load at design weather conditions. The Zone J design condition is the 67<sup>th</sup> percentile.
- Forecast values assume no reductions due to demand response and assume trended 67<sup>th</sup> percentile weather.

## Zone K Baseline Summer Coincident Peak (MW)



- Actual historical values reflect metered load.
- ICAP weather normal values include demand response added back onto the load, and reflect the adjusted load at design weather conditions. The Zone K design condition is the 50<sup>th</sup> percentile.
- Forecast values assume no reductions due to demand response and assume trended 50<sup>th</sup> percentile weather.



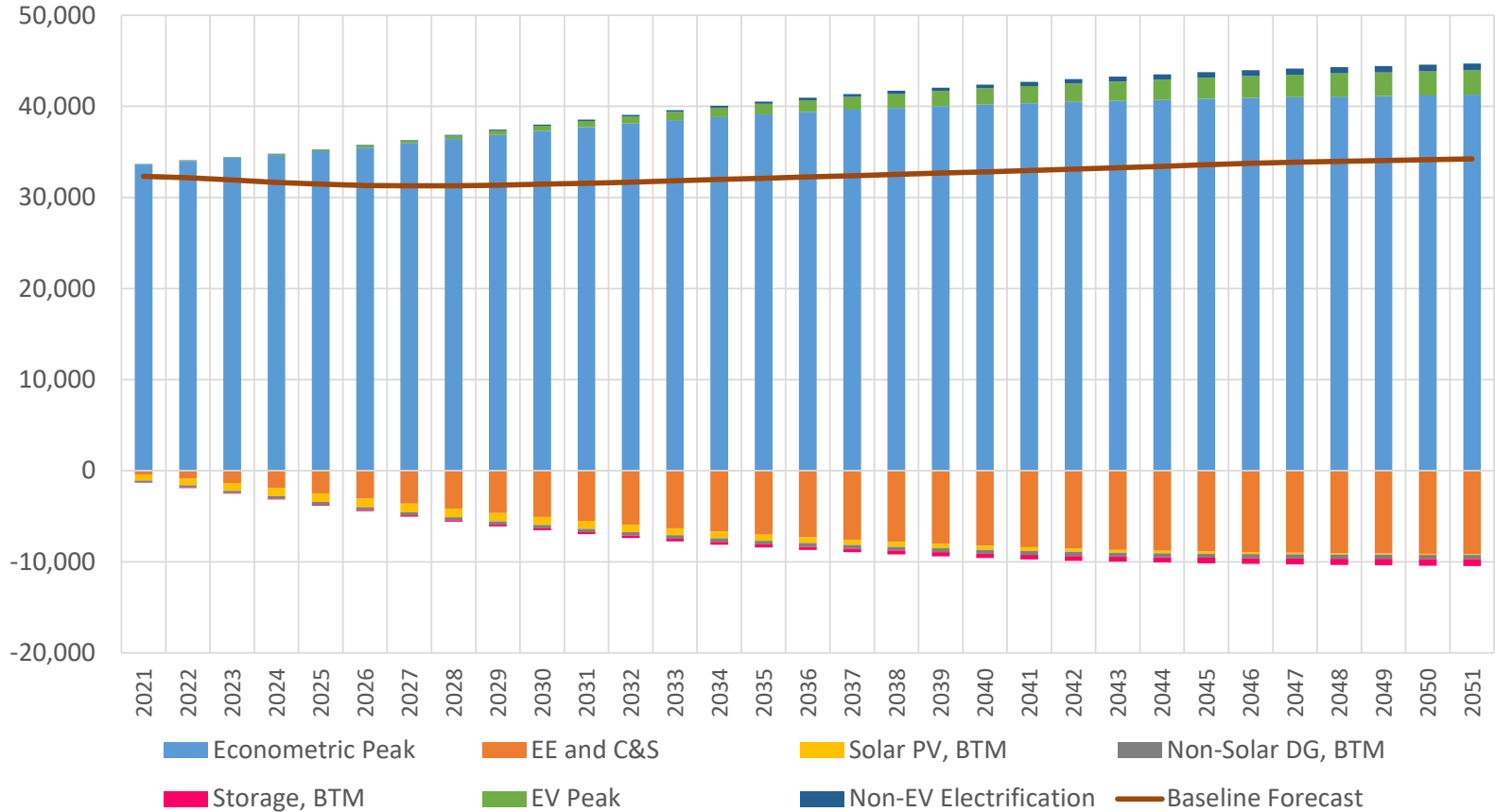
## Coincident Summer Peak Demand Forecast by Zone - MW

Year	A	B	C	D	E	F	G	H	I	J	K	NYCA
2021	2,694	1,965	2,796	619	1,372	2,364	2,219	638	1,382	11,047	5,231	32,327
2022	2,644	1,943	2,762	676	1,359	2,347	2,179	637	1,379	11,116	5,136	32,178
2023	2,604	1,932	2,732	688	1,349	2,335	2,145	636	1,375	11,075	5,039	31,910
2024	2,584	1,914	2,718	688	1,341	2,314	2,113	632	1,366	11,052	4,919	31,641
2025	2,568	1,908	2,716	688	1,340	2,304	2,097	630	1,364	11,029	4,826	31,470
2026	2,551	1,897	2,712	686	1,337	2,297	2,079	629	1,361	11,031	4,746	31,326
2027	2,532	1,892	2,706	683	1,335	2,293	2,066	631	1,363	11,082	4,695	31,278
2028	2,516	1,884	2,694	682	1,331	2,291	2,057	634	1,368	11,151	4,676	31,284
2029	2,505	1,880	2,683	680	1,326	2,291	2,051	636	1,375	11,232	4,689	31,348
2030	2,499	1,875	2,671	680	1,323	2,295	2,052	639	1,382	11,308	4,729	31,453
2031	2,494	1,867	2,659	679	1,320	2,301	2,056	645	1,392	11,381	4,771	31,565
2032	2,492	1,862	2,645	679	1,317	2,308	2,057	649	1,402	11,450	4,830	31,691
2033	2,490	1,856	2,629	679	1,316	2,319	2,060	654	1,413	11,517	4,901	31,834
2034	2,492	1,851	2,619	679	1,314	2,329	2,064	657	1,421	11,578	4,966	31,970
2035	2,496	1,848	2,610	681	1,313	2,337	2,072	661	1,430	11,638	5,031	32,117
2036	2,501	1,847	2,604	681	1,314	2,347	2,079	666	1,438	11,694	5,093	32,264
2037	2,504	1,846	2,600	682	1,316	2,354	2,085	667	1,445	11,746	5,150	32,395
2038	2,508	1,845	2,598	682	1,317	2,360	2,095	671	1,451	11,796	5,205	32,528
2039	2,516	1,849	2,596	683	1,321	2,369	2,108	674	1,457	11,843	5,255	32,671
2040	2,524	1,855	2,597	684	1,325	2,379	2,123	675	1,462	11,887	5,301	32,812
2041	2,534	1,863	2,600	686	1,332	2,392	2,143	678	1,466	11,929	5,343	32,966
2042	2,547	1,875	2,604	687	1,337	2,407	2,165	679	1,470	11,967	5,377	33,115
2043	2,562	1,890	2,610	688	1,347	2,421	2,187	683	1,473	12,003	5,411	33,275
2044	2,577	1,905	2,617	690	1,356	2,437	2,208	683	1,476	12,035	5,443	33,427
2045	2,594	1,921	2,631	691	1,366	2,453	2,231	684	1,480	12,065	5,473	33,589
2046	2,611	1,936	2,646	692	1,374	2,471	2,251	687	1,482	12,093	5,500	33,743
2047	2,624	1,949	2,660	694	1,381	2,484	2,267	687	1,484	12,117	5,516	33,863
2048	2,636	1,959	2,672	696	1,389	2,494	2,283	689	1,485	12,140	5,528	33,971
2049	2,646	1,968	2,682	697	1,393	2,504	2,296	690	1,486	12,162	5,531	34,055
2050	2,658	1,979	2,694	698	1,399	2,515	2,310	690	1,487	12,185	5,535	34,150
2051	2,670	1,988	2,706	699	1,406	2,522	2,325	690	1,488	12,206	5,540	34,240

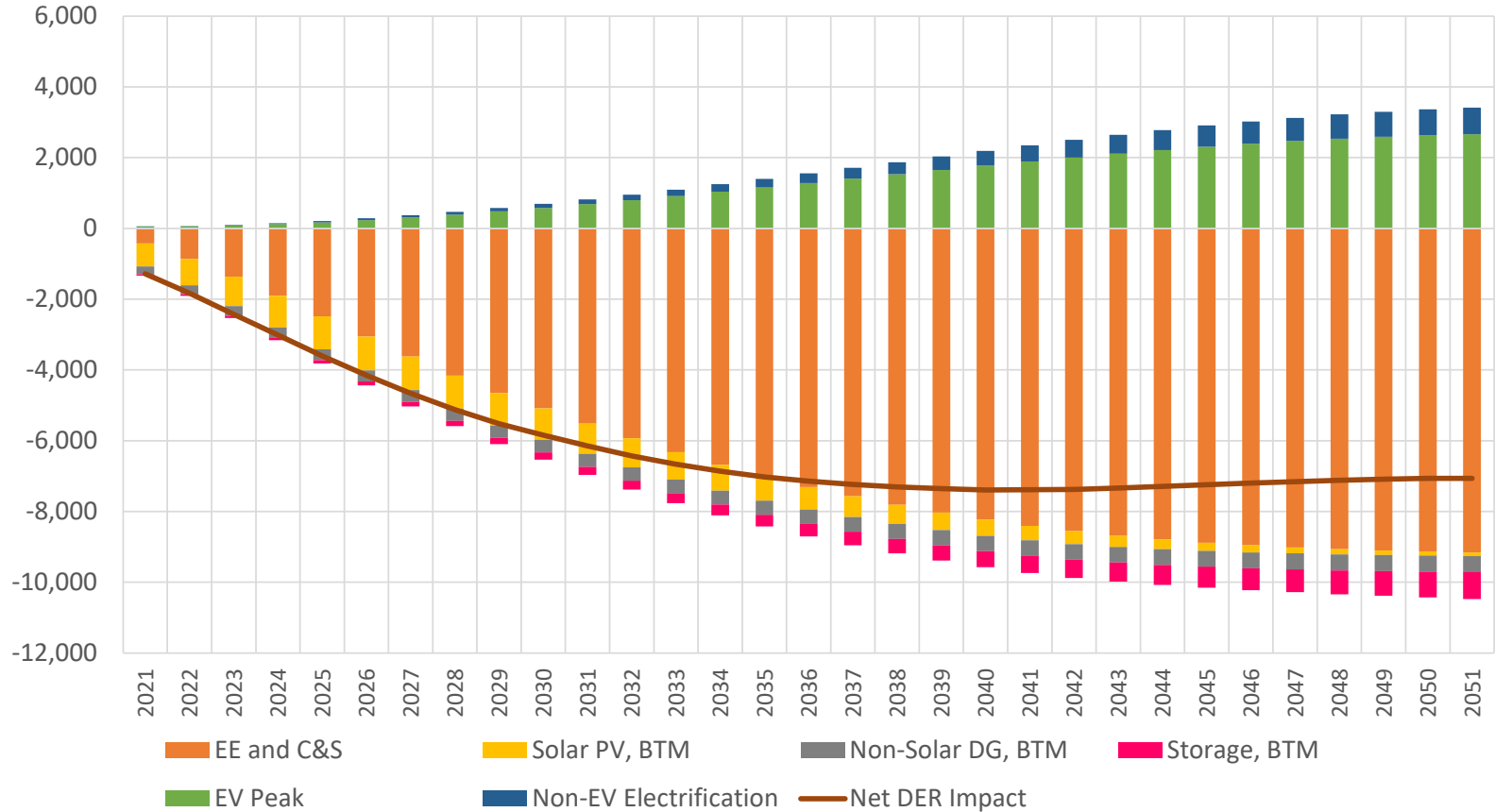
**Table I-1c: Summary of NYCA Baseline Summer Coincident Peak Demand Forecasts - MW**

Year	(a) Econometric Peak Demand	(b) (-) EE and C&S	(c) = a - b End-Use Peak Demand	(d) (-) Solar PV, BTM	(e) (-) Non-Solar DG, BTM	(f) (-) BTM Storage Peak Reductions	(g) (+) EV Peak Demand	(h) (+) Non-EV Electrification	(i) = c-d-e-f+g+h Baseline Summer Peak Forecast
2021	33,606	423	33,183	650	223	38	51	4	32,327
2022	34,012	860	33,152	749	248	49	61	11	32,178
2023	34,334	1,364	32,970	834	268	62	84	20	31,910
2024	34,653	1,902	32,751	895	286	78	121	28	31,641
2025	35,072	2,488	32,584	931	300	96	173	40	31,470
2026	35,478	3,059	32,419	951	314	115	235	52	31,326
2027	35,934	3,620	32,314	948	327	135	308	66	31,278
2028	36,403	4,161	32,242	936	338	155	389	82	31,284
2029	36,865	4,652	32,213	916	350	180	485	96	31,348
2030	37,292	5,082	32,210	889	359	204	581	114	31,453
2031	37,712	5,514	32,198	856	370	229	689	133	31,565
2032	38,117	5,933	32,184	817	378	253	801	154	31,691
2033	38,500	6,325	32,175	774	387	278	916	182	31,834
2034	38,829	6,684	32,145	728	394	303	1,037	213	31,970
2035	39,139	7,012	32,127	679	401	330	1,158	242	32,117
2036	39,407	7,307	32,100	634	409	353	1,283	277	32,264
2037	39,632	7,571	32,061	586	415	381	1,408	308	32,395
2038	39,833	7,812	32,021	542	419	406	1,531	343	32,528
2039	40,022	8,030	31,992	497	425	433	1,655	379	32,671
2040	40,201	8,229	31,972	457	430	461	1,776	412	32,812
2041	40,350	8,405	31,945	408	435	487	1,894	457	32,966
2042	40,488	8,559	31,929	364	439	514	2,006	497	33,115
2043	40,613	8,685	31,928	317	442	537	2,113	530	33,275
2044	40,720	8,791	31,929	273	445	565	2,216	565	33,427
2045	40,835	8,881	31,954	234	447	593	2,311	598	33,589
2046	40,943	8,958	31,985	197	449	618	2,395	627	33,743
2047	41,017	9,018	31,999	168	451	644	2,470	657	33,863
2048	41,089	9,068	32,021	146	452	674	2,537	685	33,971
2049	41,140	9,101	32,039	130	453	700	2,589	710	34,055
2050	41,210	9,128	32,082	115	454	728	2,633	732	34,150
2051	41,302	9,155	32,147	105	455	757	2,663	747	34,240

# Baseline Summer Peak Forecast Components - MW



# Baseline Summer Peak Forecast Net DER Impacts - MW



## Non-Coincident Summer Peak Demand Forecast by Zone - MW

Year	A	B	C	D	E	F	G	H	I	J	K
2021	2,852	2,027	2,863	633	1,431	2,402	2,256	649	1,403	11,199	5,249
2022	2,799	2,005	2,828	692	1,418	2,385	2,215	648	1,400	11,268	5,153
2023	2,757	1,993	2,798	704	1,407	2,372	2,181	647	1,396	11,227	5,056
2024	2,736	1,975	2,783	704	1,399	2,351	2,148	643	1,387	11,203	4,936
2025	2,719	1,968	2,781	704	1,398	2,341	2,132	641	1,385	11,180	4,842
2026	2,701	1,957	2,777	702	1,395	2,334	2,114	640	1,382	11,182	4,762
2027	2,681	1,952	2,771	699	1,393	2,330	2,100	642	1,384	11,234	4,711
2028	2,664	1,944	2,759	698	1,388	2,328	2,091	645	1,389	11,304	4,692
2029	2,652	1,940	2,747	696	1,383	2,328	2,085	647	1,396	11,386	4,705
2030	2,646	1,934	2,735	696	1,380	2,332	2,086	650	1,403	11,463	4,745
2031	2,640	1,926	2,723	695	1,377	2,338	2,090	656	1,413	11,537	4,787
2032	2,638	1,921	2,708	695	1,374	2,345	2,091	660	1,423	11,607	4,846
2033	2,636	1,915	2,692	695	1,373	2,356	2,094	665	1,434	11,675	4,918
2034	2,638	1,910	2,682	695	1,371	2,366	2,098	668	1,443	11,737	4,983
2035	2,643	1,907	2,673	697	1,370	2,374	2,106	672	1,452	11,797	5,048
2036	2,648	1,906	2,666	697	1,371	2,385	2,114	678	1,460	11,854	5,110
2037	2,651	1,905	2,662	698	1,373	2,392	2,120	679	1,467	11,907	5,168
2038	2,655	1,903	2,660	698	1,374	2,398	2,130	683	1,473	11,958	5,223
2039	2,664	1,908	2,658	699	1,378	2,407	2,143	686	1,479	12,005	5,273
2040	2,672	1,914	2,659	700	1,382	2,417	2,158	687	1,484	12,050	5,319
2041	2,683	1,922	2,662	702	1,390	2,430	2,179	690	1,488	12,092	5,361
2042	2,697	1,934	2,666	703	1,395	2,446	2,201	691	1,492	12,131	5,395
2043	2,712	1,950	2,673	704	1,405	2,460	2,223	695	1,495	12,167	5,429
2044	2,728	1,965	2,680	706	1,415	2,476	2,245	695	1,498	12,200	5,462
2045	2,746	1,982	2,694	707	1,425	2,492	2,268	696	1,502	12,230	5,492
2046	2,764	1,997	2,710	708	1,433	2,511	2,288	699	1,505	12,259	5,519
2047	2,778	2,011	2,724	710	1,441	2,524	2,305	699	1,507	12,283	5,535
2048	2,791	2,021	2,736	712	1,449	2,534	2,321	701	1,508	12,306	5,547
2049	2,801	2,030	2,746	713	1,453	2,544	2,334	702	1,509	12,329	5,550
2050	2,814	2,042	2,759	714	1,459	2,555	2,348	702	1,510	12,352	5,554
2051	2,827	2,051	2,771	715	1,467	2,562	2,364	702	1,511	12,373	5,559

## G-to-J Locality Summer Peak Demand by Zone - MW

Year	G	H	I	J	G-J
2021	2,237	643	1,394	11,137	15,411
2022	2,197	642	1,390	11,206	15,435
2023	2,162	641	1,386	11,165	15,354
2024	2,130	637	1,377	11,142	15,286
2025	2,114	635	1,375	11,118	15,242
2026	2,096	634	1,372	11,120	15,222
2027	2,083	636	1,374	11,172	15,265
2028	2,074	639	1,379	11,241	15,333
2029	2,068	641	1,386	11,323	15,418
2030	2,069	644	1,393	11,400	15,506
2031	2,073	650	1,403	11,473	15,599
2032	2,074	654	1,413	11,543	15,684
2033	2,077	659	1,424	11,610	15,770
2034	2,081	662	1,433	11,672	15,848
2035	2,089	666	1,442	11,732	15,929
2036	2,096	671	1,450	11,789	16,006
2037	2,102	672	1,457	11,841	16,072
2038	2,112	676	1,463	11,892	16,143
2039	2,125	679	1,469	11,939	16,212
2040	2,140	680	1,474	11,983	16,277
2041	2,160	683	1,478	12,026	16,347
2042	2,183	684	1,482	12,064	16,413
2043	2,205	689	1,485	12,100	16,479
2044	2,226	689	1,488	12,132	16,535
2045	2,249	690	1,492	12,163	16,594
2046	2,269	693	1,494	12,191	16,647
2047	2,285	693	1,496	12,215	16,689
2048	2,301	695	1,497	12,238	16,731
2049	2,315	696	1,498	12,261	16,770
2050	2,329	696	1,499	12,284	16,808
2051	2,344	696	1,500	12,305	16,845

# Climate Change Forecast Impacts

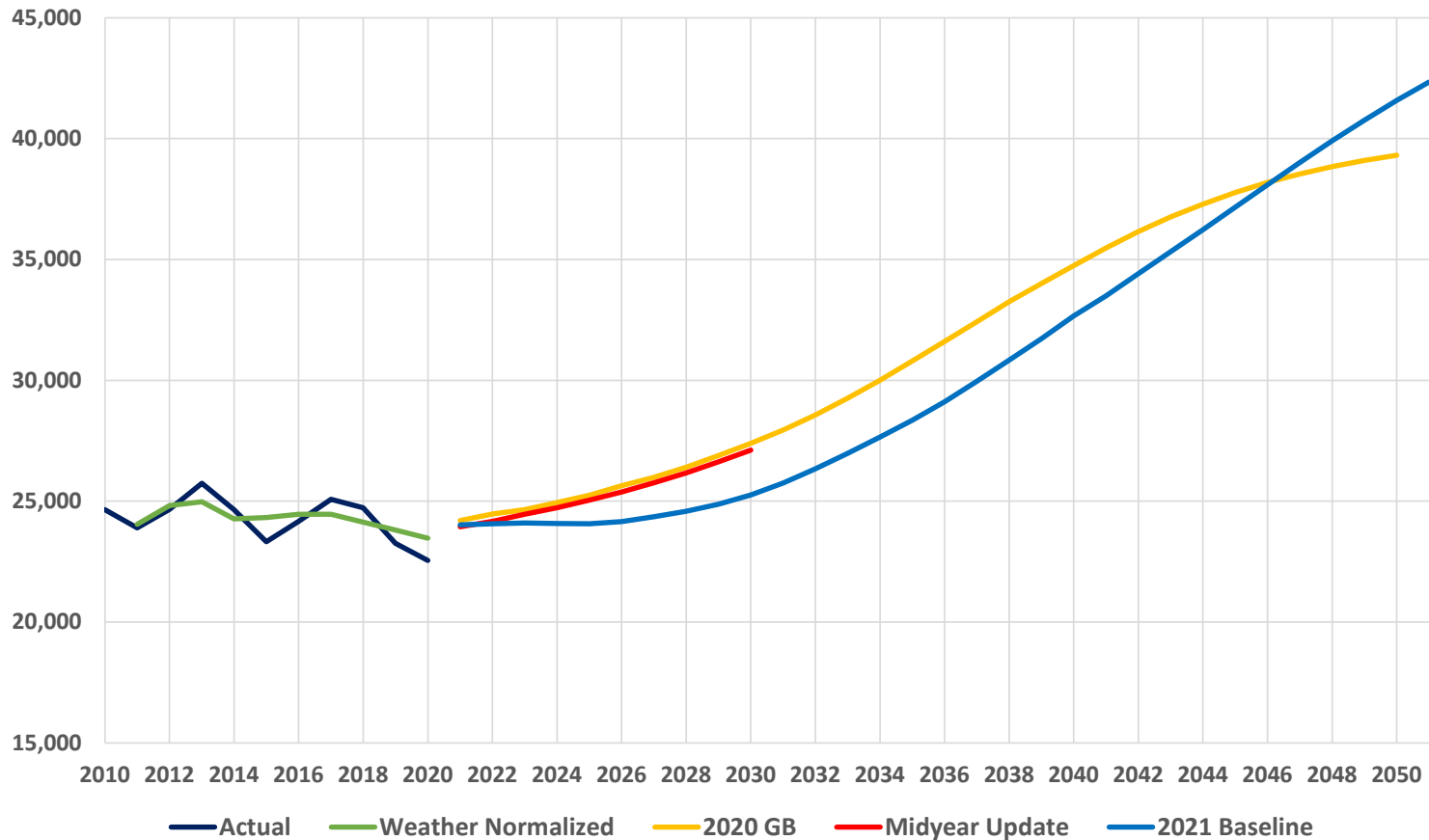
Transmission District	2050 Annual GWh Impact	2050 Summer Peak MW Impact	2050 Winter Peak MW Impact
Con Ed	989	555	-223
Cen Hud	70	91	-34
LIPA	457	307	-72
Nat Grid	218	380	-195
NYSEG	37	156	-138
O&R	57	39	-21
RG&E	74	102	-34
<b>NYCA</b>	<b>1,902</b>	<b>1,630</b>	<b>-717</b>

Note: Assumes a +0.7 degree F per decade temperature trend for NYCA.

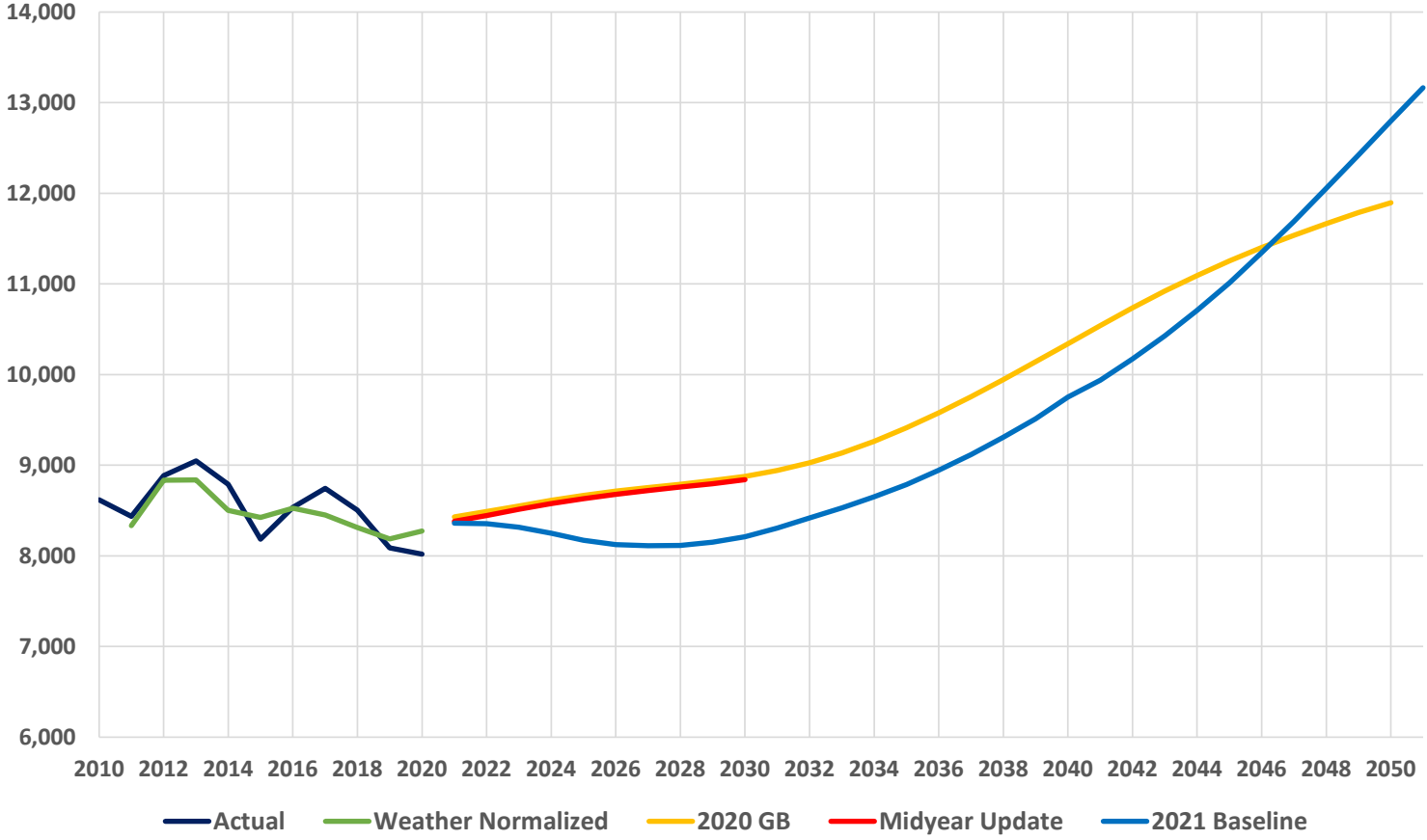
# Baseline Winter Peak Forecast



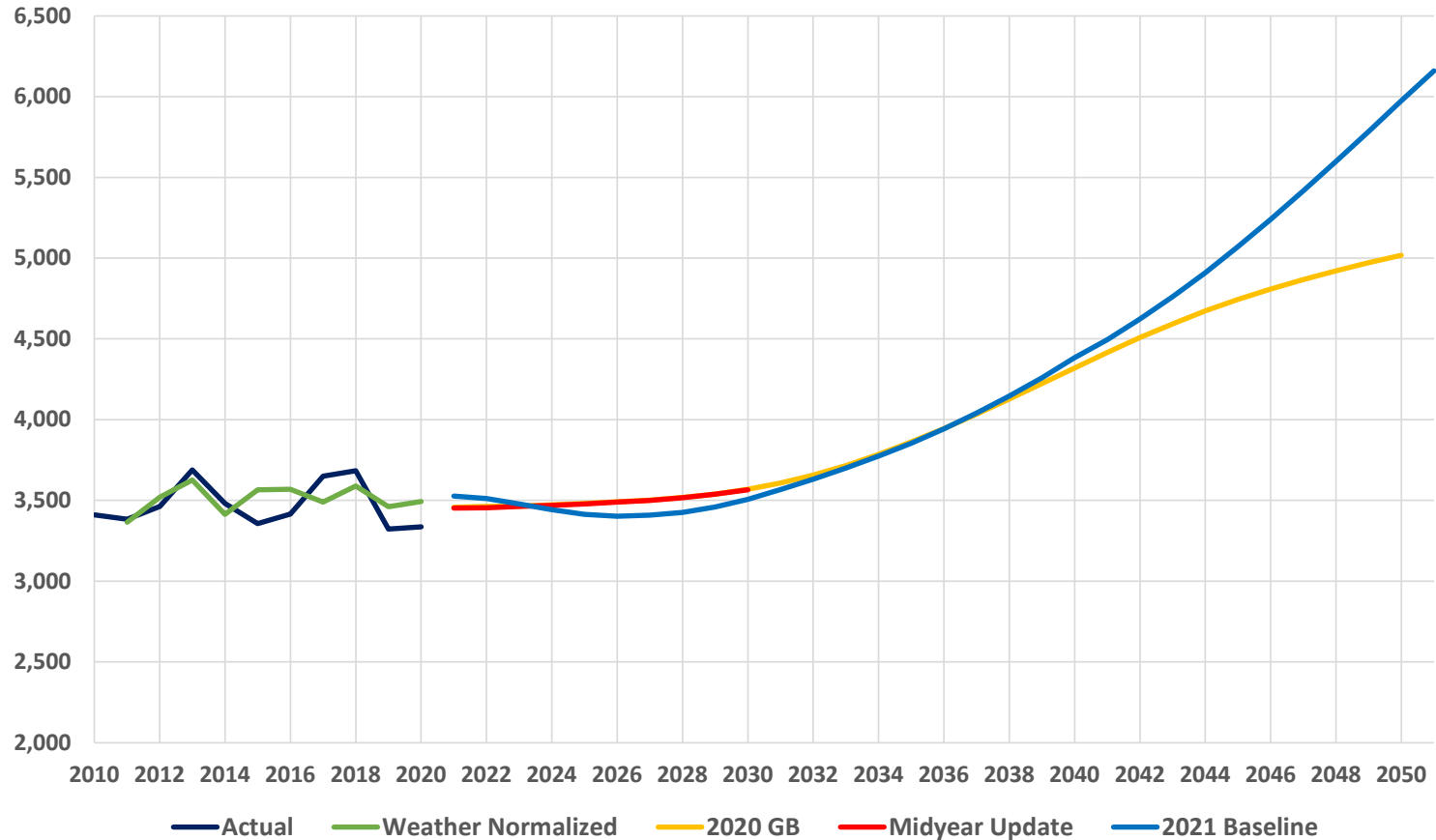
# NYCA Baseline Winter Coincident Peak (MW)



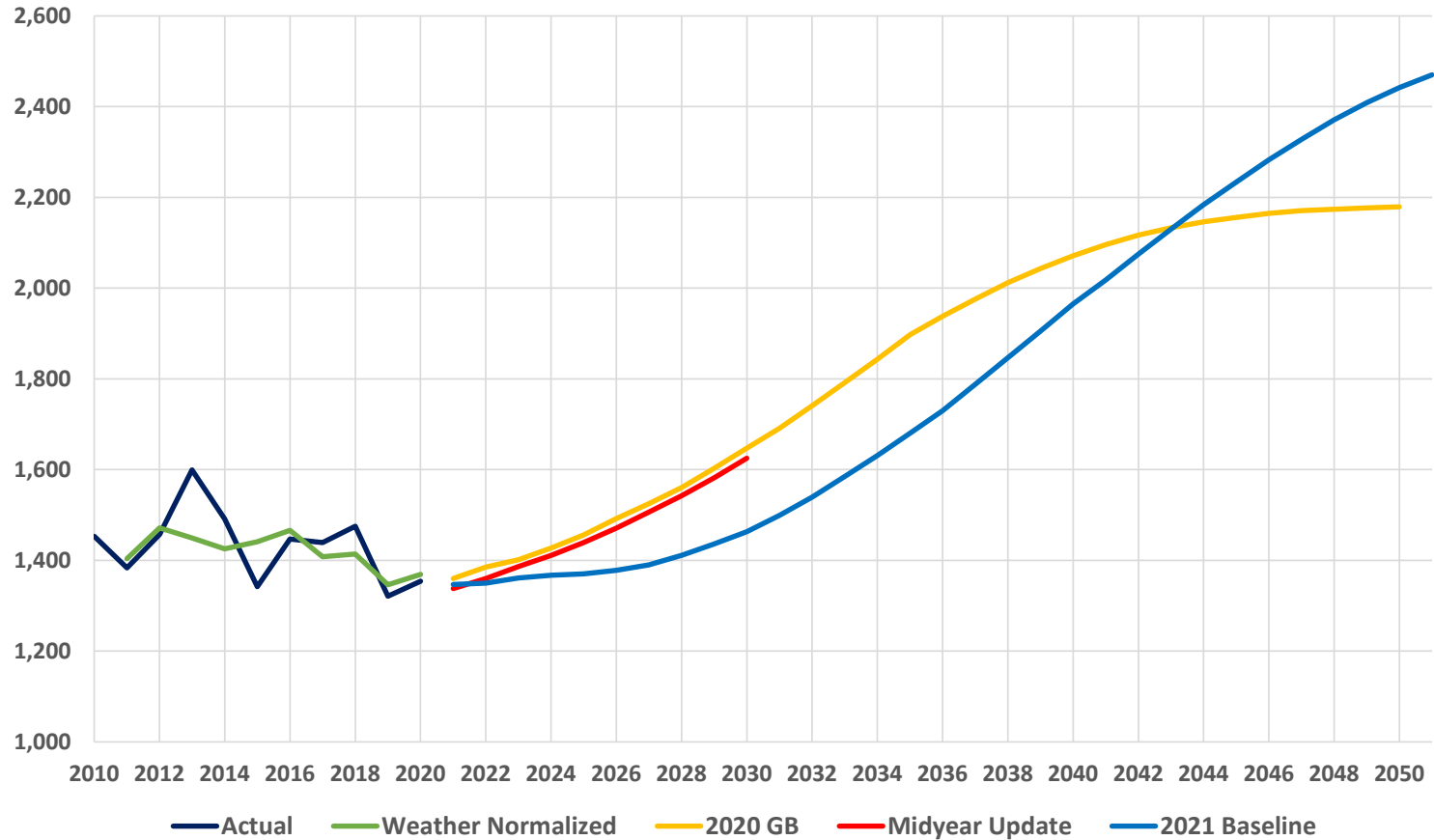
# Zones A to E Baseline Winter Coincident Peak (MW)



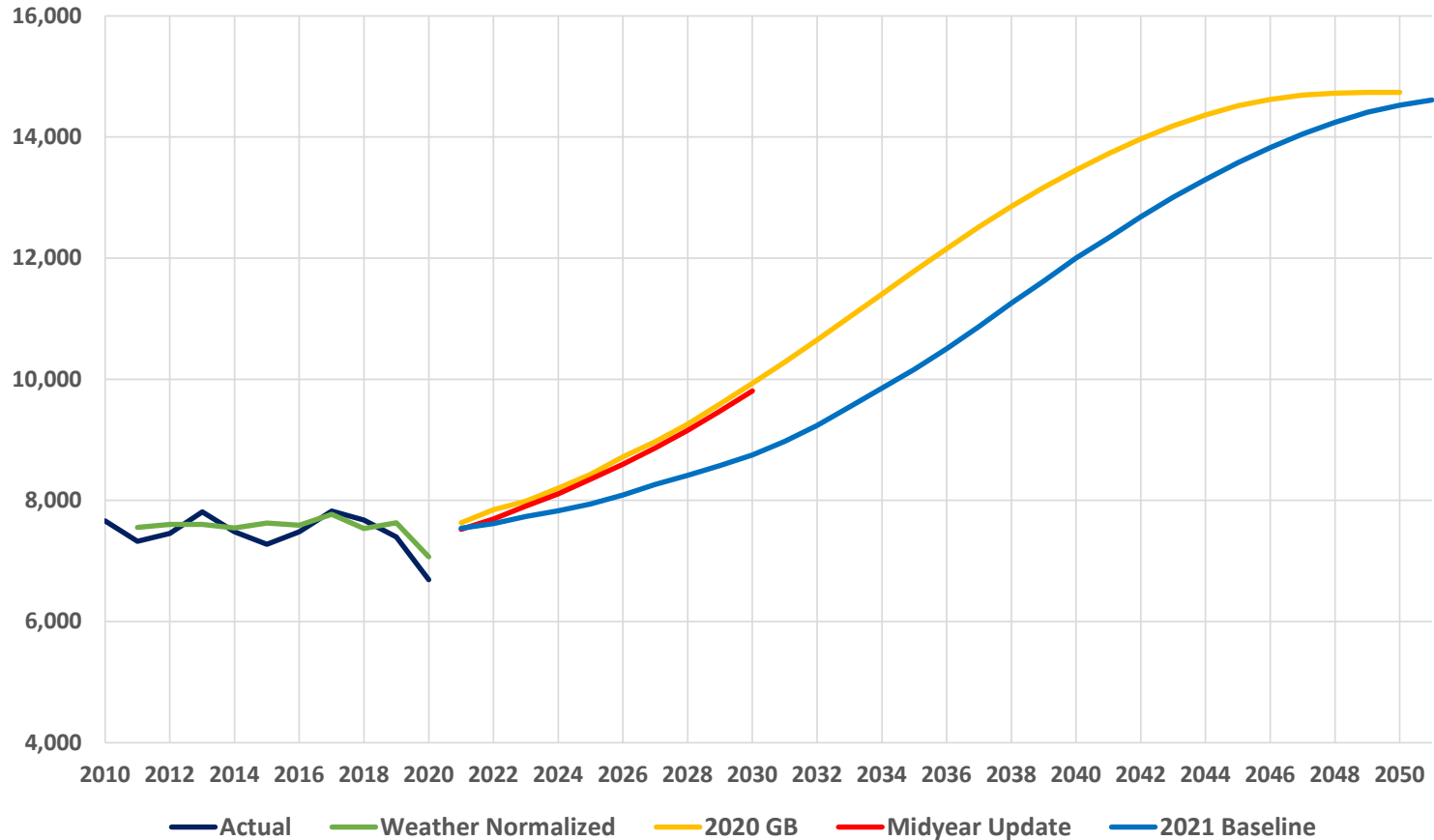
## Zones F&G Baseline Winter Coincident Peak (MW)



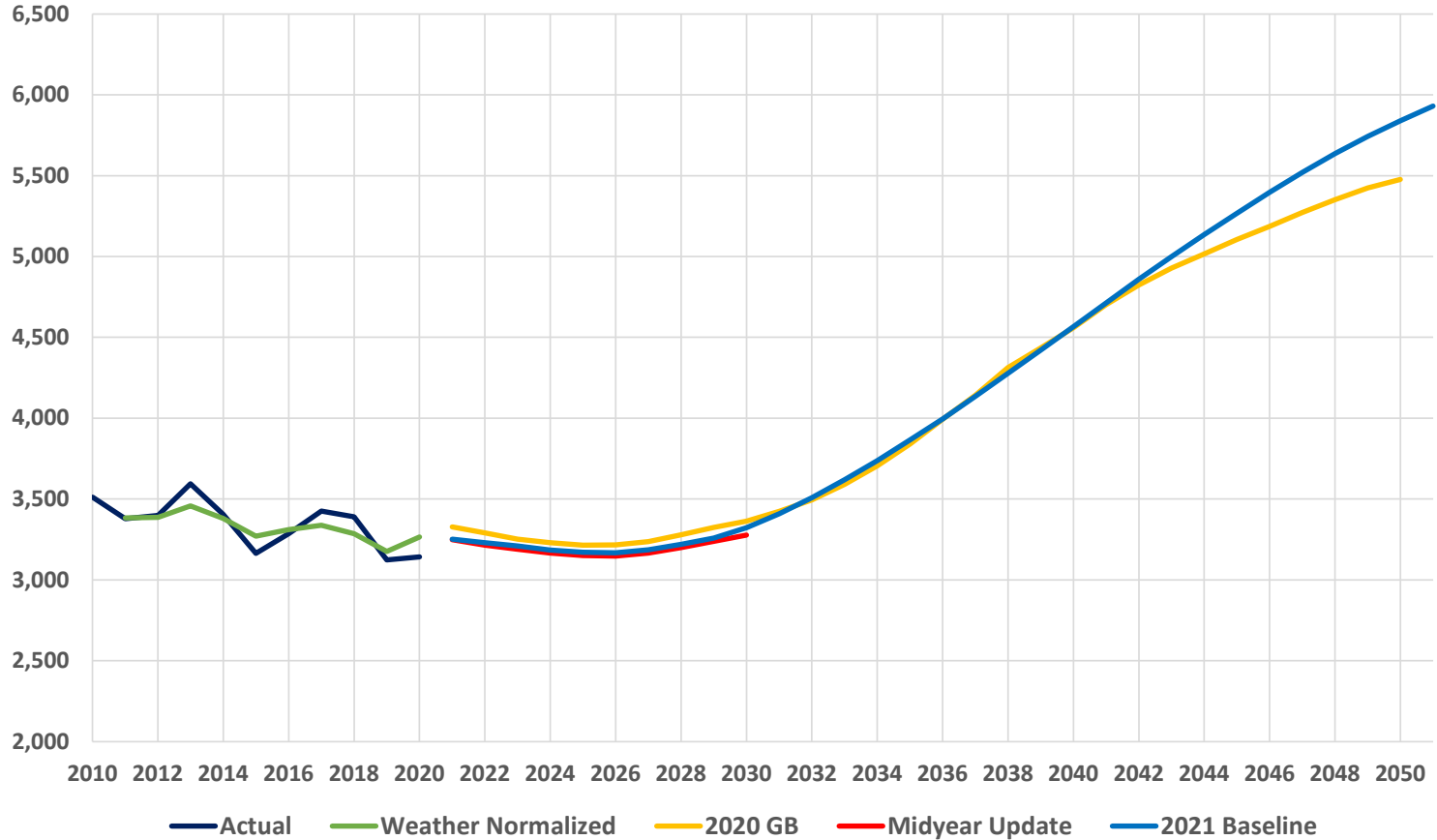
## Zones H&I Baseline Winter Coincident Peak (MW)



# Zone J Baseline Winter Coincident Peak (MW)



# Zone K Baseline Winter Coincident Peak (MW)



## Coincident Winter Peak Demand by Zone - MW

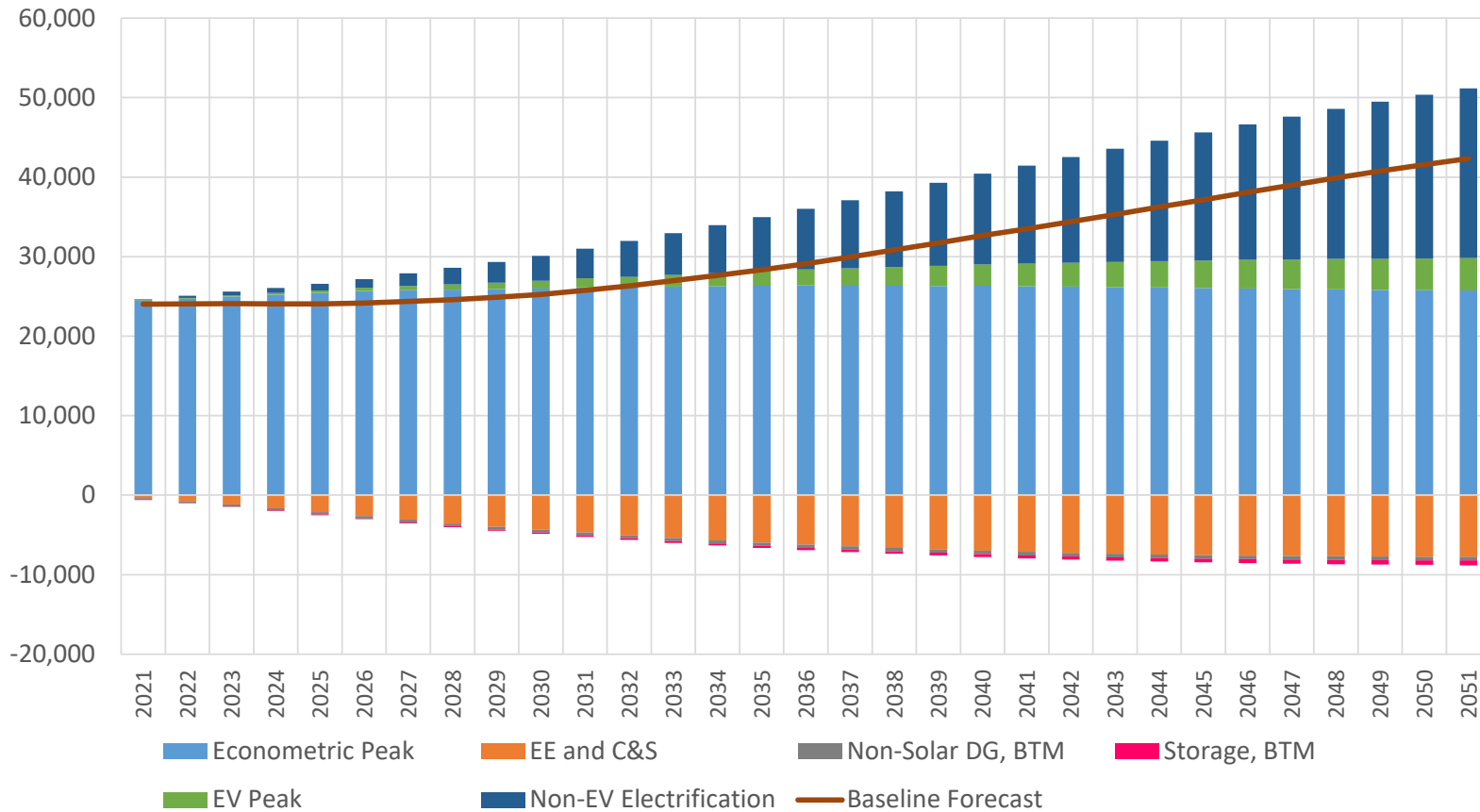
Year	A	B	C	D	E	F	G	H	I	J	K	NYCA
2021-22	2,151	1,519	2,562	817	1,311	1,958	1,569	491	856	7,540	3,251	24,025
2022-23	2,147	1,515	2,559	825	1,309	1,954	1,557	491	859	7,619	3,230	24,065
2023-24	2,133	1,503	2,546	832	1,300	1,942	1,536	493	868	7,733	3,209	24,095
2024-25	2,113	1,485	2,523	838	1,289	1,925	1,517	493	874	7,830	3,185	24,072
2025-26	2,093	1,466	2,497	838	1,276	1,910	1,504	493	877	7,941	3,170	24,065
2026-27	2,084	1,452	2,481	838	1,269	1,902	1,500	494	884	8,088	3,168	24,160
2027-28	2,084	1,446	2,477	838	1,265	1,902	1,506	494	896	8,265	3,186	24,359
2028-29	2,089	1,444	2,479	838	1,265	1,908	1,518	498	913	8,412	3,219	24,583
2029-30	2,104	1,448	2,489	840	1,269	1,920	1,539	504	932	8,575	3,259	24,879
2030-31	2,126	1,457	2,509	842	1,277	1,940	1,566	511	952	8,750	3,322	25,252
2031-32	2,158	1,473	2,540	845	1,291	1,966	1,601	521	978	8,975	3,409	25,757
2032-33	2,193	1,493	2,577	848	1,306	1,996	1,636	532	1,007	9,236	3,508	26,332
2033-34	2,229	1,515	2,613	850	1,322	2,028	1,673	544	1,041	9,543	3,619	26,977
2034-35	2,269	1,540	2,651	854	1,338	2,062	1,712	556	1,075	9,852	3,738	27,647
2035-36	2,312	1,567	2,692	858	1,356	2,100	1,754	570	1,110	10,163	3,865	28,347
2036-37	2,361	1,599	2,742	863	1,379	2,142	1,802	583	1,147	10,504	3,996	29,118
2037-38	2,416	1,635	2,796	867	1,403	2,189	1,852	600	1,188	10,870	4,136	29,952
2038-39	2,474	1,674	2,856	873	1,430	2,240	1,905	616	1,230	11,255	4,277	30,830
2039-40	2,539	1,717	2,920	878	1,459	2,296	1,963	634	1,271	11,621	4,421	31,719
2040-41	2,611	1,768	2,996	884	1,492	2,358	2,026	652	1,313	12,003	4,565	32,668
2041-42	2,668	1,813	3,051	888	1,519	2,409	2,086	667	1,351	12,334	4,712	33,498
2042-43	2,737	1,866	3,122	895	1,552	2,472	2,151	683	1,392	12,680	4,859	34,409
2043-44	2,812	1,923	3,199	901	1,590	2,541	2,220	700	1,430	13,004	4,999	35,319
2044-45	2,895	1,986	3,286	909	1,631	2,617	2,293	718	1,466	13,300	5,136	36,237
2045-46	2,984	2,055	3,380	917	1,676	2,701	2,371	737	1,497	13,575	5,268	37,161
2046-47	3,082	2,133	3,481	925	1,724	2,789	2,451	755	1,528	13,826	5,398	38,092
2047-48	3,183	2,213	3,585	934	1,774	2,883	2,535	774	1,554	14,050	5,521	39,006
2048-49	3,291	2,297	3,696	943	1,828	2,980	2,619	793	1,578	14,244	5,637	39,906
2049-50	3,399	2,381	3,809	952	1,882	3,080	2,705	810	1,599	14,407	5,743	40,767
2050-51	3,510	2,470	3,923	960	1,936	3,182	2,792	828	1,614	14,526	5,839	41,580
2051-52	3,619	2,556	4,034	966	1,990	3,283	2,877	844	1,626	14,610	5,930	42,335

**Table I-1d: Summary of NYCA Winter Coincident Peak Demand Forecasts - MW**

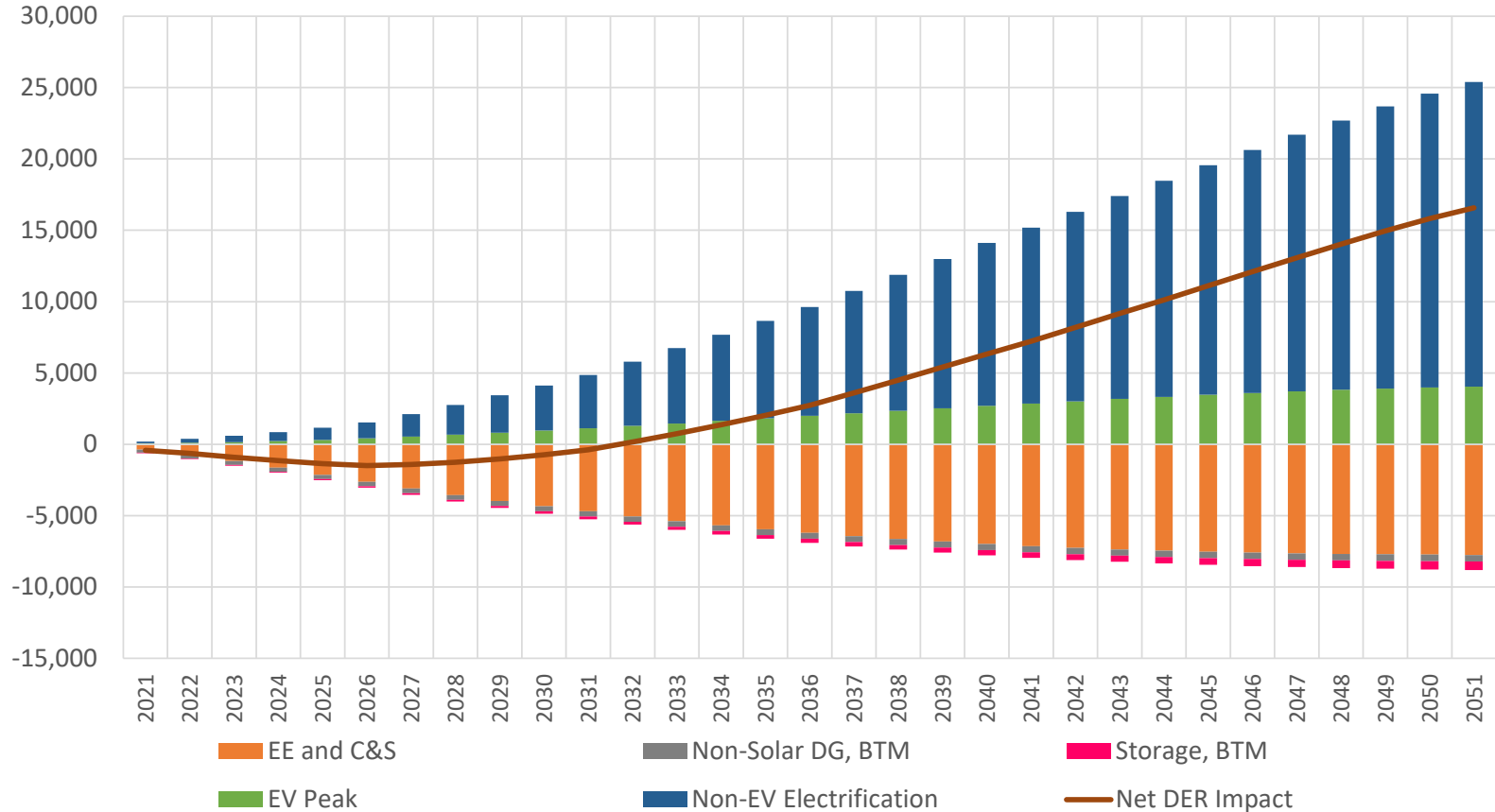
Year	(a) Econometric Peak Demand	(b) (-) EE and C&S	(c) = a - b End-Use Peak Demand	(d) (-) Solar PV, BTM	(e) (-) Non-Solar DG, BTM	(f) (-) BTM Storage Peak Reductions	(g) (+) EV Peak Demand	(h) (+) Non-EV Electrification	(i) = c-d-e-f+g+h Baseline Winter Peak Forecast
2021-22	24,444	365	24,079	0	223	30	71	128	24,025
2022-23	24,707	744	23,963	0	248	38	105	283	24,065
2023-24	24,995	1,177	23,818	0	268	50	155	440	24,095
2024-25	25,206	1,638	23,568	0	286	63	227	626	24,072
2025-26	25,415	2,132	23,283	0	300	76	317	841	24,065
2026-27	25,659	2,619	23,040	0	314	93	421	1,106	24,160
2027-28	25,769	3,096	22,673	0	327	108	540	1,581	24,359
2028-29	25,837	3,552	22,285	0	338	126	672	2,090	24,583
2029-30	25,907	3,970	21,937	0	350	143	813	2,622	24,879
2030-31	25,989	4,332	21,657	0	359	162	965	3,151	25,252
2031-32	26,142	4,695	21,447	0	370	183	1,125	3,738	25,757
2032-33	26,171	5,049	21,122	0	378	203	1,293	4,498	26,332
2033-34	26,231	5,381	20,850	0	387	224	1,465	5,273	26,977
2034-35	26,277	5,680	20,597	0	394	243	1,642	6,045	27,647
2035-36	26,321	5,957	20,364	0	401	263	1,819	6,828	28,347
2036-37	26,386	6,208	20,178	0	409	282	1,998	7,633	29,118
2037-38	26,352	6,433	19,919	0	415	305	2,177	8,576	29,952
2038-39	26,332	6,634	19,698	0	419	325	2,354	9,522	30,830
2039-40	26,310	6,815	19,495	0	425	345	2,525	10,469	31,719
2040-41	26,340	6,984	19,356	0	430	369	2,692	11,419	32,668
2041-42	26,268	7,131	19,137	0	435	390	2,860	12,326	33,498
2042-43	26,222	7,258	18,964	0	439	411	3,021	13,274	34,409
2043-44	26,154	7,364	18,790	0	442	429	3,180	14,220	35,319
2044-45	26,113	7,453	18,660	0	445	451	3,330	15,143	36,237
2045-46	26,053	7,526	18,527	0	447	474	3,469	16,086	37,161
2046-47	25,994	7,590	18,404	0	449	496	3,600	17,033	38,092
2047-48	25,924	7,639	18,285	0	451	515	3,717	17,970	39,006
2048-49	25,884	7,682	18,202	0	452	540	3,823	18,873	39,906
2049-50	25,811	7,706	18,105	0	453	560	3,912	19,763	40,767
2050-51	25,770	7,729	18,041	0	454	583	3,986	20,590	41,580
2051-52	25,756	7,752	18,004	0	455	606	4,048	21,344	42,335



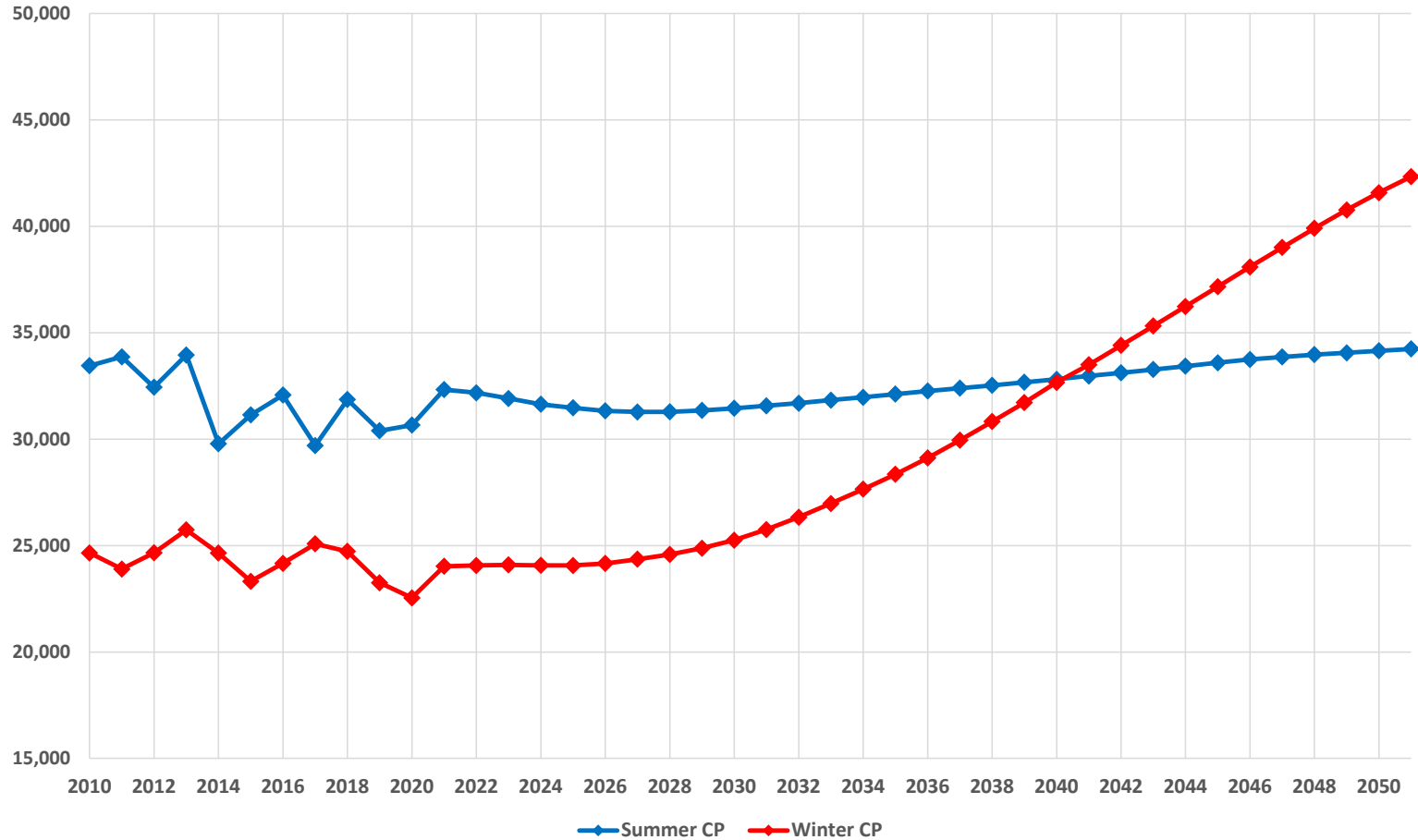
## Baseline Winter Peak Forecast Components - MW



# Baseline Winter Peak Forecast Net DER Impacts - MW

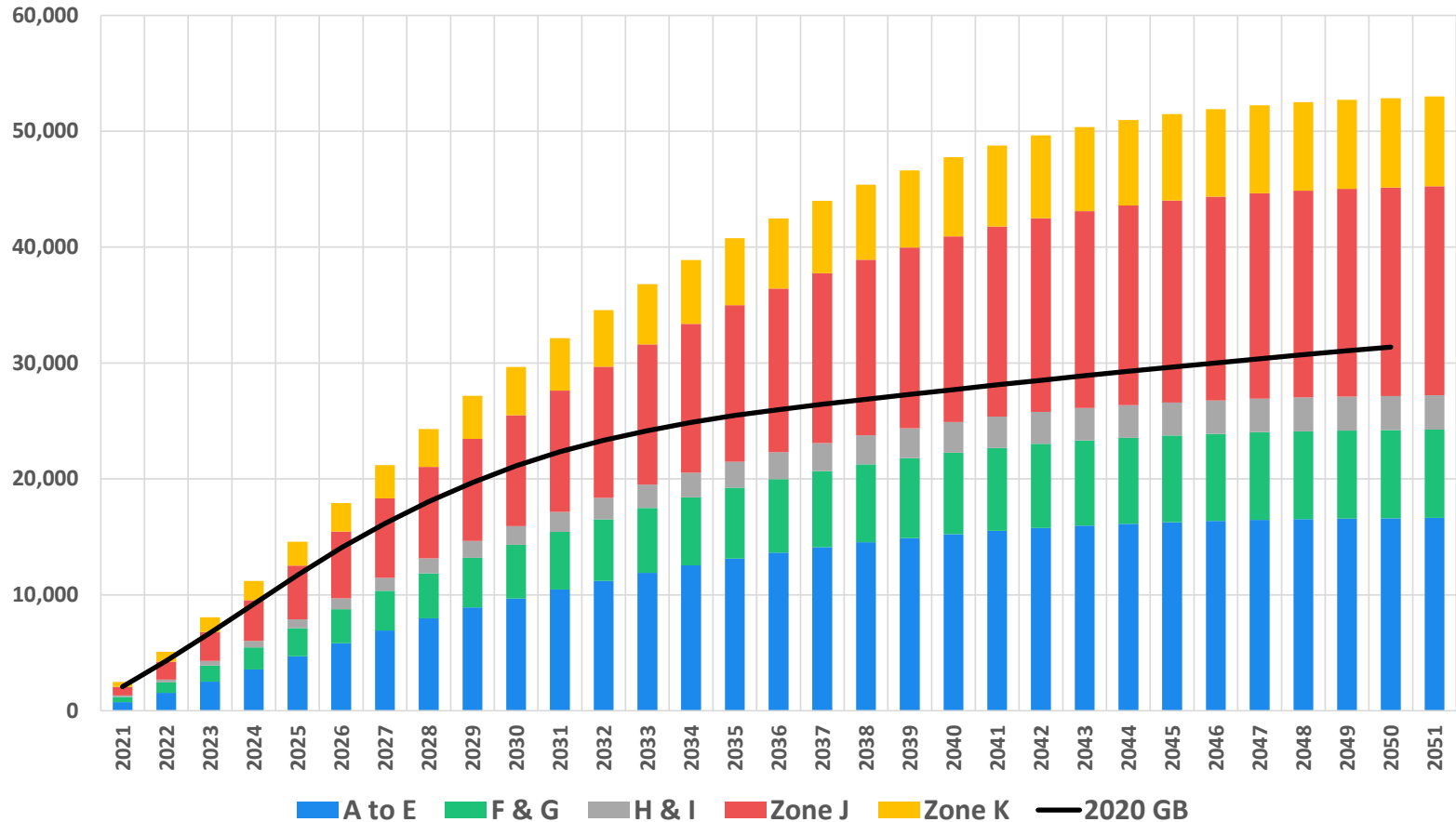


# NYCA Baseline Summer and Winter Peak Forecasts (MW)

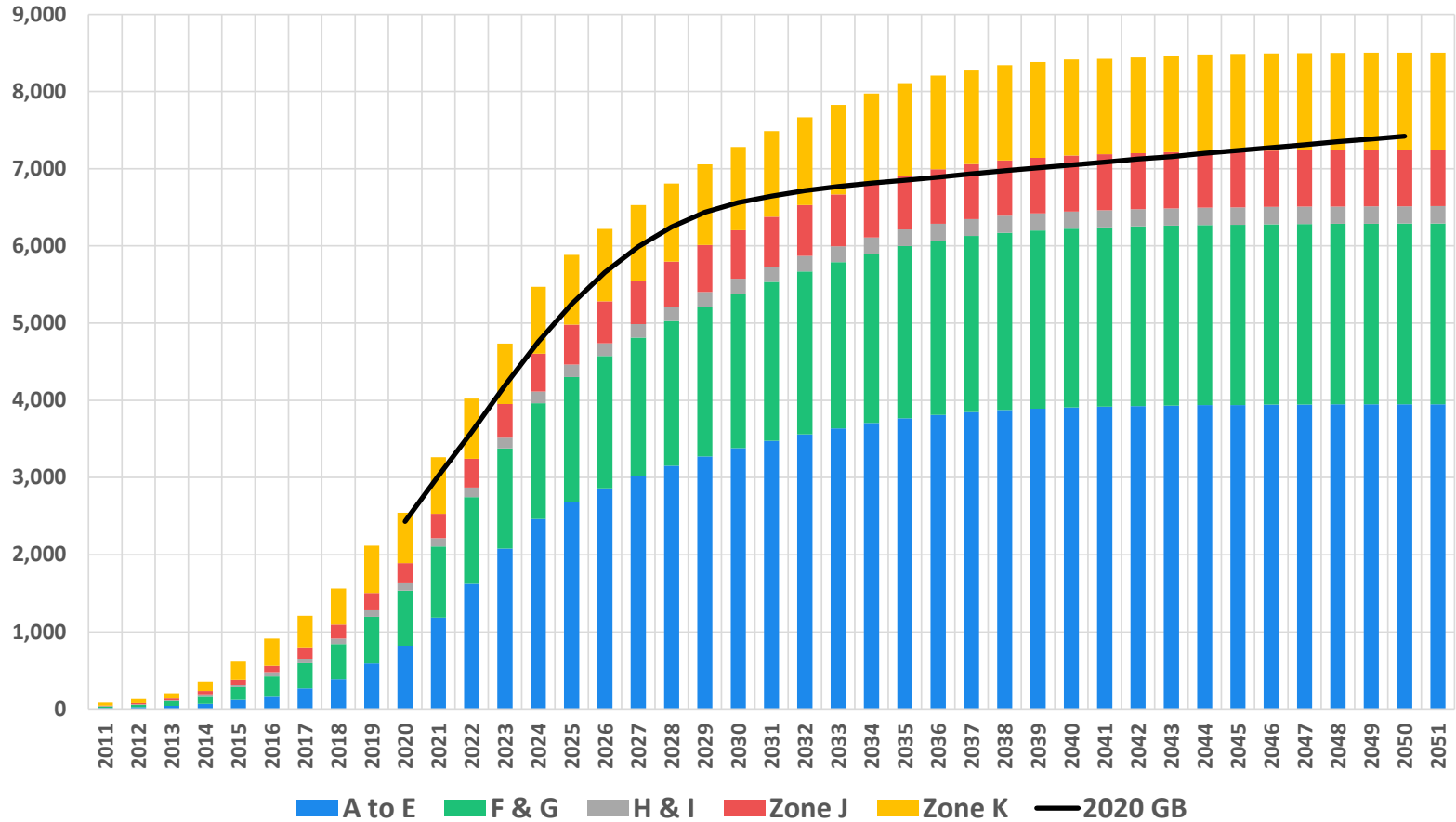


# DER Forecast Summaries

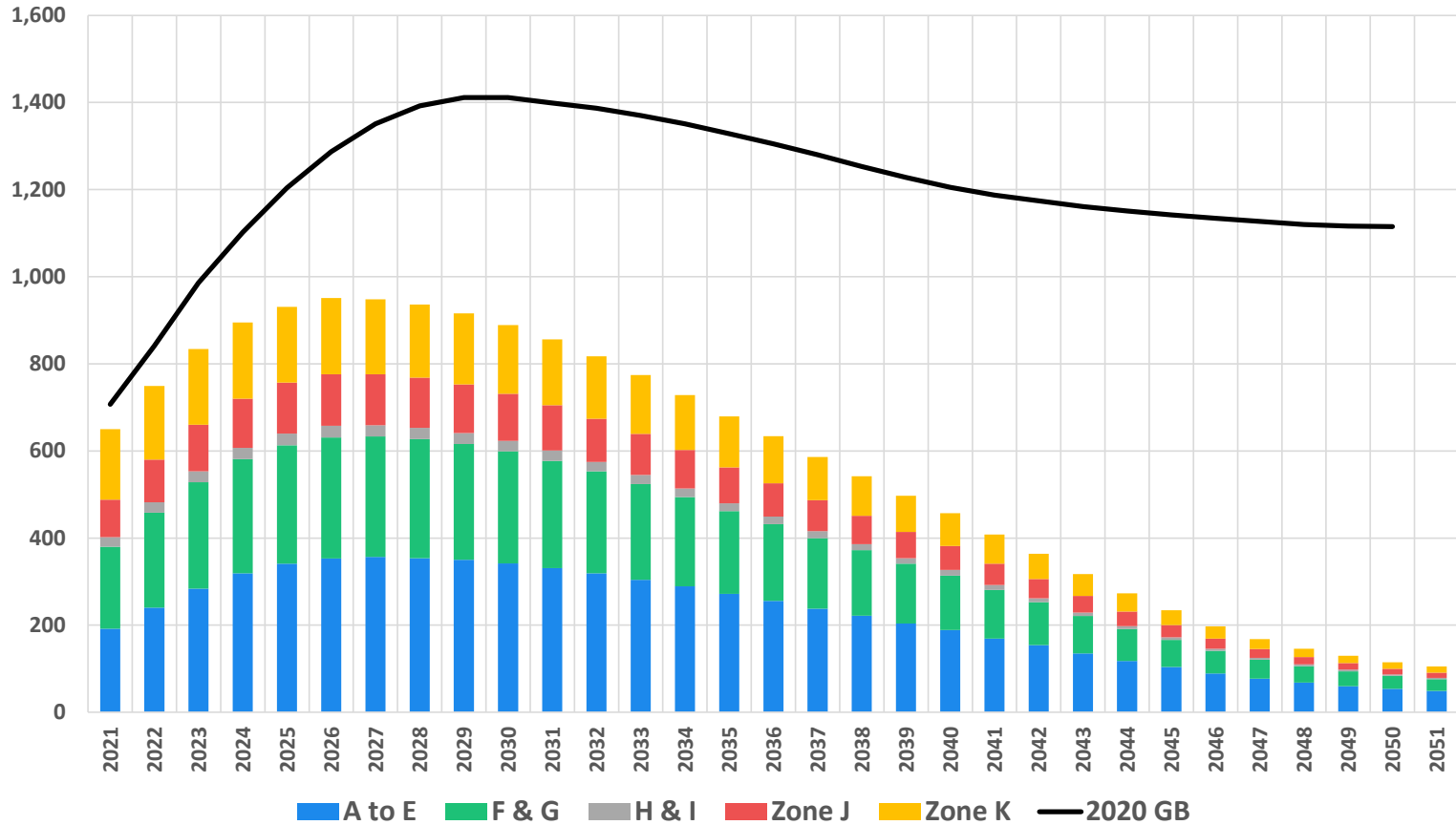
# Energy Efficiency and Codes & Standards GWh Reductions Forecast



# BTM Solar PV Nameplate Capacity - MW DC

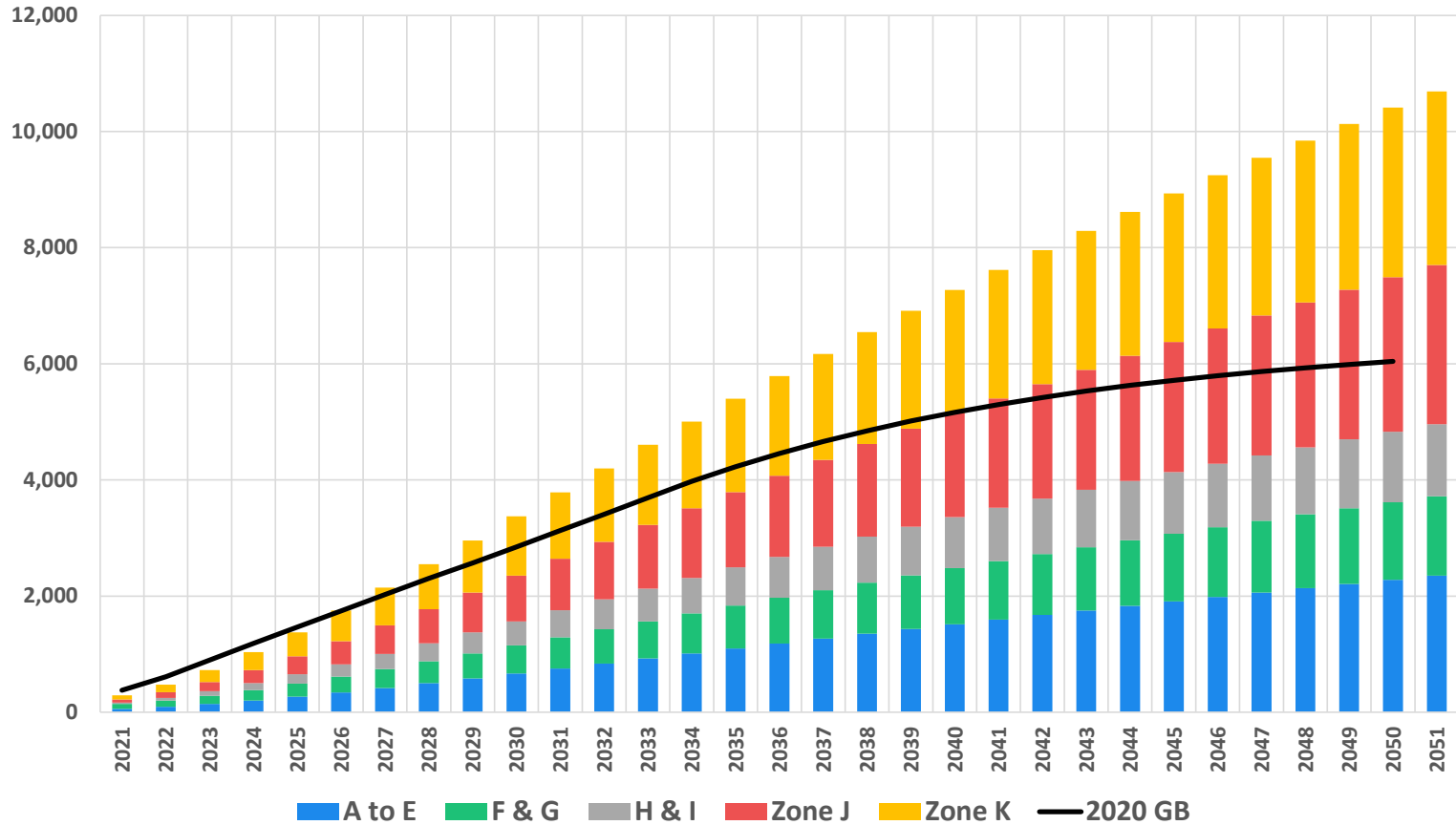


# BTM Solar PV Summer Coincident Peak Reductions Forecast



Note: The summer NYCA peak hour is assumed to shift into the evening over the course of the 30 year horizon.

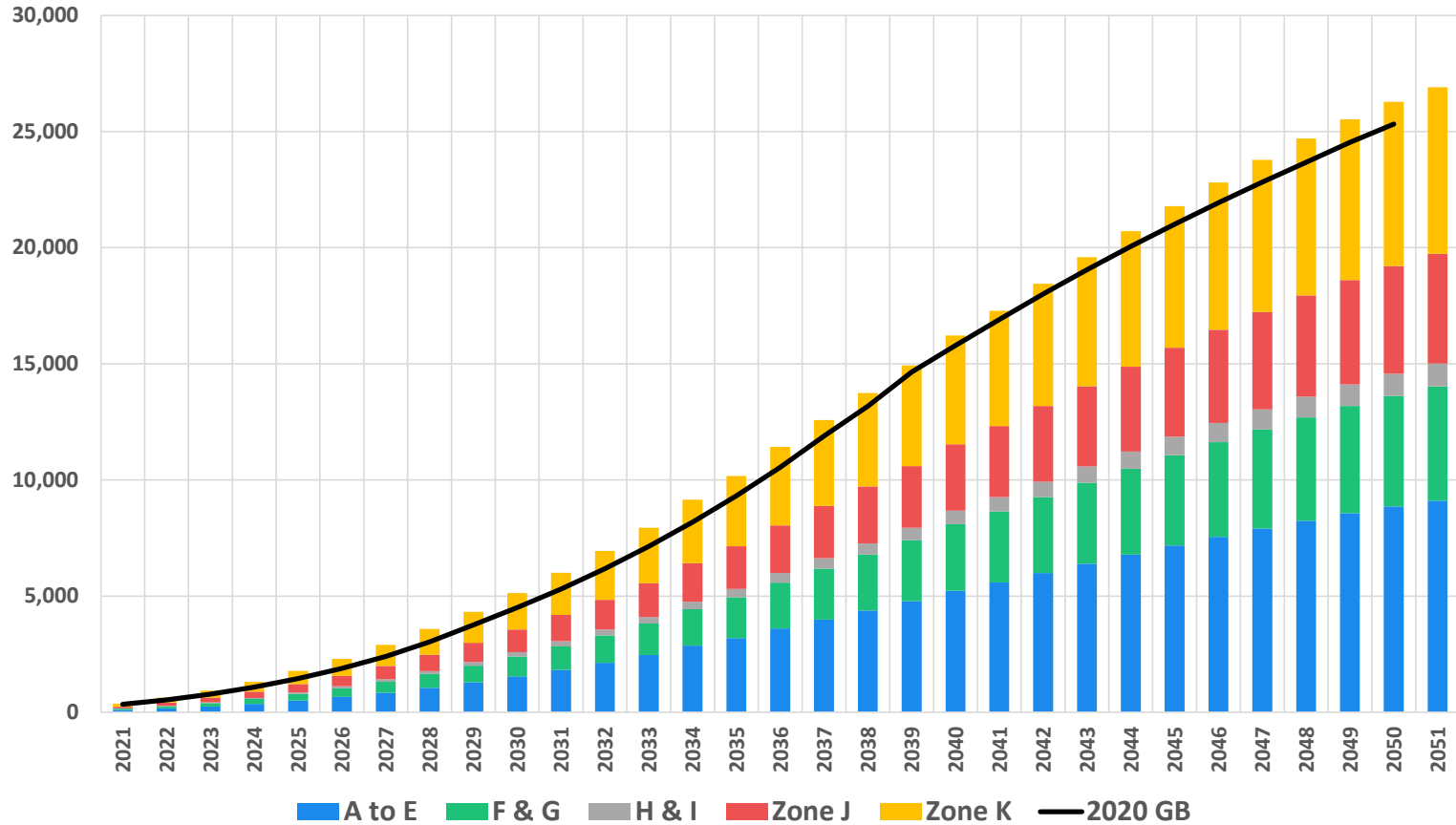
## Energy Storage Nameplate Capacity Forecast - MW



Note: Represents both wholesale and BTM storage. There is currently >12,000 MW pipeline across the NYISO and SIR queues.

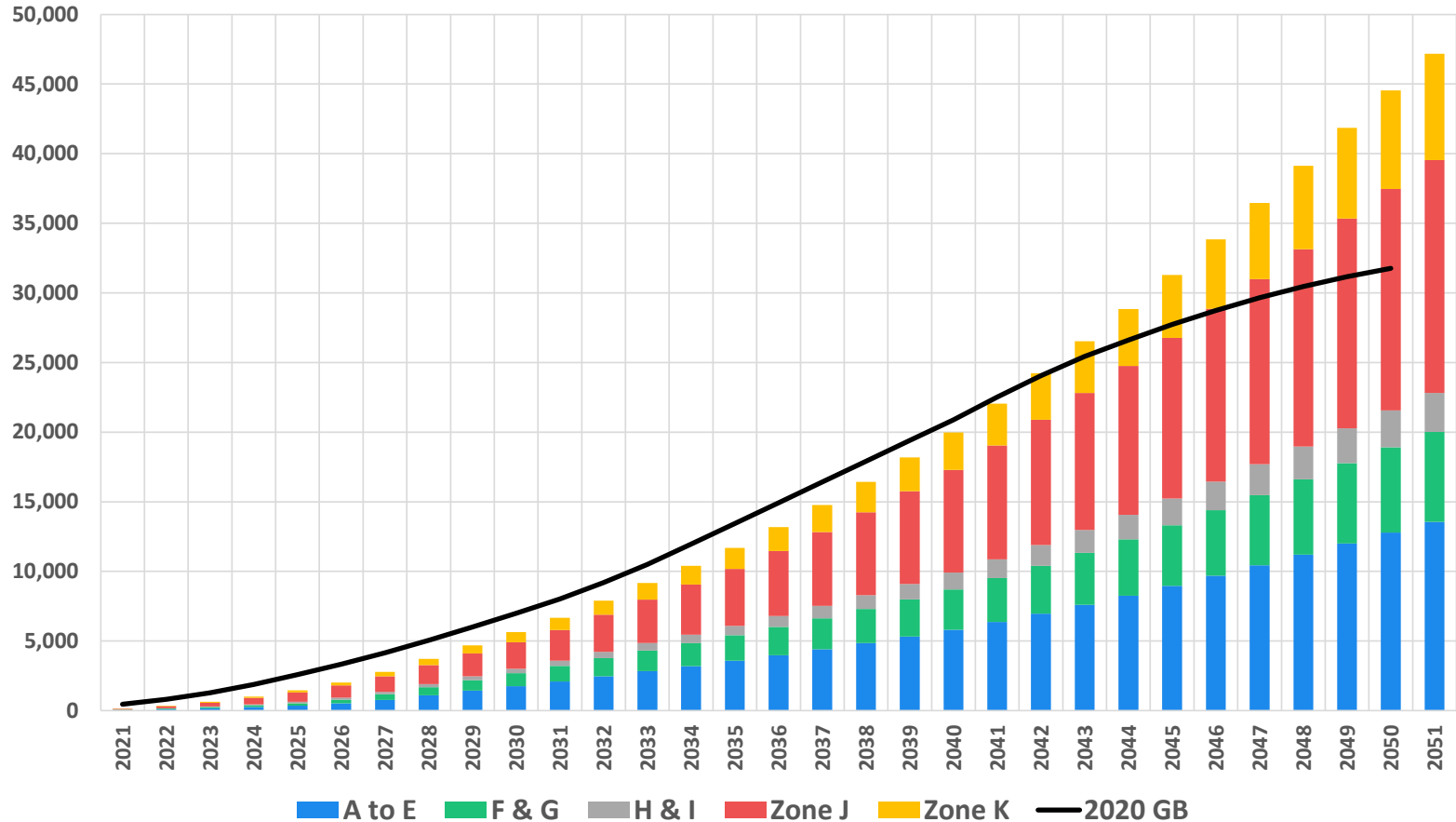


## EV Annual Energy Consumption Forecast - GWh



Note: Assumes approximately 1.4 million EVs in 2030, over 4 million EVs by 2040, and over 6 million EVs by 2050.

# Non-EV Electrification Annual Energy Usage Forecast - GWh



# Questions?

# 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

