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New York ISO Climate Change Impact Study

Phase 1: Long-Term Load Impact

Submitted to:

New York ISO, Albany New York

Submitted by:

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Contents

Overview

Over the last ten years, there has been a growing concern about the impact of climate change on the environment and ultimately impact on humanity. It has been well documented that the air mass and oceans are warming, contributing to degradation of our environment, more extreme weather events, and potentially catastrophic events in the future. New York State and New York City have been working to address the growing likelihood of Sandy-like storms in the future as a result of warming temperatures and rising sea level. NYISO is concerned about how climate change may impact the state transmission system, as NYISO is responsible for managing the New York wholesale power market, maintaining system reliability, and planning for future capacity needs.

To this end, NYISO contracted with Itron, Inc. to develop long-term energy, peak, and hourly load projections that captures the impact of increasing temperatures and state policy designed to improve energy efficiency and address climate change. Long-term hourly zonal-level load forecasts will be used in the second phase of the study to evaluate system impact and develop a climate resiliency plan.

The primary study objectives include:

- Developing a long-term energy, peak, and 8,760 hourly load forecasts that reflect the potential demand impact of climate change on the system and planning zones
- Evaluating statewide temperature and humidity trends in context of recent state and other climate impact studies
- Translating temperature and humidity projections into long-term Heating Degree Days (HDD), Cooling Degree Days (CDD), and peak-day Temperature Humidity Index Degree Days (TDD) to drive system and planning area load models.
- Constructing long-term forecast scenarios that reflect state policy goals to address climate change impacts
    - Policy Case: Accelerated energy efficiency savings and Behind-the-meter (BTM) solar adoption
    - Climate Leadership and Community Protection Act (CLCPA) Case: State electrification to meet targeted greenhouse gas emission targets

1. Summary

The core finding is that temperatures are rising across New York and will have a significant impact on summer peak demand. Since early 1990 temperatures across the state have been increasing from 0.06 to 0.09 degrees per year or 0.6 to 0.9 degrees per decade. On average, the statewide average temperature is increasing 0.7 degrees per decade. The temperature trends are consistent with the NYSERDA comprehensive climate impact study (*September 2014 ClimAID Update*), New York City's recent climate resiliency plan (*March 2019 Climate Resiliency Design Guideline*) and observed temperature trends across the country. Temperature trend analysis is presented in Section 2.

On an annual basis, increasing temperatures have minimal impact on system energy requirements as increasing cooling sales are largely mitigated by decreasing heating related sales. However, the system load profile will change over time with the strongest load growth in the shoulder months (April, May, September, and October). Summer and winter peak demand will also be significantly impacted by climate change. By 2050, increasing temperatures will potentially add between 1,600 MW to 3,800 MW or 10% to 23% of summer-peak cooling requirements. Additional discussion of the impact of increasing temperatures on system peak load is included in Section 3.

State policy designed to counter the impact of climate change may have an even larger impact on load than increasing temperatures. New state energy efficiency targets largely mitigate the impact of increasing temperatures on summer peak demand through 2045; after that point increasing electric vehicle demand and electrification activity eventually push loads above current trend.

In the most aggressive scenario, statewide electrification programs result in the system switching from a summer peaking system to a winter peaking system; this occurs around 2035. While there is still additional analysis to be done to translate greenhouse gas targets to specific end-use impacts, the amount of electrification needed to achieve state greenhouse gas targets has significant impacts on base loads, heating loads and cooling loads. An aggressive electrification program could add more than 28,000 MW to the system summer peak by 2050, and an even larger amount to winter peaks.

An end-use modeling framework is used to assess these policy impacts. The modeling framework allows us to estimate the impact of changes in end-use saturation and efficiency trends on customer class sales, system energy, hourly loads, and ultimately system peaks. An overview of the modeling framework is presented in Section 4.

Forecasts for the period from 2020 through 2050 are provided for the system and eleven planning zones are provided in Appendix A. Forecasts includes annual energy, summer coincident peak, and winter coincident peak forecasts for four scenarios. Appendix B provides a detailed description of the residential and commercial Statistically Adjusted End-Use (SAE) models used in developing class sales and end-use energy forecasts. Weather

station weights used in developing state and regional load forecasts are included in Appendix C, along with statewide maps.

2. Climate Impact Studies

New York has been on the forefront of studying temperature trends and the potential impact from climate change. In 2011, NYSERDA released the first major climate impact study for New York (*Responding to Climate Change in New York State: The ClimAID Integrated assessment for effective climate change adaption in New York State. Final report).* This study was updated in September 2014 by climatologists from Columbia University, Cornell University and the City University of New York. (*Horton, R., D. Bader, C. Rosenzweig, A. DeGaetano and W.Solecki. 2014. Climate Change in New York State: Updating the 2011 ClimAID Climate Risk Information. New York State Energy Research and Development Authority (NYSERDA), Albany, New York*).

Based on the most advanced climate models at that time, the ClimAID team found that temperature warming trends are slightly worse than the initial study. The study concluded that New York could expect to see hotter summers, warming winters, increasing rainfall, rising oceans, and more extreme weather events.

The potential impacts of climate change were glimpsed when New York was hit by Hurricane Sandy on October 29th, 2012. Superstorm Sandy caused an estimated $19 billion in losses in New York City and over $32 billion in losses in the state. There were 48 reported storm-related deaths, subways and tunnels were flooded, thousands of homes were destroyed, and with the impact on the transportation and communication systems, the City was effectively shut down for several days. Hundreds of thousands of City residences were without power for several days.

Recognizing there may be an increasing likelihood of future storms of this magnitude, both New York City and Consolidated Edison (ConEdison) have been working to improve climate resiliency. In March 2019, the City released the *Climate Resiliency Design Guidelines*. The report outlines the most recent plan for building a more climate-resilient city. The New York Panel on Climate Change (NPCC) provides the weather projections that formed the basis of the city resiliency plan and also worked on the 2014 ClimAID update. Current planning is based on the second *Panel on Climate Change Report* (NPCC2) long-term weather projections, which found the 2014 ClimAID projections to still be on track.

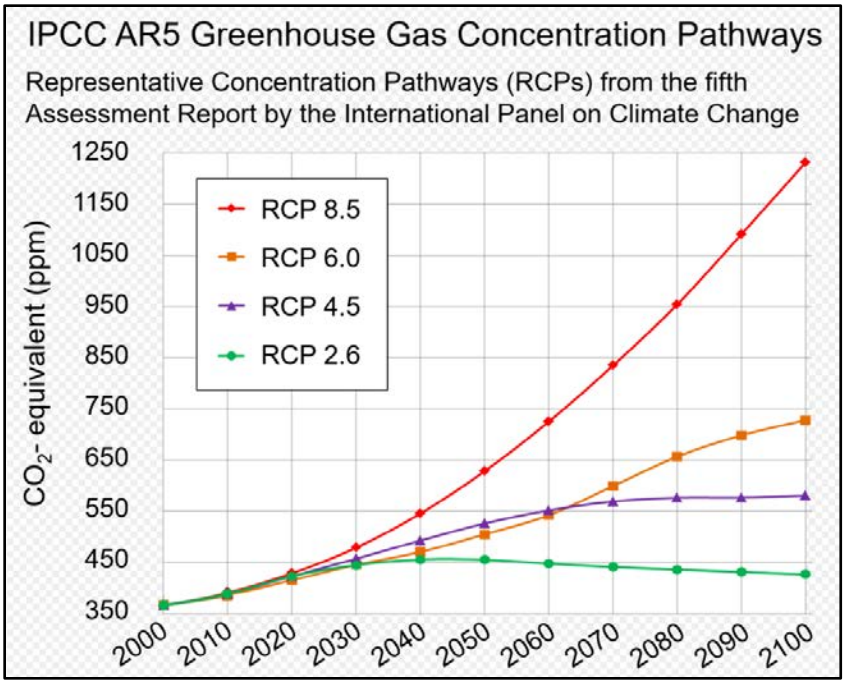
ConEdison launched a project in 2017 specifically focused on evaluating how climate change will potentially impact the electric, gas, and steam distribution operation and network and identifying infrastructure needs to build a more resilient distribution system. This project is expected to be completed by the end of 2019 (*ConEdison Climate Change Vulnerability Study*, ongoing). As part of this study, long-term climate change projections were updated by the *Columbia Center for Climate System Research* (*CCSR*) for the ConEdison service area. Results of this study should be available early next year.

In climate models, temperature and humidity projections are driven by projected levels of greenhouse gas concentration. There are a number of complex General Circulation Models (GCM) that model how increases in greenhouse gases interact with other factors that impact

temperature trends. These factors include current weather conditions, the amount of the sun's energy absorbed and radiated to space, forests, agricultural lands, and other vegetation that absorb and ultimately release CO2 gases, and physical changes in the earth such as melting ice caps and rising oceans that feedback through the model over time.

In 2014, the Intergovernmental Panel on Climate Change (IPCC) established a set of four possible greenhouse gas concentration paths that provide a common set of inputs for modeling weather impacts. These paths, known as Representative Concentration Pathways (RCPs) relate to the level of the sun's energy absorbed by the Earth and radiated back to space (radiative or climate forcing). With a higher RCP, there is an increase in temperature as the amount of energy trapped in the atmosphere increases. The RCPs are physical paths but can roughly be associated with specific human activity and response (or lack of response) to climate change. Defining socioeconomic conditions associated with these paths have been designated Shared Socioeconomic reference Pathways (SSPs). Figure 1 shows four of these relative concentration paths.

Figure 1: Relative Greenhouse Concentration Paths



RCP 8.5 represents the worse possible path. Greenhouse gases continue escalating at a faster rate and do not begin to level off until after 2100. RCP 2.6 represents the best possible path. Implicit in the RCP 2.6 path is immediate global action to address climate change. RCP 4.5 is consistent with current man-made emission trends; greenhouse gases continue to increase at roughly current rates with increases slowing significantly by mid-century and eventually leveling out at a little over 550 ppm. While RCP 8.5 begins to increase at a faster rate after 2020, there is no significant divergence between any of the paths until 2030.

2.1 Temperature Projections

While climate change will have an impact on many weather-related factors including rainfall, sea level, cloud coverage, and more extreme weather events; this study focuses on temperature and humidity projections as these have the most significant impact on electricity demand.

The 2014 ClimAID update compared modeled temperatures for future decades against a base-year temperature. The base-year temperature is defined as the average temperature between 1971 and 2000; if temperatures have been warming over this period then the reference year is 1990 (the midpoint of the 30-year temperature range). Table 1 shows ClimAID projected temperatures for New York City. The table is from the September 2014 updated report.

Table 1: New York City – Temperature Forecast Increase From Base Year

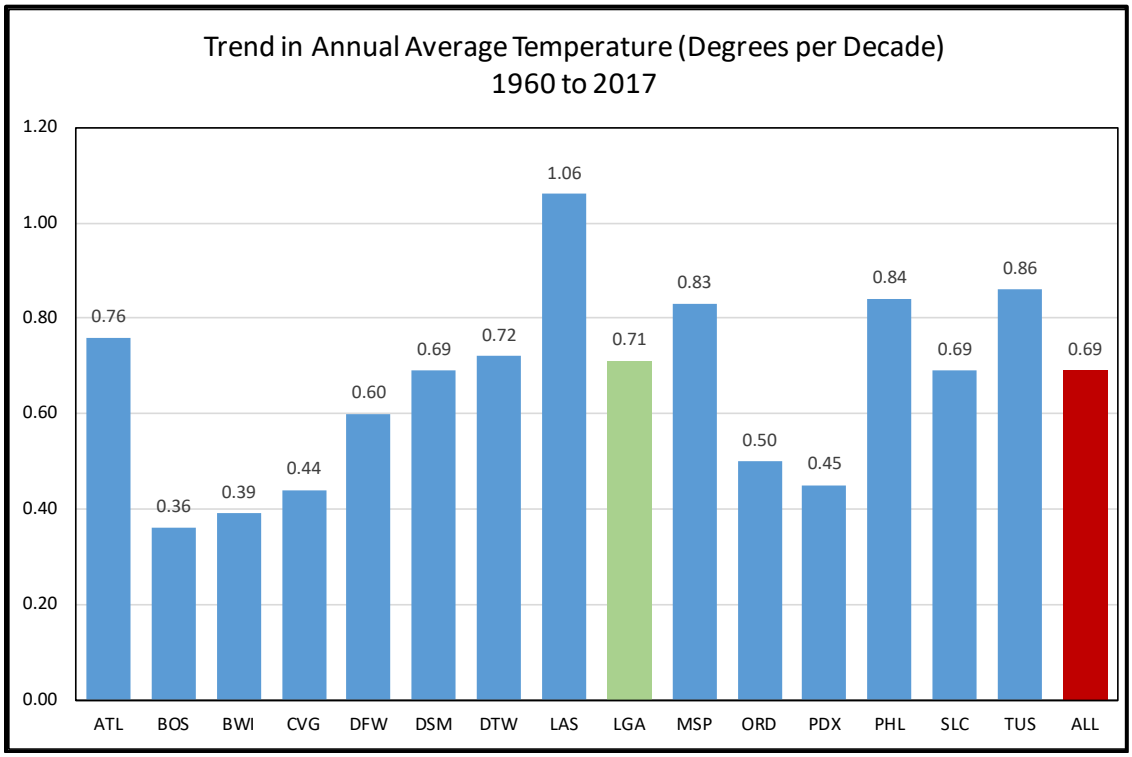
Baseline (1971-2000) 54.6 °F	Low Estimate (10th Percentile)	Middle Range (25th to 75th Percentile)	High Estimate (90th Percentile)
2020s	+ 1.5°F	+ 2.0°F to 2.9°F	+ 3.2°F
2050s	+ 3.1°F	+ 4.1°F to 5.7°F	+ 6.6°F
2080s	+ 3.8°F	+ 5.3°F to 8.8°F	+ 10.3°F
2100	+ 4.2°F	+ 5.8°F to 10.4°F	+ 12.1°F

Using 1990 as the base year implies temperatures in New York City are expected to increase 0.5 degrees per decade (Low Estimate) to 1.1 degree per decade (High Estimate). Averaging the middle range results in 0.8 degrees per decade. New York City NPCC has confirmed the reasonableness of projected New York City temperature trend as the basis for developing the City's current climate resiliency plan.

Other studies show similar projections. The *California Fourth Climate Change Assessment* projects average temperatures that are 5.6 to 8.8 degrees higher by 2100; this is an increase of 0.7 to 1.1 degrees per decade (*August, 2018* *http://www.climateassessment.ca.gov*). The IPCC in their most recent temperature projections show that by 2100, global average temperatures increase 1.1 to 2.6 Celsius for RCP 4.5 and 2.6 to 4.8 Celsius for RCP 8.5 over the base-year period (1986 – 2005); this translates into roughly 0.5 to 0.9 degrees Fahrenheit per decade. (https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter12_FINAL.pdf).

A recent study by the San Francisco Federal Reserve Board and University of Pennsylvania (https://economics.sas.upenn.edu/pier/working-paper/2019/evolution-us-temperature-dynamics) evaluated annual average temperature trends for fifteen weather stations across the United States. Figure 2 shows the study results.

Figure 2: U.S. City Temperature Trends (Degrees Per Decade)



Temperature trends varied from 0.36 degrees per decade in Boston to as high as 1.06 degrees per decade in Las Vegas. Historical trends are consistent with climate model projections.

One thing to note when reviewing climate study results is that the RCPs are physical greenhouse gas paths; there is no assigned probability. The RCPs were adopted in 2015 to provide a consistent set of input to all global climate models. The RCPs replace a set of socioeconomic scenarios. There is no significant divergence in the RCP paths until 2030, at which point the RCP 8.5 path accelerates. RCP 4.5 and RCP 6.0 track each other through 2060. RCP 2.6 is the best case scenario, with greenhouse gases beginning to decline around 2040. Most studies focus on the RCP 4.5 and RCP 8.5 outcomes. ClimAID and NPCC use RCP 4.5 to represent the low bound (assigned the 10^{th} percentile) and RCP 8.5 to represent the worst case (assigned the 90^{th} percentile); mid-range estimates are generated by the distribution of different GCM results. The California study calls RCP 8.5 the "Business as Usual" path.

The ClimAID study implies long-term average temperature increases between 0.5 to 1.1 degrees per decade with mean projection of 0.8 degrees per decade. Projected trends are consistent with the California climate assessment study, IPCC's global temperature projections, and recent temperature trends found across the country.

3. Weather Analysis

3.1 Estimate Temperature Trends

At the beginning of this project, we (i.e., Itron in coordination with NYISO staff) elected to develop a forecast based on historical weather trends rather than output from global climate models. The analysis entailed estimating temperature and Temperature Humidity Index (THI) trends from historical weather data at the weather station level, evaluating the reasonableness of these trends for forecasting, defining a temperature band that is consistent with state climate impact studies, and translating trended temperatures and Cumulative Temperature Humidity Index (CTHI) into heating, cooling, and peak degree-days for sales, energy, load profiles, and peak models.

The core of the analysis is the evaluation of long-term weather trends across New York State. Historical observations include daily data starting January 1, 1950 and extending through December 31, 2018 for 21 weather stations. Weather concepts evaluated include maximum and minimum temperatures, hot and cold days, THI (a temperature/humidity weighted variable), and cumulative THI (a three-day weighted THI variable). Table 2 lists the 21 weather stations. (See Appendix C for a map showing the locations of these stations.)

Table 2: Weather Station List

Station ID	Station
ALB	Albany
ART	Watertown
BGM	Binghampton
BUF	Buffalo
ELM	Elmira
ELZ	Wellsville Muni
FRG	Farmingdale
GFL	Glens Falls
HPN	White Plains
ISP	Islip
JFK	JFK Airport
LGA	La Guardia Airport
MSS	Massena
MSV	Monticello
NYC	Central Park
PLB	Plattsburgh
POU	Poughkeepsie
ROC	Rochester
SWF	Newburgh
SYR	Syracuse
UCA	Utica

While we explored a wide range of temperature and humidity concepts, we ultimately settled on a few temperature concepts where there are measurable trends, which could be translated into model weather variables such as heating and cooling degree-days, and could be compared with other studies. Final temperature concepts include:

- Average temperature (AvgDB): Average daily temperature
- Cold-day average temperature (MinAvgDB): Average temperature on the coldest day
- Hot-Day average temperature (MaxAvgDB): Average temperature on the hottest day
- Hot- Day cumulative THI (MaxCTHI): Average CTHI on the hottest day

Annual trend models were estimated for each of the temperature concepts. The historical period is from 1950 to 2018; this provides 69 annual observations for each concept and weather station. An example of the dataset is shown in Figure 3 for the Albany weather station (ALB).

Figure 3: Annual Drybulb Values at Albany – Degrees F

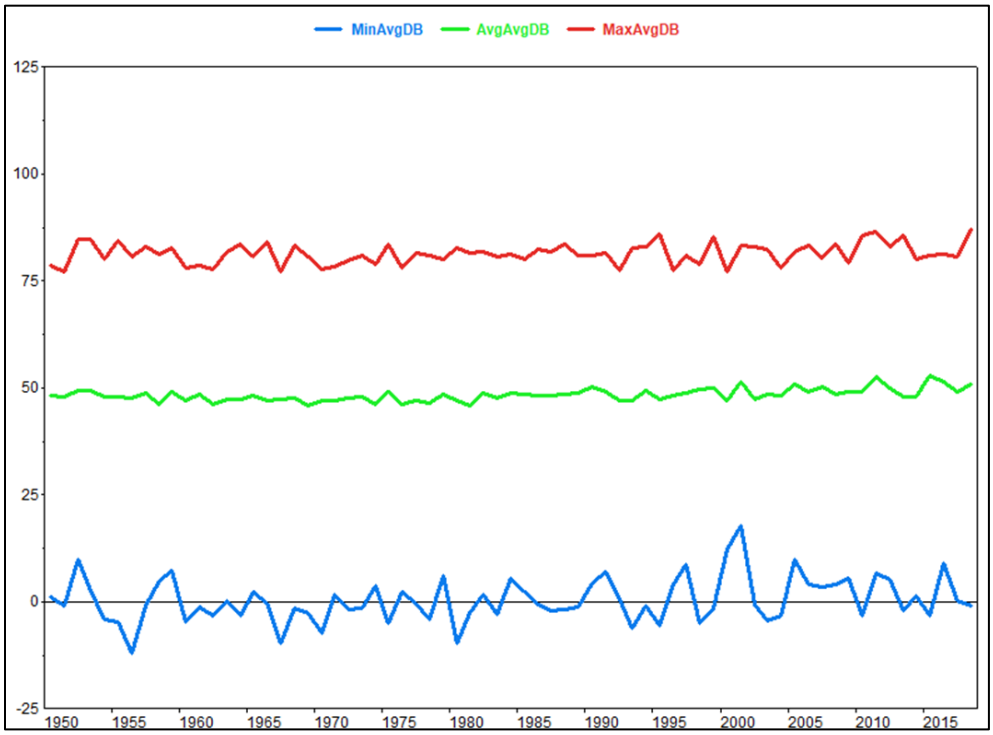
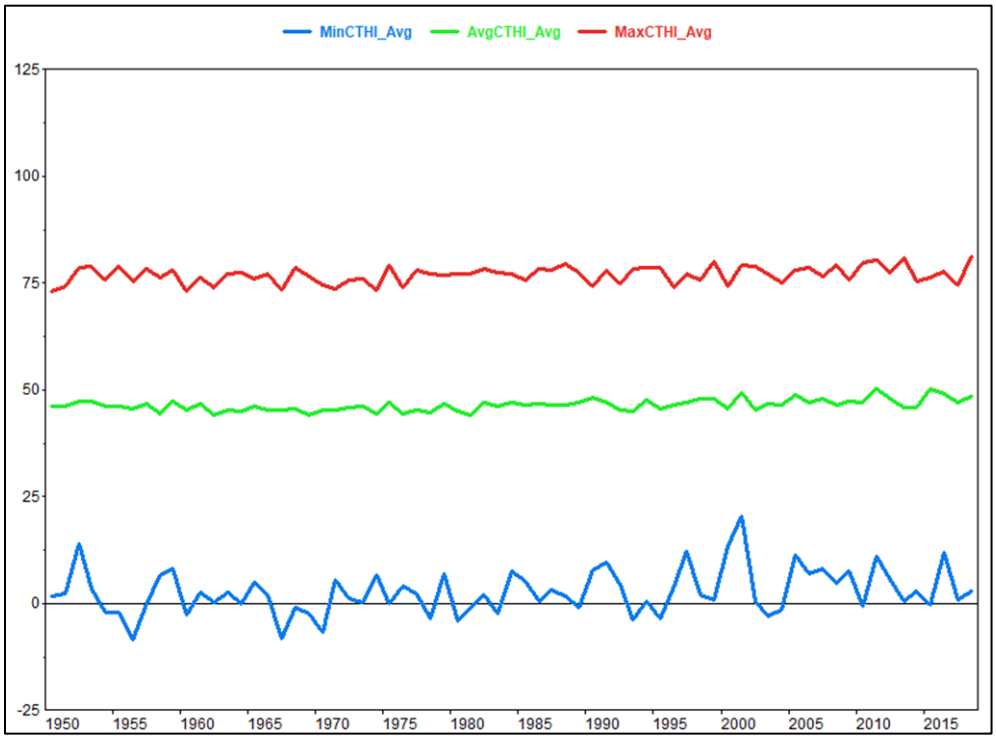


Figure 4: Annual CTHI Values at Albany – Degrees F



The modeling analysis involved fitting statistical trend models to the historical temperature and CTHI data series. We explored several model functions and determined that a hinge-fit model best explained historical weather trends and resulted in reasonable temperature trend estimates, which are consistent with other trend analyses, the *ClimAID* study update, and our own analysis of other regions.

A hinge-fit model is a relatively simple specification that involves finding the point in time where there is a statistically measurable change in temperature trend. The model specification is:

$$Value_{cy} = f(HingedTrend_y, Constant)$$

Where:

c = Weather concept:

AvgDB
MinAvgDB
MaxAvgDB
MaxCTHI

y = year

HingedTrend = A variable whose value is 0 from 1950 to 1991, then increases by 1 each year thereafter

Figure 5 depicts the actual and predicted results.

Figure 5: Hinge-Fit Model

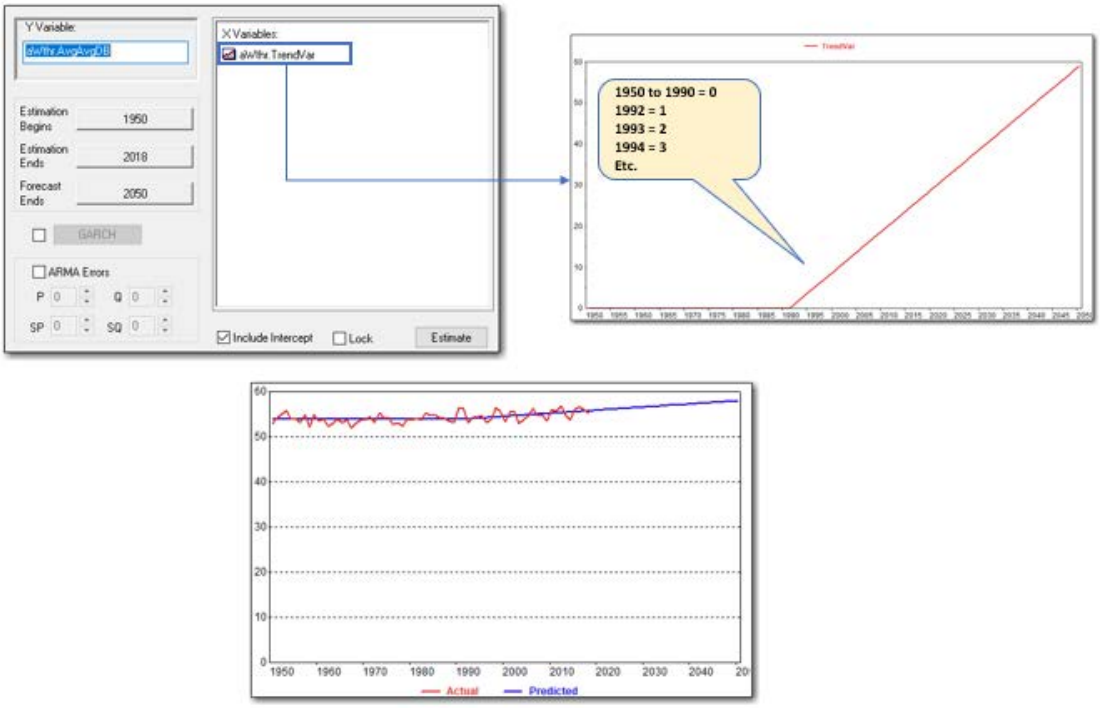
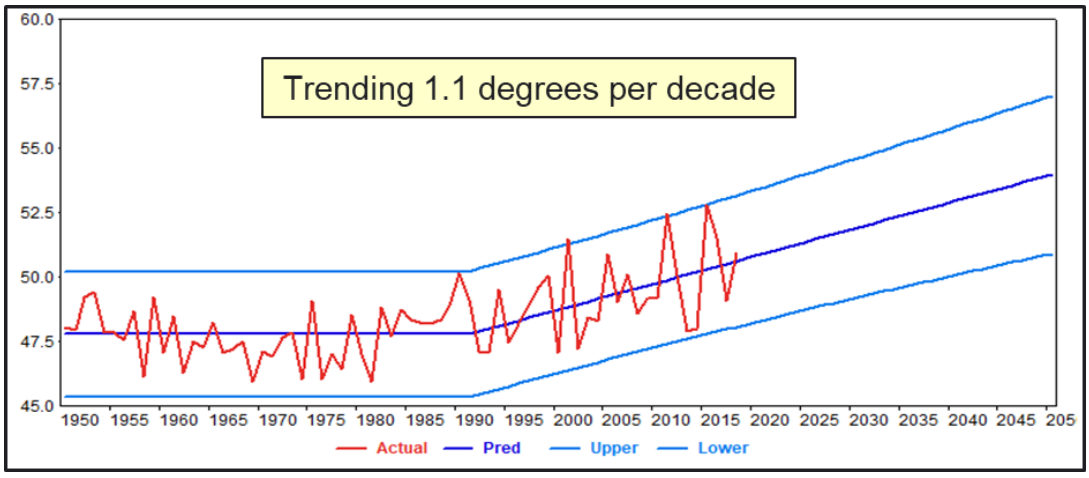


Figure 6 shows the average temperature trend projection for the Albany airport weather station.

Figure 6: Albany Average Temperature Trend – Degrees F



The upper and lower light blue lines show the 90% confidence interval around the temperature trend. The year 1992 was selected as the common hinge-point as this provided

the best overall fit across all the weather stations and weather concepts. Using a common hinge point allows us to isolate trends across weather stations and concepts that are not determined simply by differences in the starting point of the data series. The average temperature trend is highly statistically significant; this is true across all the weather stations. The estimated coefficient on Albany average temperature is 0.11; this implies that since 1992 temperatures on average have been increasing 0.11 degrees per year or 1.1 degrees per decade (climate analysis generally discuss temperature trends in terms of decades).

One of the interesting discoveries is that the temperatures on the hottest days and coldest days are trending at different rates. Figure 7 and Figure 8 show temperature trends on the hottest and coldest days.

Figure 7: Albany Hot-Day Weather Trend – Degrees F

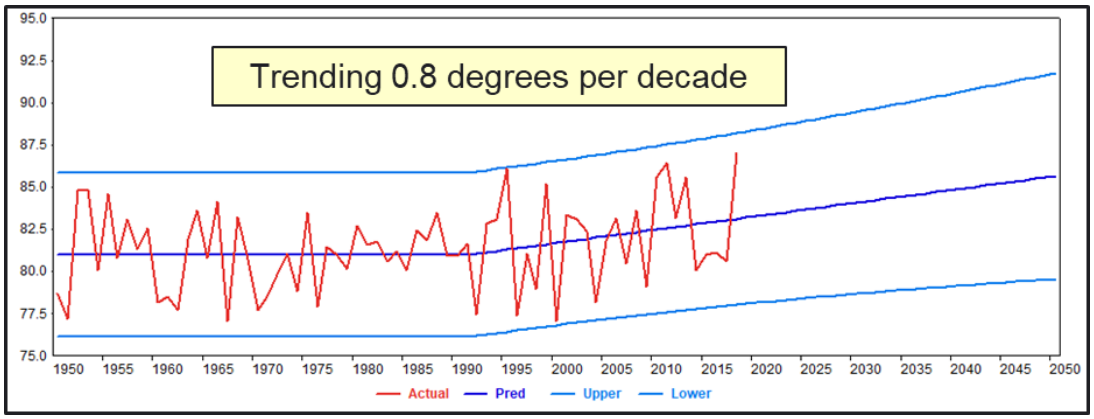
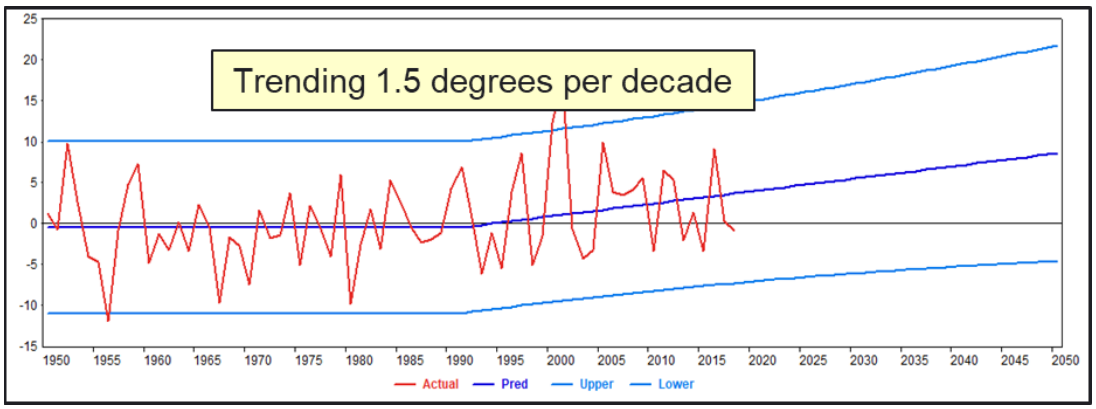


Figure 8: Albany Cold-Day Trend – Degrees F



The average temperatures on the coldest days are increasing faster than average temperatures on the hottest days. This is true for all the weather stations except La Guardia and Islip where this relationship is reversed.

While days are getting warmer, the maximum hourly temperatures are not. Increases in temperatures have largely been driven by increasing minimum temperatures. Figure 9 shows the maximum hourly temperature and Figure 10 shows the minimum hourly temperature.

Figure 9: Albany Maximum Hourly Temperature – Degrees F

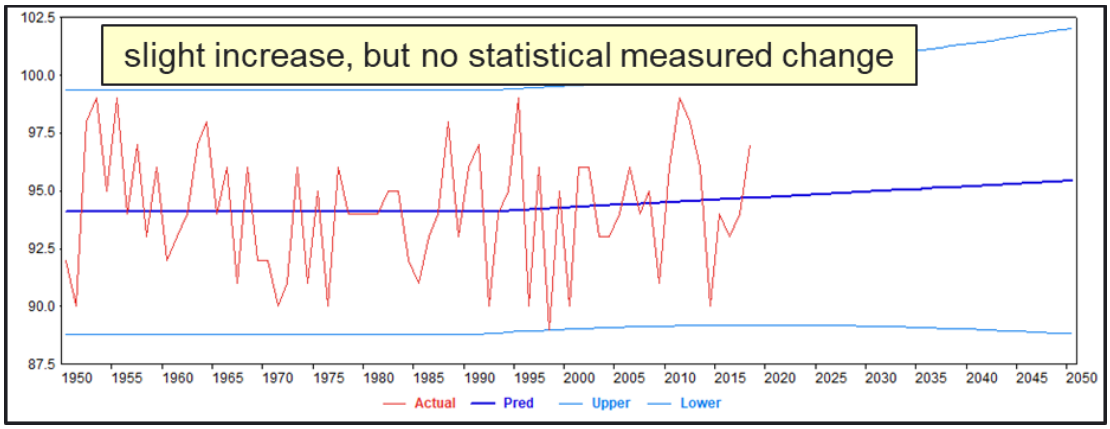
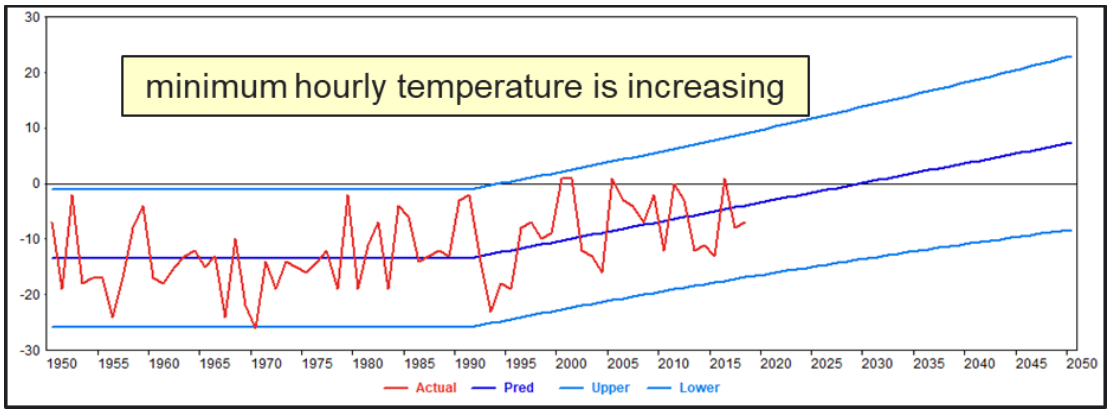


Figure 10: Albany Minimum Hourly Temperature – Degrees F



Another finding is that there are significant differences in temperature trends across the state. Figure 11 and Figure 12 show the temperature trend for Central Park and La Guardia. Both stations are within New York City, but have significantly different temperature trends.

Figure 11: Central Park Average Temperature Trend Degrees F

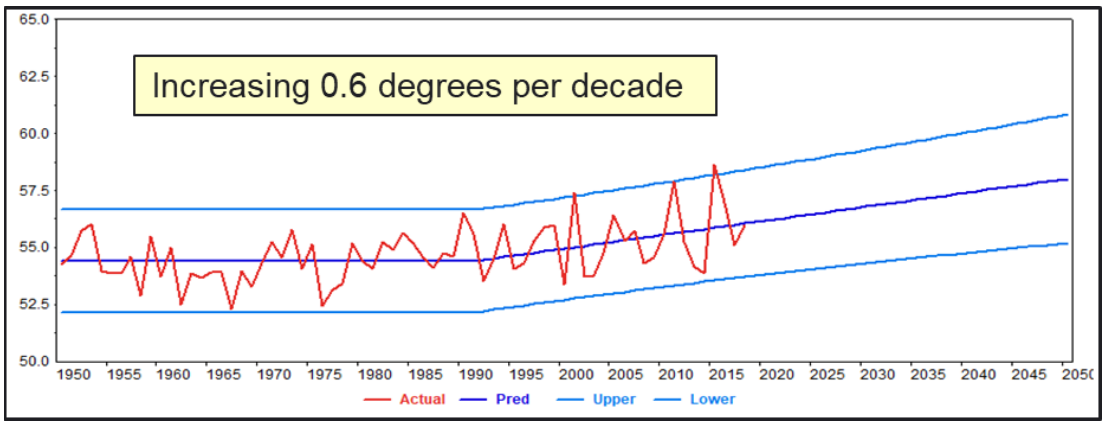
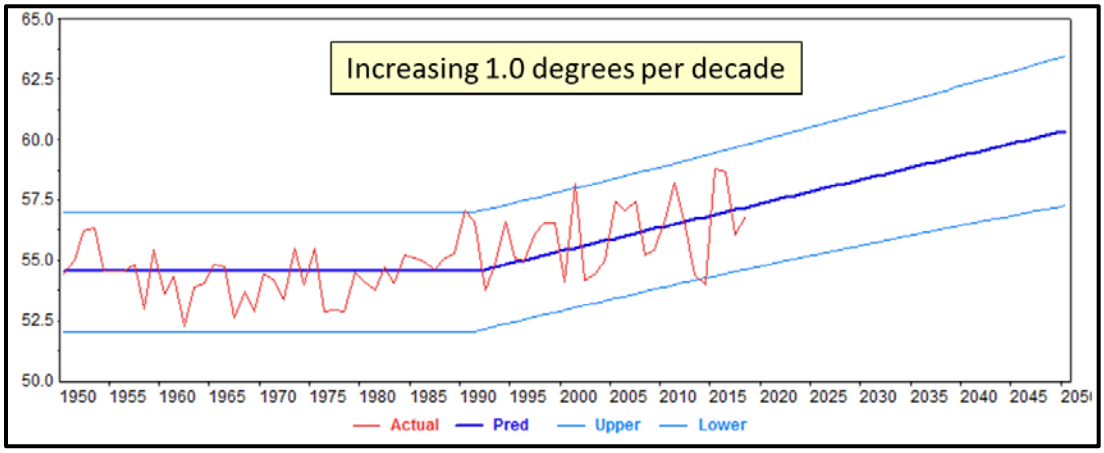


Figure 12: La Guardia Average Temperature Trend – Degrees F



Average temperatures at Central Park are increasing 0.6 degrees per decade while average temperatures at La Guardia are increasing 1.0 degrees per decade. Similarly, temperatures on the hottest days are increasing 0.4 degrees per decade at Central Park compared with 1.4 degrees per decade at La Guardia.

Estimated trend coefficients are used in constructing the long-term model weather variables. The are 84 resulting coefficients - 21 weather stations, each with 4 weather concepts. Transmission District temperature trend coefficients were calculated using a weighted average of weather station coefficients. The weather station weights were derived by the NYISO forecasting team based on weather station to Transmission District mapping. A similar set of weights were derived for each NYISO Load Zone and for the NYCA system as a whole. Table 3 shows the resulting weather trend coefficients for each Transmission District and the system (NYCA). (Appendix C includes the weather station weights.)

Table 3: Transmission District and System Weather Trend Coefficients (Degrees F per Decade)

Weather Concept	National Grid	Consolidated Edison	Central Hudson	Long Island Power Authority	New York State Electric & Gas	Orange & Rockland	Rochester Gas & Electric	NY
MinTemp	1.07	0.86	1.78	0.79	1.07	0.99	1.12	0.98
AvgTemp	0.71	0.69	0.90	0.85	0.60	0.59	0.78	0.71
MaxTemp	0.52	0.56	0.78	0.93	0.44	0.41	0.45	0.58
AvgCTHI	0.64	0.59	0.80	0.75	0.55	0.64	0.68	0.63

The state average temperature trend is 0.71 degrees per decade with peak-day CTHI averaging 0.63 degrees per decade. Average temperatures by Transmission District vary from 0.59 to 0.90 degrees per decade.

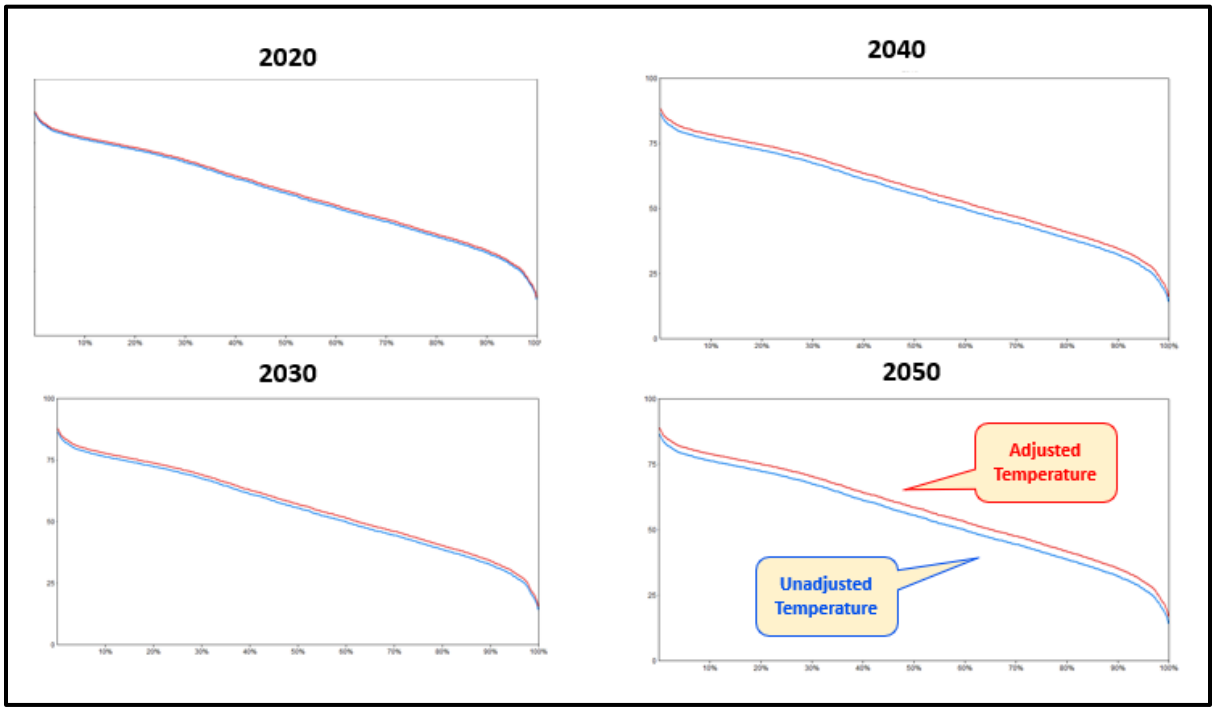
For all but LIPA, average temperatures on the coldest days are increasing faster than average temperatures on the hottest days. In LIPA is dominated by ISLIP airport were temperatures on the hottest days are increasing faster than the average temperatures. We believe proximity to the ocean plays a part in this trend. Table 4 shows expected average temperatures based on current temperature trends.

Table 4: Expected Temperature Average Temperature – Degrees F

Transmission District	Average Annual Temperature			
	2020	2030	2040	2050
National Grid	49.5	50.2	50.9	51.6
ConEdison	55.9	56.6	57.3	57.9
Central Hudson	51.9	52.8	53.7	54.6
Long Island Power Authority	54.5	55.4	56.2	57.0
New York State Electric & Gas	49.2	49.8	50.4	51.1
Orange & Rockland	51.7	52.3	52.9	53.5
Rochester Gas & Electric	50.1	50.8	51.6	52.4
New York Control Area	52.6	53.3	54.0	54.7

Differences in hot-day and cold-day temperature trends complicate the impact temperatures have on load over time. Thinking about it in terms of a temperature duration curve, the temperature curve is not only shifting out over time as average temperature increases, but the shape itself is changing — it is getting fatter at the bottom and steeper at the top. In Figure 13, the blue line represents the unadjusted temperature duration curve, which remains constant from year-to-year, while the red line represents the adjusted temperature duration curve, which is adjusted to hit the average, maximum, and minimum targets. As illustrated, the deviations from the unadjusted curve increase as the forecast horizon progresses.

Figure 13: Temperature Duration Curves



When translated into monthly CDD, the shoulder-month CDDs (in April, May, September, and October) increase faster than in the summer months (June, July, and August). Effectively, summer is coming earlier and persisting longer. Over time, system and zonal loads flatten out as loads in the shoulder months increase faster than loads in the summer months.

3.2 Calculate Trended Normal Temperatures

Forecasted HDD, CDD, and TDD are derived by combining historical average temperatures with the trend calculations. Daily, peak-day, and monthly degree-days are calculated for each planning area and the system.

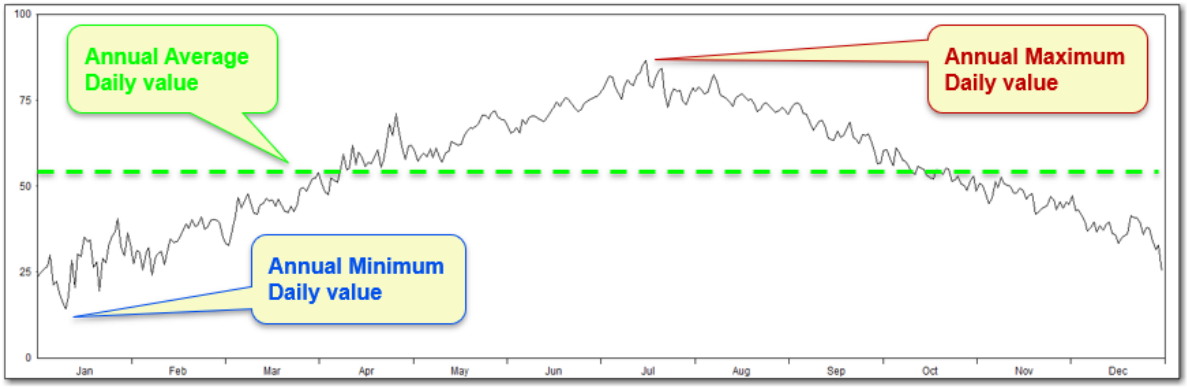
The first step is to calculate "normal" daily average temperatures and CTHI. Daily normal temperatures are calculated using an "average-by-date" approach over the period January 1, 1999 to December 31, 2018; 2018 is the last full year of data. That is, take the following steps:

- Average all the January 1st values
- Average all the January 2nd values
- … *continue through end of year*…
- Average all the December 31st values

The daily average is then assigned to a typical weather pattern that assures that the peak-producing weather conditions occur on a weekday. This is important for the purposes of

generating the peak demand forecast, as it complicates the analysis to have the most extreme days occurring on a weekend. While it is true that extreme weather can and will occur on weekends, it is necessary from a forecasting perspective to ensure the forecasts are producing extreme load values, which generally occur on weekdays, rather than to obscure the analysis with the offsetting effects of the weekend. Figure 14 shows the resulting normal daily temperature series for the state.

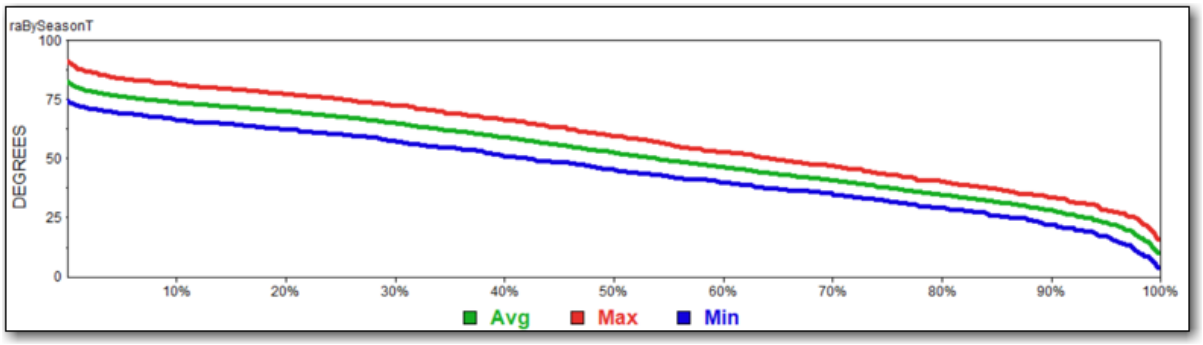
Figure 14: State-level daily normal average temperatures – Degrees F



One thing to note is that averaging-by-date first and then calculating degree-days will result in a small bias adjustment downward in the number of CDD in the shoulder months. Typically, we would calculate degree-days first and then average the daily degree-days series. But as the trends are calculated on temperature (so they are consistent with climate studies), we elected to accept the slightly biased shoulder-month CDD.

The next step is to calculate a normal temperature duration curve. The daily normal temperature (365 values for non-Leap Years and 366 value for Leap Years) are ranked from the highest temperature to the lowest temperature, as illustrated in Figure 15.

Figure 15: Normal Temperature Duration Curve



Normal daily average temperatures are shown in green. The associated maximum daily temperature is red and associated minimum temperature is blue.

The starting duration curve represents the average temperature over the period from 1999 to 2018. Effectively, it represents the 2009 expected temperatures (i.e., the midpoint of the 1999–2018 period). To get to the forecast starting point (2019), the normal-weather temperature curve for the system is shifted up 0.07 degrees per year (0.7 degrees per decade).

In summary, the steps to reach the starting year normal temperatures include:

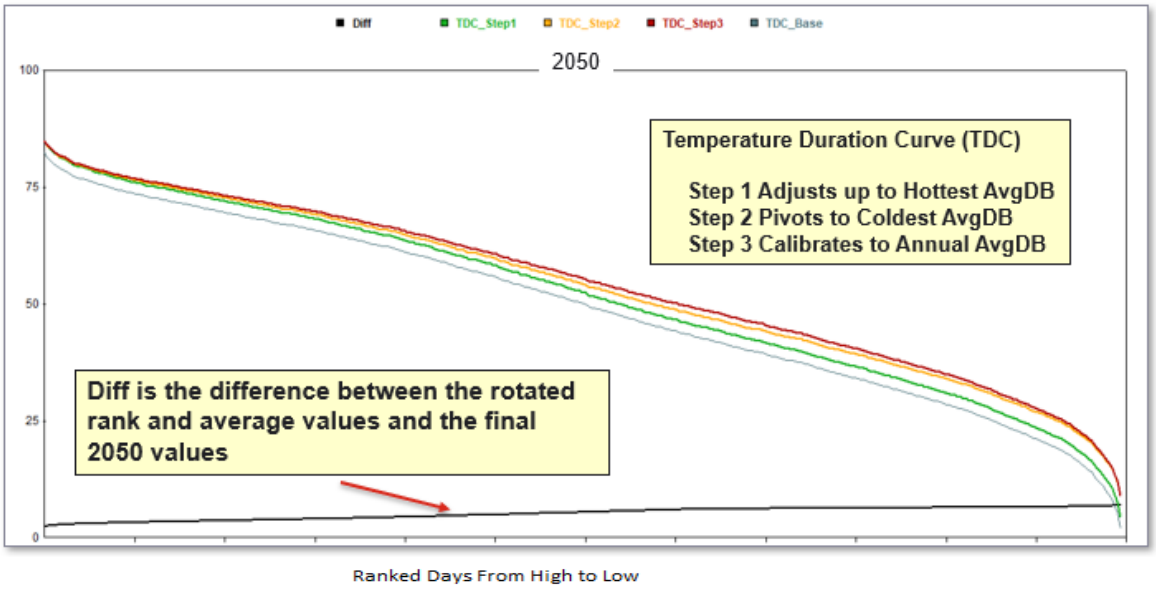
- Sorting temperatures from high to low
- Averaging by season (1999 – 2018)
- Adjusting the starting temperature duration curve to the 2019 start-year. This value is already 20 years from the starting point (i.e., 1999). This starting point (2019) is the basis for trending temperatures through 2050.

At the state level, the temperature curve continues to shift upward over time at 0.7 degrees per decade, but trend analysis has shown that the temperatures on the coldest days (1.0 degrees per decade) are increasing faster than the average temperature, while temperatures on the hottest days (0.6 degrees per decade) are increasing slower than the average temperature. The temperature curve is adjusted over time to reflect these differences in temperature trends by performing the following steps:

- Adjusting the curve upward to match the hottest day (increasing .06 degrees per year)
- Pivoting the curve to match the coldest day (increasing 0.1 degrees per year)
- Calibrating to the annual average temperature (increasing 0.07 degrees per year)

The adjustment process is illustrated in Figure 16.

Figure 16: Depiction of Trended Normal Adjustment Process

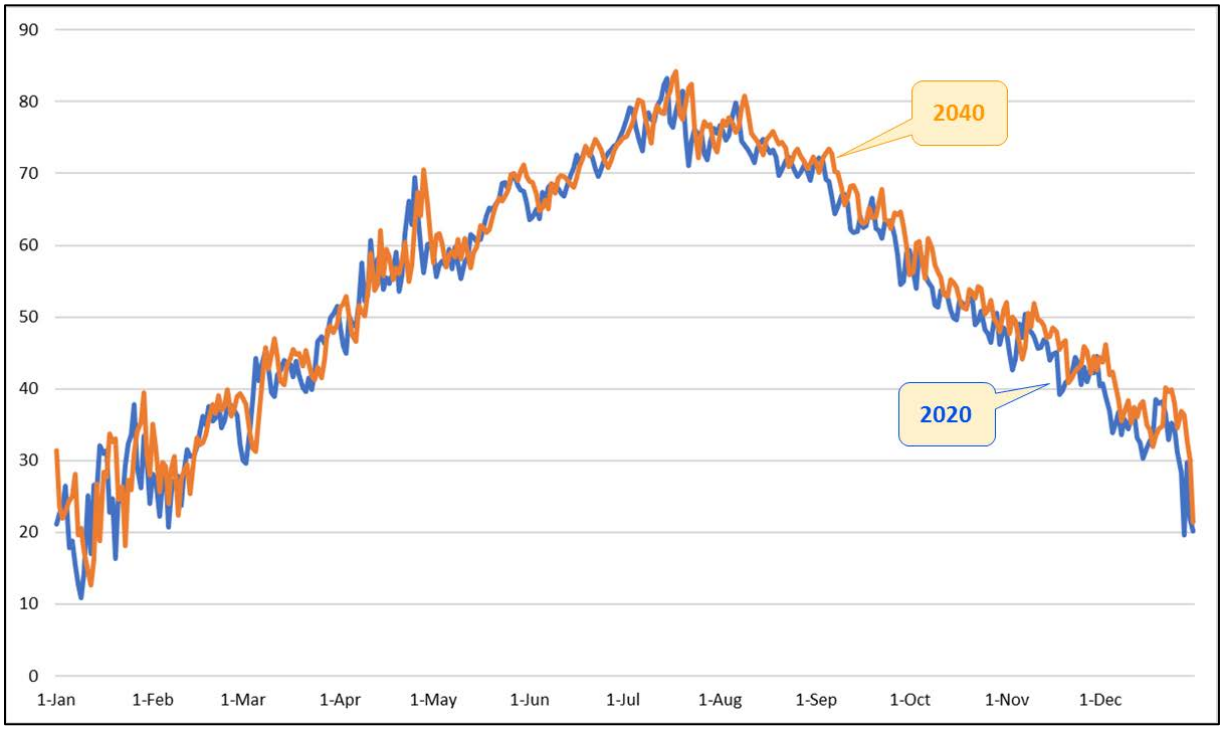


Finally, we map the duration curves to the typical weather pattern with two versions:

- **Rotation by Day** always puts the hottest day on a specified weekday (e.g., Wednesday). This approach is useful for the hourly load modeling and it ensures that the extreme weather days do not rotate onto a weekend, which will impact the peak demand values.
- **Rotation by Calendar** always starts the pattern on January 1st. This approach is useful for the monthly energy forecasting and it ensures that the calendar-month degree days do not vary (with the movement of the calendar) from year to year. In other words, this ensures that the July CDD values do not change from year to year, which will impact the monthly energy forecast.

The resulting daily normal temperature data series for NY state in 2020 and 2040 are illustrated in Figure 17. The most salient feature of the figure is that the 2040 values are higher than the 2020 values, not every single day, but in aggregate.

Figure 17: New York State Normal Daily Temperatures: 2020 and 2040



3.3 Calculate CDD, HDD, and Peak-day TDD

Daily, monthly, and peak-day degree-days are used in driving energy and demand. Degree-days are calculated from actual and trended-normal average temperatures. Typically, CDD and HDD are calculated with a 65-degree base temperature. As the relationship between energy use and temperature is nonlinear, forecast models of energy use can be improved by

using CDD and HDD variables with different and potentially multiple temperature breakpoints.

The formulas for CDD and HDD are as follows:

$$CDD_d^b = Max(AvgDB_d - BreakPoint^b, 0)$$
$$HDD_d^b = Max(BreakPoint^b - AvgDB_d, 0)$$

Where:

d	= date
b	= critical turning point (e.g., 65, 70, 75)
AvgDB	= average Daily Temperature

CDD values return a positive value when the temperature is above the Breakpoint and HDD values return a positive value when the temperature is below the Breakpoint. Otherwise, each variable returns 0. The daily CDD and HDD values are used as drivers in the hourly load models.

For the purposes of monthly energy forecasting, the CDD and HDD values are summed over the days in the month as follows:

$$CDD_{y,}^b = \sum_{ymb} CDD_{ymd}^b$$

$$HDD_{y,}^b = \sum_{ymb} HDD_{ymd}^b$$

Where:

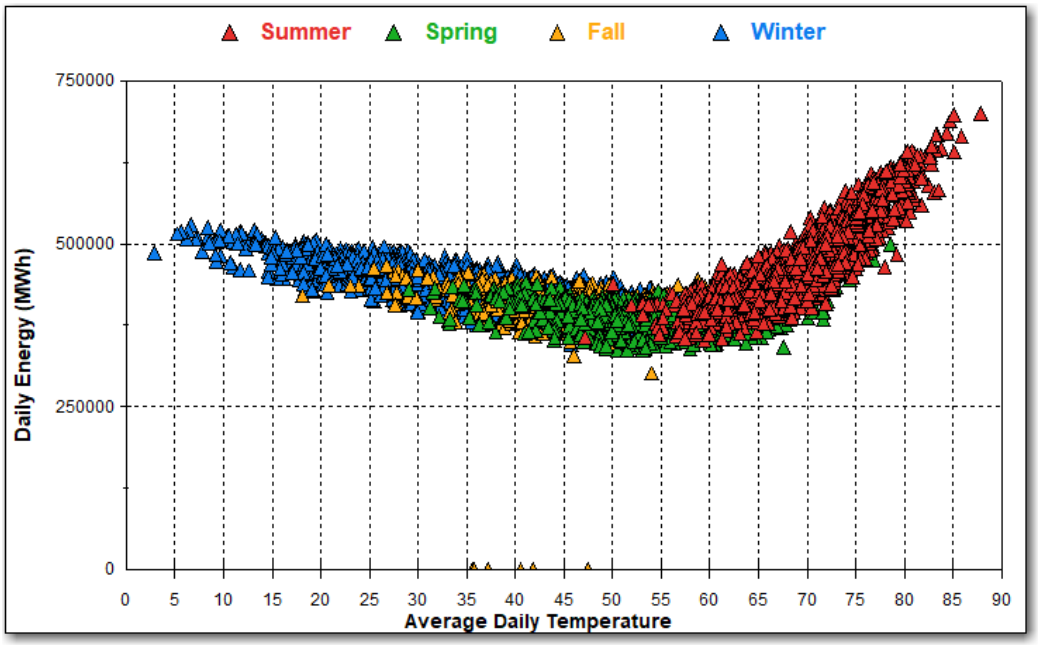
y = year (e.g., 2010, 2011)
m = month (e.g., 1, 2, …12)
d = day (e.g.., 1, 2, … 31)
b = breakpoint (e.g., 65, 70, 75)

For the purposes of the monthly peak demand forecast model, Itron utilized a TDD (i.e., THI Degree Day) calculated from the daily CDD based on the CTHI, rather than the temperature, in order to capture the effects of humidity. Further, the TDD was calculated as the maximum monthly value of this variable rather than the value coinciding with the peak demand.

Figure 18 is a scatter plot of NY State Daily energy (retail usage plus losses) plotted against average daily temperature, in which each point represents a day. The relationship is clearly non-linear. Specifically, there is a positive relationship between energy and temperature at temperatures above 65 degrees (i.e., high temperatures are associated with higher energy) and there is a negative relationship between energy and temperature at temperatures below 50 degrees (i.e., lower temperatures are associated with higher energy). This relationship is well-known and easily explained. At high temperatures, electricity consumers use more

energy for cooling. At low temperatures, electricity consumers use more energy for heating. Further, the lower temperatures are also associated with increased lighting usage as the winter has longer periods of darkness.

Figure 18: NY State Daily Energy vs. Average Temperature (2006 to 2018)



From the above figure, it is clear that using a single breakpoint of 65 for both CDD and HDD will not provide the best fit. While 65 degrees is a reasonable breakpoint for CDD, HDD defined with a 55 or even 50 degrees, will fit the heating side of the curve much better. Less obvious is that using a single breakpoint for CDD alone (and for HDD alone) may not sufficiently capture the load-weather relationship, due to the non-linear response of load to weather. To address this weakness, we develop weighted CDD and HDD values that incorporate differential effects at various breakpoints.

$$WgtCDD_{ym} = \sum_{w=1}^{n} Wgt_w \times CDD_{ym}$$

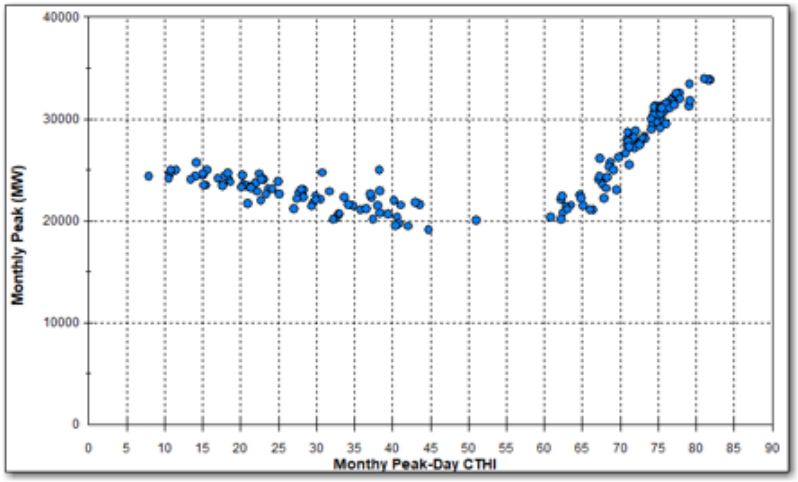
Where:

WgtCDD	= Weighted CDD
CDD	= Cooling degree
y	= year
m	= month
w	= weight option (from 1 to *n* – *CDD65, CDD70, CDD75 would be n = 3*)
Wgt	= Weight Value (e.g., 0.5). The sum of the weights is 1.0.

Analogous weighting logic applies to the monthly HDD.

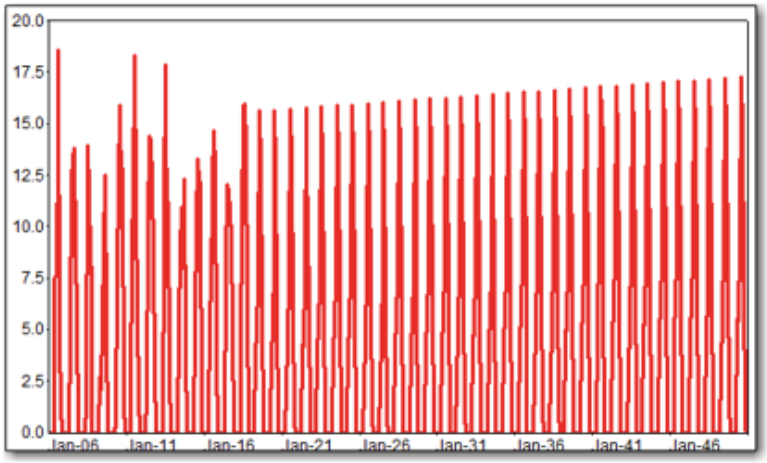
Figure 19 depicts the relationship between NY state monthly peak demand against the peak-day CTHI — each point represents the peak-day during the month, with one point per month. The relationship is very similar to the relationship between daily energy and temperature.

Figure 19: NY State Monthly Peak Demand vs. Peak Day CTHI (2006 to 2018)



For the purposes of modeling the monthly peak-demand, we calculated the CTHI on the day of the historical peak. That is, we determined the day on which the monthly peak demand occurred, and we calculated the CTHI from that particular day. We then utilized the CTHI as the basis for the TDD (analogous to the CDD), rather than using the temperature solely, in order to capture the effects of humidity. Further, we applied a similar weighting as described above for the monthly CDD and HDD variables, in order to capture non-linearities in the effects of the TDD. Figure 20 illustrates the NY State monthly peak TDD variable.

Figure 20: NY State Peak TDD History and Forecast



Trended CDD, HDD, and CTHI are used in constructing drivers for the forecast models. At the end of the process, the monthly CDD values increase during the forecast horizon and the monthly HDD values decrease during the forecast horizon, as shown in Figure 21 and Figure 22. The CDD values exhibit an increase of 0.8% annually (with a faster increase during the shoulder months than during the peak summer months), while the HDD values decrease by 0.5% annually.

Figure 21: NY State Weighted Monthly HDD

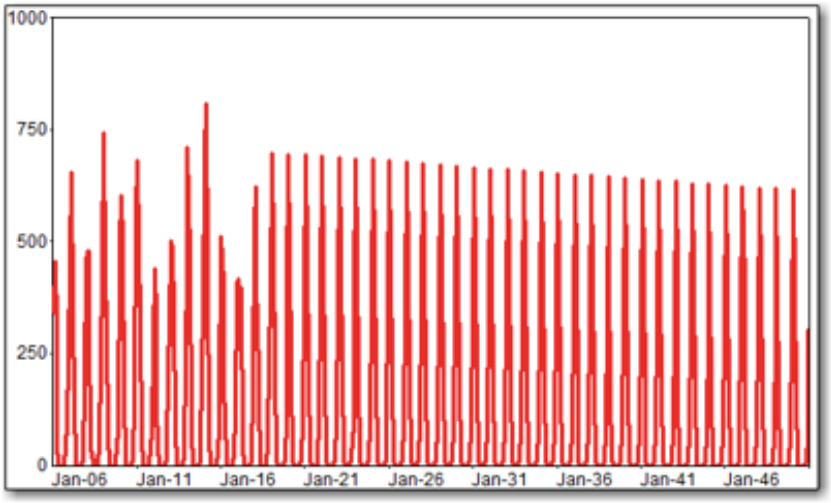
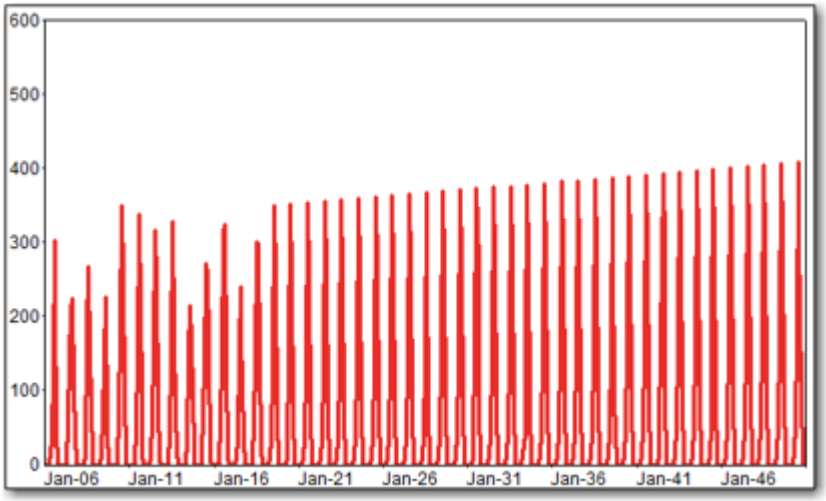


Figure 22: NY State Weighted Monthly CDD



3.4 Accelerated Temperature Scenario

Average temperatures are trending upward by 0.6 to 0.9 degrees per decade at weather stations across the state. On average, New York temperatures are increasing 0.7 degrees per decade. Temperature trends are consistent with current and projected increases in greenhouse gases at least through 2030. Our reference case assumption is temperatures will continue to trend at current rates. AccuWeather, who worked with Itron on the study, confirmed the reasonableness of projected temperature trends.

Climate-model projections are based on one of four RCP paths. NYSERDA, New York City and Consolidated Edison base their analysis on RCP 4.5 (as the low case) and RCP 8.5 (as the high case). RCP 8.5 results in significantly higher long-term temperatures. There is no significant divergence in the RCP paths until 2030; the paths are roughly linear from 2000 through 2030. After 2030, RCP 8.5 (the worst-case scenario) begins to significantly accelerate. RCP 4.5 and RCP 6.0 trend at the current rate until 2060, at which point RCP 6.0 continues at the current trend while RCP 4.5 flattens out. Greenhouse gas concentration under RCP 2.6 (the best-case secnerio) starts declining after 2040. On a long-term basis, greenhouse gas concentrations are relatively consistent between RCP 4.5 and RCP 6.0.

We recognize that there is uncertainty as to which path we will ultimately follow. To bound this uncertainty, we developed an "accelerated" temperature case. The accelerated scenario doubles the average temperature increase from 0.7 degrees per decade to 1.4 degrees per decade. The high range is consistent with the state climate study high range temperature projections. AccuWeather confirmed that 1.4 degrees per decade represents an extreme temperature outcome.

The accelerated daily temperature series is derived in a similar manner as that for the trended-normal data series; we assume that the hottest temperatures and coldest day temperatures are also increasing twice as fast as in the Reference Case. The temperature duration curve shifts out over time at 1.4 degrees per decade with results used in constructing spline-weighed CDD, HDD and peak-day TDD.

Figure 23 through Figure 25 compare HDDs, CDDs, and peak-day TDDs for the Reference Case and the accelerated weather trend scenario.

Figure 23: Heating Degree Days

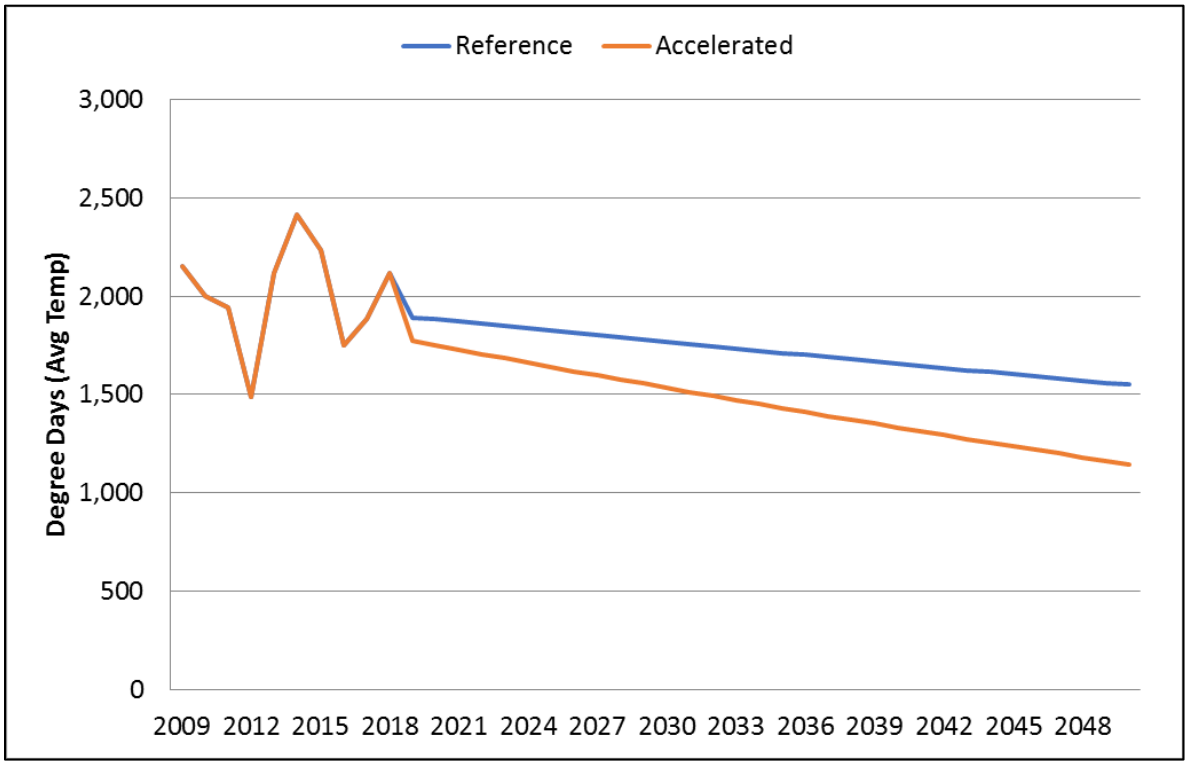


Figure 24: Cooling Degree Days

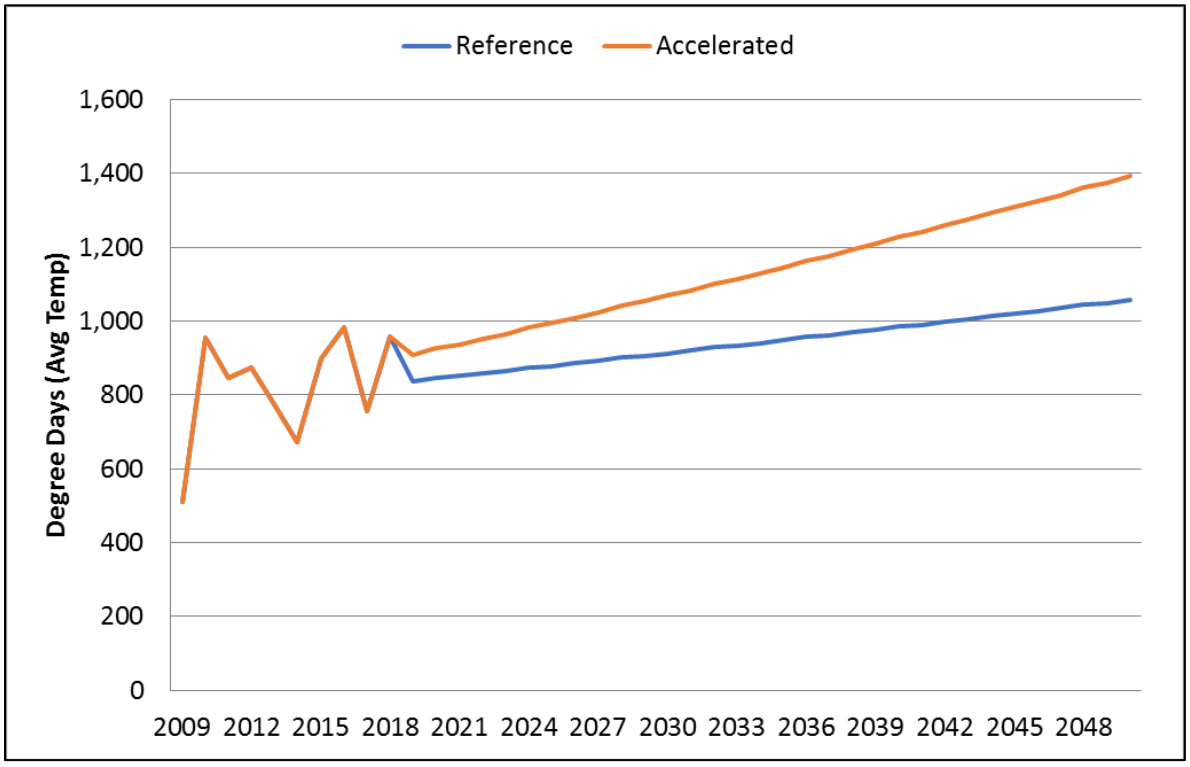
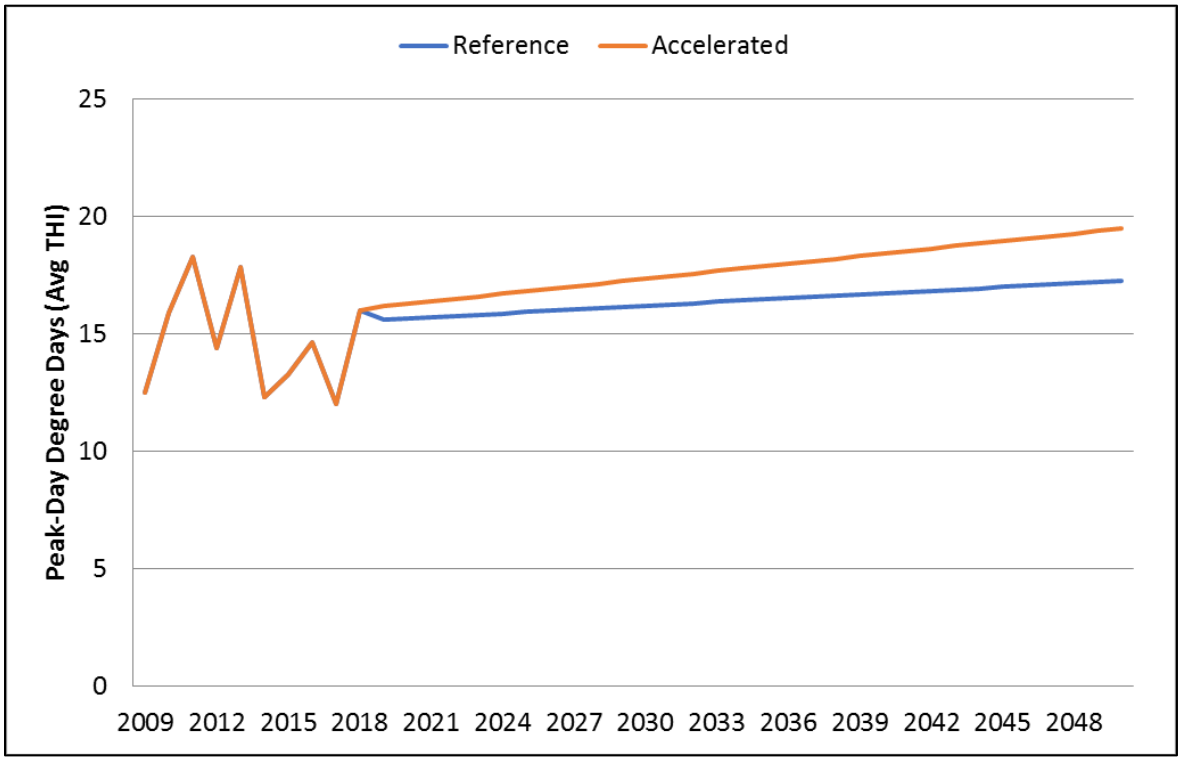


Figure 25: Peak-Day Cooling Degree Days (THI)



3.5 Load Impacts

System and zonal load forecasts are based on a set of models and assumptions on future demographic, economic, structural, and weather conditions. The models are described in Section 4. The reference case (one of the three forecast scenarios) is used to evaluate climate-change impacts. The reference case is based on the NYISO 2019 *Gold Book* forecast assumptions and trended-normal (0.7 degrees per decade) temperature projections. The reference case model is also used to estimate energy and peak demand with accelerated (1.4 degrees per decade) and "normal" temperatures (temperatures held constant at the 2019 level). Table 5 shows forecast results.

Table 5: System Peak Demand Impact

	Summer Peak Demand (MW)			Weather Impact (MW)	
	Normal	Reference	Accelerated	Reference	Accelerated
2020	32,652	32,696	33,205	44	553
2030	32,899	33,405	34,393	506	1,494
2040	36,396	37,403	38,911	1,007	2,514
2050	41,700	43,317	45,479	1,617	3,779

Reference case summer peak demand reaches 37,403 MW in 2040 and 43,317 MW in 2050. Reference case peak demand is 1,007 MW higher than the normal case demand forecast by 2040, and over 1,600 MW higher by 2050. Using the accelerated temperature projections

more than doubles the demand impact. With accelerated temperatures, peak demand reaches 45,479 MW by 2050 - 3,779 MW higher than the normal-weather forecast.

As a percent of total peak demand, the weather impacts do not appear to be all that significant. The impact is much more significant when compared against cooling load at time of peak; roughly 40% of the peak load is cooling related. Climate change accounts for 7% to 17% of projected cooling load by 2040 and 10% to 23% by 2050.

Projected demands are based on trended and accelerated weather projections. Even around these trends, there are a range of possible outcomes due to uncertainty inherent in model structure and statistical estimation process, economic and end-use intensity forecasts, and with the largest contributor being variance in peak-day weather conditions. To bound forecast uncertain, a 90% confidence interval is statistically derived as the 45th percentile above and below the 50th percentile demand forecast (corresponding to the 5th percentile and 95th percentile forecasts, respectively). Table 6 shows the 50% and 90% upper bound of the demand forecasts for the Reference and Accelerated Cases.

NYISO also performs analyses for a one-in-ten (90th percentile) possible load event. For comparison, Table 6 also shows the current NYISO Gold Book forecasts.

Table 6: 50% and 90% Percentile Forecast

	Gold Book (MW)		Reference Case (MW)		Accelerated (MW)	
	Baseline	90th	50% Prob	90% Prob	50% Prob	90% Prob
2020	32,202	33,990	32,696	34,273	33,205	34,806
2030	31,066	32,776	33,405	34,975	34,393	36,010
2040	33,006	34,810	37,403	38,944	38,911	40,513
2050	35,595	37,539	43,317	44,885	45,479	47,125

While the Reference Case forecast is based on the same set of underlying economic and end-use intensity projections, expected demand (50% probability) is also higher than Gold Book Baseline forecast. This is largely due to differences in peak-day temperature variable construction, peak-day temperature trend, and approaches for modeling impact of solar and electric vehicle loads on the system load profile.

4. Model Overview

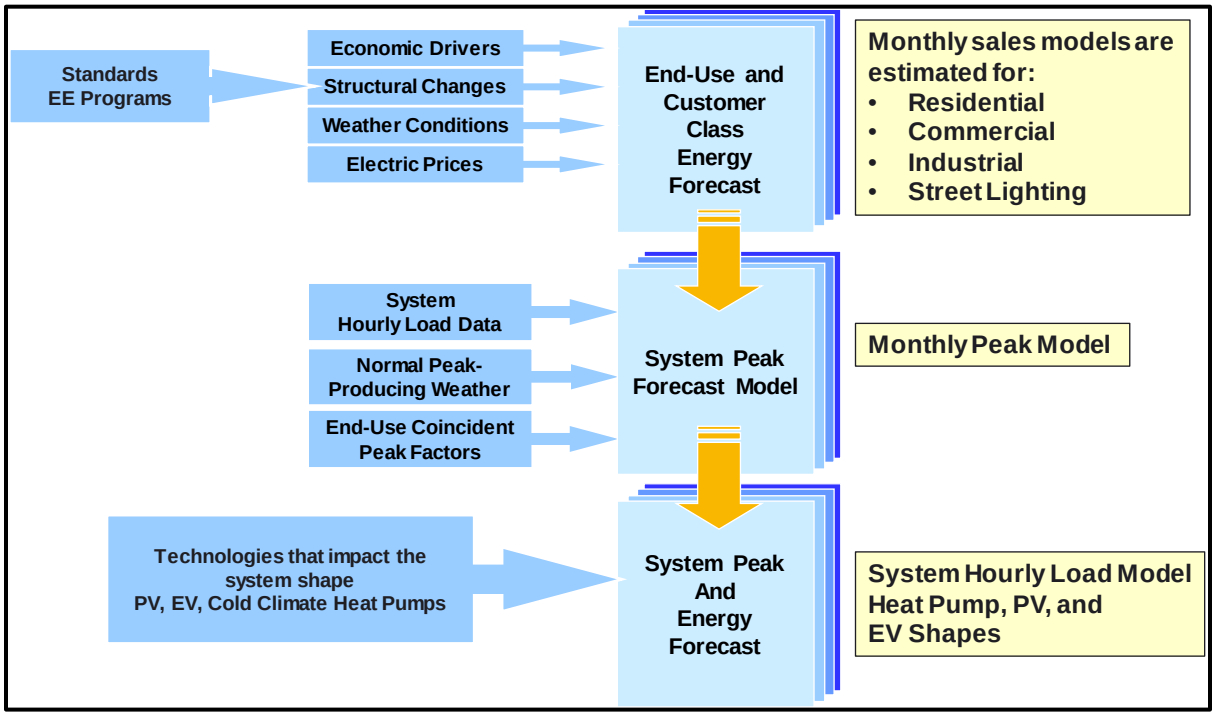
Despite moderate economic growth over the last ten years, state electric sales have been flat to slightly declining. This is primarily because improvements in end-use efficiency have countered the impacts of customer and economic growth. NYISO recognized this issue and three years ago adopted an end-use modeling framework designed to explicitly account for changes in energy efficiency as well as economic growth. The NYISO modeling framework is used in developing the climate impact forecasts.

For the system forecast, the approach starts at the customer-class level with monthly forecasts of residential, commercial, industrial, and streetlight sales. Residential and commercial customer classes are modeled using an end-use framework that explicitly incorporate end-use saturation and efficiency. Generalized econometric models are used in developing the industrial and street lighting forecast. Non-weather sensitive end-use sales estimates derived from class-level forecasts are used to forecast system peak. Impact of trending weather conditions on peak are captured through the peak model heating and cooling variables that also incorporate heating and cooling end-use intensity projections, population, and economic growth.

The peak forecast and energy forecast (derived by adjusting the sales forecast for line losses) are combined with a system hourly profile load forecast. The profile reflects expected daily weather conditions, day of the week, seasons, and holidays. The result is an 8,760 *baseline* hourly load forecast through 2050.

Long-term hourly load forecasts for solar, electric vehicles, and electrification (e.g., cold climate heat pumps) are layered on the baseline hourly load forecast. Figure 26 shows the modeling framework.

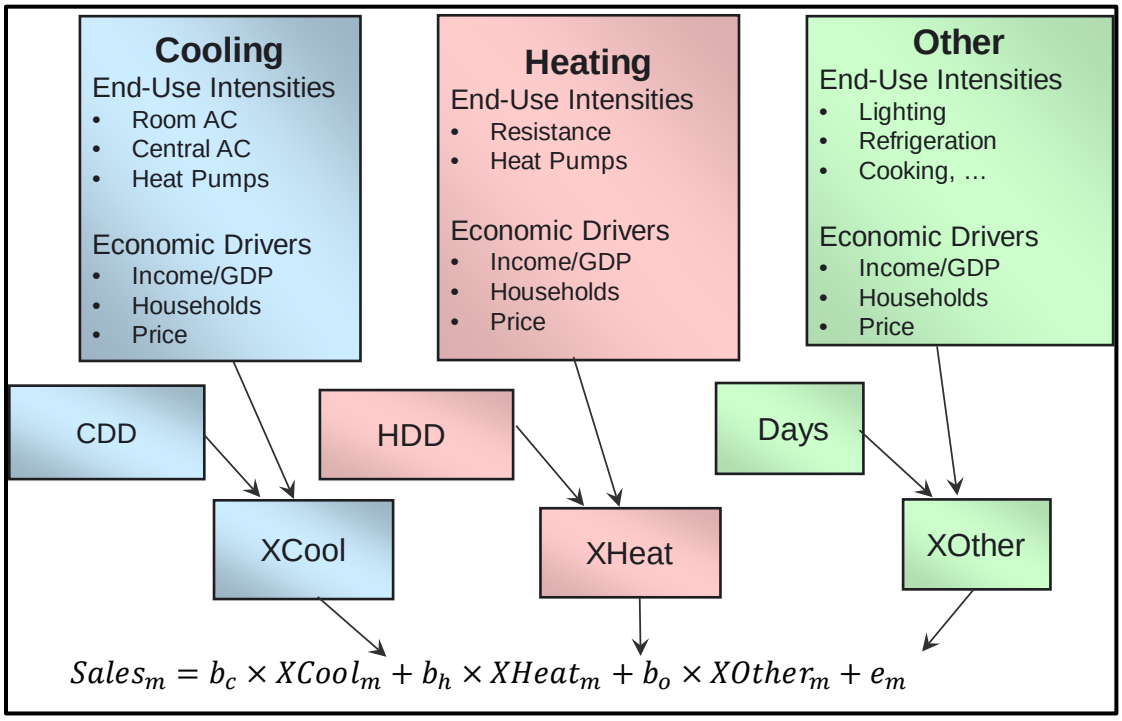
Figure 26: System Load Model Overview



4.1 Sales and Energy Forecasts

In the long-term, both economic growth and structural changes drive energy and demand requirements. Structural changes are captured in the residential and commercial sales forecast models through SAE (Statistically Adjusted End-Use) specifications. The SAE model explicitly incorporates end-use saturation and efficiency projections, thermal shell integrity, as well as changes in population, economic activity, prices, and weather. End-use efficiency projections include the expected impact of standards, naturally occurring efficiency gains, and utility efficiency (EE) programs such rebates and thermal shell improvement programs. Figure 27 shows the SAE model specification. A detailed description of the SAE model is included in Appendix B.

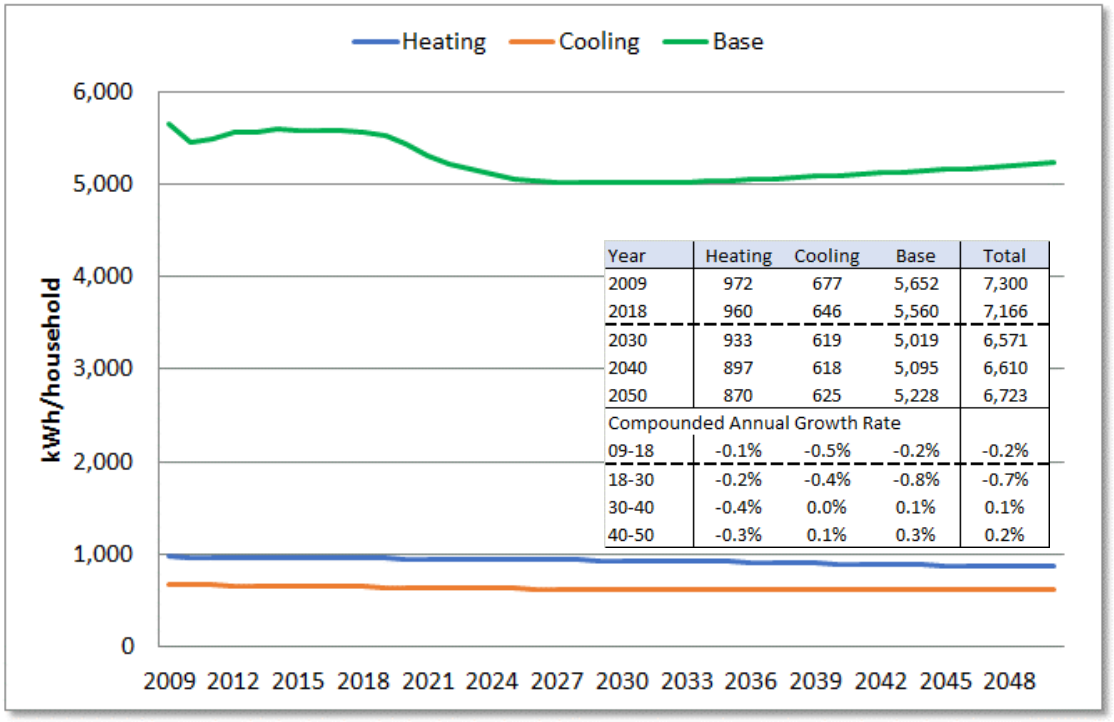
Figure 27: Statistically Adjusted End-Use (SAE) Model Overview



Monthly estimates of cooling (XCool), heating (XHeat), and other use (XOther) are derived from historical and projected end-use saturation and stock efficiency (energy intensities), economic drivers, and trended CDD and HDD. A set of coefficients (b_c, b_h, and b_o) are estimated using linear regression that statistically calibrate end-use energy estimates to monthly billed sales. Models are estimated from reported state-level sales and customer data from January 2009 through December 2018.

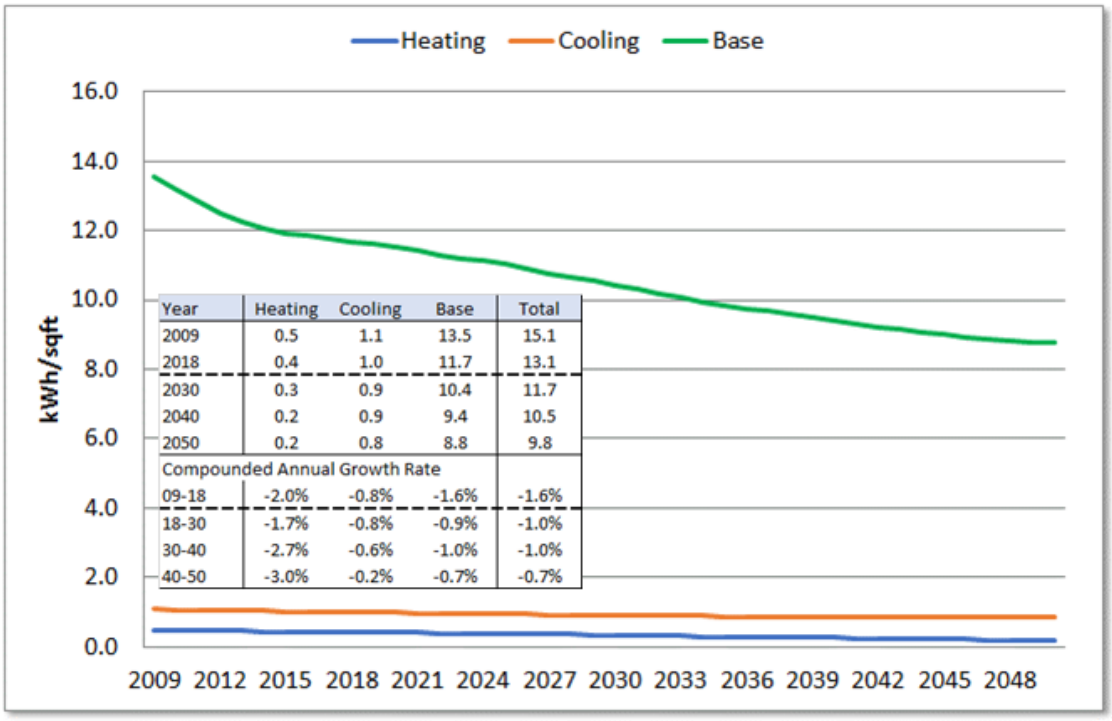
End-use intensities are derived from EIA's Annual Energy Outlook (AEO). EIA provides historical and forecasted estimates of appliance saturation, average stock efficiency, and total stock consumption. In the residential sector there are three housing types (single family, multi-family, and mobile home) and seventeen end-uses. Indices are weighted for the state and each transmission operating area based on the housing mix. In the commercial sector there are eleven building types and nine primary end-uses. End-use saturations for the Mid-Atlantic Census Division are then calibrated to New York end-use saturation survey data. Separate weighted commercial end-use intensities are estimated for New York City and Long Island based on available commercial data for these regions. Figure 28 and Figure 29 show end-use intensities for total heating, cooling, and base (non-weather sensitive) use.

Figure 28: Residential Average Intensities



Year	Heating	Cooling	Base	Total
2009	972	677	5,652	7,300
2018	960	646	5,560	7,166
2030	933	619	5,019	6,571
2040	897	618	5,095	6,610
2050	870	625	5,228	6,723
Compounded Annual Growth Rate				
09-18	-0.1%	-0.5%	-0.2%	-0.2%
18-30	-0.2%	-0.4%	-0.8%	-0.7%
30-40	-0.4%	0.0%	0.1%	0.1%
40-50	-0.3%	0.1%	0.3%	0.2%

Figure 29: Commercial Average Intensities



Year	Heating	Cooling	Base	Total
2009	0.5	1.1	13.5	15.1
2018	0.4	1.0	11.7	13.1
2030	0.3	0.9	10.4	11.7
2040	0.2	0.9	9.4	10.5
2050	0.2	0.8	8.8	9.8
Compounded Annual Growth Rate				
09-18	-2.0%	-0.8%	-1.6%	-1.6%
18-30	-1.7%	-0.8%	-0.9%	-1.0%
30-40	-2.7%	-0.6%	-1.0%	-1.0%
40-50	-3.0%	-0.2%	-0.7%	-0.7%

The strong decline in near-term residential intensity is largely the result of LED lighting adoption. After 2030, residential base-use shows slight positive growth as there are currently no additional scheduled appliance standards. Strong declines in commercial base intensities are largely the outcome of improvements in commercial lighting (conversion to LED lighting systems) and improvements in ventilation. Heating is relatively small across the residential and commercial sectors as the majority of state households and business heat with natural gas.

4.2 Economic Projections

The economic forecast is based on Moody Analytics 2018 long-term economic outlook for New York. Economic drivers include the number of households and household income in the residential sector, and GDP and employment in the commercial and industrial sectors. The industrial model also includes a measure of efficiency (kWh per employee) derived from the EIA's annual U.S. industrial sales outlook. Table 7 and Table 8 show the state economic variables for the residential and non-residential sectors. Transmission District level forecasts are based on associated regional economic forecasts.

Table 7: Residential Economic Drivers

Year	Population (,000)	Households (,000)	Income Per Household ($)
2009	19,365	7,321	133,050
2018	19,629	7,357	135,790
2030	19,815	7,433	138,630
2040	19,975	7,481	142,690
2050	20,136	7,536	141,820
Compound Annual Growth Rate			
09-18	0.15%	0.06%	0.23%
18-30	0.08%	0.08%	0.17%
30-40	0.08%	0.06%	0.29%
40-50	0.08%	0.07%	-0.06%

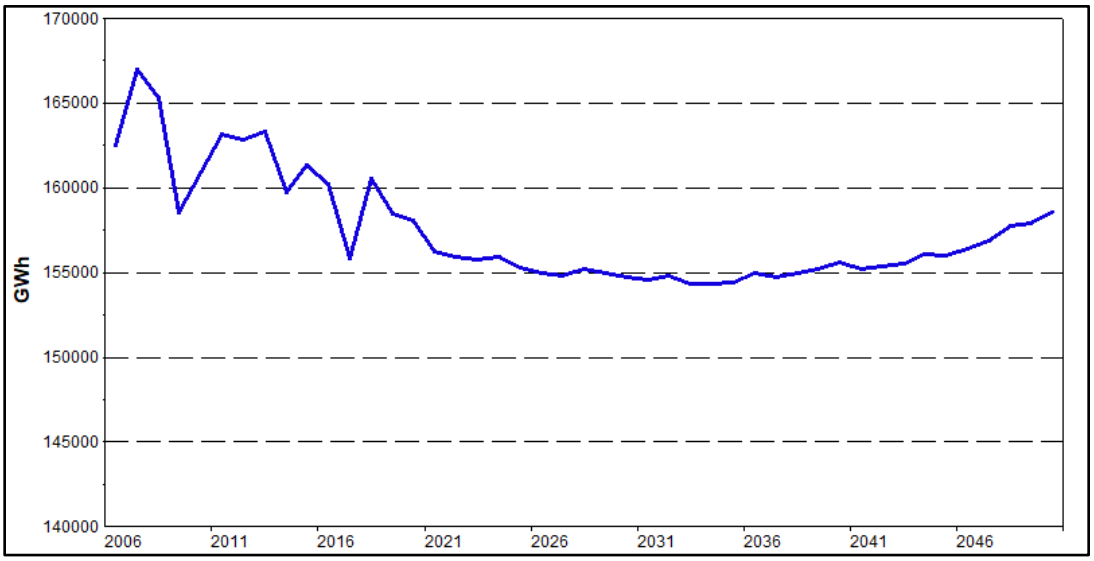
Table 8: Non-Residential Economic Drivers

Year	Gross State Product(mil$)	Employment (,000)	Manuf Employ (,000)
2009	1,224,402	8,551	476.3
2018	1,456,436	8,556	457.3
2030	1,796,789	8,701	459.0
2040	2,092,292	8,830	459.7
2050	2,433,073	8,968	456.7
Compounded Annual Growth Rate			
09-18	1.9%	0.0%	-0.4%
18-30	1.8%	0.1%	0.0%
30-40	1.5%	0.1%	0.0%
40-50	1.5%	0.2%	-0.1%

Projected state economic growth is simlar to the last ten years with little population, household, and employment growth. Long-term state GDP growth is positive but increases at slower rate than the most recent ten years.

Declines in end-use energy intensities combined with moderate economic growth result in a flat to slightly negative sales trend. While increasing temperatures overall contribute to sales growth, the increase in cooling loads are partially offset by decreases in heating-related sales. Heating loads include a small amount of electric heat, backup electric heat, and fans and pumps associated with gas and other fossil fuel heating systems. Sales trend upward around 2045 as there are no additional impacts from end-use standards after this time. Figure 30 shows the Reference Case baseline energy forecast.

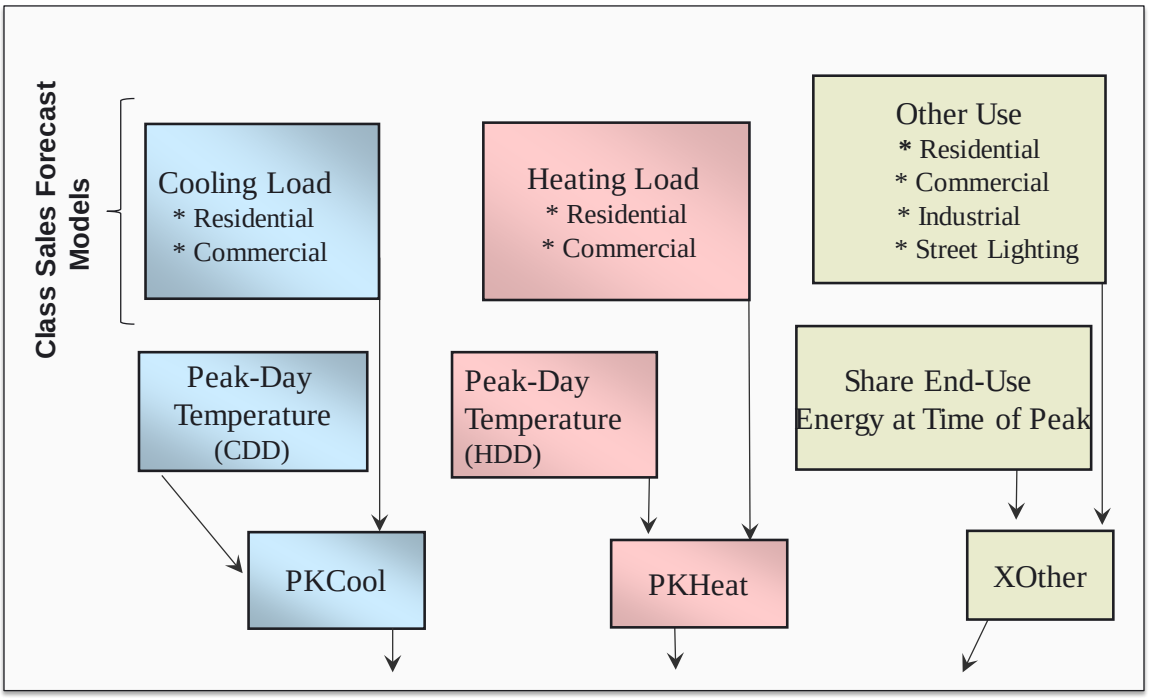
Figure 30: Baseline Forecast (Includes Efficiency Impacts)



4.3 Peak Demand Forecast

Peak Demand is driven by underlying energy requirements. A standard modeling approach is to find the historical relationship between peak and energy (either a load factor or with a linear regression model) and to assume this relationship holds through the forecast period. While this is sufficient for a short-term period, the relationship between energy and peaks changes further into the forecast horizon, as the peak hour load depends on the timing and relative size of the underlying end-use loads. We would expect increasing temperatures to have a significant impact on summer peaks as approximately 40% of the load at time of peak is cooling related. Changes in lighting requirements as a result of LED market penetration have a larger impact on winter peak than summer peak as there is more lighting use at time of winter peak. To the extent possible, we want to capture changing load dynamics in the peak forecast. Figure 31 shows the peak modeling framework.

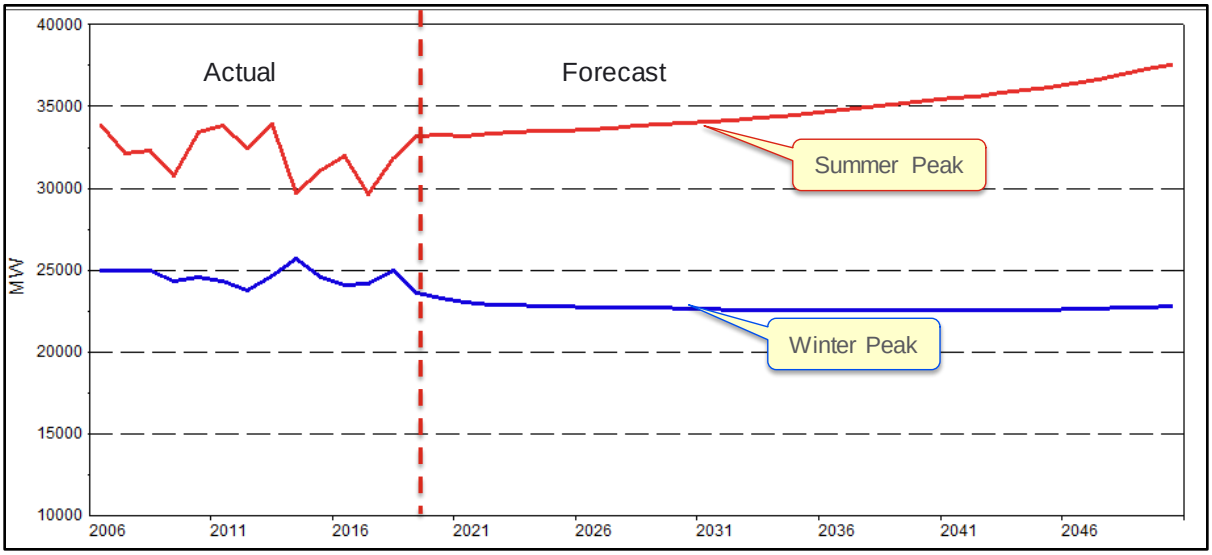
Figure 31: Peak Model Framework



$$Peak_m = a + b_c \times PkCool_m + b_h \times PkHeat_m + b_o \times PKOther_m + e_m$$

Monthly peak demand is driven by end-use load estimates derived from the customer class sales forecast models. *Other Use* is disggregated to end-use estimates at time of peak (*PkOther*). The peak-day cooling (PkCool) and heating (PkHeat) variables are constructed by combining residential and commercial cooling and heating requirements with trended peak-day degree-days. The coefficients b_c, b_h, and b_o are estiamted with linear regression. The model is estimated over the period January 2009 to December 2018. Figure 32 shows baseline peak demand forecast.

Figure 32: Baseline Peak Forecast (Reference Case)



Increasing peak-day TDD contributes to strong summer peak demand growth while declining peak-day HDD reduces winter peak demand.

Table 9 presents the baseline energy and peak forecast for the Reference Case. Baseline forecast includes state economic projections, EIA end-use intensity trends projections, and increase in temperatures (0.7 degrees per decade).

Table 9: Baseline Forecast (Reference Case)

Year	Energy (GWh)	Summer Peak (MW)	Winter Peak (MW)
2009	158,578	30,765	24,344
2018	160,565	31,802	25,009
2030	154,756	33,991	22,653
2040	155,578	35,325	22,565
2050	158,575	37,551	22,820
Compounded Annual Growth Rate			
09-18	0.1%	0.4%	0.3%
18-30	-0.3%	0.6%	-0.8%
30-40	0.1%	0.4%	0.0%
40-50	0.2%	0.6%	0.1%

Total system energy is relatively flat as efficiency improvements counter household and economic growth and the impact of increasing CDD are mitigated by decreasing HDD.

The baseline end-use forecast is adjusted downward for expected BTM solar adoption and upward for electric vehicle charging loads. BTM solar and electric vehicle charging forecasts were developed as part of the NYISO 2019 Gold Book Forecast.

A BTM solar forecast is developed for each load zone. The forecast of installed solar PV capacity is based on a model that fits historical adoption trends with a logistic S-shape curve. GWh generation is then derived based on the expected solar PV installed capacity (MW) and the solar PV annual capacity factor. We expect to see strong solar adoption through 2030. In the Reference Case, solar generation doubles from 2,647 GWh in 2020 to 5,223 GWh in 2030. BTM solar generation continues to increase in subsequent year but at a slower rate, as the potential market flattens out.

The electric vehicle forecast starts with a projection of total registered vehicles. The historical number of registered vehicles are first obtained from county registars. Future total vehicles are based on the historical relationship of the number of registered vehicles and regional population. Moody's regional population forecasts then drive total vehicle forecast forward. Electric vehicle saturation projections (the number of electric cars as a share of total vehicles in a given year) are based on National Energy Renewable Laboratory (NREL) U.S. electric vehicle projections for "all electric" (Battery Electric Vehicle or BEV) and hybrid electric vehicles (Plug-in Hybrid Electric Vehicles or PHEV). PHEV have a much lower kWh per mile input than BEV, since they also combust gasoline.

The changing mix of BEV and PHEV is reflected in the kWh per vehicle forecast. The kWh per vehicle increases over time with increasing share of BEV adoption and decreasing share of PHEV. A simple model is used to translate electric vehicle purchases to annual charging energy requirements:

$$EV\ GWh_t = EV\ Units_t \times VMT_t \times \left(\frac{kWh}{mile} \times EIF_t\right)$$

Where:

EV Units	= Forecasted number of electric vehicles by type
VMT	= Annual vehicle miles traveled
kWh/mile	= Expected annual kWh use per vehicle mile weighted across vehicle class/type
EIF	= Efficiency Improvement Factor; an index that reflects increased efficiency of electric vehicles over time
t	= Index representing the year

By 2030 electric vehicles (both BEV and PHEV) account for 14% of passenger electric vehicles and light duty trucks; this increases to nearly 40% by 2040. With the additional penetration of commercial electric vehicles (representing medium and heavy dutry trucks and buses), the total EV sales reach 13,174 GWh by 2040 and 24,360 GWh by 2050. Commercial electric vehicle sales are estimated using the same approach as that for passenger vehicles. Estimates of bus and large vehicle mileage and required electricity input (kWh/mile) are based on a number of data sources including Columbia University, National Renewable Energy Laboratory (NREL), New York State Energy Research and Development Agency (NYSERDA) and the California Energy Commission (CEC).

Table 10 summarizes the reference case results.

Table 10: Reference Case Energy Forecast (GWh)

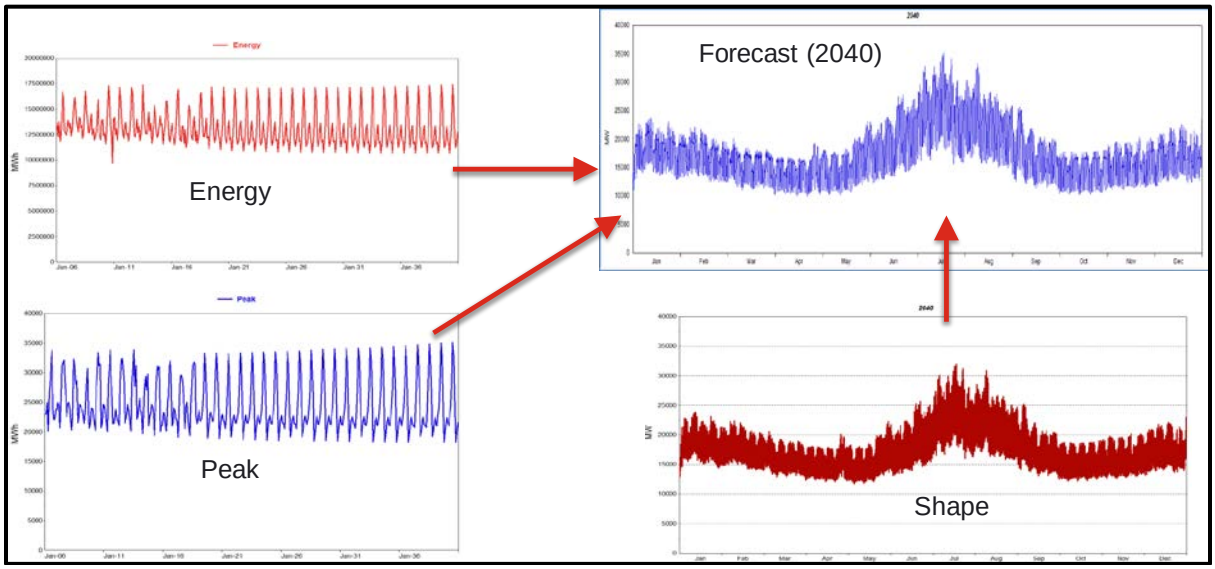
Year	Base	EV	PV	Electrification	Battery	Adjusted
2020	158,047	371	(2,647)	-	15	155,786
2030	154,756	4,226	(5,223)	-	200	153,959
2040	155,578	13,174	(5,928)	-	346	163,170
2050	158,575	24,360	(6,398)	-	416	176,952
Change						
20-30	-0.2%					-0.1%
30-40	0.1%					0.6%
40-50	0.2%					0.8%

4.4 Baseline Hourly Load Forecast

Adoption of new technologies including solar, electric vehicles, and cold climate heat pumps will significantly impact the system hourly load and as a result the timing and level of system peak demand. Increases in solar load, for example, shift the summer peak later into the day and eventually into the early evening. Aggressive market penetration of cold climate heat pumps could shift the system peak from summer to winter. An hourly load modeling approach is used to capture the changing load dynamics. The process starts by first developing a baseline hourly load forecast.

The system profile is estimated with historical system hourly load (adjusted for solar load impacts). The model relates hourly loads to daily degree-days, hours of light, and variables that capture day of the week, holidays, and other seaonsal changes. The baseline profiles change over time with increasing CDD and HDD. The system profile is extended through 2050. The baseline hourly load forecast is then calculated by combining the system profile forecast with the baseline energy and peak demand forecasts. Figure 33 illustrates this process.

Figure 33: Baseline Hourly Load Forecast



4.5 Adjusting for New Technologies

In the Reference Case, the baseline hourly load forecast is adjusted for BTM PV, EV, and a small amount of battery storage. Forecasts are generated by combining these technology energy forecasts with their hourly load profiles. A typical solar load profile is derived from National Renewable Energy Laboratory (NREL). The electric vehicle charging profile is based on measured charging data from a study completed by Idaho National Laboratories for the Nashville Metropolitan Area. Figure 34 and Figure 35 show summer BTM PV and EV hourly load forecast for the week of July 22nd in 2040.

Figure 34: Solar Load Forecast 2040 (MW)

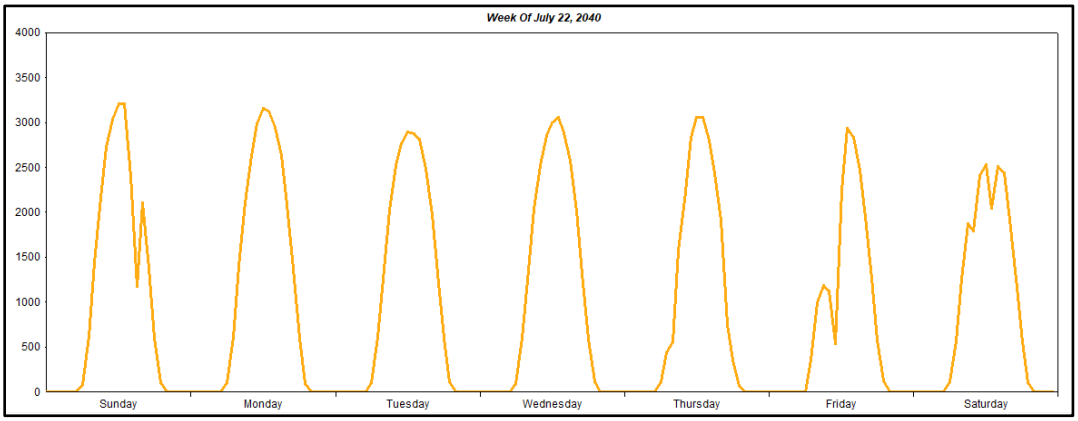
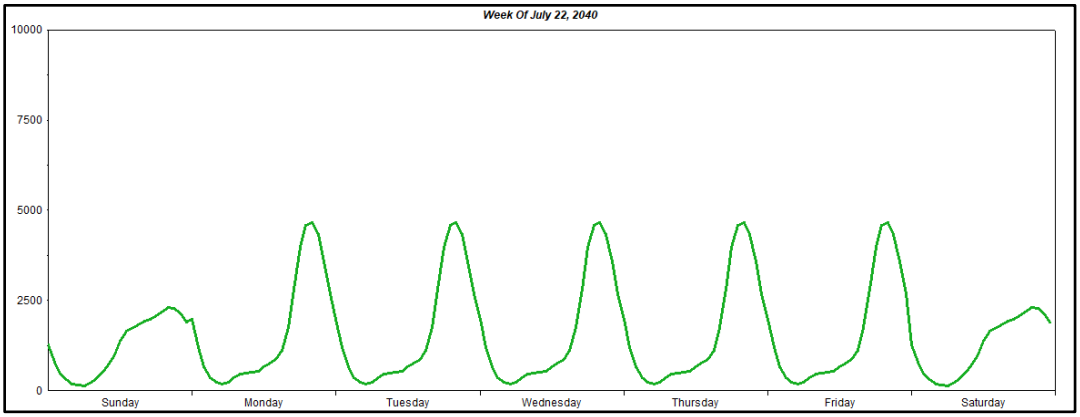
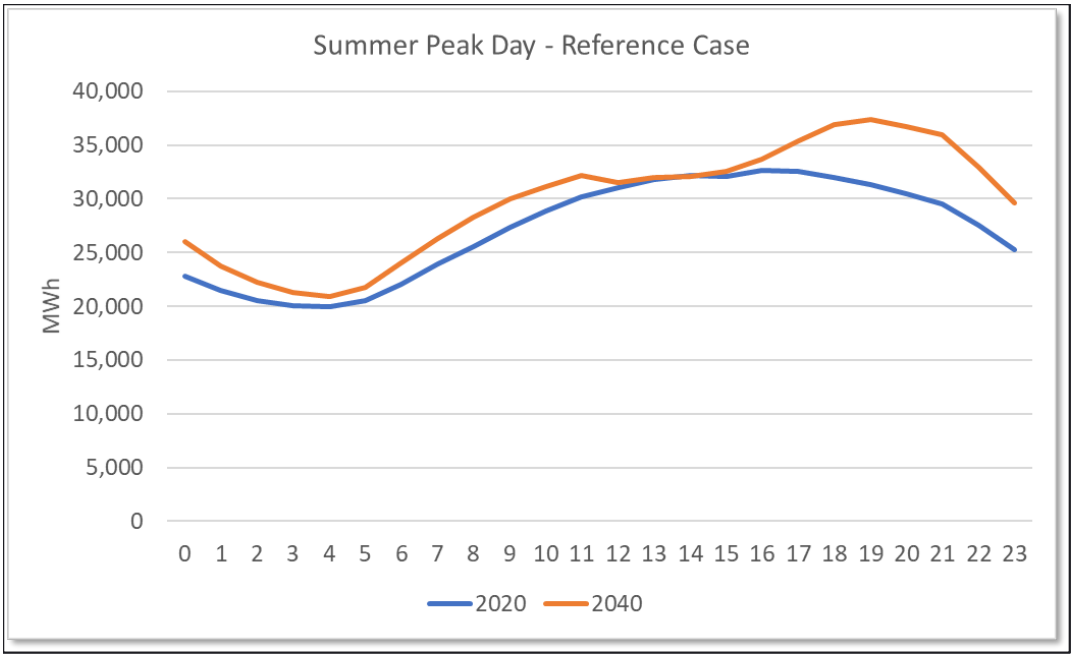


Figure 35: Electric Vehicle Charging Load Forecast 2040 (MW)



The Reference Case adjusted system load forecast is calculated by adding the electric vehicle hourly load forecast and subtracting out solar and battery hourly load forecasts. Figure 36 shows how adjustments for BTM solar and electric vehicles reshape system load over time.

Figure 36: Reference Case System Load Forecast Comparison (2020 vs. 2040)



As the profile changes over time, so does the hour at which the system peaks.

Table 11 shows Reference Case adjusted peak demand and contribution by baseline load and technology.

Table 11: Reference Case Coincident Peak Demand Forecast (MW)

PeakTime	Baseline	Solar	EV	Battery	Adjusted
7/14/2020 16:00	32,932	(228)	49	(57)	32,696
7/17/2030 18:00	33,348	(504)	1,275	(714)	33,405
7/18/2040 19:00	33,802	(118)	4,578	(859)	37,403
7/20/2050 19:00	35,996	(128)	8,485	(1,036)	43,317

(Peak time of the forecast is hour-beginning)

Note that by 2040, the solar load impact is insignificant as the peak demand has shifted later into the evening largely as the result of increased EV charging. For comparison to coincident peaks, Table 12 shows the maximum baseline, solar, EV, and battery demand.

Table 12: Reference Case Maximum Demand (MW)

Maximum Demand (MW)				
Year	Baseline	Solar	EV	Battery
2020	33,270	(1,619)	131	(57)
2030	33,991	(3,206)	1,495	(714)
2040	35,325	(3,629)	4,649	(859)
2050	37,551	(3,926)	8,615	(1,036)

5. Forecast Scenarios

Two forecast scenarios are designed to incorporate recent state policy goals. The Policy Scenario assumes the State Clean Energy Standards (CES) Goal is met. In addition to renewable generation targets, the CES sets new energy efficiency, solar capacity, and battery storage targets for 2025.

The Policy Scenario includes:

- State average temperature trending 0.7 degrees per decade
- An additional 2,200 GWh per year in EE savings over the Reference Case
- A total of 6,000 MW of behind-the-meter solar capacity by 2025 and an additional 3,000 MW through 2050
- Implementation of state electrification programs with 25% of existing homes converting from fossil fuel to cold climate heat pumps by 2050
- 3,000 MW of battery storage by 2030, 5,000 MW by 2050 (battery load impacts included in the Reference Case will be treated as a resource during the system planning phase of the study – not as a load reduction)
- Stronger electric vehicle market penetration than the Reference Case

In July 2019, the State passed the Climate Leadership & Community Protection Act (CLCPA). The CLCPA establishes aggressive greenhouse gas reduction goals with a target of 85% reduction from 1990 levels by 2050. The CLCPA Scenario is based on achieving targeted emission reductions in the residential and commercial sectors.

The CLCPA Scenario builds on the Policy Case. In addition to higher Policy Case efficiency savings, solar capacity and electric vehicle penetration, the CLCPA adds aggressive electrification in residential and commercial sectors. The largest targeted end-use is residential fossil fuel heating; we assume gas, oil, and propane heating systems are replaced with cold climate heat pumps with electric resistance backup to meet heating requirements on the coldest days. Other targeted end-uses including water heating, clothes drying, and cooking.

The process of estimating electricity gains from electrification programs starts with estimates of sector-specific CO2 reduction goals. In July 2019, NYSERDA updated the state greenhouse gas inventory (*New York State Greenhouse Gas Inventory 1990 – 2016. Final Report. July 2019*). The report estimates greenhouse gas emissions associated with a wide range of human-related activities. Table 13 summarizes the NYSERDA greenhouse gas emissions and trends.

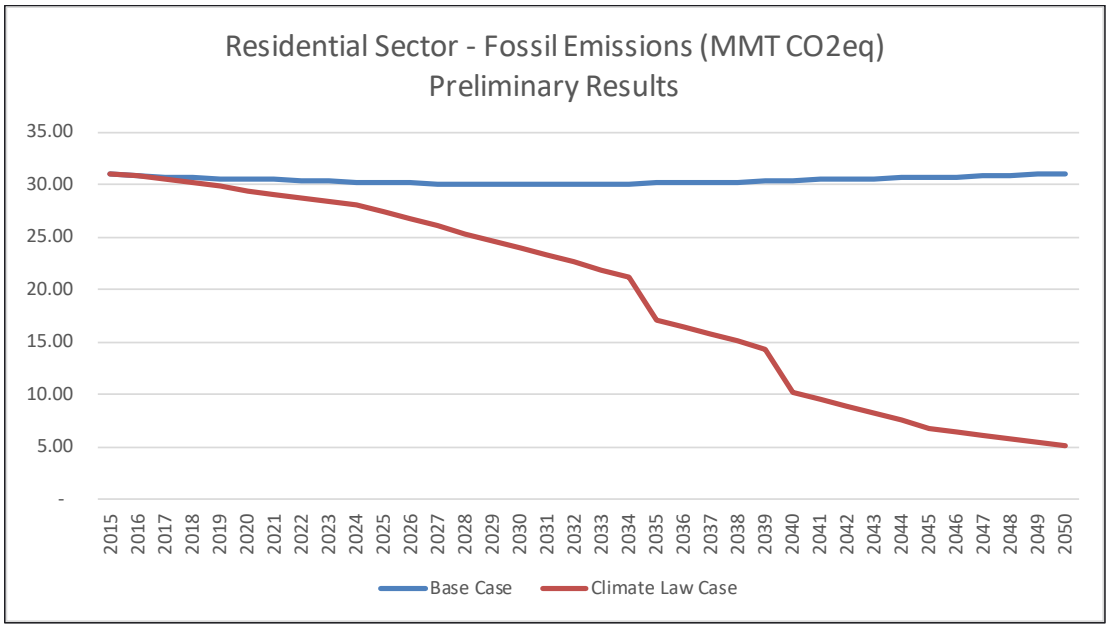
Table 13: New York State Greenhouse Gas Inventory (NYSERDA)

Metric Tons (Millions)	1990	1995	2000	2005	2010	2015	2016
Energy	208.96	206.87	228.2	230.69	193.21	180.69	172.79
Electric Generation	63.02	51.28	55.68	53.58	37.31	29.13	27.72
Residential (Non-Electric)	34.25	34.98	40.28	39.83	31.7	35.64	30.89
Commercial (Non-Electric)	26.55	27.04	32.23	28.66	24.19	21.87	20.66
Industrial (Non-Electric)	20.02	22.54	17.52	14.89	10.27	10.8	10.23
Transportation	59.37	61.82	71.66	79.23	74.93	74.15	73.98
Net Imported Electricity	1.74	4.52	6.04	7.35	9.2	3.37	3.82
Incineration of Waste	1.27	1.96	2.05	3.6	2.35	2.92	2.79
Natural Gas Systems	2.74	2.74	2.73	3.52	3.25	2.82	2.73
Non-Energy Sources	27.22	28.05	30.28	31.19	31.56	32.91	32.82
Agriculture	8.37	7.8	8.55	8.27	8.73	8.86	8.86
Waste	14.86	15.43	15.62	15.62	14.29	13.23	12.8
Industrial Processes & Product Use	3.99	4.83	6.11	7.3	8.54	10.82	11.15
Total	236.19	234.92	258.48	261.88	224.77	213.59	205.61
Fuel Combustion	204.95	202.17	223.41	223.57	187.6	174.95	167.28
NonFuel Combustion	31.24	32.75	35.07	38.31	37.17	38.65	38.33

New York State Greenhouse Gas Inventory 1990 – 2016. Final Report. July 2019

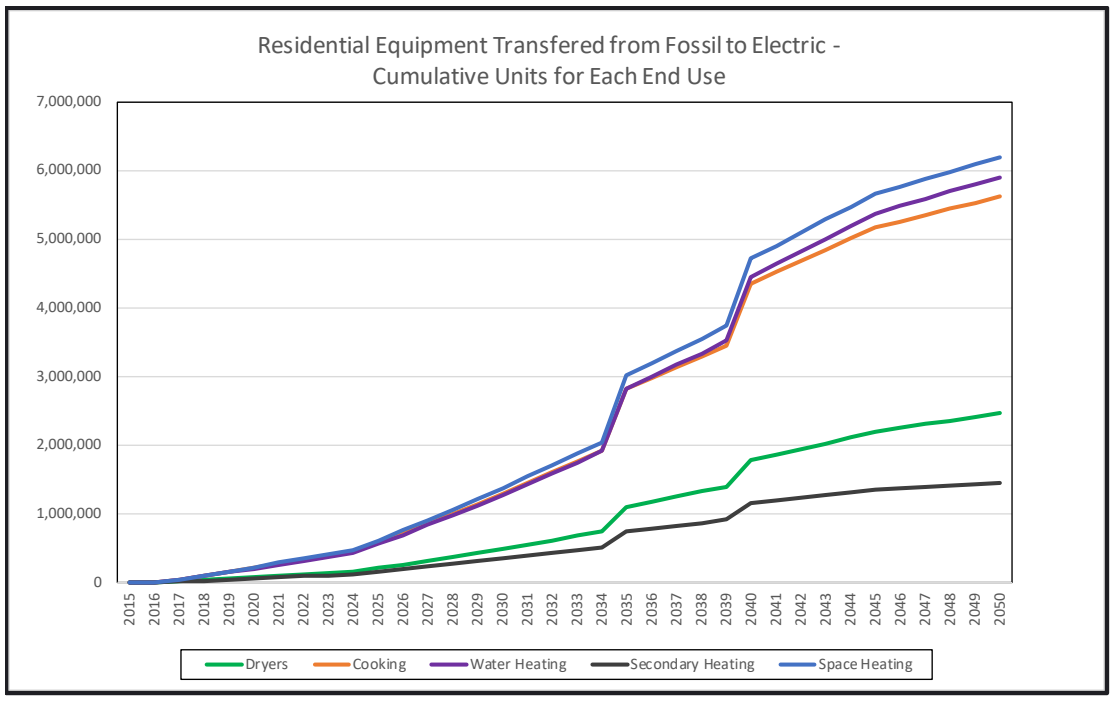
In 1990 (the target year), NYSERDA estimates that greenhouse gases in total were 236.19 million metric tons, with the Residential sector contributing 34.25 million metric tons. By 2050, assuming that greenhouse gas reductions are evenly distributed across all levels of activity, the residential greenhouse gas target reduction is 29.1 million metric tons (85% of 90 level) resulting in a 2050 emissions level of 5.1 million metric tons. Fortunately, since 1990, greenhouse gas emissions have been decreasing. By 2016, residential direct greenhouse gas emissions were 30.89 million metric tons. This still leaves the need to reduce residential greenhouse gas emissions by an additional 25.8 million tons by 2050. Figure 37 shows a possible path towards the reduction of greenhouse gases in the residential sector.

Figure 37: Residential Greenhouse Gas Reduction Path



From the statewide estimates of gas end-use appliances and associated appliance usage, we can back into the number of units that must be converted from fossil fuel to comparable electric end-uses to achieve the CO_2 targets. Figure 38 shows the resulting number of residential gas appliances converted to electric appliances.

Figure 38: Appliance Conversion Forecast

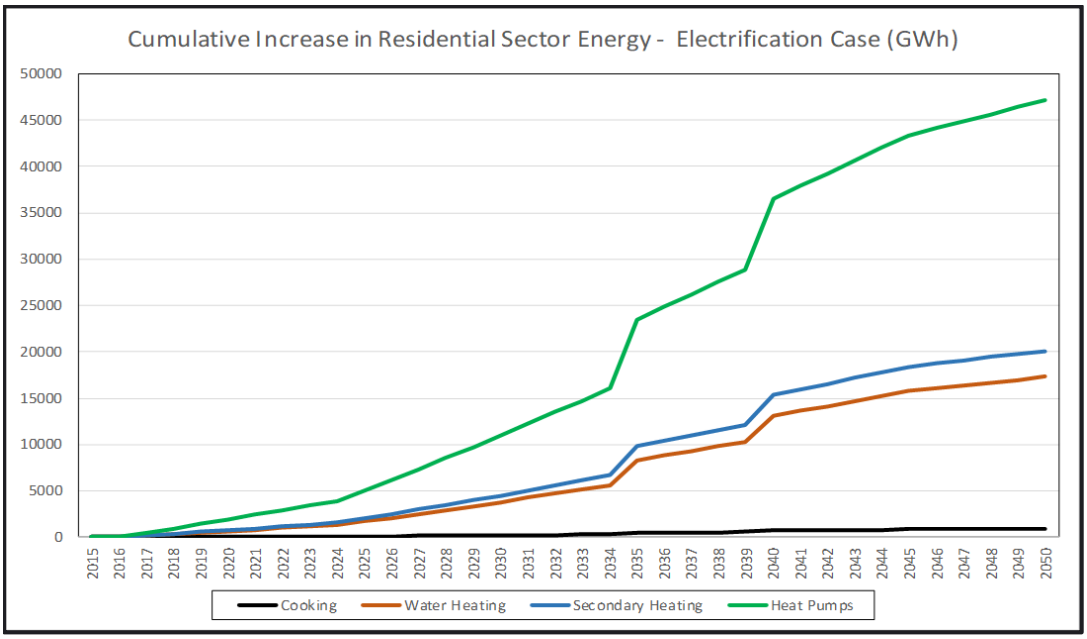


5.1 Energy Impacts

To achieve the greenhouse gas emission target for the residential sector, over 6,000,000 households would have to switch from gas heat to electric heat by 2050. Other end-uses would also need to be converted, including water heating, clothes drying and cooking.

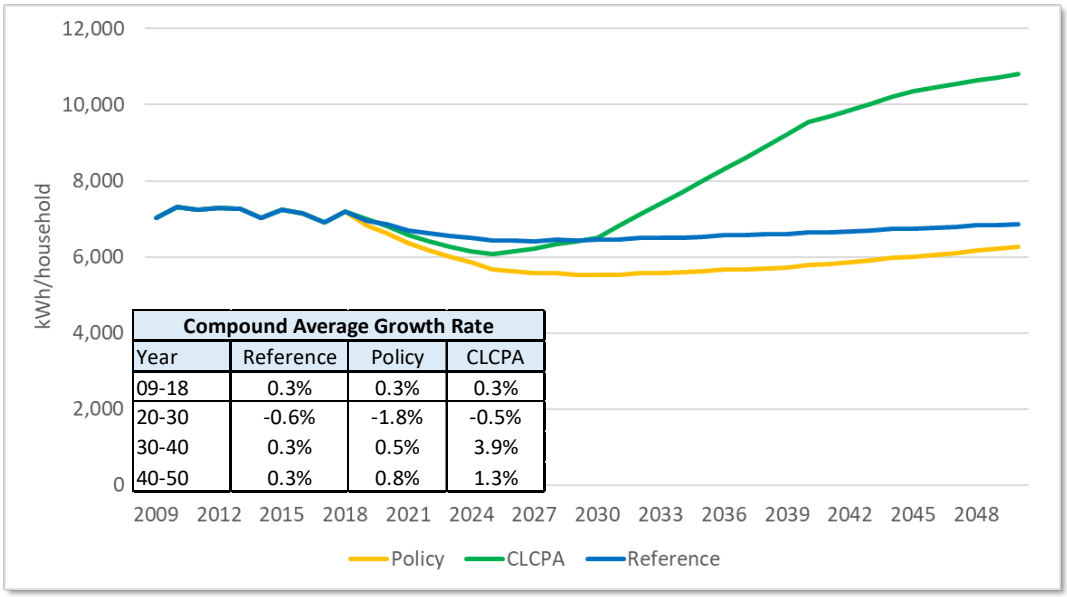
We assume fossil fuel heating is converted to cold climate heat pumps with resistance heat backup, gas water heaters are converted to electric water heaters, gas dryers are converted to electric dryers, and gas stoves are converted to electric stoves. Total electrification sales are then estimated as the product of units converted to electricity times the end-use electricity energy requirements (UEC). Electrification reflects improving end-use efficiency that is embedded in the UEC forecast. Figure 39 shows resulting end-use electric sales gains.

Figure 39: Residential Electrification Impact Forecast



By far, the largest impact is conversion of fossil fuel heating systems to heat pumps and resistance heating backup or secondary heating. Figure 40 compares residential average use for the Reference, Policy, and CLCPA Scenarios.

Figure 40: Residential Average Use Forecast



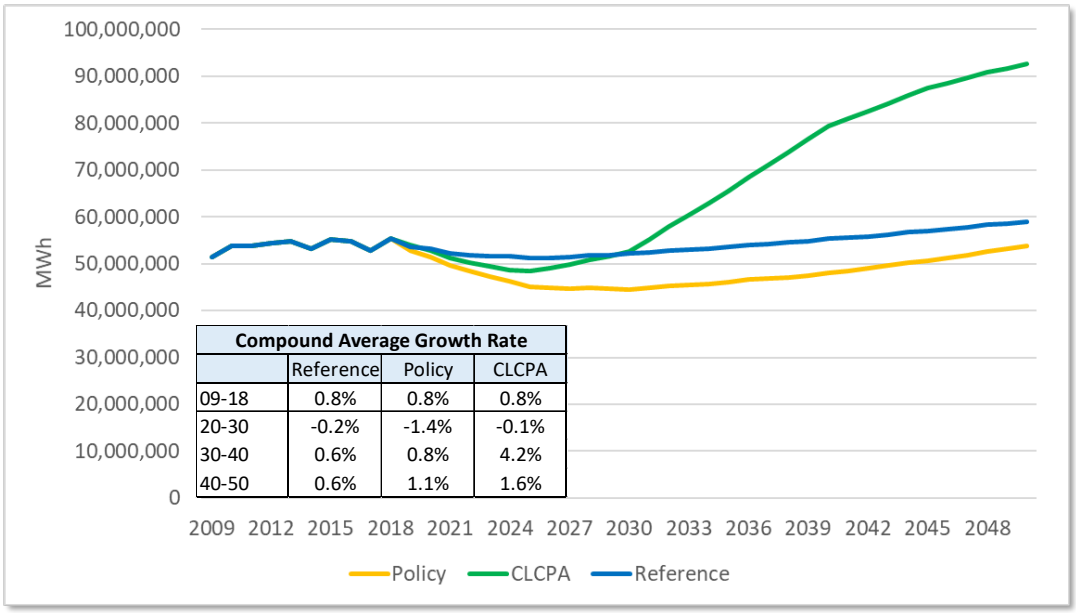
Compound Average Growth Rate			
Year	Reference	Policy	CLCPA
09-18	0.3%	0.3%	0.3%
20-30	-0.6%	-1.8%	-0.5%
30-40	0.3%	0.5%	3.9%
40-50	0.3%	0.8%	1.3%

The Reference Case average use (shown in blue) declines over the next ten years, as gains in efficiency outweigh household income growth and rising temperatures. Rising temperatures impact on sales is minimal as increases in cooling use are countered with decreasing space and water heating use. After 2030 average use shows small, but positive increases largely due to slower improvements in end-use stock efficiency. For example, LED lighting adoption is a major contributor to declining usage through 2030. By 2030, LED is expected to be the dominant lighting technology; the impact of additional lighting efficiency after this point is small.

The Policy Scenario (shown in orange) is driven largely by CES efficiency targets; average use falls significantly between 2020 and 2030 and then shows positive growth with electrification. The increase in usage due to electrification is still not large enough to counter decreases in usage caused by energy efficiency savings. The CLPCA Scenario (in Green) includes the Policy Scenario efficiency projections but incorporates a much more aggressive electrification program. Average use per household increases from approximately 7,000 kWh in 2020 to 11,000 kWh in 2050.

The residential sales forecast is calculated as the product of average use per customer and the state household forecast (number of households). Figure 41 shows the residential sales forecast.

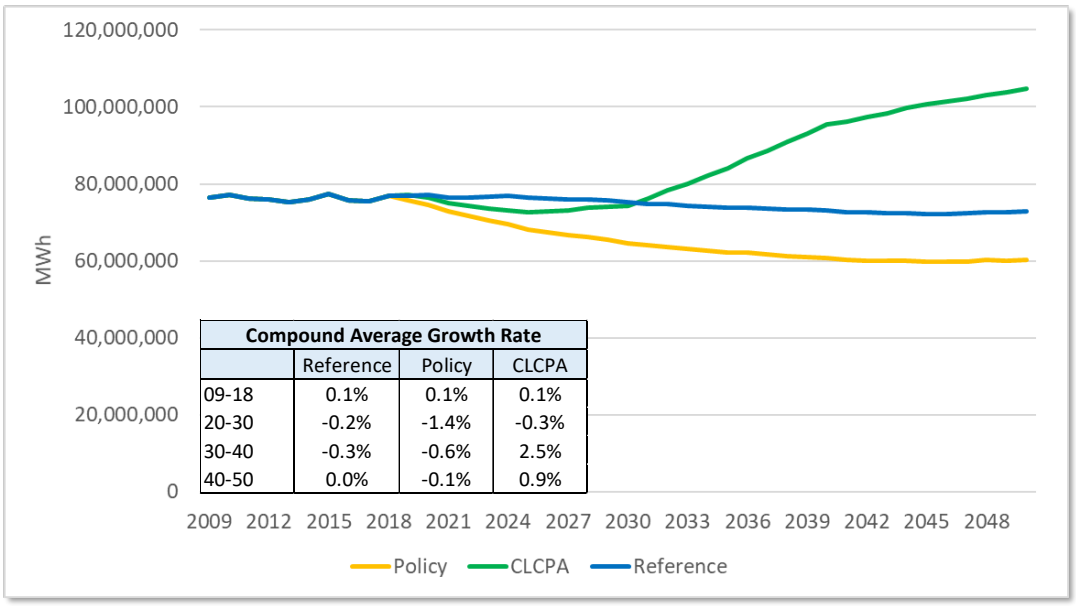
Figure 41: Residential Sales Forecast



Compound Average Growth Rate			
	Reference	Policy	CLCPA
09-18	0.8%	0.8%	0.8%
20-30	-0.2%	-1.4%	-0.1%
30-40	0.6%	0.8%	4.2%
40-50	0.6%	1.1%	1.6%

Project time constraints limited our ability to conduct the same CLCPA end-use impact study for the commercial sector. We assume electric sales gains from commercial gas conversions are similar in proportion to residential electrification, based on similar size in total energy usage in the two sectors, and similar proportions of heating and cooling end uses. Figure 42 shows the commercial sales forecast.

Figure 42: Commercial Sales Forecast

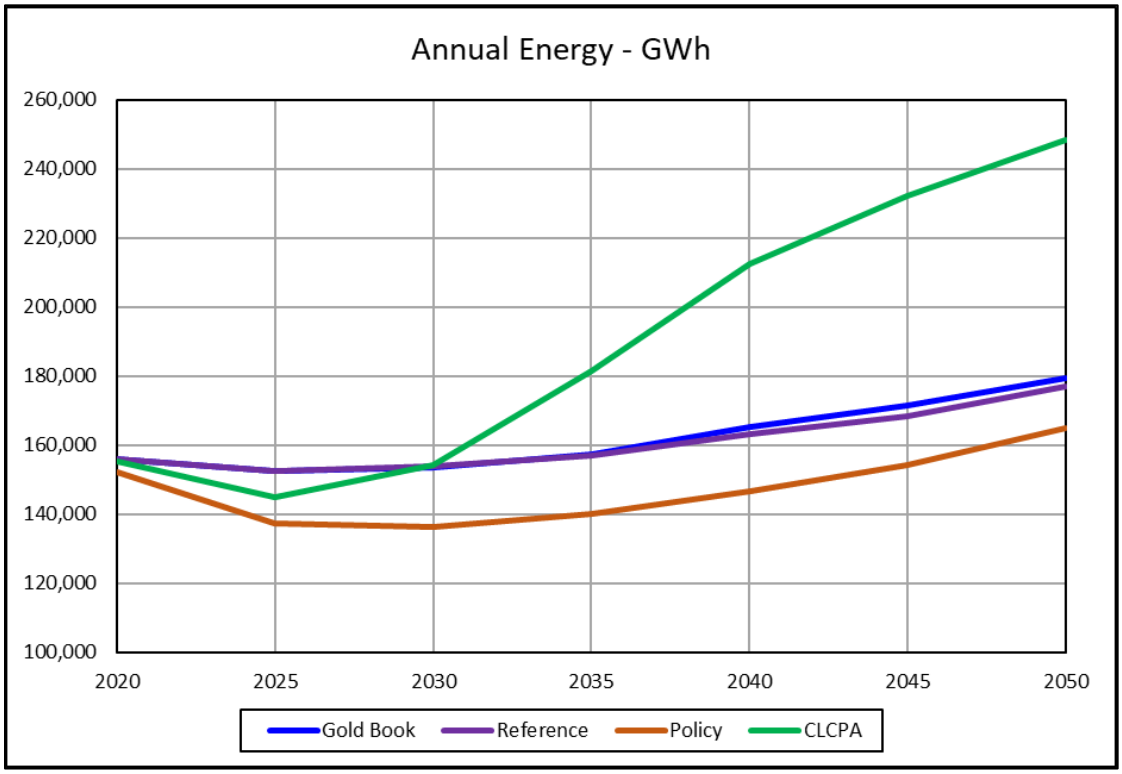


Compound Average Growth Rate			
	Reference	Policy	CLCPA
09-18	0.1%	0.1%	0.1%
20-30	-0.2%	-1.4%	-0.3%
30-40	-0.3%	-0.6%	2.5%
40-50	0.0%	-0.1%	0.9%

Reference Case commercial sales are consistent with historical sales; the impact of economic growth and increasing temperatures are mitigated by increases in commercial efficiency. The forecast reflects EIA's projection for strong efficiency gains in commercial lighting, ventilation, and other end-uses.

Declining sales in the Policy Scenario are again driven by CES energy efficiency savings target; efficiency gains outweigh economic growth and increasing temperatures. In the CLCPA Scenario, sales increase dramatically after 2030 as a result of aggressive electrification. While we account for improving efficiency in the industrial sector, we make no adjustment for electrification as we have little information on industrial end-use processes and to what extent processes currently dependent on natural gas can be converted to electric processes. Figure 43 depicts system energy forecast including the current Gold Book forecast.

Figure 43: System Energy Forecast



The Reference Case is consistent with the current Gold Book forecast. The Policy Case is lower as additional EE savings and PV adoption outweigh gains from electric vehicles and electrification. After 2030, CLCPA forecast is significantly higher than the Reference Case largely driven by aggressive statewide electrification.

Table 14 shows forecast results by technology. Energy efficiency impacts are embedded in the baseline energy forecasts.

Table 14: System Energy Forecast

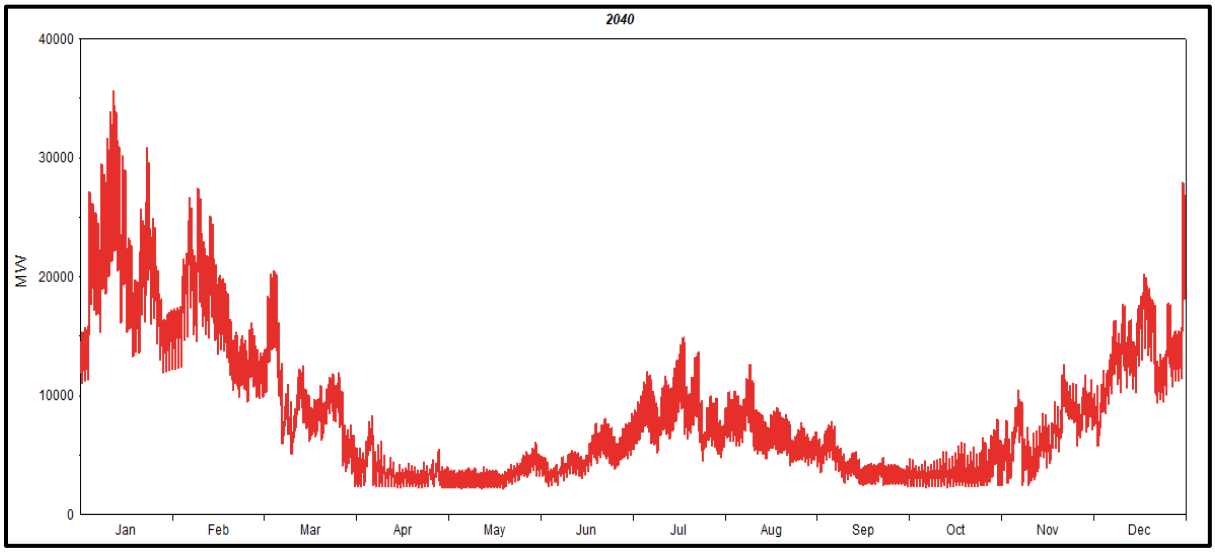
Reference Case (GWh)						
Year	Base	EV	PV	Electrification	Battery	Adjusted
2020	158,047	371	(2,647)	-	15	155,786
2030	154,756	4,226	(5,223)	-	200	153,959
2040	155,578	13,174	(5,928)	-	346	163,170
2050	158,575	24,360	(6,398)	-	416	176,952
Policy Case (GWh)						
Year	Base	EV	PV	Electrification	Battery	Adjusted
2020	153,647	420	(2,647)	755	15	152,190
2030	133,856	5,488	(8,081)	4,952	200	136,416
2040	129,178	16,361	(8,885)	9,679	346	146,679
2050	129,425	30,253	(9,662)	14,614	416	165,046
CLCPA Case (GWh)						
Year	Base	EV	PV	Electrification	Battery	Adjusted
2020	153,647	420	(2,647)	3,961	15	155,396
2030	133,856	5,488	(8,081)	22,633	200	154,096
2040	129,178	16,361	(8,885)	75,594	346	212,594
2050	129,425	30,253	(9,662)	97,917	416	248,349

5.2 Demand Impacts

Demand impacts from the Policy and CLCPA scenarios are estimated by combining baseline, BTM solar, electric vehicle, and electrification hourly load forecasts. The derivation is similar to the development of the Reference Case hourly load and peak demand forecast. Additional CLCPA EE savings are captured in the baseline hourly load forecast, higher solar load projections are derived by combining Policy Case solar generation forecast with the solar hourly load profile, and EV hourly load forecast is calculated by combining higher EV charging energy with EV charging profile.

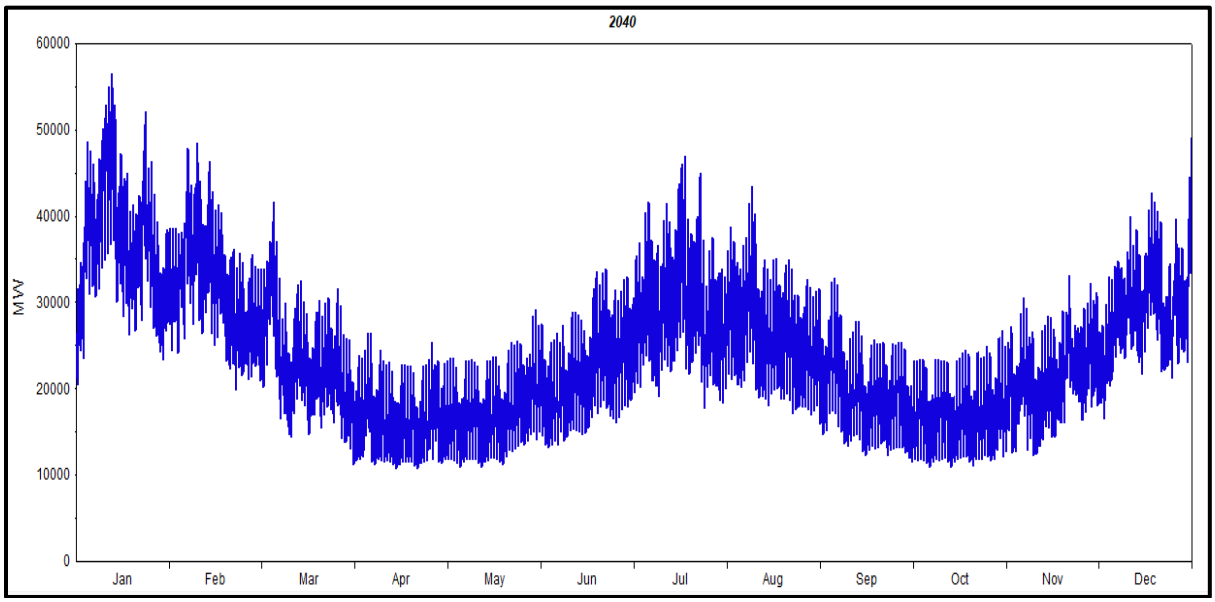
As electrification has a significant impact on heating loads, electrification impacts are modeled outside the baseline load forecast. Separate end-use profiles are developed for residential and commercial heating, cooling, and base-use. Profiles are derived from AMI data from an adjoining state. Base, cooling, and heating load models are estimated with host data and used to simulate load profiles with New York actual and trended degree-days. This is often referred to as a transfer model. An electrification hourly load forecast is calculated by combining heating, cooling, and base-use electrification sales with heating, cooling, and base-use load profiles. Figure 44 shows the electrification hourly load forecasts for 2040.

Figure 44: CLCPA Scenario Electrification Hourly Load Forecast (2040)



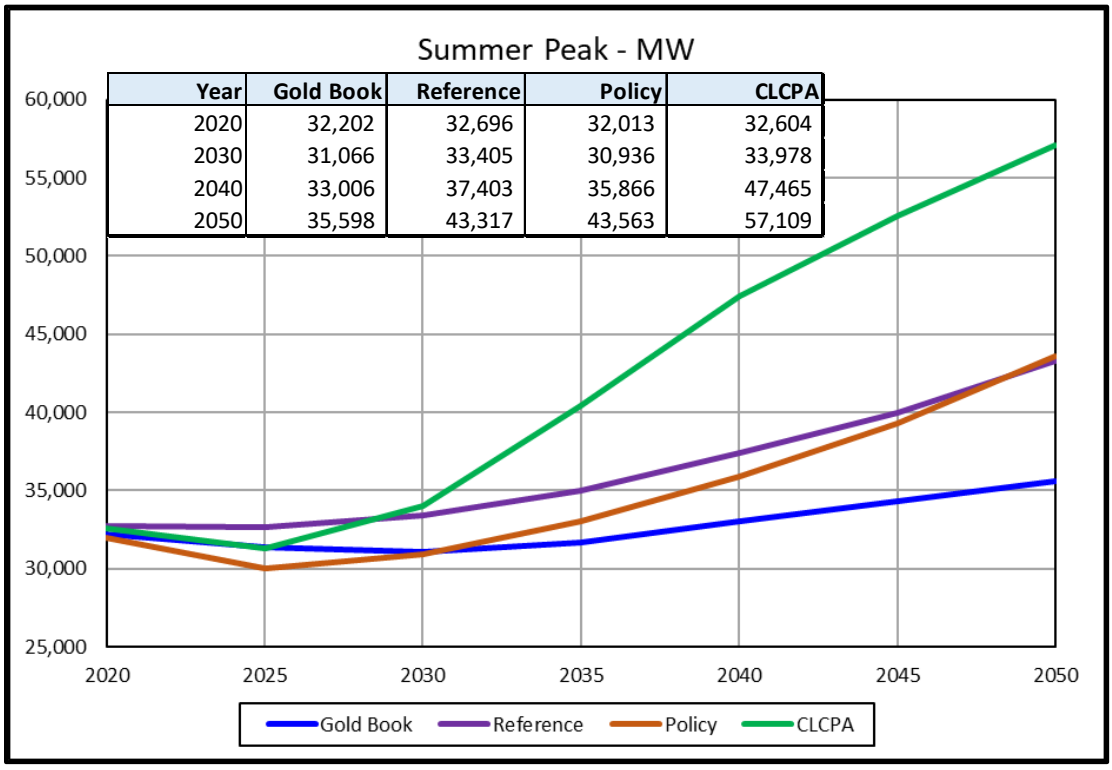
The electrification hourly load forecast is combined with the baseline, BTM solar, and battery load forecasts. Figure 45 shows the system hourly load forecast.

Figure 45: CLCPA Scenario System Hourly Load Forecast (2040)



Annual summer peaks are derived by finding the maximum hourly summer load. Figure 46 compares the summer peak forecast scenarios.

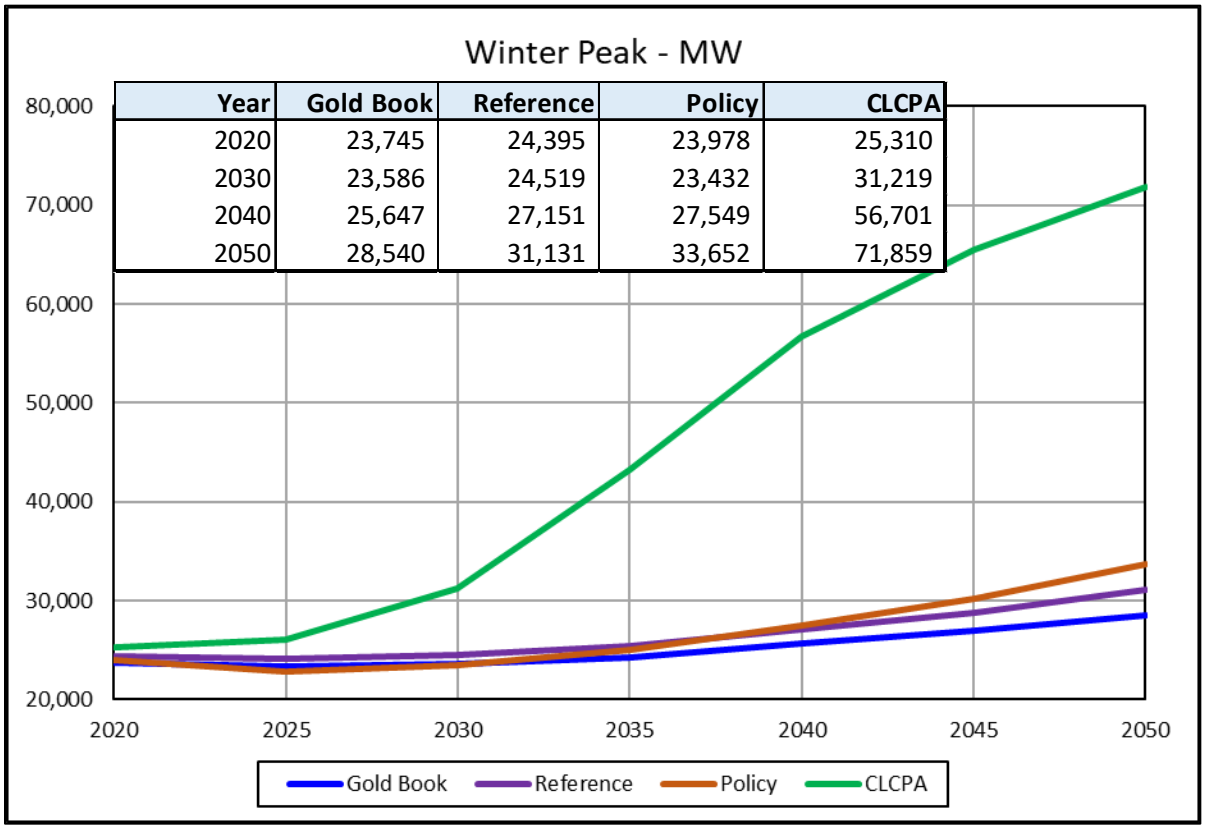
Figure 46: Summer Peak Forecast Comparison



While the Gold Book energy and Reference Case energy forecasts track each other, the Reference Case peak demand is significantly higher than the Gold Book peak demand. This is largely due to the trended peak-day TDD incorporated in the Reference Case Scenario. The Policy Case summer demand declines through 2025 as a result of CES energy efficiency targets. With stronger EV adoption and electrification through in the later years, Policy peak demand reaches the Reference Case peak demand by 2048.

The system peaks in the summer over the entire forecast horizon except for in the CLCPA Scenario. The CLCPA peak demand forecast switches to a winter peak in 2035. Figure 47 compares the winter peak forecasts.

Figure 47: Winter Peak Forecast Comparison



6. Zonal Load Forecasts

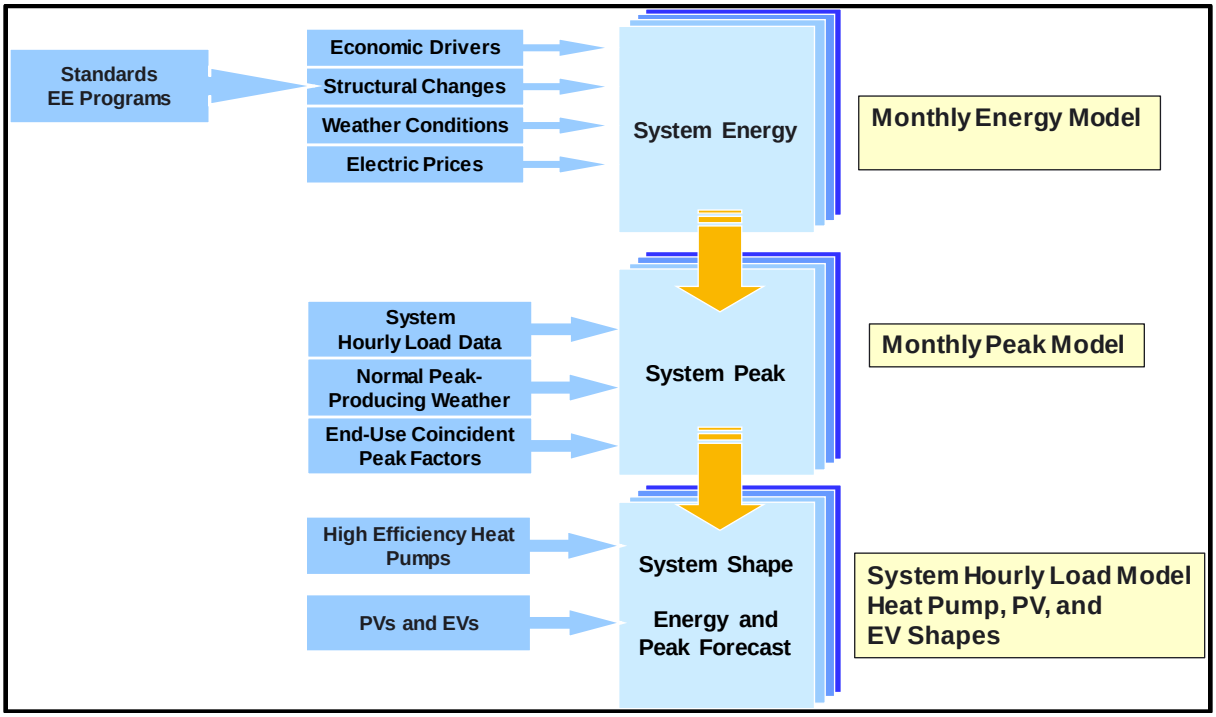
Hourly load forecasts are also developed for each of the NYISO Load Zones. Hourly load forecasts are first estimated for each of the Transmission Districts (TD) and then allocated to NYISO planning zones based on a set of TD-to-zonal allocation factors.

Forecast structure is similar to the system forecast, but rather than build-up from class sales, TD models are estimated at the total energy level, because the NYISO has total hourly loads for each TD. Forecast drivers account for regional economic growth, mix of residential and non-residential customers, expected weather trends due to climate change. For Consolidated Edison, the residential end-use intensity projections reflect the higher share of multi-family housing in that system. Monthly energy, peak demand, and baseline hourly load profiles are estimated for each TD. Model inputs include:

- Historical TD hourly load data
- TD-specific historical and trended temperature projections
- Weighted residential and commercial heating, cooling, and other use energy intensities
- TD-specific historical and projected monthly economic data from Moodys Analytics.

Figure 48 shows the TD/Zonal model structure.

Figure 48: Planning Area Model Structure



Energy, peak demand, and hourly profile are combined to generate a baseline hourly load forecast through 2050. TD baseline load forecasts are then calibrated to the system baseline hourly load forecast, after which the zonal forecasts are produced.
Forecasts are also adjusted for PV, EV, and electrification impacts. State-level PV generation, EV charging load, and electrification sales are allocated to TDs based on the NYISO 2019 Gold Book forecast. Results are then allocated to the NYISO load zones. Hourly load forecasts are generated for the Reference, Policy and CLCPA Scenarios. Zonal results are provided in Appendix A.

Appendix A: Forecast Results

A-1: Reference Case

Table A-15: Zone A Energy – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	15,707	-262	-316	29	2	0	0	15,160
2021	15,720	-456	-386	37	3	0	0	14,918
2022	15,851	-620	-456	50	5	0	0	14,829
2023	15,962	-759	-520	65	7	0	0	14,755
2024	16,093	-895	-577	84	9	0	0	14,713
2025	16,126	-1,018	-624	106	11	0	0	14,601
2026	16,195	-1,138	-664	141	13	0	0	14,547
2027	16,261	-1,244	-698	183	16	0	0	14,518
2028	16,372	-1,338	-725	230	18	0	0	14,556
2029	16,400	-1,414	-748	277	20	0	0	14,535
2030	16,495	-1,529	-768	322	22	0	0	14,543
2031	16,583	-1,635	-784	370	24	0	0	14,558
2032	16,708	-1,738	-798	429	27	0	0	14,627
2033	16,746	-1,826	-812	487	29	0	0	14,624
2034	16,821	-1,912	-823	553	31	0	0	14,671
2035	16,895	-1,989	-834	618	33	0	0	14,723
2036	17,009	-2,066	-843	688	35	0	0	14,822
2037	17,031	-2,127	-853	757	36	0	0	14,844
2038	17,090	-2,187	-862	829	37	0	0	14,907
2039	17,144	-2,242	-869	905	38	0	0	14,976
2040	17,268	-2,327	-877	986	38	0	0	15,088
2041	17,295	-2,393	-884	1,051	39	0	0	15,108
2042	17,359	-2,459	-891	1,126	40	0	0	15,176
2043	17,423	-2,520	-898	1,205	41	0	0	15,250
2044	17,527	-2,585	-904	1,285	42	0	0	15,364
2045	17,543	-2,628	-911	1,368	43	0	0	15,414
2046	17,605	-2,673	-918	1,453	43	0	0	15,511
2047	17,663	-2,711	-926	1,541	44	0	0	15,612
2048	17,765	-2,752	-932	1,632	45	0	0	15,758
2049	17,778	-2,772	-939	1,724	46	0	0	15,837
2050	17,835	-2,795	-946	1,823	47	0	0	15,963

Table A-16: Zone A Summer Peaks – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,718	-34	-26	4	-7	0	0	2,655
2021	2,740	-59	-86	8	-13	0	0	2,591
2022	2,772	-84	-101	10	-18	0	0	2,580
2023	2,778	-111	-48	19	-23	0	0	2,616
2024	2,803	-135	-53	24	-29	0	0	2,610
2025	2,842	-158	-51	14	-41	0	0	2,606
2026	2,851	-181	-61	41	-45	0	0	2,605
2027	2,872	-201	-64	53	-53	0	0	2,606
2028	2,894	-219	-66	66	-60	0	0	2,614
2029	2,916	-236	-69	80	-67	0	0	2,624
2030	2,941	-259	-70	93	-76	0	0	2,629
2031	2,965	-279	-72	107	-82	0	0	2,639
2032	2,952	-301	-15	142	-63	0	0	2,716
2033	2,977	-319	-15	162	-69	0	0	2,736
2034	3,001	-337	-16	184	-73	0	0	2,760
2035	3,024	-353	-16	206	-77	0	0	2,784
2036	3,048	-368	-16	228	-81	0	0	2,810
2037	3,072	-382	-16	252	-84	0	0	2,841
2038	3,093	-396	-16	276	-87	0	0	2,870
2039	3,114	-409	-16	301	-89	0	0	2,901
2040	3,139	-425	-17	327	-91	0	0	2,933
2041	3,162	-441	-17	350	-93	0	0	2,962
2042	3,185	-455	-17	375	-95	0	0	2,993
2043	3,208	-468	-17	401	-97	0	0	3,027
2044	3,231	-481	-17	427	-99	0	0	3,061
2045	3,254	-493	-17	456	-101	0	0	3,099
2046	3,279	-505	-17	484	-103	0	0	3,138
2047	3,304	-516	-16	513	-105	0	0	3,181
2048	3,329	-526	-18	542	-106	0	0	3,221
2049	3,355	-535	-18	574	-109	0	0	3,269
2050	3,381	-543	-18	607	-111	0	0	3,316

Table A-17: Zone A Winter Peaks – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	2,487	-105	0	11	-12	0	0	2,381
2021-22	2,512	-133	0	14	-16	0	0	2,377
2022-23	2,538	-154	0	19	-23	0	0	2,379
2023-24	2,559	-174	0	24	-29	0	0	2,379
2024-25	2,575	-193	0	31	-38	0	0	2,374
2025-26	2,566	-211	0	41	-45	0	0	2,351
2026-27	2,588	-227	0	53	-53	0	0	2,360
2027-28	2,601	-241	0	66	-60	0	0	2,366
2028-29	2,608	-253	0	80	-67	0	0	2,368
2029-30	2,629	-270	0	93	-76	0	0	2,376
2030-31	2,648	-286	0	107	-82	0	0	2,386
2031-32	2,609	-302	0	142	-63	0	0	2,386
2032-33	2,628	-316	0	162	-69	0	0	2,406
2033-34	2,641	-329	0	184	-73	0	0	2,423
2034-35	2,648	-341	0	206	-77	0	0	2,435
2035-36	2,667	-353	0	228	-81	0	0	2,462
2036-37	2,657	-362	0	252	-84	0	0	2,463
2037-38	2,676	-371	0	276	-87	0	0	2,494
2038-39	2,684	-380	0	301	-89	0	0	2,517
2039-40	2,701	-392	0	327	-91	0	0	2,545
2040-41	2,707	-404	0	350	-93	0	0	2,560
2041-42	2,721	-415	0	375	-95	0	0	2,586
2042-43	2,710	-423	0	401	-97	0	0	2,591
2043-44	2,731	-432	0	427	-99	0	0	2,627
2044-45	2,740	-441	0	456	-101	0	0	2,655
2045-46	2,745	-448	0	484	-103	0	0	2,677
2046-47	2,758	-455	0	513	-105	0	0	2,712
2047-48	2,773	-461	0	542	-106	0	0	2,747
2048-49	2,771	-464	0	574	-109	0	0	2,773
2049-50	2,781	-468	0	607	-111	0	0	2,809
2050-51	2,791	-472	0	641	-113	0	0	2,847

Table A-18: Zone B Energy – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	10,225	-170	-122	21	0	0	0	9,954
2021	10,258	-298	-148	27	1	0	0	9,840
2022	10,370	-406	-172	36	2	0	0	9,831
2023	10,469	-498	-194	47	3	0	0	9,827
2024	10,579	-588	-212	61	3	0	0	9,843
2025	10,626	-671	-228	78	4	0	0	9,808
2026	10,694	-751	-242	103	5	0	0	9,808
2027	10,760	-823	-253	133	6	0	0	9,822
2028	10,854	-887	-262	165	7	0	0	9,877
2029	10,893	-939	-270	198	7	0	0	9,889
2030	10,975	-1,017	-277	230	8	0	0	9,918
2031	11,051	-1,089	-283	264	9	0	0	9,952
2032	11,152	-1,160	-289	305	9	0	0	10,018
2033	11,194	-1,221	-294	346	11	0	0	10,036
2034	11,262	-1,280	-297	392	11	0	0	10,088
2035	11,328	-1,334	-302	438	12	0	0	10,142
2036	11,423	-1,388	-305	487	12	0	0	10,229
2037	11,455	-1,431	-310	536	13	0	0	10,264
2038	11,511	-1,473	-313	588	13	0	0	10,326
2039	11,565	-1,512	-315	642	13	0	0	10,393
2040	11,666	-1,572	-318	699	14	0	0	10,488
2041	11,700	-1,619	-321	745	14	0	0	10,520
2042	11,761	-1,666	-323	799	14	0	0	10,585
2043	11,820	-1,710	-326	854	14	0	0	10,652
2044	11,907	-1,756	-328	911	14	0	0	10,748
2045	11,934	-1,788	-330	970	14	0	0	10,800
2046	11,992	-1,821	-333	1,031	14	0	0	10,884
2047	12,049	-1,849	-335	1,093	15	0	0	10,971
2048	12,135	-1,880	-338	1,157	15	0	0	11,090
2049	12,160	-1,896	-341	1,223	15	0	0	11,161
2050	12,215	-1,914	-343	1,293	15	0	0	11,265

Table A-19: Zone B Summer Peak – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,112	-26	-11	3	-1	0	0	2,076
2021	2,138	-46	-35	6	-5	0	0	2,058
2022	2,170	-65	-41	8	-6	0	0	2,065
2023	2,163	-86	-19	14	-10	0	0	2,063
2024	2,188	-105	-21	18	-11	0	0	2,069
2025	2,237	-124	-20	10	-16	0	0	2,087
2026	2,236	-142	-24	31	-19	0	0	2,083
2027	2,257	-158	-25	40	-20	0	0	2,094
2028	2,279	-173	-26	50	-24	0	0	2,106
2029	2,301	-186	-27	60	-25	0	0	2,123
2030	2,325	-205	-27	70	-29	0	0	2,133
2031	2,348	-221	-28	81	-33	0	0	2,146
2032	2,308	-235	-6	107	-24	0	0	2,150
2033	2,331	-250	-6	122	-27	0	0	2,170
2034	2,353	-264	-6	138	-28	0	0	2,194
2035	2,375	-277	-6	154	-31	0	0	2,216
2036	2,396	-289	-6	171	-31	0	0	2,241
2037	2,421	-301	-6	189	-34	0	0	2,269
2038	2,442	-313	-6	207	-34	0	0	2,296
2039	2,462	-323	-6	226	-34	0	0	2,324
2040	2,484	-337	-6	246	-35	0	0	2,352
2041	2,506	-349	-7	263	-35	0	0	2,378
2042	2,527	-361	-7	281	-35	0	0	2,406
2043	2,553	-373	-7	301	-36	0	0	2,439
2044	2,574	-383	-7	320	-36	0	0	2,468
2045	2,596	-394	-7	342	-36	0	0	2,501
2046	2,619	-403	-7	363	-37	0	0	2,535
2047	2,641	-412	-6	385	-37	0	0	2,571
2048	2,665	-421	-7	406	-37	0	0	2,606
2049	2,692	-429	-7	431	-38	0	0	2,650
2050	2,716	-436	-7	455	-38	0	0	2,690

Table A-20: Zone B Winter Peak – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	1,649	-69	0	8	-5	0	0	1,583
2021-22	1,668	-88	0	11	-6	0	0	1,585
2022-23	1,687	-102	0	14	-10	0	0	1,589
2023-24	1,702	-116	0	18	-11	0	0	1,594
2024-25	1,717	-129	0	24	-15	0	0	1,597
2025-26	1,719	-141	0	31	-19	0	0	1,590
2026-27	1,737	-153	0	40	-20	0	0	1,605
2027-28	1,749	-162	0	50	-24	0	0	1,613
2028-29	1,753	-170	0	60	-25	0	0	1,618
2029-30	1,769	-182	0	70	-29	0	0	1,628
2030-31	1,784	-193	0	81	-33	0	0	1,639
2031-32	1,756	-203	0	107	-24	0	0	1,636
2032-33	1,772	-213	0	122	-27	0	0	1,654
2033-34	1,782	-222	0	138	-28	0	0	1,670
2034-35	1,787	-230	0	154	-31	0	0	1,680
2035-36	1,802	-238	0	171	-31	0	0	1,704
2036-37	1,803	-246	0	189	-34	0	0	1,713
2037-38	1,820	-252	0	207	-34	0	0	1,741
2038-39	1,828	-259	0	226	-34	0	0	1,761
2039-40	1,839	-267	0	246	-35	0	0	1,783
2040-41	1,844	-275	0	263	-35	0	0	1,797
2041-42	1,857	-283	0	281	-35	0	0	1,820
2042-43	1,857	-290	0	301	-36	0	0	1,832
2043-44	1,875	-297	0	320	-36	0	0	1,862
2044-45	1,882	-303	0	342	-36	0	0	1,885
2045-46	1,885	-308	0	363	-37	0	0	1,904
2046-47	1,897	-313	0	385	-37	0	0	1,932
2047-48	1,910	-317	0	406	-37	0	0	1,961
2048-49	1,918	-321	0	431	-38	0	0	1,990
2049-50	1,927	-324	0	455	-38	0	0	2,020
2050-51	1,936	-327	0	481	-38	0	0	2,051

Table A-21: Zone C Energy – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	16,256	-271	-310	31	2	0	0	15,707
2021	16,267	-472	-381	39	3	0	0	15,456
2022	16,397	-641	-452	52	4	0	0	15,360
2023	16,507	-785	-515	69	6	0	0	15,282
2024	16,637	-925	-572	88	8	0	0	15,236
2025	16,666	-1,052	-619	112	11	0	0	15,118
2026	16,731	-1,176	-659	148	13	0	0	15,058
2027	16,794	-1,285	-691	192	15	0	0	15,025
2028	16,902	-1,382	-718	241	18	0	0	15,060
2029	16,925	-1,459	-741	291	19	0	0	15,035
2030	17,018	-1,577	-760	338	22	0	0	15,041
2031	17,103	-1,686	-776	388	24	0	0	15,053
2032	17,226	-1,792	-790	450	26	0	0	15,121
2033	17,260	-1,882	-803	511	29	0	0	15,114
2034	17,332	-1,970	-815	581	31	0	0	15,159
2035	17,401	-2,048	-825	650	32	0	0	15,209
2036	17,511	-2,127	-834	723	34	0	0	15,306
2037	17,526	-2,189	-844	796	35	0	0	15,325
2038	17,578	-2,249	-852	872	36	0	0	15,384
2039	17,625	-2,305	-859	952	37	0	0	15,450
2040	17,742	-2,391	-867	1,037	38	0	0	15,560
2041	17,761	-2,457	-874	1,106	39	0	0	15,575
2042	17,819	-2,524	-881	1,185	40	0	0	15,639
2043	17,874	-2,586	-888	1,268	41	0	0	15,709
2044	17,970	-2,650	-894	1,352	41	0	0	15,819
2045	17,977	-2,693	-901	1,439	42	0	0	15,865
2046	18,029	-2,737	-908	1,530	43	0	0	15,957
2047	18,079	-2,775	-915	1,622	44	0	0	16,055
2048	18,172	-2,815	-922	1,717	45	0	0	16,197
2049	18,175	-2,834	-929	1,815	45	0	0	16,272
2050	18,223	-2,856	-936	1,918	46	0	0	16,396

Table A-22: Zone C Summer Peak – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,853	-35	-26	4	-6	0	0	2,789
2021	2,877	-62	-86	8	-11	0	0	2,726
2022	2,909	-88	-101	11	-16	0	0	2,715
2023	2,921	-116	-48	20	-22	0	0	2,754
2024	2,945	-142	-53	25	-29	0	0	2,747
2025	2,978	-166	-51	14	-40	0	0	2,736
2026	2,993	-190	-61	43	-44	0	0	2,741
2027	3,014	-211	-64	56	-52	0	0	2,742
2028	3,036	-230	-67	70	-60	0	0	2,749
2029	3,058	-248	-69	84	-67	0	0	2,759
2030	3,084	-271	-71	98	-75	0	0	2,765
2031	3,108	-292	-72	113	-82	0	0	2,775
2032	3,089	-315	-15	151	-63	0	0	2,846
2033	3,113	-334	-15	172	-69	0	0	2,867
2034	3,138	-352	-16	195	-73	0	0	2,892
2035	3,161	-369	-16	218	-77	0	0	2,917
2036	3,185	-385	-16	242	-82	0	0	2,944
2037	3,209	-399	-16	267	-85	0	0	2,975
2038	3,230	-413	-16	293	-87	0	0	3,006
2039	3,251	-427	-16	319	-89	0	0	3,038
2040	3,275	-444	-17	347	-91	0	0	3,071
2041	3,298	-460	-17	371	-93	0	0	3,100
2042	3,320	-474	-17	398	-95	0	0	3,131
2043	3,343	-488	-17	425	-97	0	0	3,166
2044	3,365	-501	-17	453	-99	0	0	3,200
2045	3,388	-514	-17	484	-101	0	0	3,240
2046	3,412	-526	-17	513	-103	0	0	3,279
2047	3,436	-536	-16	544	-105	0	0	3,323
2048	3,460	-546	-18	574	-107	0	0	3,364
2049	3,486	-555	-18	609	-109	0	0	3,413
2050	3,511	-564	-18	644	-111	0	0	3,462

Table A-23: Zone C Winter Peaks – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	2,648	-112	0	11	-11	0	0	2,537
2021-22	2,674	-142	0	15	-15	0	0	2,532
2022-23	2,701	-164	0	20	-22	0	0	2,535
2023-24	2,724	-186	0	25	-29	0	0	2,535
2024-25	2,740	-206	0	32	-37	0	0	2,529
2025-26	2,728	-224	0	43	-44	0	0	2,503
2026-27	2,750	-241	0	56	-52	0	0	2,512
2027-28	2,763	-256	0	70	-60	0	0	2,517
2028-29	2,771	-269	0	84	-67	0	0	2,520
2029-30	2,792	-287	0	98	-75	0	0	2,528
2030-31	2,812	-304	0	113	-82	0	0	2,539
2031-32	2,768	-320	0	151	-63	0	0	2,535
2032-33	2,788	-335	0	172	-69	0	0	2,555
2033-34	2,801	-349	0	195	-73	0	0	2,574
2034-35	2,807	-362	0	218	-77	0	0	2,586
2035-36	2,828	-374	0	242	-82	0	0	2,614
2036-37	2,814	-383	0	267	-85	0	0	2,613
2037-38	2,833	-393	0	293	-87	0	0	2,645
2038-39	2,841	-402	0	319	-89	0	0	2,669
2039-40	2,858	-415	0	347	-91	0	0	2,699
2040-41	2,864	-427	0	371	-93	0	0	2,714
2041-42	2,877	-439	0	398	-95	0	0	2,741
2042-43	2,863	-447	0	425	-97	0	0	2,744
2043-44	2,883	-457	0	453	-99	0	0	2,780
2044-45	2,892	-465	0	484	-101	0	0	2,809
2045-46	2,895	-473	0	513	-103	0	0	2,833
2046-47	2,908	-480	0	544	-105	0	0	2,868
2047-48	2,922	-486	0	574	-107	0	0	2,904
2048-49	2,917	-489	0	609	-109	0	0	2,929
2049-50	2,926	-493	0	644	-111	0	0	2,966
2050-51	2,935	-496	0	680	-113	0	0	3,006

Table A-24: Zone D Energy – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	4,417	-74	-33	5	0	0	0	4,315
2021	4,384	-127	-42	6	0	0	0	4,221
2022	4,396	-172	-49	7	0	0	0	4,183
2023	4,410	-210	-58	10	1	0	0	4,153
2024	4,431	-246	-66	13	1	0	0	4,132
2025	4,415	-279	-74	16	1	0	0	4,080
2026	4,410	-310	-81	21	1	0	0	4,042
2027	4,408	-337	-87	27	1	0	0	4,012
2028	4,427	-362	-94	34	2	0	0	4,008
2029	4,416	-381	-100	42	2	0	0	3,979
2030	4,420	-410	-104	48	2	0	0	3,956
2031	4,424	-436	-109	55	2	0	0	3,937
2032	4,446	-462	-113	64	2	0	0	3,937
2033	4,435	-484	-116	73	3	0	0	3,912
2034	4,440	-505	-118	83	3	0	0	3,904
2035	4,446	-523	-121	92	4	0	0	3,897
2036	4,466	-543	-123	102	4	0	0	3,907
2037	4,451	-556	-124	113	4	0	0	3,888
2038	4,450	-569	-126	123	4	0	0	3,881
2039	4,447	-582	-128	134	4	0	0	3,876
2040	4,464	-602	-130	146	4	0	0	3,882
2041	4,444	-615	-130	155	4	0	0	3,858
2042	4,440	-629	-132	167	4	0	0	3,850
2043	4,436	-642	-132	178	4	0	0	3,844
2044	4,447	-656	-134	190	4	0	0	3,852
2045	4,426	-663	-135	202	4	0	0	3,835
2046	4,422	-671	-136	215	5	0	0	3,835
2047	4,419	-678	-137	228	5	0	0	3,837
2048	4,432	-686	-138	241	5	0	0	3,854
2049	4,414	-688	-139	256	5	0	0	3,848
2050	4,413	-692	-140	271	5	0	0	3,857

Table A-25: Zone D Summer Peaks – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	538	-7	-2	1	0	0	0	529
2021	533	-11	-8	1	-1	0	0	514
2022	536	-16	-9	1	-1	0	0	511
2023	538	-21	-4	3	-1	0	0	513
2024	541	-26	-5	3	-2	0	0	511
2025	546	-30	-5	2	-3	0	0	510
2026	543	-34	-6	5	-3	0	0	505
2027	544	-38	-7	7	-4	0	0	503
2028	546	-41	-7	9	-4	0	0	502
2029	548	-44	-8	10	-5	0	0	502
2030	550	-48	-8	12	-5	0	0	500
2031	551	-52	-9	14	-6	0	0	499
2032	550	-56	-2	19	-4	0	0	507
2033	552	-59	-2	21	-6	0	0	506
2034	554	-62	-2	24	-7	0	0	507
2035	556	-65	-2	27	-7	0	0	509
2036	558	-67	-2	30	-7	0	0	511
2037	560	-70	-2	33	-7	0	0	513
2038	561	-72	-2	36	-8	0	0	515
2039	563	-74	-2	39	-8	0	0	518
2040	564	-76	-2	42	-8	0	0	520
2041	565	-79	-2	45	-8	0	0	521
2042	566	-81	-2	48	-8	0	0	523
2043	567	-83	-2	52	-8	0	0	525
2044	568	-85	-2	55	-8	0	0	528
2045	569	-86	-2	59	-9	0	0	531
2046	570	-88	-2	62	-9	0	0	534
2047	572	-89	-2	66	-9	0	0	538
2048	574	-91	-2	70	-9	0	0	542
2049	576	-92	-2	74	-9	0	0	547
2050	578	-93	-2	79	-9	0	0	552

Table A-26: Zone D Winter Peaks – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	552	-23	0	1	-1	0	0	530
2021-22	556	-29	0	2	-1	0	0	527
2022-23	558	-34	0	3	-1	0	0	526
2023-24	560	-38	0	3	-2	0	0	523
2024-25	561	-42	0	4	-3	0	0	520
2025-26	559	-46	0	5	-3	0	0	515
2026-27	559	-49	0	7	-4	0	0	514
2027-28	561	-52	0	9	-4	0	0	513
2028-29	561	-54	0	10	-5	0	0	513
2029-30	562	-58	0	12	-5	0	0	512
2030-31	564	-61	0	14	-6	0	0	511
2031-32	560	-65	0	19	-4	0	0	510
2032-33	562	-68	0	21	-6	0	0	509
2033-34	563	-70	0	24	-7	0	0	511
2034-35	564	-73	0	27	-7	0	0	511
2035-36	566	-75	0	30	-7	0	0	514
2036-37	565	-77	0	33	-7	0	0	513
2037-38	566	-79	0	36	-8	0	0	516
2038-39	566	-80	0	39	-8	0	0	517
2039-40	567	-82	0	42	-8	0	0	519
2040-41	567	-85	0	45	-8	0	0	520
2041-42	568	-87	0	48	-8	0	0	521
2042-43	566	-88	0	52	-8	0	0	521
2043-44	567	-90	0	55	-8	0	0	524
2044-45	567	-91	0	59	-9	0	0	526
2045-46	567	-93	0	62	-9	0	0	528
2046-47	568	-94	0	66	-9	0	0	532
2047-48	569	-95	0	70	-9	0	0	535
2048-49	568	-95	0	74	-9	0	0	538
2049-50	569	-96	0	79	-9	0	0	543
2050-51	570	-96	0	83	-9	0	0	547

Table A-27: Zone E Energy – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	7,900	-132	-157	15	1	0	0	7,628
2021	7,907	-230	-192	19	2	0	0	7,506
2022	7,972	-312	-226	25	2	0	0	7,461
2023	8,027	-382	-258	33	3	0	0	7,423
2024	8,092	-450	-286	42	4	0	0	7,402
2025	8,108	-512	-310	54	6	0	0	7,346
2026	8,141	-572	-330	72	7	0	0	7,318
2027	8,174	-625	-346	93	8	0	0	7,303
2028	8,228	-673	-360	116	9	0	0	7,321
2029	8,242	-710	-371	140	10	0	0	7,310
2030	8,289	-768	-381	163	11	0	0	7,314
2031	8,332	-821	-389	187	12	0	0	7,321
2032	8,394	-873	-396	217	13	0	0	7,355
2033	8,412	-917	-403	247	14	0	0	7,353
2034	8,449	-960	-408	280	15	0	0	7,376
2035	8,485	-999	-413	313	16	0	0	7,402
2036	8,541	-1,038	-418	349	17	0	0	7,451
2037	8,551	-1,068	-423	384	18	0	0	7,462
2038	8,579	-1,098	-427	420	18	0	0	7,492
2039	8,605	-1,125	-431	459	19	0	0	7,526
2040	8,665	-1,168	-435	500	19	0	0	7,582
2041	8,677	-1,200	-438	533	20	0	0	7,591
2042	8,708	-1,234	-442	571	20	0	0	7,624
2043	8,738	-1,264	-445	611	20	0	0	7,660
2044	8,789	-1,296	-448	651	21	0	0	7,717
2045	8,796	-1,318	-452	694	21	0	0	7,741
2046	8,825	-1,340	-455	737	22	0	0	7,788
2047	8,852	-1,359	-459	781	22	0	0	7,838
2048	8,901	-1,379	-462	827	22	0	0	7,910
2049	8,906	-1,389	-466	875	23	0	0	7,949
2050	8,933	-1,400	-469	924	23	0	0	8,012

Table A-28: Zone E Summer Peaks – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	1,359	-17	-13	2	-4	0	0	1,328
2021	1,370	-29	-43	4	-6	0	0	1,296
2022	1,386	-42	-50	5	-9	0	0	1,291
2023	1,390	-55	-24	9	-11	0	0	1,309
2024	1,402	-68	-26	12	-14	0	0	1,306
2025	1,421	-79	-25	7	-20	0	0	1,303
2026	1,426	-90	-30	20	-22	0	0	1,303
2027	1,436	-101	-32	26	-26	0	0	1,304
2028	1,447	-110	-33	33	-30	0	0	1,307
2029	1,458	-118	-34	40	-33	0	0	1,312
2030	1,471	-129	-35	47	-38	0	0	1,315
2031	1,483	-139	-36	53	-41	0	0	1,320
2032	1,476	-150	-7	71	-31	0	0	1,358
2033	1,488	-160	-8	81	-34	0	0	1,368
2034	1,500	-168	-8	92	-36	0	0	1,380
2035	1,512	-176	-8	103	-39	0	0	1,392
2036	1,523	-184	-8	114	-41	0	0	1,405
2037	1,535	-191	-8	126	-42	0	0	1,420
2038	1,546	-198	-8	138	-43	0	0	1,435
2039	1,556	-204	-8	151	-44	0	0	1,451
2040	1,568	-213	-8	164	-45	0	0	1,467
2041	1,580	-220	-8	175	-46	0	0	1,481
2042	1,591	-227	-8	188	-47	0	0	1,496
2043	1,603	-234	-8	201	-48	0	0	1,513
2044	1,614	-240	-8	214	-49	0	0	1,530
2045	1,626	-246	-9	229	-50	0	0	1,549
2046	1,638	-252	-9	242	-51	0	0	1,569
2047	1,650	-258	-8	257	-52	0	0	1,590
2048	1,662	-262	-9	271	-53	0	0	1,610
2049	1,676	-267	-9	288	-54	0	0	1,634
2050	1,689	-271	-9	304	-55	0	0	1,657

Table A-29: Zone E Winter Peaks – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	1,246	-53	0	5	-6	0	0	1,193
2021-22	1,258	-67	0	7	-8	0	0	1,191
2022-23	1,271	-77	0	9	-11	0	0	1,192
2023-24	1,282	-87	0	12	-14	0	0	1,192
2024-25	1,290	-97	0	15	-19	0	0	1,189
2025-26	1,285	-106	0	20	-22	0	0	1,178
2026-27	1,296	-114	0	26	-26	0	0	1,182
2027-28	1,302	-121	0	33	-30	0	0	1,185
2028-29	1,306	-127	0	40	-33	0	0	1,186
2029-30	1,316	-135	0	47	-38	0	0	1,190
2030-31	1,326	-143	0	53	-41	0	0	1,195
2031-32	1,306	-151	0	71	-31	0	0	1,195
2032-33	1,316	-158	0	81	-34	0	0	1,205
2033-34	1,322	-165	0	92	-36	0	0	1,213
2034-35	1,325	-171	0	103	-39	0	0	1,219
2035-36	1,335	-177	0	114	-41	0	0	1,233
2036-37	1,330	-181	0	126	-42	0	0	1,233
2037-38	1,339	-186	0	138	-43	0	0	1,248
2038-39	1,343	-190	0	151	-44	0	0	1,260
2039-40	1,352	-196	0	164	-45	0	0	1,274
2040-41	1,355	-202	0	175	-46	0	0	1,282
2041-42	1,362	-208	0	188	-47	0	0	1,295
2042-43	1,356	-212	0	201	-48	0	0	1,297
2043-44	1,366	-216	0	214	-49	0	0	1,315
2044-45	1,371	-221	0	229	-50	0	0	1,329
2045-46	1,373	-224	0	242	-51	0	0	1,340
2046-47	1,380	-228	0	257	-52	0	0	1,357
2047-48	1,387	-231	0	271	-53	0	0	1,375
2048-49	1,386	-232	0	288	-54	0	0	1,388
2049-50	1,391	-234	0	304	-55	0	0	1,406
2050-51	1,396	-236	0	321	-56	0	0	1,425

Table A-30: Zone F Energy – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	12,326	-205	-254	23	2	0	0	11,890
2021	12,337	-358	-310	29	3	0	0	11,701
2022	12,442	-487	-365	39	4	0	0	11,633
2023	12,530	-596	-416	51	6	0	0	11,575
2024	12,635	-703	-462	65	7	0	0	11,543
2025	12,663	-799	-500	83	9	0	0	11,456
2026	12,719	-894	-532	110	11	0	0	11,414
2027	12,774	-977	-559	143	13	0	0	11,393
2028	12,863	-1,052	-581	179	14	0	0	11,424
2029	12,887	-1,111	-599	216	16	0	0	11,409
2030	12,964	-1,202	-615	251	18	0	0	11,416
2031	13,035	-1,285	-628	288	19	0	0	11,429
2032	13,136	-1,366	-640	334	21	0	0	11,485
2033	13,167	-1,436	-651	380	23	0	0	11,484
2034	13,229	-1,503	-660	431	25	0	0	11,522
2035	13,289	-1,564	-668	482	26	0	0	11,565
2036	13,382	-1,626	-676	536	28	0	0	11,644
2037	13,402	-1,674	-684	590	29	0	0	11,663
2038	13,452	-1,721	-691	646	29	0	0	11,714
2039	13,498	-1,765	-697	704	30	0	0	11,770
2040	13,598	-1,833	-703	767	31	0	0	11,861
2041	13,622	-1,885	-709	818	31	0	0	11,878
2042	13,677	-1,937	-714	877	32	0	0	11,934
2043	13,730	-1,986	-720	938	33	0	0	11,995
2044	13,817	-2,038	-725	1,000	33	0	0	12,087
2045	13,833	-2,072	-730	1,065	34	0	0	12,129
2046	13,885	-2,108	-736	1,131	35	0	0	12,207
2047	13,935	-2,139	-742	1,199	35	0	0	12,290
2048	14,020	-2,172	-747	1,270	36	0	0	12,407
2049	14,033	-2,188	-753	1,342	37	0	0	12,471
2050	14,082	-2,207	-759	1,419	37	0	0	12,573

Table A-31: Zone F Summer Peaks – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,497	-31	-25	3	-7	0	0	2,438
2021	2,517	-54	-81	7	-12	0	0	2,376
2022	2,547	-77	-96	9	-17	0	0	2,367
2023	2,550	-102	-45	17	-23	0	0	2,398
2024	2,573	-124	-50	22	-28	0	0	2,393
2025	2,614	-145	-48	12	-39	0	0	2,393
2026	2,619	-166	-57	37	-43	0	0	2,389
2027	2,638	-185	-60	48	-51	0	0	2,390
2028	2,659	-202	-63	60	-57	0	0	2,398
2029	2,680	-217	-65	73	-64	0	0	2,407
2030	2,704	-238	-67	85	-72	0	0	2,412
2031	2,727	-256	-68	97	-78	0	0	2,422
2032	2,719	-277	-14	130	-60	0	0	2,498
2033	2,742	-294	-15	148	-65	0	0	2,516
2034	2,764	-310	-15	168	-69	0	0	2,538
2035	2,786	-325	-15	188	-73	0	0	2,561
2036	2,808	-339	-15	208	-77	0	0	2,585
2037	2,831	-352	-15	230	-80	0	0	2,614
2038	2,852	-365	-15	252	-82	0	0	2,641
2039	2,872	-377	-16	275	-84	0	0	2,670
2040	2,895	-392	-16	299	-86	0	0	2,700
2041	2,917	-407	-16	319	-88	0	0	2,726
2042	2,939	-420	-16	342	-90	0	0	2,755
2043	2,962	-432	-16	366	-92	0	0	2,788
2044	2,984	-445	-16	389	-93	0	0	2,819
2045	3,006	-456	-16	416	-95	0	0	2,855
2046	3,030	-467	-16	441	-97	0	0	2,891
2047	3,054	-477	-15	468	-99	0	0	2,932
2048	3,078	-486	-17	494	-101	0	0	2,969
2049	3,104	-495	-17	524	-103	0	0	3,013
2050	3,129	-503	-17	554	-105	0	0	3,058

Table A-32: Zone F Winter Peaks – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	2,263	-95	0	10	-12	0	0	2,166
2021-22	2,286	-121	0	13	-16	0	0	2,162
2022-23	2,309	-140	0	17	-23	0	0	2,163
2023-24	2,328	-159	0	22	-28	0	0	2,163
2024-25	2,344	-176	0	28	-37	0	0	2,159
2025-26	2,338	-192	0	37	-43	0	0	2,139
2026-27	2,357	-207	0	48	-51	0	0	2,148
2027-28	2,370	-219	0	60	-57	0	0	2,153
2028-29	2,377	-231	0	73	-64	0	0	2,155
2029-30	2,396	-246	0	85	-72	0	0	2,162
2030-31	2,413	-261	0	97	-78	0	0	2,172
2031-32	2,379	-275	0	130	-60	0	0	2,174
2032-33	2,398	-288	0	148	-65	0	0	2,193
2033-34	2,409	-300	0	168	-69	0	0	2,208
2034-35	2,416	-311	0	188	-73	0	0	2,219
2035-36	2,434	-322	0	208	-77	0	0	2,244
2036-37	2,426	-330	0	230	-80	0	0	2,246
2037-38	2,444	-339	0	252	-82	0	0	2,274
2038-39	2,452	-347	0	275	-84	0	0	2,296
2039-40	2,467	-358	0	299	-86	0	0	2,322
2040-41	2,474	-369	0	319	-88	0	0	2,336
2041-42	2,488	-379	0	342	-90	0	0	2,361
2042-43	2,479	-387	0	366	-92	0	0	2,366
2043-44	2,499	-396	0	389	-93	0	0	2,399
2044-45	2,508	-403	0	416	-95	0	0	2,425
2045-46	2,513	-411	0	441	-97	0	0	2,447
2046-47	2,526	-417	0	468	-99	0	0	2,479
2047-48	2,541	-422	0	494	-101	0	0	2,512
2048-49	2,541	-426	0	524	-103	0	0	2,536
2049-50	2,551	-429	0	554	-105	0	0	2,570
2050-51	2,561	-433	0	585	-107	0	0	2,606

Table A-33: Zone G Energy – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	9,957	-166	-354	29	2	0	0	9,468
2021	10,024	-291	-414	37	3	0	0	9,359
2022	10,166	-398	-466	50	5	0	0	9,357
2023	10,296	-490	-507	65	8	0	0	9,373
2024	10,444	-581	-542	84	10	0	0	9,415
2025	10,525	-664	-568	108	13	0	0	9,414
2026	10,626	-747	-591	144	15	0	0	9,447
2027	10,727	-821	-610	185	18	0	0	9,499
2028	10,860	-888	-626	229	20	0	0	9,595
2029	10,937	-943	-639	274	21	0	0	9,651
2030	11,058	-1,025	-651	318	24	0	0	9,725
2031	11,174	-1,102	-663	364	26	0	0	9,801
2032	11,315	-1,177	-672	421	29	0	0	9,916
2033	11,397	-1,243	-680	477	31	0	0	9,981
2034	11,505	-1,307	-689	540	34	0	0	10,083
2035	11,614	-1,367	-696	604	36	0	0	10,190
2036	11,753	-1,428	-704	672	38	0	0	10,332
2037	11,826	-1,477	-711	741	39	0	0	10,419
2038	11,928	-1,526	-718	813	40	0	0	10,536
2039	12,027	-1,573	-723	889	41	0	0	10,661
2040	12,176	-1,641	-729	969	42	0	0	10,816
2041	12,257	-1,696	-735	1,033	43	0	0	10,901
2042	12,366	-1,752	-741	1,107	44	0	0	11,024
2043	12,473	-1,804	-747	1,184	45	0	0	11,150
2044	12,614	-1,860	-753	1,263	46	0	0	11,310
2045	12,691	-1,901	-759	1,344	47	0	0	11,422
2046	12,803	-1,944	-765	1,428	48	0	0	11,571
2047	12,915	-1,982	-770	1,515	49	0	0	11,726
2048	13,060	-2,023	-776	1,604	50	0	0	11,915
2049	13,136	-2,048	-781	1,695	51	0	0	12,052
2050	13,248	-2,076	-786	1,791	52	0	0	12,229

Table A-34: Zone G Summer Peaks – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,314	-29	-31	4	-7	0	0	2,251
2021	2,381	-51	-97	8	-11	0	0	2,230
2022	2,425	-73	-109	11	-19	0	0	2,235
2023	2,450	-98	-49	20	-28	0	0	2,296
2024	2,489	-120	-52	25	-35	0	0	2,307
2025	2,498	-139	-49	15	-49	0	0	2,276
2026	2,561	-162	-57	43	-52	0	0	2,332
2027	2,595	-182	-59	56	-63	0	0	2,347
2028	2,631	-200	-61	69	-70	0	0	2,371
2029	2,668	-216	-62	83	-77	0	0	2,396
2030	2,707	-238	-63	96	-87	0	0	2,415
2031	2,746	-258	-64	110	-94	0	0	2,440
2032	2,711	-276	-13	147	-73	0	0	2,495
2033	2,749	-295	-14	167	-78	0	0	2,529
2034	2,788	-313	-14	189	-85	0	0	2,565
2035	2,826	-330	-14	211	-90	0	0	2,603
2036	2,864	-346	-14	234	-95	0	0	2,644
2037	2,902	-361	-14	259	-98	0	0	2,689
2038	2,940	-376	-14	284	-100	0	0	2,733
2039	2,977	-391	-14	311	-102	0	0	2,780
2040	3,018	-409	-15	338	-105	0	0	2,828
2041	3,058	-426	-15	361	-107	0	0	2,871
2042	3,098	-443	-15	387	-110	0	0	2,918
2043	3,139	-458	-15	414	-112	0	0	2,968
2044	3,180	-474	-15	441	-114	0	0	3,017
2045	3,221	-488	-15	471	-117	0	0	3,071
2046	3,266	-503	-15	499	-119	0	0	3,127
2047	3,309	-516	-14	530	-122	0	0	3,187
2048	3,354	-530	-15	559	-124	0	0	3,244
2049	3,400	-542	-16	593	-127	0	0	3,309
2050	3,446	-554	-16	626	-129	0	0	3,373

Table A-35: Zone G Winter Peaks – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	1,649	-70	0	11	-10	0	0	1,581
2021-22	1,675	-89	0	15	-17	0	0	1,584
2022-23	1,701	-103	0	20	-28	0	0	1,590
2023-24	1,721	-117	0	25	-35	0	0	1,594
2024-25	1,739	-131	0	33	-45	0	0	1,596
2025-26	1,743	-143	0	43	-52	0	0	1,590
2026-27	1,765	-155	0	56	-63	0	0	1,603
2027-28	1,783	-165	0	69	-70	0	0	1,617
2028-29	1,797	-174	0	83	-77	0	0	1,628
2029-30	1,816	-187	0	96	-87	0	0	1,639
2030-31	1,836	-199	0	110	-94	0	0	1,654
2031-32	1,817	-210	0	147	-73	0	0	1,681
2032-33	1,838	-221	0	167	-78	0	0	1,706
2033-34	1,855	-231	0	189	-85	0	0	1,728
2034-35	1,866	-241	0	211	-90	0	0	1,747
2035-36	1,886	-249	0	234	-95	0	0	1,776
2036-37	1,889	-257	0	259	-98	0	0	1,793
2037-38	1,909	-265	0	284	-100	0	0	1,829
2038-39	1,925	-272	0	311	-102	0	0	1,861
2039-40	1,944	-282	0	338	-105	0	0	1,895
2040-41	1,955	-292	0	361	-107	0	0	1,918
2041-42	1,973	-301	0	387	-110	0	0	1,949
2042-43	1,976	-309	0	414	-112	0	0	1,970
2043-44	2,001	-317	0	441	-114	0	0	2,010
2044-45	2,017	-324	0	471	-117	0	0	2,046
2045-46	2,028	-331	0	499	-119	0	0	2,077
2046-47	2,045	-337	0	530	-122	0	0	2,116
2047-48	2,064	-343	0	559	-124	0	0	2,156
2048-49	2,075	-348	0	593	-127	0	0	2,193
2049-50	2,093	-352	0	626	-129	0	0	2,237
2050-51	2,111	-357	0	661	-132	0	0	2,283

Table A-36: Zone H Energy – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,765	-46	-35	5	0	0	0	2,689
2021	2,767	-80	-42	6	0	0	0	2,651
2022	2,788	-109	-50	8	1	0	0	2,638
2023	2,807	-133	-57	11	1	0	0	2,629
2024	2,832	-157	-63	14	1	0	0	2,626
2025	2,840	-179	-68	18	2	0	0	2,612
2026	2,853	-200	-72	24	2	0	0	2,606
2027	2,866	-219	-76	31	2	0	0	2,604
2028	2,887	-236	-79	39	2	0	0	2,613
2029	2,893	-249	-81	46	3	0	0	2,612
2030	2,908	-270	-83	54	3	0	0	2,612
2031	2,921	-288	-85	61	3	0	0	2,613
2032	2,941	-306	-86	71	4	0	0	2,624
2033	2,946	-321	-88	81	4	0	0	2,622
2034	2,958	-336	-89	91	4	0	0	2,629
2035	2,971	-350	-90	102	5	0	0	2,638
2036	2,990	-363	-91	114	5	0	0	2,655
2037	2,994	-374	-92	125	5	0	0	2,659
2038	3,005	-385	-93	137	5	0	0	2,671
2039	3,015	-394	-93	150	5	0	0	2,683
2040	3,034	-409	-94	164	5	0	0	2,700
2041	3,037	-420	-95	174	6	0	0	2,702
2042	3,047	-432	-96	187	6	0	0	2,712
2043	3,057	-442	-96	200	6	0	0	2,724
2044	3,074	-453	-97	213	6	0	0	2,743
2045	3,077	-461	-98	227	6	0	0	2,751
2046	3,088	-469	-99	241	6	0	0	2,768
2047	3,099	-476	-99	256	6	0	0	2,786
2048	3,117	-483	-100	271	6	0	0	2,811
2049	3,120	-487	-101	286	6	0	0	2,825
2050	3,131	-491	-101	303	7	0	0	2,848

Table A-37: Zone H Summer Peaks – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	634	-8	-4	1	-1	0	0	622
2021	641	-14	-12	2	-2	0	0	615
2022	648	-20	-14	2	-3	0	0	614
2023	647	-26	-7	4	-4	0	0	615
2024	653	-31	-8	5	-5	0	0	614
2025	663	-37	-7	3	-7	0	0	615
2026	664	-42	-9	9	-8	0	0	614
2027	669	-47	-9	11	-9	0	0	615
2028	675	-51	-9	14	-11	0	0	617
2029	680	-55	-10	17	-12	0	0	620
2030	685	-60	-10	19	-13	0	0	621
2031	691	-65	-10	22	-14	0	0	623
2032	682	-70	-2	29	-11	0	0	629
2033	687	-74	-2	33	-12	0	0	633
2034	693	-78	-2	38	-13	0	0	638
2035	698	-81	-2	42	-14	0	0	643
2036	703	-85	-2	47	-14	0	0	649
2037	709	-88	-2	52	-15	0	0	656
2038	714	-91	-2	57	-15	0	0	662
2039	719	-94	-2	62	-16	0	0	669
2040	724	-98	-2	68	-16	0	0	675
2041	729	-102	-2	72	-16	0	0	681
2042	734	-105	-2	78	-17	0	0	688
2043	739	-108	-2	83	-17	0	0	695
2044	744	-111	-2	88	-17	0	0	702
2045	750	-114	-2	94	-18	0	0	710
2046	755	-116	-2	100	-18	0	0	719
2047	761	-119	-2	106	-18	0	0	728
2048	767	-121	-2	112	-19	0	0	736
2049	773	-123	-2	119	-19	0	0	747
2050	779	-125	-3	126	-19	0	0	757

Table A-38: Zone H Winter Peaks – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	533	-22	0	2	-2	0	0	511
2021-22	537	-28	0	3	-2	0	0	509
2022-23	543	-33	0	4	-4	0	0	510
2023-24	547	-37	0	5	-5	0	0	510
2024-25	550	-41	0	6	-6	0	0	509
2025-26	549	-45	0	9	-8	0	0	505
2026-27	553	-49	0	11	-9	0	0	507
2027-28	556	-51	0	14	-11	0	0	508
2028-29	557	-54	0	17	-12	0	0	508
2029-30	561	-58	0	19	-13	0	0	510
2030-31	564	-61	0	22	-14	0	0	511
2031-32	554	-64	0	29	-11	0	0	509
2032-33	558	-67	0	33	-12	0	0	513
2033-34	561	-70	0	38	-13	0	0	516
2034-35	561	-72	0	42	-14	0	0	518
2035-36	565	-75	0	47	-14	0	0	523
2036-37	563	-77	0	52	-15	0	0	524
2037-38	567	-79	0	57	-15	0	0	530
2038-39	569	-80	0	62	-16	0	0	535
2039-40	571	-83	0	68	-16	0	0	540
2040-41	572	-85	0	72	-16	0	0	543
2041-42	574	-88	0	78	-17	0	0	548
2042-43	572	-89	0	83	-17	0	0	549
2043-44	576	-91	0	88	-17	0	0	556
2044-45	578	-93	0	94	-18	0	0	562
2045-46	578	-94	0	100	-18	0	0	566
2046-47	581	-96	0	106	-18	0	0	573
2047-48	583	-97	0	112	-19	0	0	580
2048-49	584	-98	0	119	-19	0	0	586
2049-50	586	-99	0	126	-19	0	0	593
2050-51	587	-99	0	133	-20	0	0	601

Table A-39: Zone I Energy – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	6,099	-102	-38	9	0	0	0	5,969
2021	6,104	-177	-43	12	1	0	0	5,897
2022	6,152	-241	-50	17	1	0	0	5,879
2023	6,201	-295	-56	22	2	0	0	5,873
2024	6,263	-348	-61	28	2	0	0	5,884
2025	6,293	-397	-66	37	3	0	0	5,870
2026	6,333	-445	-69	48	4	0	0	5,870
2027	6,373	-488	-72	61	4	0	0	5,879
2028	6,431	-526	-75	76	5	0	0	5,911
2029	6,458	-557	-77	90	5	0	0	5,919
2030	6,490	-602	-79	104	6	0	0	5,919
2031	6,520	-643	-80	119	6	0	0	5,922
2032	6,565	-683	-81	137	7	0	0	5,944
2033	6,579	-717	-82	155	8	0	0	5,942
2034	6,611	-751	-83	175	8	0	0	5,959
2035	6,645	-782	-84	195	9	0	0	5,982
2036	6,697	-813	-85	217	9	0	0	6,025
2037	6,716	-839	-85	239	10	0	0	6,040
2038	6,751	-864	-86	262	10	0	0	6,073
2039	6,786	-887	-87	287	10	0	0	6,109
2040	6,830	-921	-87	313	10	0	0	6,145
2041	6,842	-947	-88	333	10	0	0	6,151
2042	6,872	-973	-89	357	11	0	0	6,177
2043	6,903	-999	-90	382	11	0	0	6,208
2044	6,954	-1,025	-90	407	11	0	0	6,256
2045	6,972	-1,045	-91	434	11	0	0	6,282
2046	7,010	-1,064	-92	461	11	0	0	6,327
2047	7,048	-1,082	-92	489	12	0	0	6,375
2048	7,104	-1,100	-93	517	12	0	0	6,440
2049	7,125	-1,111	-94	547	12	0	0	6,479
2050	7,164	-1,123	-94	578	12	0	0	6,537

Table A-40: Zone I Summer Peaks – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	1,370	-17	-3	1	-1	0	0	1,349
2021	1,392	-30	-11	3	-3	0	0	1,351
2022	1,408	-42	-12	4	-5	0	0	1,352
2023	1,387	-55	-6	7	-7	0	0	1,327
2024	1,402	-68	-6	9	-9	0	0	1,328
2025	1,441	-80	-6	5	-12	0	0	1,348
2026	1,432	-91	-7	15	-13	0	0	1,336
2027	1,445	-101	-7	19	-15	0	0	1,341
2028	1,459	-111	-8	24	-18	0	0	1,347
2029	1,474	-119	-8	28	-20	0	0	1,355
2030	1,486	-131	-8	33	-22	0	0	1,358
2031	1,497	-141	-8	38	-24	0	0	1,362
2032	1,473	-150	-2	50	-18	0	0	1,353
2033	1,485	-159	-2	57	-20	0	0	1,361
2034	1,498	-168	-2	64	-22	0	0	1,371
2035	1,510	-176	-2	72	-23	0	0	1,381
2036	1,523	-184	-2	79	-24	0	0	1,393
2037	1,538	-191	-2	88	-25	0	0	1,407
2038	1,551	-199	-2	96	-26	0	0	1,421
2039	1,564	-205	-2	105	-26	0	0	1,436
2040	1,576	-214	-2	114	-27	0	0	1,448
2041	1,588	-221	-2	122	-27	0	0	1,459
2042	1,600	-229	-2	131	-28	0	0	1,472
2043	1,615	-236	-2	140	-28	0	0	1,489
2044	1,628	-243	-2	149	-29	0	0	1,504
2045	1,642	-249	-2	159	-29	0	0	1,521
2046	1,657	-255	-2	169	-30	0	0	1,539
2047	1,672	-261	-2	179	-30	0	0	1,558
2048	1,688	-266	-2	189	-31	0	0	1,577
2049	1,706	-272	-2	201	-31	0	0	1,601
2050	1,722	-277	-2	212	-32	0	0	1,623

Table A-41: Zone I Winter Peaks – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	944	-40	0	4	-3	0	0	906
2021-22	951	-50	0	5	-5	0	0	902
2022-23	960	-58	0	7	-7	0	0	902
2023-24	966	-66	0	9	-9	0	0	900
2024-25	973	-73	0	12	-12	0	0	900
2025-26	977	-80	0	15	-13	0	0	898
2026-27	987	-87	0	19	-15	0	0	904
2027-28	993	-92	0	24	-18	0	0	907
2028-29	995	-96	0	28	-20	0	0	907
2029-30	1,000	-103	0	33	-22	0	0	908
2030-31	1,004	-109	0	38	-24	0	0	909
2031-32	985	-114	0	50	-18	0	0	903
2032-33	992	-119	0	57	-20	0	0	910
2033-34	995	-124	0	64	-22	0	0	914
2034-35	996	-128	0	72	-23	0	0	916
2035-36	1,002	-132	0	79	-24	0	0	925
2036-37	1,005	-137	0	88	-25	0	0	931
2037-38	1,014	-141	0	96	-26	0	0	944
2038-39	1,018	-144	0	105	-26	0	0	953
2039-40	1,021	-148	0	114	-27	0	0	960
2040-41	1,020	-152	0	122	-27	0	0	963
2041-42	1,024	-156	0	131	-28	0	0	971
2042-43	1,027	-160	0	140	-28	0	0	979
2043-44	1,036	-164	0	149	-29	0	0	992
2044-45	1,039	-167	0	159	-29	0	0	1,001
2045-46	1,040	-170	0	169	-30	0	0	1,009
2046-47	1,046	-172	0	179	-30	0	0	1,022
2047-48	1,052	-175	0	189	-31	0	0	1,035
2048-49	1,060	-178	0	201	-31	0	0	1,051
2049-50	1,065	-179	0	212	-32	0	0	1,066
2050-51	1,071	-181	0	224	-33	0	0	1,081

Table A-42: Zone J Energy – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	53,504	-891	-335	82	3	0	0	52,363
2021	53,545	-1,554	-377	106	6	0	0	51,726
2022	53,966	-2,111	-438	145	11	0	0	51,572
2023	54,398	-2,586	-495	191	16	0	0	51,523
2024	54,943	-3,056	-539	247	21	0	0	51,615
2025	55,206	-3,485	-577	321	27	0	0	51,492
2026	55,553	-3,904	-609	421	31	0	0	51,493
2027	55,907	-4,278	-634	537	36	0	0	51,567
2028	56,414	-4,612	-657	665	42	0	0	51,852
2029	56,652	-4,884	-676	788	46	0	0	51,926
2030	56,931	-5,277	-692	911	51	0	0	51,924
2031	57,192	-5,638	-703	1,041	57	0	0	51,949
2032	57,586	-5,990	-713	1,199	61	0	0	52,143
2033	57,715	-6,294	-722	1,357	67	0	0	52,123
2034	57,993	-6,590	-730	1,532	72	0	0	52,276
2035	58,287	-6,862	-736	1,712	76	0	0	52,478
2036	58,744	-7,136	-741	1,902	80	0	0	52,848
2037	58,912	-7,357	-748	2,097	84	0	0	52,988
2038	59,220	-7,578	-754	2,302	86	0	0	53,276
2039	59,527	-7,783	-760	2,518	88	0	0	53,588
2040	59,916	-8,076	-767	2,742	89	0	0	53,904
2041	60,020	-8,304	-773	2,924	91	0	0	53,958
2042	60,281	-8,539	-779	3,133	93	0	0	54,189
2043	60,556	-8,760	-785	3,350	95	0	0	54,455
2044	60,998	-8,995	-791	3,574	96	0	0	54,882
2045	61,161	-9,163	-797	3,805	98	0	0	55,104
2046	61,495	-9,337	-803	4,042	100	0	0	55,497
2047	61,828	-9,489	-809	4,287	102	0	0	55,919
2048	62,317	-9,653	-816	4,539	103	0	0	56,491
2049	62,502	-9,747	-821	4,797	105	0	0	56,837
2050	62,844	-9,848	-827	5,070	107	0	0	57,346

Table A-43: Zone J Summer Peaks – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	11,345	-141	-29	11	-10	0	0	11,177
2021	11,528	-247	-87	22	-24	0	0	11,192
2022	11,662	-351	-102	31	-40	0	0	11,200
2023	11,493	-458	-47	57	-57	0	0	10,989
2024	11,615	-560	-52	74	-73	0	0	11,004
2025	11,937	-663	-50	43	-102	0	0	11,164
2026	11,859	-752	-58	126	-111	0	0	11,064
2027	11,970	-839	-61	161	-127	0	0	11,104
2028	12,088	-917	-63	199	-147	0	0	11,160
2029	12,207	-989	-65	236	-163	0	0	11,226
2030	12,307	-1,083	-66	273	-182	0	0	11,249
2031	12,404	-1,167	-67	312	-202	0	0	11,280
2032	12,203	-1,244	-14	414	-152	0	0	11,208
2033	12,305	-1,320	-14	470	-165	0	0	11,275
2034	12,407	-1,392	-14	531	-178	0	0	11,354
2035	12,511	-1,459	-15	592	-189	0	0	11,441
2036	12,616	-1,524	-15	656	-198	0	0	11,535
2037	12,742	-1,586	-15	726	-208	0	0	11,659
2038	12,849	-1,645	-15	797	-212	0	0	11,774
2039	12,956	-1,701	-15	871	-217	0	0	11,895
2040	13,052	-1,769	-15	947	-220	0	0	11,994
2041	13,151	-1,833	-15	1,012	-225	0	0	12,090
2042	13,252	-1,894	-15	1,084	-230	0	0	12,197
2043	13,376	-1,952	-16	1,159	-234	0	0	12,333
2044	13,486	-2,009	-16	1,234	-238	0	0	12,457
2045	13,602	-2,062	-16	1,318	-243	0	0	12,599
2046	13,728	-2,114	-16	1,399	-247	0	0	12,749
2047	13,851	-2,161	-14	1,484	-252	0	0	12,908
2048	13,979	-2,207	-16	1,566	-255	0	0	13,067
2049	14,131	-2,252	-16	1,661	-260	0	0	13,263
2050	14,265	-2,292	-16	1,755	-265	0	0	13,446

Table A-44: Zone J Winter Peaks – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	7,821	-330	0	32	-22	0	0	7,501
2021-22	7,882	-418	0	43	-38	0	0	7,470
2022-23	7,950	-483	0	57	-57	0	0	7,468
2023-24	8,002	-546	0	74	-73	0	0	7,456
2024-25	8,057	-605	0	96	-96	0	0	7,453
2025-26	8,093	-666	0	126	-111	0	0	7,442
2026-27	8,174	-718	0	161	-127	0	0	7,490
2027-28	8,224	-762	0	199	-147	0	0	7,515
2028-29	8,241	-799	0	236	-163	0	0	7,514
2029-30	8,282	-851	0	273	-182	0	0	7,522
2030-31	8,320	-899	0	312	-202	0	0	7,530
2031-32	8,164	-944	0	414	-152	0	0	7,482
2032-33	8,220	-988	0	470	-165	0	0	7,537
2033-34	8,244	-1,028	0	531	-178	0	0	7,569
2034-35	8,251	-1,064	0	592	-189	0	0	7,590
2035-36	8,299	-1,097	0	656	-198	0	0	7,660
2036-37	8,328	-1,134	0	726	-208	0	0	7,712
2037-38	8,397	-1,165	0	797	-212	0	0	7,817
2038-39	8,434	-1,193	0	871	-217	0	0	7,896
2039-40	8,456	-1,228	0	947	-220	0	0	7,954
2040-41	8,451	-1,261	0	1,012	-225	0	0	7,977
2041-42	8,484	-1,293	0	1,084	-230	0	0	8,045
2042-43	8,511	-1,329	0	1,159	-234	0	0	8,107
2043-44	8,578	-1,358	0	1,234	-238	0	0	8,216
2044-45	8,604	-1,384	0	1,318	-243	0	0	8,295
2045-46	8,615	-1,407	0	1,399	-247	0	0	8,359
2046-47	8,661	-1,429	0	1,484	-252	0	0	8,465
2047-48	8,711	-1,448	0	1,566	-255	0	0	8,574
2048-49	8,780	-1,471	0	1,661	-260	0	0	8,710
2049-50	8,825	-1,485	0	1,755	-265	0	0	8,829
2050-51	8,869	-1,500	0	1,853	-269	0	0	8,953

Table A-45: Zone K Energy – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	21,568	-359	-692	122	3	0	0	20,642
2021	21,597	-627	-742	212	5	0	0	20,445
2022	21,778	-852	-755	300	8	0	0	20,479
2023	21,943	-1,043	-762	402	11	0	0	20,551
2024	22,157	-1,232	-769	518	14	0	0	20,687
2025	22,255	-1,405	-777	655	17	0	0	20,746
2026	22,415	-1,575	-783	796	20	0	0	20,873
2027	22,578	-1,728	-791	948	23	0	0	21,030
2028	22,795	-1,864	-799	1,112	26	0	0	21,270
2029	22,904	-1,974	-806	1,291	29	0	0	21,444
2030	23,020	-2,134	-814	1,486	32	0	0	21,590
2031	23,140	-2,281	-838	1,701	35	0	0	21,757
2032	23,315	-2,425	-848	1,939	39	0	0	22,019
2033	23,391	-2,551	-857	2,203	42	0	0	22,228
2034	23,527	-2,674	-866	2,497	45	0	0	22,529
2035	23,670	-2,787	-876	2,825	47	0	0	22,880
2036	23,879	-2,901	-885	3,193	50	0	0	23,336
2037	23,969	-2,993	-895	3,604	52	0	0	23,737
2038	24,121	-3,087	-905	4,064	53	0	0	24,246
2039	24,275	-3,174	-914	4,479	54	0	0	24,719
2040	24,455	-3,296	-922	4,852	55	0	0	25,144
2041	24,525	-3,393	-928	5,172	56	0	0	25,432
2042	24,659	-3,493	-935	5,544	57	0	0	25,832
2043	24,793	-3,586	-943	5,928	58	0	0	26,249
2044	25,002	-3,687	-951	6,324	59	0	0	26,747
2045	25,097	-3,760	-959	6,732	60	0	0	27,170
2046	25,262	-3,836	-967	7,153	61	0	0	27,674
2047	25,430	-3,903	-972	7,586	62	0	0	28,203
2048	25,666	-3,975	-979	8,031	63	0	0	28,805
2049	25,774	-4,019	-988	8,488	64	0	0	29,319
2050	25,955	-4,067	-997	8,971	65	0	0	29,927

Table A-46: Zone K Summer Peaks – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	5,606	-69	-60	16	-11	0	0	5,482
2021	5,726	-123	-173	45	-19	0	0	5,456
2022	5,812	-175	-176	64	-31	0	0	5,494
2023	5,791	-231	-73	121	-39	0	0	5,570
2024	5,866	-283	-74	156	-50	0	0	5,615
2025	5,960	-331	-67	87	-65	0	0	5,584
2026	6,014	-381	-75	240	-71	0	0	5,726
2027	6,087	-426	-76	286	-82	0	0	5,788
2028	6,161	-467	-77	335	-93	0	0	5,859
2029	6,235	-505	-78	389	-104	0	0	5,938
2030	6,305	-555	-79	448	-114	0	0	6,006
2031	6,374	-599	-81	513	-125	0	0	6,082
2032	6,205	-632	-17	674	-97	0	0	6,133
2033	6,277	-673	-17	767	-105	0	0	6,249
2034	6,350	-712	-17	871	-112	0	0	6,379
2035	6,424	-749	-17	984	-117	0	0	6,524
2036	6,500	-785	-18	1,109	-124	0	0	6,682
2037	6,580	-819	-18	1,255	-130	0	0	6,869
2038	6,655	-852	-18	1,416	-132	0	0	7,070
2039	6,731	-884	-18	1,560	-134	0	0	7,255
2040	6,807	-923	-18	1,686	-137	0	0	7,415
2041	6,883	-959	-19	1,803	-139	0	0	7,568
2042	6,959	-994	-19	1,931	-142	0	0	7,735
2043	7,042	-1,028	-19	2,065	-144	0	0	7,915
2044	7,122	-1,061	-19	2,198	-147	0	0	8,093
2045	7,206	-1,092	-19	2,348	-149	0	0	8,293
2046	7,296	-1,124	-19	2,491	-152	0	0	8,493
2047	7,385	-1,152	-17	2,644	-154	0	0	8,705
2048	7,478	-1,181	-19	2,789	-156	0	0	8,910
2049	7,576	-1,207	-20	2,958	-159	0	0	9,148
2050	7,671	-1,232	-20	3,125	-162	0	0	9,382

Table A-47: Zone K Winter Peaks – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	3,393	-143	0	64	-18	0	0	3,296
2021-22	3,421	-181	0	90	-29	0	0	3,302
2022-23	3,455	-210	0	121	-39	0	0	3,327
2023-24	3,475	-237	0	156	-50	0	0	3,344
2024-25	3,493	-262	0	197	-61	0	0	3,368
2025-26	3,497	-288	0	240	-71	0	0	3,378
2026-27	3,531	-310	0	286	-82	0	0	3,425
2027-28	3,554	-329	0	335	-93	0	0	3,467
2028-29	3,567	-346	0	389	-104	0	0	3,507
2029-30	3,579	-368	0	448	-114	0	0	3,546
2030-31	3,593	-388	0	513	-125	0	0	3,593
2031-32	3,519	-407	0	674	-97	0	0	3,689
2032-33	3,541	-426	0	767	-105	0	0	3,778
2033-34	3,557	-443	0	871	-112	0	0	3,873
2034-35	3,560	-459	0	984	-117	0	0	3,968
2035-36	3,580	-473	0	1,109	-124	0	0	4,091
2036-37	3,580	-488	0	1,255	-130	0	0	4,218
2037-38	3,607	-500	0	1,416	-132	0	0	4,391
2038-39	3,624	-512	0	1,560	-134	0	0	4,537
2039-40	3,637	-528	0	1,686	-137	0	0	4,658
2040-41	3,634	-542	0	1,803	-139	0	0	4,755
2041-42	3,646	-556	0	1,931	-142	0	0	4,879
2042-43	3,646	-569	0	2,065	-144	0	0	4,997
2043-44	3,673	-582	0	2,198	-147	0	0	5,143
2044-45	3,689	-593	0	2,348	-149	0	0	5,294
2045-46	3,693	-603	0	2,491	-152	0	0	5,429
2046-47	3,708	-612	0	2,644	-154	0	0	5,586
2047-48	3,727	-620	0	2,789	-156	0	0	5,740
2048-49	3,743	-627	0	2,958	-159	0	0	5,915
2049-50	3,762	-633	0	3,125	-162	0	0	6,092
2050-51	3,782	-640	0	3,301	-165	0	0	6,278

Table A-48: NYCA Energy – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	160,724	-2,677	-2,647	371	15	0	0	155,786
2021	160,908	-4,671	-3,077	530	28	0	0	153,718
2022	162,276	-6,348	-3,479	730	43	0	0	153,222
2023	163,550	-7,776	-3,838	966	63	0	0	152,965
2024	165,107	-9,184	-4,149	1,243	80	0	0	153,097
2025	165,724	-10,461	-4,412	1,588	103	0	0	152,542
2026	166,671	-11,711	-4,632	2,028	121	0	0	152,476
2027	167,623	-12,827	-4,816	2,533	141	0	0	152,654
2028	169,035	-13,819	-4,975	3,086	161	0	0	153,487
2029	169,606	-14,621	-5,108	3,653	178	0	0	153,708
2030	170,566	-15,810	-5,223	4,226	200	0	0	153,959
2031	171,475	-16,903	-5,337	4,840	219	0	0	154,294
2032	172,783	-17,973	-5,426	5,565	240	0	0	155,189
2033	173,242	-18,891	-5,508	6,316	261	0	0	155,420
2034	174,127	-19,788	-5,579	7,156	280	0	0	156,196
2035	175,029	-20,605	-5,644	8,031	296	0	0	157,108
2036	176,394	-21,428	-5,705	8,981	312	0	0	158,554
2037	176,834	-22,084	-5,768	9,983	324	0	0	159,289
2038	177,685	-22,738	-5,828	11,057	332	0	0	160,507
2039	178,514	-23,342	-5,878	12,119	339	0	0	161,752
2040	179,814	-24,236	-5,928	13,174	346	0	0	163,170
2041	180,181	-24,928	-5,975	14,044	353	0	0	163,675
2042	180,989	-25,637	-6,022	15,053	360	0	0	164,742
2043	181,801	-26,299	-6,069	16,097	367	0	0	165,896
2044	183,098	-27,002	-6,116	17,171	374	0	0	167,525
2045	183,506	-27,493	-6,163	18,280	381	0	0	168,512
2046	184,416	-28,000	-6,210	19,423	388	0	0	170,017
2047	185,318	-28,440	-6,257	20,597	395	0	0	171,613
2048	186,690	-28,917	-6,304	21,807	402	0	0	173,678
2049	187,125	-29,181	-6,351	23,048	409	0	0	175,050
2050	188,043	-29,468	-6,398	24,360	416	0	0	176,952

Table A-49: NYCA Summer Peaks – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	33,345	-413	-228	49	-57	0	0	32,696
2021	33,842	-725	-718	113	-107	0	0	32,406
2022	34,276	-1,033	-812	156	-164	0	0	32,423
2023	34,109	-1,358	-370	292	-225	0	0	32,448
2024	34,475	-1,661	-400	374	-285	0	0	32,503
2025	35,137	-1,953	-381	212	-393	0	0	32,622
2026	35,197	-2,231	-446	611	-432	0	0	32,699
2027	35,527	-2,489	-465	764	-503	0	0	32,834
2028	35,875	-2,721	-480	929	-573	0	0	33,030
2029	36,225	-2,936	-493	1,101	-635	0	0	33,262
2030	36,565	-3,217	-504	1,275	-714	0	0	33,405
2031	36,894	-3,470	-514	1,459	-782	0	0	33,587
2032	36,369	-3,707	-108	1,934	-596	0	0	33,891
2033	36,706	-3,937	-110	2,200	-650	0	0	34,209
2034	37,045	-4,155	-111	2,496	-697	0	0	34,577
2035	37,384	-4,360	-113	2,797	-737	0	0	34,972
2036	37,725	-4,557	-114	3,119	-775	0	0	35,398
2037	38,100	-4,743	-115	3,477	-807	0	0	35,912
2038	38,433	-4,920	-116	3,853	-827	0	0	36,423
2039	38,764	-5,088	-117	4,221	-844	0	0	36,936
2040	39,102	-5,300	-118	4,578	-859	0	0	37,403
2041	39,437	-5,497	-119	4,895	-879	0	0	37,837
2042	39,771	-5,683	-120	5,243	-897	0	0	38,314
2043	40,146	-5,860	-121	5,607	-914	0	0	38,858
2044	40,496	-6,033	-122	5,967	-929	0	0	39,379
2045	40,860	-6,195	-123	6,376	-949	0	0	39,969
2046	41,252	-6,353	-124	6,765	-966	0	0	40,573
2047	41,634	-6,497	-111	7,179	-984	0	0	41,221
2048	42,032	-6,636	-125	7,573	-999	0	0	41,845
2049	42,474	-6,768	-127	8,032	-1,019	0	0	42,593
2050	42,886	-6,890	-128	8,485	-1,036	0	0	43,317

Table A-50: NYCA Winter Peaks – Reference Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	25,185	-1,061	0	160	-100	0	0	24,184
2021-22	25,420	-1,347	0	220	-154	0	0	24,139
2022-23	25,673	-1,559	0	292	-225	0	0	24,180
2023-24	25,865	-1,763	0	374	-285	0	0	24,191
2024-25	26,037	-1,955	0	479	-368	0	0	24,194
2025-26	26,053	-2,144	0	611	-432	0	0	24,089
2026-27	26,298	-2,309	0	764	-503	0	0	24,250
2027-28	26,455	-2,450	0	929	-573	0	0	24,361
2028-29	26,532	-2,574	0	1,101	-635	0	0	24,425
2029-30	26,703	-2,745	0	1,275	-714	0	0	24,519
2030-31	26,865	-2,904	0	1,459	-782	0	0	24,638
2031-32	26,417	-3,055	0	1,934	-596	0	0	24,700
2032-33	26,614	-3,198	0	2,200	-650	0	0	24,966
2033-34	26,731	-3,332	0	2,496	-697	0	0	25,198
2034-35	26,781	-3,452	0	2,797	-737	0	0	25,389
2035-36	26,965	-3,565	0	3,119	-775	0	0	25,744
2036-37	26,960	-3,672	0	3,477	-807	0	0	25,958
2037-38	27,172	-3,769	0	3,853	-827	0	0	26,429
2038-39	27,285	-3,859	0	4,221	-844	0	0	26,803
2039-40	27,413	-3,981	0	4,578	-859	0	0	27,151
2040-41	27,445	-4,096	0	4,895	-879	0	0	27,364
2041-42	27,573	-4,204	0	5,243	-897	0	0	27,716
2042-43	27,565	-4,304	0	5,607	-914	0	0	27,953
2043-44	27,786	-4,400	0	5,967	-929	0	0	28,424
2044-45	27,887	-4,486	0	6,376	-949	0	0	28,828
2045-46	27,933	-4,563	0	6,765	-966	0	0	29,169
2046-47	28,078	-4,632	0	7,179	-984	0	0	29,641
2047-48	28,240	-4,694	0	7,573	-999	0	0	30,121
2048-49	28,344	-4,748	0	8,032	-1,019	0	0	30,609
2049-50	28,476	-4,793	0	8,485	-1,036	0	0	31,131
2050-51	28,609	-4,839	0	8,963	-1,054	0	0	31,679

A-2: Reference Case with Accelerated Weather Trend

Table A-51: Zone A Energy – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	15,770	-261	-316	29	2	0	0	15,223
2021	15,788	-456	-386	37	3	0	0	14,987
2022	15,925	-620	-456	50	5	0	0	14,904
2023	16,042	-758	-520	65	7	0	0	14,836
2024	16,178	-894	-577	84	9	0	0	14,800
2025	16,218	-1,017	-624	106	11	0	0	14,694
2026	16,293	-1,137	-664	141	13	0	0	14,647
2027	16,367	-1,243	-698	183	16	0	0	14,625
2028	16,484	-1,337	-725	230	18	0	0	14,669
2029	16,518	-1,412	-748	277	20	0	0	14,655
2030	16,620	-1,527	-768	322	22	0	0	14,671
2031	16,715	-1,632	-784	370	24	0	0	14,693
2032	16,849	-1,735	-798	429	27	0	0	14,771
2033	16,894	-1,823	-812	487	29	0	0	14,775
2034	16,978	-1,908	-823	553	31	0	0	14,831
2035	17,060	-1,985	-834	618	33	0	0	14,892
2036	17,182	-2,062	-843	688	35	0	0	14,999
2037	17,214	-2,123	-853	757	36	0	0	15,031
2038	17,281	-2,182	-862	829	37	0	0	15,103
2039	17,344	-2,237	-869	905	38	0	0	15,181
2040	17,477	-2,322	-877	986	38	0	0	15,302
2041	17,513	-2,387	-884	1,051	39	0	0	15,332
2042	17,587	-2,453	-891	1,126	40	0	0	15,409
2043	17,661	-2,514	-898	1,205	41	0	0	15,495
2044	17,775	-2,578	-904	1,285	42	0	0	15,619
2045	17,802	-2,621	-911	1,368	43	0	0	15,680
2046	17,873	-2,665	-918	1,453	43	0	0	15,787
2047	17,942	-2,702	-926	1,541	44	0	0	15,899
2048	18,054	-2,743	-932	1,632	45	0	0	16,056
2049	18,080	-2,763	-939	1,724	46	0	0	16,147
2050	18,148	-2,785	-946	1,823	47	0	0	16,286

Table A-52: Zone A Summer Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,759	-34	-26	4	-7	0	0	2,696
2021	2,785	-59	-86	8	-13	0	0	2,636
2022	2,821	-84	-101	10	-18	0	0	2,629
2023	2,831	-111	-48	19	-23	0	0	2,668
2024	2,859	-135	-53	24	-29	0	0	2,666
2025	2,902	-158	-51	14	-41	0	0	2,666
2026	2,915	-181	-61	41	-45	0	0	2,669
2027	2,939	-201	-64	53	-53	0	0	2,674
2028	2,965	-219	-66	66	-60	0	0	2,685
2029	2,991	-236	-69	80	-67	0	0	2,699
2030	3,021	-259	-70	93	-76	0	0	2,709
2031	3,049	-279	-72	107	-82	0	0	2,723
2032	3,039	-301	-15	142	-63	0	0	2,802
2033	3,068	-319	-15	162	-69	0	0	2,826
2034	3,096	-337	-16	184	-73	0	0	2,855
2035	3,124	-353	-16	206	-77	0	0	2,883
2036	3,151	-368	-16	228	-81	0	0	2,914
2037	3,179	-382	-16	252	-84	0	0	2,949
2038	3,205	-396	-16	276	-87	0	0	2,982
2039	3,231	-409	-16	301	-89	0	0	3,018
2040	3,260	-425	-17	327	-91	0	0	3,054
2041	3,288	-441	-17	350	-93	0	0	3,087
2042	3,315	-455	-17	375	-95	0	0	3,123
2043	3,343	-468	-17	401	-97	0	0	3,162
2044	3,371	-481	-17	427	-99	0	0	3,200
2045	3,399	-493	-17	456	-101	0	0	3,243
2046	3,429	-505	-17	484	-103	0	0	3,287
2047	3,458	-516	-16	513	-105	0	0	3,335
2048	3,488	-526	-18	542	-106	0	0	3,380
2049	3,520	-535	-18	574	-109	0	0	3,434
2050	3,552	-543	-18	607	-111	0	0	3,487

Table A-53: Zone A Winter Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	2,471	-105	0	11	-12	0	0	2,365
2021-22	2,493	-133	0	14	-16	0	0	2,358
2022-23	2,518	-154	0	19	-23	0	0	2,359
2023-24	2,537	-174	0	24	-29	0	0	2,357
2024-25	2,551	-193	0	31	-38	0	0	2,350
2025-26	2,542	-211	0	41	-45	0	0	2,327
2026-27	2,562	-227	0	53	-53	0	0	2,334
2027-28	2,573	-241	0	66	-60	0	0	2,338
2028-29	2,579	-253	0	80	-67	0	0	2,339
2029-30	2,598	-270	0	93	-76	0	0	2,345
2030-31	2,615	-286	0	107	-82	0	0	2,353
2031-32	2,576	-302	0	142	-63	0	0	2,353
2032-33	2,594	-316	0	162	-69	0	0	2,371
2033-34	2,605	-329	0	184	-73	0	0	2,387
2034-35	2,610	-341	0	206	-77	0	0	2,397
2035-36	2,627	-353	0	228	-81	0	0	2,421
2036-37	2,617	-362	0	252	-84	0	0	2,423
2037-38	2,634	-371	0	276	-87	0	0	2,452
2038-39	2,641	-380	0	301	-89	0	0	2,473
2039-40	2,655	-392	0	327	-91	0	0	2,500
2040-41	2,660	-404	0	350	-93	0	0	2,513
2041-42	2,672	-415	0	375	-95	0	0	2,537
2042-43	2,661	-423	0	401	-97	0	0	2,542
2043-44	2,680	-432	0	427	-99	0	0	2,575
2044-45	2,687	-441	0	456	-101	0	0	2,602
2045-46	2,690	-448	0	484	-103	0	0	2,622
2046-47	2,701	-455	0	513	-105	0	0	2,654
2047-48	2,713	-461	0	542	-106	0	0	2,687
2048-49	2,711	-464	0	574	-109	0	0	2,713
2049-50	2,719	-468	0	607	-111	0	0	2,747
2050-51	2,727	-472	0	641	-113	0	0	2,783

Table A-54: Zone B Energy – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	10,269	-170	-122	21	0	0	0	9,998
2021	10,306	-298	-148	27	1	0	0	9,889
2022	10,423	-406	-172	36	2	0	0	9,884
2023	10,526	-498	-194	47	3	0	0	9,884
2024	10,641	-588	-212	61	3	0	0	9,904
2025	10,691	-670	-228	78	4	0	0	9,875
2026	10,765	-751	-242	103	5	0	0	9,880
2027	10,836	-823	-253	133	6	0	0	9,899
2028	10,935	-887	-262	165	7	0	0	9,958
2029	10,979	-938	-270	198	7	0	0	9,975
2030	11,066	-1,017	-277	230	8	0	0	10,010
2031	11,148	-1,089	-283	264	9	0	0	10,050
2032	11,255	-1,159	-289	305	9	0	0	10,121
2033	11,302	-1,220	-294	346	11	0	0	10,145
2034	11,376	-1,279	-297	392	11	0	0	10,203
2035	11,449	-1,332	-302	438	12	0	0	10,264
2036	11,550	-1,386	-305	487	12	0	0	10,357
2037	11,588	-1,429	-310	536	13	0	0	10,399
2038	11,651	-1,471	-313	588	13	0	0	10,468
2039	11,712	-1,510	-315	642	13	0	0	10,542
2040	11,819	-1,570	-318	699	14	0	0	10,644
2041	11,861	-1,617	-321	745	14	0	0	10,683
2042	11,929	-1,664	-323	799	14	0	0	10,755
2043	11,995	-1,707	-326	854	14	0	0	10,831
2044	12,090	-1,753	-328	911	14	0	0	10,934
2045	12,125	-1,785	-330	970	14	0	0	10,994
2046	12,191	-1,818	-333	1,031	14	0	0	11,086
2047	12,255	-1,846	-335	1,093	15	0	0	11,181
2048	12,350	-1,876	-338	1,157	15	0	0	11,308
2049	12,384	-1,893	-341	1,223	15	0	0	11,388
2050	12,448	-1,911	-343	1,293	15	0	0	11,501

Table A-55: Zone B Summer Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,144	-26	-11	3	-1	0	0	2,109
2021	2,174	-46	-35	6	-5	0	0	2,093
2022	2,208	-65	-41	8	-6	0	0	2,104
2023	2,204	-86	-19	14	-10	0	0	2,104
2024	2,232	-105	-21	18	-11	0	0	2,113
2025	2,285	-124	-20	10	-16	0	0	2,135
2026	2,286	-142	-24	31	-19	0	0	2,133
2027	2,310	-158	-25	40	-20	0	0	2,147
2028	2,335	-173	-26	50	-24	0	0	2,163
2029	2,360	-186	-27	60	-25	0	0	2,182
2030	2,387	-205	-27	70	-29	0	0	2,196
2031	2,414	-221	-28	81	-33	0	0	2,212
2032	2,376	-235	-6	107	-24	0	0	2,218
2033	2,402	-250	-6	122	-27	0	0	2,241
2034	2,428	-264	-6	138	-28	0	0	2,268
2035	2,453	-277	-6	154	-31	0	0	2,293
2036	2,478	-289	-6	171	-31	0	0	2,322
2037	2,506	-301	-6	189	-34	0	0	2,354
2038	2,530	-313	-6	207	-34	0	0	2,385
2039	2,554	-323	-6	226	-34	0	0	2,416
2040	2,580	-337	-6	246	-35	0	0	2,448
2041	2,606	-349	-7	263	-35	0	0	2,477
2042	2,631	-361	-7	281	-35	0	0	2,509
2043	2,660	-373	-7	301	-36	0	0	2,546
2044	2,685	-383	-7	320	-36	0	0	2,579
2045	2,711	-394	-7	342	-36	0	0	2,616
2046	2,738	-403	-7	363	-37	0	0	2,654
2047	2,765	-412	-6	385	-37	0	0	2,695
2048	2,792	-421	-7	406	-37	0	0	2,734
2049	2,825	-429	-7	431	-38	0	0	2,782
2050	2,853	-436	-7	455	-38	0	0	2,827

Table A-56: Zone B Winter Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	1,638	-69	0	8	-5	0	0	1,572
2021-22	1,656	-88	0	11	-6	0	0	1,573
2022-23	1,674	-102	0	14	-10	0	0	1,576
2023-24	1,688	-116	0	18	-11	0	0	1,579
2024-25	1,701	-129	0	24	-15	0	0	1,581
2025-26	1,702	-141	0	31	-19	0	0	1,574
2026-27	1,720	-153	0	40	-20	0	0	1,588
2027-28	1,730	-162	0	50	-24	0	0	1,595
2028-29	1,733	-170	0	60	-25	0	0	1,599
2029-30	1,748	-182	0	70	-29	0	0	1,607
2030-31	1,762	-193	0	81	-33	0	0	1,617
2031-32	1,733	-203	0	107	-24	0	0	1,613
2032-33	1,749	-213	0	122	-27	0	0	1,631
2033-34	1,757	-222	0	138	-28	0	0	1,646
2034-35	1,761	-230	0	154	-31	0	0	1,654
2035-36	1,775	-238	0	171	-31	0	0	1,676
2036-37	1,776	-246	0	189	-34	0	0	1,686
2037-38	1,791	-252	0	207	-34	0	0	1,712
2038-39	1,798	-259	0	226	-34	0	0	1,732
2039-40	1,808	-267	0	246	-35	0	0	1,752
2040-41	1,812	-275	0	263	-35	0	0	1,764
2041-42	1,823	-283	0	281	-35	0	0	1,786
2042-43	1,824	-290	0	301	-36	0	0	1,799
2043-44	1,840	-297	0	320	-36	0	0	1,827
2044-45	1,845	-303	0	342	-36	0	0	1,848
2045-46	1,847	-308	0	363	-37	0	0	1,866
2046-47	1,857	-313	0	385	-37	0	0	1,892
2047-48	1,868	-317	0	406	-37	0	0	1,920
2048-49	1,876	-321	0	431	-38	0	0	1,948
2049-50	1,884	-324	0	455	-38	0	0	1,977
2050-51	1,892	-327	0	481	-38	0	0	2,006

Table A-57: Zone C Energy – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	16,319	-271	-310	31	2	0	0	15,771
2021	16,336	-472	-381	39	3	0	0	15,525
2022	16,472	-641	-452	52	4	0	0	15,436
2023	16,588	-784	-515	69	6	0	0	15,363
2024	16,724	-924	-572	88	8	0	0	15,323
2025	16,759	-1,051	-619	112	11	0	0	15,211
2026	16,831	-1,174	-659	148	13	0	0	15,159
2027	16,900	-1,283	-691	192	15	0	0	15,133
2028	17,015	-1,380	-718	241	18	0	0	15,175
2029	17,045	-1,457	-741	291	19	0	0	15,157
2030	17,144	-1,575	-760	338	22	0	0	15,170
2031	17,237	-1,683	-776	388	24	0	0	15,190
2032	17,368	-1,789	-790	450	26	0	0	15,266
2033	17,409	-1,879	-803	511	29	0	0	15,267
2034	17,489	-1,966	-815	581	31	0	0	15,320
2035	17,566	-2,044	-825	650	32	0	0	15,379
2036	17,684	-2,122	-834	723	34	0	0	15,484
2037	17,709	-2,184	-844	796	35	0	0	15,513
2038	17,770	-2,244	-852	872	36	0	0	15,581
2039	17,825	-2,299	-859	952	37	0	0	15,656
2040	17,952	-2,385	-867	1,037	38	0	0	15,775
2041	17,980	-2,451	-874	1,106	39	0	0	15,800
2042	18,046	-2,517	-881	1,185	40	0	0	15,873
2043	18,112	-2,578	-888	1,268	41	0	0	15,955
2044	18,218	-2,642	-894	1,352	41	0	0	16,075
2045	18,235	-2,685	-901	1,439	42	0	0	16,131
2046	18,297	-2,728	-908	1,530	43	0	0	16,234
2047	18,357	-2,765	-915	1,622	44	0	0	16,342
2048	18,460	-2,804	-922	1,717	45	0	0	16,495
2049	18,476	-2,824	-929	1,815	45	0	0	16,584
2050	18,534	-2,845	-936	1,918	46	0	0	16,719

Table A-58: Zone C Summer Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,896	-35	-26	4	-6	0	0	2,833
2021	2,924	-62	-86	8	-11	0	0	2,773
2022	2,961	-88	-101	11	-16	0	0	2,766
2023	2,976	-116	-48	20	-22	0	0	2,810
2024	3,005	-142	-53	25	-29	0	0	2,807
2025	3,042	-166	-51	14	-40	0	0	2,799
2026	3,060	-190	-61	43	-44	0	0	2,808
2027	3,085	-211	-64	56	-52	0	0	2,813
2028	3,111	-230	-67	70	-60	0	0	2,824
2029	3,138	-248	-69	84	-67	0	0	2,839
2030	3,167	-271	-71	98	-75	0	0	2,848
2031	3,196	-292	-72	113	-82	0	0	2,862
2032	3,179	-315	-15	151	-63	0	0	2,937
2033	3,208	-334	-15	172	-69	0	0	2,962
2034	3,237	-352	-16	195	-73	0	0	2,991
2035	3,265	-369	-16	218	-77	0	0	3,021
2036	3,293	-385	-16	242	-82	0	0	3,052
2037	3,321	-399	-16	267	-85	0	0	3,088
2038	3,347	-413	-16	293	-87	0	0	3,123
2039	3,372	-427	-16	319	-89	0	0	3,159
2040	3,401	-444	-17	347	-91	0	0	3,197
2041	3,429	-460	-17	371	-93	0	0	3,231
2042	3,456	-474	-17	398	-95	0	0	3,267
2043	3,484	-488	-17	425	-97	0	0	3,307
2044	3,511	-501	-17	453	-99	0	0	3,346
2045	3,538	-514	-17	484	-101	0	0	3,390
2046	3,568	-526	-17	513	-103	0	0	3,435
2047	3,596	-536	-16	544	-105	0	0	3,484
2048	3,626	-546	-18	574	-107	0	0	3,530
2049	3,657	-555	-18	609	-109	0	0	3,584
2050	3,688	-564	-18	644	-111	0	0	3,639

Table A-59: Zone C Winter Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	2,630	-112	0	11	-11	0	0	2,519
2021-22	2,654	-142	0	15	-15	0	0	2,512
2022-23	2,680	-164	0	20	-22	0	0	2,514
2023-24	2,700	-186	0	25	-29	0	0	2,511
2024-25	2,715	-206	0	32	-37	0	0	2,504
2025-26	2,702	-224	0	43	-44	0	0	2,477
2026-27	2,722	-241	0	56	-52	0	0	2,485
2027-28	2,734	-256	0	70	-60	0	0	2,488
2028-29	2,740	-269	0	84	-67	0	0	2,489
2029-30	2,759	-287	0	98	-75	0	0	2,495
2030-31	2,777	-304	0	113	-82	0	0	2,504
2031-32	2,733	-320	0	151	-63	0	0	2,500
2032-33	2,751	-335	0	172	-69	0	0	2,519
2033-34	2,763	-349	0	195	-73	0	0	2,536
2034-35	2,767	-362	0	218	-77	0	0	2,546
2035-36	2,785	-374	0	242	-82	0	0	2,571
2036-37	2,772	-383	0	267	-85	0	0	2,571
2037-38	2,788	-393	0	293	-87	0	0	2,601
2038-39	2,795	-402	0	319	-89	0	0	2,623
2039-40	2,809	-415	0	347	-91	0	0	2,651
2040-41	2,813	-427	0	371	-93	0	0	2,664
2041-42	2,825	-439	0	398	-95	0	0	2,689
2042-43	2,811	-447	0	425	-97	0	0	2,692
2043-44	2,829	-457	0	453	-99	0	0	2,726
2044-45	2,836	-465	0	484	-101	0	0	2,753
2045-46	2,837	-473	0	513	-103	0	0	2,774
2046-47	2,848	-480	0	544	-105	0	0	2,807
2047-48	2,859	-486	0	574	-107	0	0	2,841
2048-49	2,854	-489	0	609	-109	0	0	2,866
2049-50	2,861	-493	0	644	-111	0	0	2,901
2050-51	2,867	-496	0	680	-113	0	0	2,938

Table A-60: Zone D Energy – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	4,434	-74	-33	5	0	0	0	4,332
2021	4,402	-127	-42	6	0	0	0	4,239
2022	4,416	-172	-49	7	0	0	0	4,203
2023	4,431	-209	-58	10	1	0	0	4,174
2024	4,454	-246	-66	13	1	0	0	4,155
2025	4,439	-278	-74	16	1	0	0	4,104
2026	4,436	-309	-81	21	1	0	0	4,068
2027	4,435	-337	-87	27	1	0	0	4,040
2028	4,456	-361	-94	34	2	0	0	4,037
2029	4,446	-380	-100	42	2	0	0	4,010
2030	4,453	-409	-104	48	2	0	0	3,989
2031	4,458	-435	-109	55	2	0	0	3,971
2032	4,482	-462	-113	64	2	0	0	3,974
2033	4,472	-483	-116	73	3	0	0	3,950
2034	4,479	-503	-118	83	3	0	0	3,944
2035	4,487	-522	-121	92	4	0	0	3,940
2036	4,509	-541	-123	102	4	0	0	3,951
2037	4,496	-554	-124	113	4	0	0	3,934
2038	4,497	-568	-126	123	4	0	0	3,929
2039	4,496	-580	-128	134	4	0	0	3,926
2040	4,514	-600	-130	146	4	0	0	3,935
2041	4,497	-613	-130	155	4	0	0	3,913
2042	4,494	-627	-132	167	4	0	0	3,906
2043	4,493	-639	-132	178	4	0	0	3,903
2044	4,506	-653	-134	190	4	0	0	3,913
2045	4,487	-661	-135	202	4	0	0	3,898
2046	4,485	-669	-136	215	5	0	0	3,900
2047	4,484	-675	-137	228	5	0	0	3,904
2048	4,499	-683	-138	241	5	0	0	3,924
2049	4,484	-685	-139	256	5	0	0	3,920
2050	4,485	-688	-140	271	5	0	0	3,932

Table A-61: Zone D Summer Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	546	-7	-2	1	0	0	0	537
2021	542	-11	-8	1	-1	0	0	523
2022	545	-16	-9	1	-1	0	0	521
2023	548	-21	-4	3	-1	0	0	524
2024	551	-26	-5	3	-2	0	0	522
2025	558	-30	-5	2	-3	0	0	521
2026	555	-34	-6	5	-3	0	0	517
2027	557	-38	-7	7	-4	0	0	515
2028	560	-41	-7	9	-4	0	0	516
2029	562	-44	-8	10	-5	0	0	516
2030	565	-48	-8	12	-5	0	0	515
2031	567	-52	-9	14	-6	0	0	515
2032	566	-56	-2	19	-4	0	0	523
2033	569	-59	-2	21	-6	0	0	523
2034	572	-62	-2	24	-7	0	0	525
2035	574	-65	-2	27	-7	0	0	527
2036	577	-67	-2	30	-7	0	0	530
2037	580	-70	-2	33	-7	0	0	533
2038	582	-72	-2	36	-8	0	0	536
2039	584	-74	-2	39	-8	0	0	539
2040	586	-76	-2	42	-8	0	0	542
2041	587	-79	-2	45	-8	0	0	543
2042	589	-81	-2	48	-8	0	0	546
2043	591	-83	-2	52	-8	0	0	549
2044	593	-85	-2	55	-8	0	0	553
2045	594	-86	-2	59	-9	0	0	556
2046	596	-88	-2	62	-9	0	0	560
2047	599	-89	-2	66	-9	0	0	565
2048	601	-91	-2	70	-9	0	0	569
2049	604	-92	-2	74	-9	0	0	575
2050	607	-93	-2	79	-9	0	0	581

Table A-62: Zone D Winter Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	549	-23	0	1	-1	0	0	526
2021-22	552	-29	0	2	-1	0	0	523
2022-23	554	-34	0	3	-1	0	0	521
2023-24	555	-38	0	3	-2	0	0	518
2024-25	556	-42	0	4	-3	0	0	515
2025-26	553	-46	0	5	-3	0	0	510
2026-27	554	-49	0	7	-4	0	0	508
2027-28	555	-52	0	9	-4	0	0	507
2028-29	555	-54	0	10	-5	0	0	507
2029-30	556	-58	0	12	-5	0	0	505
2030-31	557	-61	0	14	-6	0	0	504
2031-32	553	-65	0	19	-4	0	0	503
2032-33	555	-68	0	21	-6	0	0	502
2033-34	556	-70	0	24	-7	0	0	503
2034-35	556	-73	0	27	-7	0	0	503
2035-36	558	-75	0	30	-7	0	0	505
2036-37	556	-77	0	33	-7	0	0	505
2037-38	557	-79	0	36	-8	0	0	507
2038-39	557	-80	0	39	-8	0	0	508
2039-40	558	-82	0	42	-8	0	0	510
2040-41	557	-85	0	45	-8	0	0	510
2041-42	557	-87	0	48	-8	0	0	511
2042-43	556	-88	0	52	-8	0	0	511
2043-44	556	-90	0	55	-8	0	0	513
2044-45	556	-91	0	59	-9	0	0	515
2045-46	556	-93	0	62	-9	0	0	517
2046-47	556	-94	0	66	-9	0	0	520
2047-48	557	-95	0	70	-9	0	0	523
2048-49	556	-95	0	74	-9	0	0	526
2049-50	556	-96	0	79	-9	0	0	530
2050-51	557	-96	0	83	-9	0	0	534

Table A-63: Zone E Energy – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	7,932	-131	-157	15	1	0	0	7,659
2021	7,941	-229	-192	19	2	0	0	7,540
2022	8,009	-312	-226	25	2	0	0	7,498
2023	8,067	-381	-258	33	3	0	0	7,464
2024	8,135	-450	-286	42	4	0	0	7,445
2025	8,154	-511	-310	54	6	0	0	7,392
2026	8,191	-571	-330	72	7	0	0	7,368
2027	8,226	-625	-346	93	8	0	0	7,356
2028	8,284	-672	-360	116	9	0	0	7,378
2029	8,301	-710	-371	140	10	0	0	7,370
2030	8,351	-767	-381	163	11	0	0	7,378
2031	8,398	-820	-389	187	12	0	0	7,389
2032	8,464	-872	-396	217	13	0	0	7,427
2033	8,486	-916	-403	247	14	0	0	7,429
2034	8,527	-958	-408	280	15	0	0	7,456
2035	8,567	-997	-413	313	16	0	0	7,486
2036	8,627	-1,035	-418	349	17	0	0	7,539
2037	8,642	-1,066	-423	384	18	0	0	7,555
2038	8,674	-1,095	-427	420	18	0	0	7,590
2039	8,704	-1,123	-431	459	19	0	0	7,628
2040	8,769	-1,165	-435	500	19	0	0	7,689
2041	8,786	-1,197	-438	533	20	0	0	7,702
2042	8,821	-1,230	-442	571	20	0	0	7,740
2043	8,857	-1,261	-445	611	20	0	0	7,782
2044	8,912	-1,292	-448	651	21	0	0	7,844
2045	8,924	-1,314	-452	694	21	0	0	7,873
2046	8,958	-1,336	-455	737	22	0	0	7,926
2047	8,991	-1,354	-459	781	22	0	0	7,981
2048	9,045	-1,374	-462	827	22	0	0	8,059
2049	9,056	-1,384	-466	875	23	0	0	8,104
2050	9,088	-1,395	-469	924	23	0	0	8,172

Table A-64: Zone E Summer Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	1,380	-17	-13	2	-4	0	0	1,348
2021	1,393	-29	-43	4	-6	0	0	1,319
2022	1,411	-42	-50	5	-9	0	0	1,315
2023	1,416	-55	-24	9	-11	0	0	1,335
2024	1,430	-68	-26	12	-14	0	0	1,334
2025	1,451	-79	-25	7	-20	0	0	1,333
2026	1,458	-90	-30	20	-22	0	0	1,335
2027	1,470	-101	-32	26	-26	0	0	1,338
2028	1,483	-110	-33	33	-30	0	0	1,343
2029	1,496	-118	-34	40	-33	0	0	1,350
2030	1,510	-129	-35	47	-38	0	0	1,355
2031	1,524	-139	-36	53	-41	0	0	1,362
2032	1,519	-150	-7	71	-31	0	0	1,401
2033	1,533	-160	-8	81	-34	0	0	1,413
2034	1,547	-168	-8	92	-36	0	0	1,427
2035	1,561	-176	-8	103	-39	0	0	1,442
2036	1,575	-184	-8	114	-41	0	0	1,457
2037	1,589	-191	-8	126	-42	0	0	1,474
2038	1,602	-198	-8	138	-43	0	0	1,491
2039	1,615	-204	-8	151	-44	0	0	1,509
2040	1,629	-213	-8	164	-45	0	0	1,527
2041	1,643	-220	-8	175	-46	0	0	1,543
2042	1,656	-227	-8	188	-47	0	0	1,561
2043	1,670	-234	-8	201	-48	0	0	1,581
2044	1,684	-240	-8	214	-49	0	0	1,600
2045	1,698	-246	-9	229	-50	0	0	1,621
2046	1,713	-252	-9	242	-51	0	0	1,643
2047	1,727	-258	-8	257	-52	0	0	1,667
2048	1,742	-262	-9	271	-53	0	0	1,689
2049	1,758	-267	-9	288	-54	0	0	1,716
2050	1,774	-271	-9	304	-55	0	0	1,742

Table A-65: Zone E Winter Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	1,237	-53	0	5	-6	0	0	1,185
2021-22	1,249	-67	0	7	-8	0	0	1,181
2022-23	1,261	-77	0	9	-11	0	0	1,182
2023-24	1,271	-87	0	12	-14	0	0	1,181
2024-25	1,278	-97	0	15	-19	0	0	1,177
2025-26	1,273	-106	0	20	-22	0	0	1,166
2026-27	1,283	-114	0	26	-26	0	0	1,169
2027-28	1,289	-121	0	33	-30	0	0	1,171
2028-29	1,292	-127	0	40	-33	0	0	1,171
2029-30	1,301	-135	0	47	-38	0	0	1,174
2030-31	1,309	-143	0	53	-41	0	0	1,179
2031-32	1,290	-151	0	71	-31	0	0	1,179
2032-33	1,299	-158	0	81	-34	0	0	1,187
2033-34	1,304	-165	0	92	-36	0	0	1,195
2034-35	1,306	-171	0	103	-39	0	0	1,200
2035-36	1,315	-177	0	114	-41	0	0	1,212
2036-37	1,310	-181	0	126	-42	0	0	1,213
2037-38	1,318	-186	0	138	-43	0	0	1,227
2038-39	1,322	-190	0	151	-44	0	0	1,238
2039-40	1,329	-196	0	164	-45	0	0	1,251
2040-41	1,331	-202	0	175	-46	0	0	1,258
2041-42	1,337	-208	0	188	-47	0	0	1,270
2042-43	1,332	-212	0	201	-48	0	0	1,273
2043-44	1,341	-216	0	214	-49	0	0	1,289
2044-45	1,344	-221	0	229	-50	0	0	1,302
2045-46	1,346	-224	0	242	-51	0	0	1,313
2046-47	1,351	-228	0	257	-52	0	0	1,328
2047-48	1,357	-231	0	271	-53	0	0	1,345
2048-49	1,356	-232	0	288	-54	0	0	1,357
2049-50	1,360	-234	0	304	-55	0	0	1,375
2050-51	1,363	-236	0	321	-56	0	0	1,393

Table A-66: Zone F Energy – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	12,375	-205	-254	23	2	0	0	11,940
2021	12,391	-358	-310	29	3	0	0	11,755
2022	12,501	-486	-365	39	4	0	0	11,692
2023	12,594	-595	-416	51	6	0	0	11,639
2024	12,703	-702	-462	65	7	0	0	11,612
2025	12,736	-799	-500	83	9	0	0	11,530
2026	12,798	-893	-532	110	11	0	0	11,494
2027	12,857	-976	-559	143	13	0	0	11,478
2028	12,952	-1,050	-581	179	14	0	0	11,514
2029	12,981	-1,110	-599	216	16	0	0	11,505
2030	13,064	-1,200	-615	251	18	0	0	11,518
2031	13,141	-1,283	-628	288	19	0	0	11,537
2032	13,248	-1,364	-640	334	21	0	0	11,599
2033	13,285	-1,434	-651	380	23	0	0	11,604
2034	13,353	-1,501	-660	431	25	0	0	11,649
2035	13,420	-1,562	-668	482	26	0	0	11,698
2036	13,519	-1,623	-676	536	28	0	0	11,784
2037	13,547	-1,671	-684	590	29	0	0	11,811
2038	13,604	-1,718	-691	646	29	0	0	11,870
2039	13,657	-1,761	-697	704	30	0	0	11,933
2040	13,765	-1,829	-703	767	31	0	0	12,031
2041	13,796	-1,880	-709	818	31	0	0	12,056
2042	13,858	-1,933	-714	877	32	0	0	12,120
2043	13,920	-1,981	-720	938	33	0	0	12,190
2044	14,014	-2,032	-725	1,000	33	0	0	12,290
2045	14,039	-2,067	-730	1,065	34	0	0	12,340
2046	14,099	-2,102	-736	1,131	35	0	0	12,427
2047	14,158	-2,132	-742	1,199	35	0	0	12,518
2048	14,251	-2,165	-747	1,270	36	0	0	12,644
2049	14,274	-2,182	-753	1,342	37	0	0	12,719
2050	14,332	-2,200	-759	1,419	37	0	0	12,830

Table A-67: Zone F Summer Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,535	-31	-25	3	-7	0	0	2,476
2021	2,558	-54	-81	7	-12	0	0	2,418
2022	2,592	-77	-96	9	-17	0	0	2,412
2023	2,598	-102	-45	17	-23	0	0	2,446
2024	2,624	-124	-50	22	-28	0	0	2,444
2025	2,669	-145	-48	12	-39	0	0	2,449
2026	2,677	-166	-57	37	-43	0	0	2,448
2027	2,701	-185	-60	48	-51	0	0	2,453
2028	2,725	-202	-63	60	-57	0	0	2,464
2029	2,750	-217	-65	73	-64	0	0	2,477
2030	2,777	-238	-67	85	-72	0	0	2,485
2031	2,803	-256	-68	97	-78	0	0	2,499
2032	2,798	-277	-14	130	-60	0	0	2,577
2033	2,825	-294	-15	148	-65	0	0	2,600
2034	2,852	-310	-15	168	-69	0	0	2,626
2035	2,878	-325	-15	188	-73	0	0	2,652
2036	2,904	-339	-15	208	-77	0	0	2,681
2037	2,930	-352	-15	230	-80	0	0	2,713
2038	2,955	-365	-15	252	-82	0	0	2,744
2039	2,979	-377	-16	275	-84	0	0	2,777
2040	3,007	-392	-16	299	-86	0	0	2,811
2041	3,033	-407	-16	319	-88	0	0	2,842
2042	3,059	-420	-16	342	-90	0	0	2,875
2043	3,086	-432	-16	366	-92	0	0	2,912
2044	3,113	-445	-16	389	-93	0	0	2,948
2045	3,140	-456	-16	416	-95	0	0	2,988
2046	3,168	-467	-16	441	-97	0	0	3,029
2047	3,196	-477	-15	468	-99	0	0	3,074
2048	3,225	-486	-17	494	-101	0	0	3,116
2049	3,256	-495	-17	524	-103	0	0	3,166
2050	3,286	-503	-17	554	-105	0	0	3,216

Table A-68: Zone F Winter Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	2,248	-95	0	10	-12	0	0	2,151
2021-22	2,269	-121	0	13	-16	0	0	2,145
2022-23	2,291	-140	0	17	-23	0	0	2,145
2023-24	2,308	-159	0	22	-28	0	0	2,143
2024-25	2,322	-176	0	28	-37	0	0	2,138
2025-26	2,316	-192	0	37	-43	0	0	2,117
2026-27	2,334	-207	0	48	-51	0	0	2,124
2027-28	2,345	-219	0	60	-57	0	0	2,128
2028-29	2,350	-231	0	73	-64	0	0	2,129
2029-30	2,367	-246	0	85	-72	0	0	2,134
2030-31	2,383	-261	0	97	-78	0	0	2,142
2031-32	2,349	-275	0	130	-60	0	0	2,145
2032-33	2,366	-288	0	148	-65	0	0	2,161
2033-34	2,376	-300	0	168	-69	0	0	2,175
2034-35	2,381	-311	0	188	-73	0	0	2,184
2035-36	2,397	-322	0	208	-77	0	0	2,207
2036-37	2,389	-330	0	230	-80	0	0	2,209
2037-38	2,405	-339	0	252	-82	0	0	2,236
2038-39	2,413	-347	0	275	-84	0	0	2,256
2039-40	2,426	-358	0	299	-86	0	0	2,280
2040-41	2,431	-369	0	319	-88	0	0	2,293
2041-42	2,442	-379	0	342	-90	0	0	2,315
2042-43	2,435	-387	0	366	-92	0	0	2,322
2043-44	2,452	-396	0	389	-93	0	0	2,352
2044-45	2,460	-403	0	416	-95	0	0	2,377
2045-46	2,463	-411	0	441	-97	0	0	2,396
2046-47	2,474	-417	0	468	-99	0	0	2,426
2047-48	2,486	-422	0	494	-101	0	0	2,457
2048-49	2,486	-426	0	524	-103	0	0	2,481
2049-50	2,494	-429	0	554	-105	0	0	2,513
2050-51	2,502	-433	0	585	-107	0	0	2,547

Table A-69: Zone G Energy – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	10,004	-166	-354	29	2	0	0	9,515
2021	10,075	-291	-414	37	3	0	0	9,411
2022	10,222	-398	-466	50	5	0	0	9,413
2023	10,357	-490	-507	65	8	0	0	9,434
2024	10,510	-581	-542	84	10	0	0	9,481
2025	10,597	-664	-568	108	13	0	0	9,485
2026	10,703	-747	-591	144	15	0	0	9,524
2027	10,810	-821	-610	185	18	0	0	9,582
2028	10,949	-888	-626	229	20	0	0	9,684
2029	11,031	-943	-639	274	21	0	0	9,745
2030	11,158	-1,025	-651	318	24	0	0	9,825
2031	11,282	-1,102	-663	364	26	0	0	9,908
2032	11,430	-1,177	-672	421	29	0	0	10,030
2033	11,518	-1,243	-680	477	31	0	0	10,102
2034	11,634	-1,308	-689	540	34	0	0	10,211
2035	11,750	-1,367	-696	604	36	0	0	10,326
2036	11,897	-1,428	-704	672	38	0	0	10,476
2037	11,978	-1,477	-711	741	39	0	0	10,571
2038	12,088	-1,527	-718	813	40	0	0	10,696
2039	12,196	-1,573	-723	889	41	0	0	10,829
2040	12,354	-1,641	-729	969	42	0	0	10,994
2041	12,443	-1,696	-735	1,033	43	0	0	11,087
2042	12,562	-1,752	-741	1,107	44	0	0	11,219
2043	12,678	-1,805	-747	1,184	45	0	0	11,355
2044	12,829	-1,860	-753	1,263	46	0	0	11,525
2045	12,916	-1,902	-759	1,344	47	0	0	11,647
2046	13,039	-1,944	-765	1,428	48	0	0	11,806
2047	13,161	-1,982	-770	1,515	49	0	0	11,972
2048	13,318	-2,023	-776	1,604	50	0	0	12,172
2049	13,405	-2,049	-781	1,695	51	0	0	12,321
2050	13,529	-2,077	-786	1,791	52	0	0	12,509

Table A-70: Zone G Summer Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,349	-29	-31	4	-7	0	0	2,287
2021	2,420	-51	-97	8	-11	0	0	2,269
2022	2,468	-73	-109	11	-19	0	0	2,278
2023	2,497	-98	-49	20	-28	0	0	2,342
2024	2,539	-120	-52	25	-35	0	0	2,357
2025	2,551	-139	-49	15	-49	0	0	2,329
2026	2,618	-162	-57	43	-52	0	0	2,390
2027	2,656	-182	-59	56	-63	0	0	2,409
2028	2,696	-200	-61	69	-70	0	0	2,436
2029	2,737	-216	-62	83	-77	0	0	2,465
2030	2,781	-238	-63	96	-87	0	0	2,488
2031	2,824	-258	-64	110	-94	0	0	2,517
2032	2,790	-276	-13	147	-73	0	0	2,575
2033	2,833	-295	-14	167	-78	0	0	2,613
2034	2,876	-313	-14	189	-85	0	0	2,653
2035	2,919	-330	-14	211	-90	0	0	2,696
2036	2,961	-346	-14	234	-95	0	0	2,741
2037	3,004	-361	-14	259	-98	0	0	2,791
2038	3,046	-376	-14	284	-100	0	0	2,840
2039	3,088	-391	-14	311	-102	0	0	2,891
2040	3,134	-409	-15	338	-105	0	0	2,944
2041	3,180	-426	-15	361	-107	0	0	2,993
2042	3,225	-443	-15	387	-110	0	0	3,045
2043	3,271	-458	-15	414	-112	0	0	3,100
2044	3,317	-474	-15	441	-114	0	0	3,154
2045	3,364	-488	-15	471	-117	0	0	3,214
2046	3,414	-503	-15	499	-119	0	0	3,276
2047	3,464	-516	-14	530	-122	0	0	3,342
2048	3,515	-530	-15	559	-124	0	0	3,405
2049	3,567	-542	-16	593	-127	0	0	3,476
2050	3,619	-554	-16	626	-129	0	0	3,547

Table A-71: Zone G Winter Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	1,638	-70	0	11	-10	0	0	1,569
2021-22	1,663	-89	0	15	-17	0	0	1,571
2022-23	1,688	-103	0	20	-28	0	0	1,576
2023-24	1,706	-117	0	25	-35	0	0	1,580
2024-25	1,723	-131	0	33	-45	0	0	1,580
2025-26	1,726	-143	0	43	-52	0	0	1,574
2026-27	1,747	-155	0	56	-63	0	0	1,585
2027-28	1,764	-165	0	69	-70	0	0	1,599
2028-29	1,777	-174	0	83	-77	0	0	1,608
2029-30	1,795	-187	0	96	-87	0	0	1,617
2030-31	1,813	-199	0	110	-94	0	0	1,631
2031-32	1,794	-210	0	147	-73	0	0	1,658
2032-33	1,814	-221	0	167	-78	0	0	1,682
2033-34	1,830	-231	0	189	-85	0	0	1,703
2034-35	1,840	-241	0	211	-90	0	0	1,720
2035-36	1,857	-249	0	234	-95	0	0	1,748
2036-37	1,860	-257	0	259	-98	0	0	1,765
2037-38	1,879	-265	0	284	-100	0	0	1,799
2038-39	1,894	-272	0	311	-102	0	0	1,830
2039-40	1,912	-282	0	338	-105	0	0	1,863
2040-41	1,921	-292	0	361	-107	0	0	1,883
2041-42	1,937	-301	0	387	-110	0	0	1,913
2042-43	1,941	-309	0	414	-112	0	0	1,934
2043-44	1,963	-317	0	441	-114	0	0	1,973
2044-45	1,978	-324	0	471	-117	0	0	2,007
2045-46	1,988	-331	0	499	-119	0	0	2,036
2046-47	2,002	-337	0	530	-122	0	0	2,073
2047-48	2,019	-343	0	559	-124	0	0	2,112
2048-49	2,030	-348	0	593	-127	0	0	2,148
2049-50	2,046	-352	0	626	-129	0	0	2,191
2050-51	2,062	-357	0	661	-132	0	0	2,235

Table A-72: Zone H Energy – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,777	-46	-35	5	0	0	0	2,701
2021	2,780	-80	-42	6	0	0	0	2,664
2022	2,802	-109	-50	8	1	0	0	2,652
2023	2,823	-133	-57	11	1	0	0	2,644
2024	2,848	-157	-63	14	1	0	0	2,643
2025	2,857	-179	-68	18	2	0	0	2,630
2026	2,872	-200	-72	24	2	0	0	2,625
2027	2,886	-219	-76	31	2	0	0	2,624
2028	2,908	-236	-79	39	2	0	0	2,635
2029	2,916	-249	-81	46	3	0	0	2,635
2030	2,932	-269	-83	54	3	0	0	2,636
2031	2,947	-288	-85	61	3	0	0	2,639
2032	2,968	-306	-86	71	4	0	0	2,651
2033	2,975	-321	-88	81	4	0	0	2,651
2034	2,989	-336	-89	91	4	0	0	2,660
2035	3,002	-349	-90	102	5	0	0	2,670
2036	3,024	-363	-91	114	5	0	0	2,689
2037	3,030	-374	-92	125	5	0	0	2,695
2038	3,042	-384	-93	137	5	0	0	2,708
2039	3,054	-394	-93	150	5	0	0	2,722
2040	3,074	-408	-94	164	5	0	0	2,741
2041	3,079	-420	-95	174	6	0	0	2,744
2042	3,090	-431	-96	187	6	0	0	2,756
2043	3,103	-442	-96	200	6	0	0	2,770
2044	3,122	-453	-97	213	6	0	0	2,791
2045	3,127	-460	-98	227	6	0	0	2,802
2046	3,140	-468	-99	241	6	0	0	2,820
2047	3,153	-475	-99	256	6	0	0	2,840
2048	3,173	-482	-100	271	6	0	0	2,868
2049	3,178	-486	-101	286	6	0	0	2,884
2050	3,191	-490	-101	303	7	0	0	2,909

Table A-73: Zone H Summer Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	643	-8	-4	1	-1	0	0	632
2021	652	-14	-12	2	-2	0	0	626
2022	660	-20	-14	2	-3	0	0	625
2023	659	-26	-7	4	-4	0	0	627
2024	666	-31	-8	5	-5	0	0	627
2025	677	-37	-7	3	-7	0	0	629
2026	679	-42	-9	9	-8	0	0	629
2027	685	-47	-9	11	-9	0	0	631
2028	691	-51	-9	14	-11	0	0	634
2029	698	-55	-10	17	-12	0	0	638
2030	704	-60	-10	19	-13	0	0	640
2031	710	-65	-10	22	-14	0	0	643
2032	702	-70	-2	29	-11	0	0	649
2033	708	-74	-2	33	-12	0	0	654
2034	715	-78	-2	38	-13	0	0	660
2035	721	-81	-2	42	-14	0	0	666
2036	727	-85	-2	47	-14	0	0	673
2037	734	-88	-2	52	-15	0	0	680
2038	740	-91	-2	57	-15	0	0	688
2039	746	-94	-2	62	-16	0	0	696
2040	752	-98	-2	68	-16	0	0	703
2041	758	-102	-2	72	-16	0	0	710
2042	764	-105	-2	78	-17	0	0	718
2043	770	-108	-2	83	-17	0	0	726
2044	777	-111	-2	88	-17	0	0	734
2045	783	-114	-2	94	-18	0	0	743
2046	790	-116	-2	100	-18	0	0	753
2047	796	-119	-2	106	-18	0	0	763
2048	803	-121	-2	112	-19	0	0	773
2049	811	-123	-2	119	-19	0	0	785
2050	818	-125	-3	126	-19	0	0	797

Table A-74: Zone H Winter Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	529	-22	0	2	-2	0	0	507
2021-22	533	-28	0	3	-2	0	0	505
2022-23	538	-33	0	4	-4	0	0	506
2023-24	542	-37	0	5	-5	0	0	505
2024-25	545	-41	0	6	-6	0	0	504
2025-26	544	-45	0	9	-8	0	0	499
2026-27	548	-49	0	11	-9	0	0	501
2027-28	550	-51	0	14	-11	0	0	502
2028-29	551	-54	0	17	-12	0	0	502
2029-30	555	-58	0	19	-13	0	0	503
2030-31	557	-61	0	22	-14	0	0	504
2031-32	547	-64	0	29	-11	0	0	502
2032-33	551	-67	0	33	-12	0	0	505
2033-34	553	-70	0	38	-13	0	0	508
2034-35	553	-72	0	42	-14	0	0	510
2035-36	557	-75	0	47	-14	0	0	514
2036-37	555	-77	0	52	-15	0	0	515
2037-38	558	-79	0	57	-15	0	0	521
2038-39	560	-80	0	62	-16	0	0	526
2039-40	562	-83	0	68	-16	0	0	531
2040-41	562	-85	0	72	-16	0	0	533
2041-42	564	-88	0	78	-17	0	0	537
2042-43	562	-89	0	83	-17	0	0	539
2043-44	565	-91	0	88	-17	0	0	545
2044-45	567	-93	0	94	-18	0	0	550
2045-46	567	-94	0	100	-18	0	0	554
2046-47	569	-96	0	106	-18	0	0	561
2047-48	571	-97	0	112	-19	0	0	567
2048-49	571	-98	0	119	-19	0	0	573
2049-50	572	-99	0	126	-19	0	0	580
2050-51	574	-99	0	133	-20	0	0	587

Table A-75: Zone I Energy – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	6,130	-102	-38	9	0	0	0	6,000
2021	6,138	-177	-43	12	1	0	0	5,930
2022	6,189	-241	-50	17	1	0	0	5,916
2023	6,241	-295	-56	22	2	0	0	5,913
2024	6,306	-349	-61	28	2	0	0	5,927
2025	6,340	-398	-66	37	3	0	0	5,916
2026	6,382	-445	-69	48	4	0	0	5,919
2027	6,426	-488	-72	61	4	0	0	5,931
2028	6,488	-526	-75	76	5	0	0	5,967
2029	6,518	-557	-77	90	5	0	0	5,979
2030	6,554	-602	-79	104	6	0	0	5,983
2031	6,587	-643	-80	119	6	0	0	5,989
2032	6,636	-683	-81	137	7	0	0	6,015
2033	6,655	-718	-82	155	8	0	0	6,017
2034	6,691	-752	-83	175	8	0	0	6,038
2035	6,728	-783	-84	195	9	0	0	6,065
2036	6,785	-814	-85	217	9	0	0	6,112
2037	6,809	-840	-85	239	10	0	0	6,132
2038	6,848	-865	-86	262	10	0	0	6,170
2039	6,888	-888	-87	287	10	0	0	6,210
2040	6,937	-922	-87	313	10	0	0	6,251
2041	6,954	-948	-88	333	10	0	0	6,262
2042	6,989	-975	-89	357	11	0	0	6,293
2043	7,025	-1,000	-90	382	11	0	0	6,328
2044	7,081	-1,027	-90	407	11	0	0	6,382
2045	7,105	-1,046	-91	434	11	0	0	6,413
2046	7,149	-1,066	-92	461	11	0	0	6,463
2047	7,193	-1,083	-92	489	12	0	0	6,517
2048	7,255	-1,102	-93	517	12	0	0	6,589
2049	7,281	-1,113	-94	547	12	0	0	6,634
2050	7,326	-1,125	-94	578	12	0	0	6,698

Table A-76: Zone I Summer Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	1,390	-17	-3	1	-1	0	0	1,370
2021	1,415	-30	-11	3	-3	0	0	1,374
2022	1,433	-42	-12	4	-5	0	0	1,377
2023	1,414	-55	-6	7	-7	0	0	1,353
2024	1,430	-68	-6	9	-9	0	0	1,356
2025	1,472	-80	-6	5	-12	0	0	1,378
2026	1,464	-91	-7	15	-13	0	0	1,368
2027	1,479	-101	-7	19	-15	0	0	1,375
2028	1,495	-111	-8	24	-18	0	0	1,383
2029	1,512	-119	-8	28	-20	0	0	1,393
2030	1,526	-131	-8	33	-22	0	0	1,398
2031	1,540	-141	-8	38	-24	0	0	1,404
2032	1,516	-150	-2	50	-18	0	0	1,396
2033	1,531	-159	-2	57	-20	0	0	1,406
2034	1,545	-168	-2	64	-22	0	0	1,418
2035	1,560	-176	-2	72	-23	0	0	1,431
2036	1,575	-184	-2	79	-24	0	0	1,444
2037	1,592	-191	-2	88	-25	0	0	1,461
2038	1,607	-199	-2	96	-26	0	0	1,478
2039	1,623	-205	-2	105	-26	0	0	1,494
2040	1,636	-214	-2	114	-27	0	0	1,509
2041	1,651	-221	-2	122	-27	0	0	1,522
2042	1,665	-229	-2	131	-28	0	0	1,538
2043	1,682	-236	-2	140	-28	0	0	1,557
2044	1,698	-243	-2	149	-29	0	0	1,574
2045	1,715	-249	-2	159	-29	0	0	1,594
2046	1,733	-255	-2	169	-30	0	0	1,615
2047	1,750	-261	-2	179	-30	0	0	1,636
2048	1,769	-266	-2	189	-31	0	0	1,658
2049	1,790	-272	-2	201	-31	0	0	1,685
2050	1,809	-277	-2	212	-32	0	0	1,710

Table A-77: Zone I Winter Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	938	-40	0	4	-3	0	0	899
2021-22	945	-50	0	5	-5	0	0	895
2022-23	952	-58	0	7	-7	0	0	894
2023-24	958	-66	0	9	-9	0	0	892
2024-25	964	-73	0	12	-12	0	0	891
2025-26	968	-80	0	15	-13	0	0	889
2026-27	977	-87	0	19	-15	0	0	894
2027-28	982	-92	0	24	-18	0	0	897
2028-29	984	-96	0	28	-20	0	0	896
2029-30	988	-103	0	33	-22	0	0	896
2030-31	992	-109	0	38	-24	0	0	897
2031-32	973	-114	0	50	-18	0	0	891
2032-33	979	-119	0	57	-20	0	0	897
2033-34	982	-124	0	64	-22	0	0	900
2034-35	982	-128	0	72	-23	0	0	902
2035-36	987	-132	0	79	-24	0	0	910
2036-37	990	-137	0	88	-25	0	0	916
2037-38	998	-141	0	96	-26	0	0	928
2038-39	1,002	-144	0	105	-26	0	0	937
2039-40	1,004	-148	0	114	-27	0	0	943
2040-41	1,002	-152	0	122	-27	0	0	945
2041-42	1,006	-156	0	131	-28	0	0	953
2042-43	1,009	-160	0	140	-28	0	0	960
2043-44	1,016	-164	0	149	-29	0	0	972
2044-45	1,019	-167	0	159	-29	0	0	981
2045-46	1,019	-170	0	169	-30	0	0	988
2046-47	1,024	-172	0	179	-30	0	0	1,000
2047-48	1,029	-175	0	189	-31	0	0	1,012
2048-49	1,037	-178	0	201	-31	0	0	1,028
2049-50	1,041	-179	0	212	-32	0	0	1,042
2050-51	1,046	-181	0	224	-33	0	0	1,056

Table A-78: Zone J Energy – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	53,775	-891	-335	82	3	0	0	52,633
2021	53,840	-1,555	-377	106	6	0	0	52,020
2022	54,288	-2,112	-438	145	11	0	0	51,893
2023	54,745	-2,588	-495	191	16	0	0	51,869
2024	55,319	-3,058	-539	247	21	0	0	51,990
2025	55,611	-3,487	-577	321	27	0	0	51,895
2026	55,987	-3,906	-609	421	31	0	0	51,925
2027	56,371	-4,281	-634	537	36	0	0	52,029
2028	56,911	-4,616	-657	665	42	0	0	52,345
2029	57,180	-4,888	-676	788	46	0	0	52,450
2030	57,491	-5,281	-692	911	51	0	0	52,480
2031	57,785	-5,643	-703	1,041	57	0	0	52,538
2032	58,213	-5,996	-713	1,199	61	0	0	52,765
2033	58,377	-6,299	-722	1,357	67	0	0	52,779
2034	58,691	-6,597	-730	1,532	72	0	0	52,968
2035	59,023	-6,869	-736	1,712	76	0	0	53,207
2036	59,522	-7,144	-741	1,902	80	0	0	53,618
2037	59,727	-7,365	-748	2,097	84	0	0	53,795
2038	60,076	-7,587	-754	2,302	86	0	0	54,123
2039	60,424	-7,793	-760	2,518	88	0	0	54,477
2040	60,856	-8,086	-767	2,742	89	0	0	54,835
2041	61,003	-8,315	-773	2,924	91	0	0	54,930
2042	61,309	-8,550	-779	3,133	93	0	0	55,205
2043	61,626	-8,772	-785	3,350	95	0	0	55,514
2044	62,116	-9,008	-791	3,574	96	0	0	55,988
2045	62,325	-9,176	-797	3,805	98	0	0	56,255
2046	62,709	-9,351	-803	4,042	100	0	0	56,698
2047	63,095	-9,503	-809	4,287	102	0	0	57,171
2048	63,639	-9,668	-816	4,539	103	0	0	57,798
2049	63,873	-9,762	-821	4,797	105	0	0	58,192
2050	64,269	-9,864	-827	5,070	107	0	0	58,755

Table A-79: Zone J Summer Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	11,518	-141	-29	11	-10	0	0	11,350
2021	11,718	-247	-87	22	-24	0	0	11,382
2022	11,869	-351	-102	31	-40	0	0	11,406
2023	11,710	-458	-47	57	-57	0	0	11,206
2024	11,848	-560	-52	74	-73	0	0	11,237
2025	12,191	-663	-50	43	-102	0	0	11,418
2026	12,125	-752	-58	126	-111	0	0	11,330
2027	12,252	-839	-61	161	-127	0	0	11,387
2028	12,387	-917	-63	199	-147	0	0	11,459
2029	12,523	-989	-65	236	-163	0	0	11,542
2030	12,640	-1,083	-66	273	-182	0	0	11,582
2031	12,754	-1,167	-67	312	-202	0	0	11,630
2032	12,561	-1,244	-14	414	-152	0	0	11,566
2033	12,680	-1,320	-14	470	-165	0	0	11,650
2034	12,800	-1,392	-14	531	-178	0	0	11,746
2035	12,921	-1,459	-15	592	-189	0	0	11,851
2036	13,045	-1,524	-15	656	-198	0	0	11,964
2037	13,190	-1,586	-15	726	-208	0	0	12,107
2038	13,315	-1,645	-15	797	-212	0	0	12,240
2039	13,441	-1,701	-15	871	-217	0	0	12,380
2040	13,555	-1,769	-15	947	-220	0	0	12,498
2041	13,673	-1,833	-15	1,012	-225	0	0	12,612
2042	13,793	-1,894	-15	1,084	-230	0	0	12,738
2043	13,937	-1,952	-16	1,159	-234	0	0	12,895
2044	14,068	-2,009	-16	1,234	-238	0	0	13,039
2045	14,205	-2,062	-16	1,318	-243	0	0	13,202
2046	14,353	-2,114	-16	1,399	-247	0	0	13,374
2047	14,498	-2,161	-14	1,484	-252	0	0	13,555
2048	14,650	-2,207	-16	1,566	-255	0	0	13,737
2049	14,826	-2,252	-16	1,661	-260	0	0	13,958
2050	14,984	-2,292	-16	1,755	-265	0	0	14,165

Table A-80: Zone J Winter Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	7,769	-330	0	32	-22	0	0	7,449
2021-22	7,824	-418	0	43	-38	0	0	7,412
2022-23	7,888	-483	0	57	-57	0	0	7,405
2023-24	7,933	-546	0	74	-73	0	0	7,388
2024-25	7,983	-605	0	96	-96	0	0	7,378
2025-26	8,017	-666	0	126	-111	0	0	7,366
2026-27	8,092	-718	0	161	-127	0	0	7,408
2027-28	8,138	-762	0	199	-147	0	0	7,428
2028-29	8,149	-799	0	236	-163	0	0	7,422
2029-30	8,184	-851	0	273	-182	0	0	7,424
2030-31	8,216	-899	0	312	-202	0	0	7,427
2031-32	8,061	-944	0	414	-152	0	0	7,379
2032-33	8,112	-988	0	470	-165	0	0	7,429
2033-34	8,132	-1,028	0	531	-178	0	0	7,457
2034-35	8,133	-1,064	0	592	-189	0	0	7,473
2035-36	8,174	-1,097	0	656	-198	0	0	7,535
2036-37	8,203	-1,134	0	726	-208	0	0	7,587
2037-38	8,266	-1,165	0	797	-212	0	0	7,686
2038-39	8,297	-1,193	0	871	-217	0	0	7,759
2039-40	8,313	-1,228	0	947	-220	0	0	7,812
2040-41	8,303	-1,261	0	1,012	-225	0	0	7,829
2041-42	8,330	-1,293	0	1,084	-230	0	0	7,891
2042-43	8,357	-1,329	0	1,159	-234	0	0	7,953
2043-44	8,417	-1,358	0	1,234	-238	0	0	8,054
2044-45	8,437	-1,384	0	1,318	-243	0	0	8,129
2045-46	8,442	-1,407	0	1,399	-247	0	0	8,187
2046-47	8,480	-1,429	0	1,484	-252	0	0	8,284
2047-48	8,522	-1,448	0	1,566	-255	0	0	8,385
2048-49	8,590	-1,471	0	1,661	-260	0	0	8,520
2049-50	8,627	-1,485	0	1,755	-265	0	0	8,631
2050-51	8,664	-1,500	0	1,853	-269	0	0	8,748

Table A-81: Zone K Energy – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	21,685	-360	-692	122	3	0	0	20,758
2021	21,724	-627	-742	212	5	0	0	20,572
2022	21,918	-853	-755	300	8	0	0	20,618
2023	22,095	-1,044	-762	402	11	0	0	20,701
2024	22,321	-1,234	-769	518	14	0	0	20,850
2025	22,433	-1,407	-777	655	17	0	0	20,922
2026	22,606	-1,577	-783	796	20	0	0	21,062
2027	22,783	-1,730	-791	948	23	0	0	21,233
2028	23,015	-1,867	-799	1,112	26	0	0	21,488
2029	23,139	-1,978	-806	1,291	29	0	0	21,675
2030	23,270	-2,138	-814	1,486	32	0	0	21,837
2031	23,407	-2,286	-838	1,701	35	0	0	22,019
2032	23,597	-2,430	-848	1,939	39	0	0	22,297
2033	23,690	-2,556	-857	2,203	42	0	0	22,522
2034	23,844	-2,680	-866	2,497	45	0	0	22,840
2035	24,005	-2,794	-876	2,825	47	0	0	23,208
2036	24,235	-2,909	-885	3,193	50	0	0	23,684
2037	24,342	-3,002	-895	3,604	52	0	0	24,101
2038	24,515	-3,096	-905	4,064	53	0	0	24,631
2039	24,689	-3,184	-914	4,479	54	0	0	25,124
2040	24,892	-3,307	-922	4,852	55	0	0	25,570
2041	24,983	-3,405	-928	5,172	56	0	0	25,878
2042	25,140	-3,506	-935	5,544	57	0	0	26,300
2043	25,294	-3,600	-943	5,928	58	0	0	26,737
2044	25,530	-3,702	-951	6,324	59	0	0	27,259
2045	25,648	-3,776	-959	6,732	60	0	0	27,705
2046	25,840	-3,853	-967	7,153	61	0	0	28,234
2047	26,034	-3,921	-972	7,586	62	0	0	28,789
2048	26,300	-3,996	-979	8,031	63	0	0	29,420
2049	26,433	-4,040	-988	8,488	64	0	0	29,957
2050	26,643	-4,089	-997	8,971	65	0	0	30,593

Table A-82: Zone K Summer Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	5,691	-69	-60	16	-11	0	0	5,567
2021	5,820	-123	-173	45	-19	0	0	5,551
2022	5,915	-175	-176	64	-31	0	0	5,597
2023	5,901	-231	-73	121	-39	0	0	5,679
2024	5,983	-283	-74	156	-50	0	0	5,733
2025	6,087	-331	-67	87	-65	0	0	5,711
2026	6,149	-381	-75	240	-71	0	0	5,861
2027	6,230	-426	-76	286	-82	0	0	5,931
2028	6,313	-467	-77	335	-93	0	0	6,011
2029	6,397	-505	-78	389	-104	0	0	6,099
2030	6,475	-555	-79	448	-114	0	0	6,176
2031	6,553	-599	-81	513	-125	0	0	6,261
2032	6,387	-632	-17	674	-97	0	0	6,315
2033	6,468	-673	-17	767	-105	0	0	6,440
2034	6,551	-712	-17	871	-112	0	0	6,580
2035	6,635	-749	-17	984	-117	0	0	6,735
2036	6,720	-785	-18	1,109	-124	0	0	6,902
2037	6,811	-819	-18	1,255	-130	0	0	7,100
2038	6,897	-852	-18	1,416	-132	0	0	7,311
2039	6,983	-884	-18	1,560	-134	0	0	7,507
2040	7,069	-923	-18	1,686	-137	0	0	7,678
2041	7,156	-959	-19	1,803	-139	0	0	7,841
2042	7,244	-994	-19	1,931	-142	0	0	8,020
2043	7,337	-1,028	-19	2,065	-144	0	0	8,211
2044	7,429	-1,061	-19	2,198	-147	0	0	8,400
2045	7,525	-1,092	-19	2,348	-149	0	0	8,612
2046	7,628	-1,124	-19	2,491	-152	0	0	8,825
2047	7,730	-1,152	-17	2,644	-154	0	0	9,050
2048	7,836	-1,181	-19	2,789	-156	0	0	9,269
2049	7,948	-1,207	-20	2,958	-159	0	0	9,520
2050	8,058	-1,232	-20	3,125	-162	0	0	9,769

Table A-83: Zone K Winter Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	3,371	-143	0	64	-18	0	0	3,274
2021-22	3,396	-181	0	90	-29	0	0	3,277
2022-23	3,428	-210	0	121	-39	0	0	3,300
2023-24	3,445	-237	0	156	-50	0	0	3,314
2024-25	3,461	-262	0	197	-61	0	0	3,336
2025-26	3,464	-288	0	240	-71	0	0	3,345
2026-27	3,495	-310	0	286	-82	0	0	3,389
2027-28	3,516	-329	0	335	-93	0	0	3,429
2028-29	3,527	-346	0	389	-104	0	0	3,467
2029-30	3,537	-368	0	448	-114	0	0	3,503
2030-31	3,548	-388	0	513	-125	0	0	3,548
2031-32	3,475	-407	0	674	-97	0	0	3,645
2032-33	3,494	-426	0	767	-105	0	0	3,731
2033-34	3,508	-443	0	871	-112	0	0	3,824
2034-35	3,510	-459	0	984	-117	0	0	3,918
2035-36	3,526	-473	0	1,109	-124	0	0	4,037
2036-37	3,526	-488	0	1,255	-130	0	0	4,164
2037-38	3,550	-500	0	1,416	-132	0	0	4,334
2038-39	3,565	-512	0	1,560	-134	0	0	4,478
2039-40	3,576	-528	0	1,686	-137	0	0	4,597
2040-41	3,571	-542	0	1,803	-139	0	0	4,691
2041-42	3,579	-556	0	1,931	-142	0	0	4,812
2042-43	3,580	-569	0	2,065	-144	0	0	4,931
2043-44	3,604	-582	0	2,198	-147	0	0	5,074
2044-45	3,618	-593	0	2,348	-149	0	0	5,223
2045-46	3,619	-603	0	2,491	-152	0	0	5,355
2046-47	3,631	-612	0	2,644	-154	0	0	5,509
2047-48	3,646	-620	0	2,789	-156	0	0	5,659
2048-49	3,662	-627	0	2,958	-159	0	0	5,834
2049-50	3,678	-633	0	3,125	-162	0	0	6,008
2050-51	3,694	-640	0	3,301	-165	0	0	6,191

Table A-84: NYCA Energy – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	161,470	-2,677	-2,647	371	15	0	0	156,532
2021	161,722	-4,671	-3,077	530	28	0	0	154,532
2022	163,164	-6,348	-3,479	730	43	0	0	154,110
2023	164,508	-7,776	-3,838	966	63	0	0	153,923
2024	166,139	-9,184	-4,149	1,243	80	0	0	154,129
2025	166,836	-10,461	-4,412	1,588	103	0	0	153,654
2026	167,863	-11,711	-4,632	2,028	121	0	0	153,669
2027	168,898	-12,827	-4,816	2,533	141	0	0	153,930
2028	170,398	-13,819	-4,975	3,086	161	0	0	154,850
2029	171,056	-14,621	-5,108	3,653	178	0	0	155,158
2030	172,103	-15,810	-5,223	4,226	200	0	0	155,496
2031	173,104	-16,903	-5,337	4,840	219	0	0	155,923
2032	174,509	-17,973	-5,426	5,565	240	0	0	156,915
2033	175,064	-18,891	-5,508	6,316	261	0	0	157,242
2034	176,050	-19,788	-5,579	7,156	280	0	0	158,119
2035	177,058	-20,605	-5,644	8,031	296	0	0	159,136
2036	178,533	-21,428	-5,705	8,981	312	0	0	160,693
2037	179,082	-22,084	-5,768	9,983	324	0	0	161,537
2038	180,045	-22,738	-5,828	11,057	332	0	0	162,868
2039	180,991	-23,342	-5,878	12,119	339	0	0	164,229
2040	182,409	-24,236	-5,928	13,174	346	0	0	165,766
2041	182,893	-24,928	-5,975	14,044	353	0	0	166,388
2042	183,825	-25,637	-6,022	15,053	360	0	0	167,578
2043	184,764	-26,299	-6,069	16,097	367	0	0	168,859
2044	186,194	-27,002	-6,116	17,171	374	0	0	170,622
2045	186,731	-27,493	-6,163	18,280	381	0	0	171,737
2046	187,779	-28,000	-6,210	19,423	388	0	0	173,380
2047	188,821	-28,440	-6,257	20,597	395	0	0	175,117
2048	190,344	-28,917	-6,304	21,807	402	0	0	177,332
2049	190,923	-29,181	-6,351	23,048	409	0	0	178,849
2050	191,994	-29,468	-6,398	24,360	416	0	0	180,903

Table A-85: NYCA Summer Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	33,854	-413	-228	49	-57	0	0	33,205
2021	34,400	-725	-718	113	-107	0	0	32,964
2022	34,883	-1,033	-812	156	-164	0	0	33,030
2023	34,754	-1,358	-370	292	-225	0	0	33,093
2024	35,167	-1,661	-400	374	-285	0	0	33,195
2025	35,884	-1,953	-381	212	-393	0	0	33,368
2026	35,985	-2,231	-446	611	-432	0	0	33,488
2027	36,364	-2,489	-465	764	-503	0	0	33,671
2028	36,762	-2,721	-480	929	-573	0	0	33,917
2029	37,163	-2,936	-493	1,101	-635	0	0	34,200
2030	37,553	-3,217	-504	1,275	-714	0	0	34,393
2031	37,933	-3,470	-514	1,459	-782	0	0	34,627
2032	37,435	-3,707	-108	1,934	-596	0	0	34,958
2033	37,825	-3,937	-110	2,200	-650	0	0	35,328
2034	38,217	-4,155	-111	2,496	-697	0	0	35,749
2035	38,610	-4,360	-113	2,797	-737	0	0	36,198
2036	39,006	-4,557	-114	3,119	-775	0	0	36,679
2037	39,437	-4,743	-115	3,477	-807	0	0	37,249
2038	39,826	-4,920	-116	3,853	-827	0	0	37,817
2039	40,215	-5,088	-117	4,221	-844	0	0	38,386
2040	40,610	-5,300	-118	4,578	-859	0	0	38,911
2041	41,003	-5,497	-119	4,895	-879	0	0	39,403
2042	41,396	-5,683	-120	5,243	-897	0	0	39,939
2043	41,832	-5,860	-121	5,607	-914	0	0	40,544
2044	42,244	-6,033	-122	5,967	-929	0	0	41,127
2045	42,672	-6,195	-123	6,376	-949	0	0	41,781
2046	43,130	-6,353	-124	6,765	-966	0	0	42,452
2047	43,580	-6,497	-111	7,179	-984	0	0	43,167
2048	44,049	-6,636	-125	7,573	-999	0	0	43,862
2049	44,562	-6,768	-127	8,032	-1,019	0	0	44,681
2050	45,048	-6,890	-128	8,485	-1,036	0	0	45,479

Table A-86: NYCA Winter Peaks – Reference Case with Accelerated Weather Trend

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	25,017	-1,061	0	160	-100	0	0	24,015
2021-22	25,234	-1,347	0	220	-154	0	0	23,954
2022-23	25,471	-1,559	0	292	-225	0	0	23,978
2023-24	25,643	-1,763	0	374	-285	0	0	23,968
2024-25	25,798	-1,955	0	479	-368	0	0	23,954
2025-26	25,808	-2,144	0	611	-432	0	0	23,844
2026-27	26,034	-2,309	0	764	-503	0	0	23,986
2027-28	26,176	-2,450	0	929	-573	0	0	24,081
2028-29	26,237	-2,574	0	1,101	-635	0	0	24,129
2029-30	26,388	-2,745	0	1,275	-714	0	0	24,204
2030-31	26,531	-2,904	0	1,459	-782	0	0	24,304
2031-32	26,085	-3,055	0	1,934	-596	0	0	24,367
2032-33	26,264	-3,198	0	2,200	-650	0	0	24,616
2033-34	26,366	-3,332	0	2,496	-697	0	0	24,833
2034-35	26,400	-3,452	0	2,797	-737	0	0	25,008
2035-36	26,559	-3,565	0	3,119	-775	0	0	25,337
2036-37	26,555	-3,672	0	3,477	-807	0	0	25,553
2037-38	26,746	-3,769	0	3,853	-827	0	0	26,003
2038-39	26,842	-3,859	0	4,221	-844	0	0	26,360
2039-40	26,952	-3,981	0	4,578	-859	0	0	26,690
2040-41	26,964	-4,096	0	4,895	-879	0	0	26,883
2041-42	27,071	-4,204	0	5,243	-897	0	0	27,214
2042-43	27,066	-4,304	0	5,607	-914	0	0	27,454
2043-44	27,263	-4,400	0	5,967	-929	0	0	27,901
2044-45	27,347	-4,486	0	6,376	-949	0	0	28,288
2045-46	27,374	-4,563	0	6,765	-966	0	0	28,609
2046-47	27,492	-4,632	0	7,179	-984	0	0	29,055
2047-48	27,627	-4,694	0	7,573	-999	0	0	29,508
2048-49	27,729	-4,748	0	8,032	-1,019	0	0	29,995
2049-50	27,838	-4,793	0	8,485	-1,036	0	0	30,493
2050-51	27,948	-4,839	0	8,963	-1,054	0	0	31,017

A-3: Policy Case

Table A-87: Zone A Energy – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	15,707	-692	-316	33	2	0	74	14,808
2021	15,720	-1,101	-386	43	3	0	111	14,389
2022	15,851	-1,480	-456	60	5	0	147	14,127
2023	15,962	-1,833	-520	80	7	0	184	13,879
2024	16,093	-2,182	-777	104	9	0	221	13,467
2025	16,126	-2,517	-1,037	129	11	0	264	12,975
2026	16,195	-2,742	-1,074	169	13	0	307	12,868
2027	16,261	-2,952	-1,108	225	16	0	349	12,791
2028	16,372	-3,150	-1,139	288	18	0	391	12,780
2029	16,400	-3,329	-1,168	354	20	0	431	12,708
2030	16,495	-3,551	-1,187	418	22	0	471	12,668
2031	16,583	-3,710	-1,202	487	24	0	511	12,693
2032	16,708	-3,866	-1,219	563	27	0	553	12,766
2033	16,746	-4,006	-1,232	635	29	0	592	12,763
2034	16,821	-4,144	-1,245	715	31	0	633	12,812
2035	16,895	-4,272	-1,257	795	33	0	673	12,867
2036	17,009	-4,401	-1,269	874	35	0	715	12,964
2037	17,031	-4,511	-1,280	954	36	0	753	12,983
2038	17,090	-4,621	-1,292	1,035	37	0	793	13,041
2039	17,144	-4,725	-1,303	1,124	38	0	834	13,112
2040	17,268	-4,863	-1,314	1,224	38	0	875	13,229
2041	17,295	-4,954	-1,325	1,305	39	0	913	13,273
2042	17,359	-5,045	-1,337	1,399	40	0	953	13,370
2043	17,423	-5,130	-1,348	1,496	41	0	993	13,474
2044	17,527	-5,218	-1,359	1,595	42	0	1,035	13,623
2045	17,543	-5,284	-1,370	1,699	43	0	1,072	13,702
2046	17,605	-5,351	-1,381	1,805	43	0	1,111	13,831
2047	17,663	-5,411	-1,394	1,914	44	0	1,149	13,965
2048	17,765	-5,474	-1,405	2,026	45	0	1,190	14,147
2049	17,778	-5,516	-1,417	2,142	46	0	1,225	14,257
2050	17,835	-5,560	-1,429	2,264	47	0	1,263	14,419

Table A-88: Zone A Summer Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,718	-108	-26	4	-7	0	21	2,602
2021	2,740	-172	-86	9	-13	0	34	2,513
2022	2,772	-257	-42	17	-16	0	45	2,520
2023	2,778	-299	-48	23	-23	0	57	2,488
2024	2,803	-361	-71	30	-29	0	68	2,439
2025	2,842	-440	-95	37	-38	0	82	2,388
2026	2,851	-505	-20	56	-31	0	95	2,445
2027	2,872	-544	-21	75	-37	0	108	2,452
2028	2,894	-581	-22	96	-42	0	120	2,466
2029	2,916	-617	-22	118	-47	0	133	2,481
2030	2,941	-659	-22	139	-53	0	146	2,492
2031	2,965	-689	-23	162	-57	0	158	2,517
2032	2,952	-678	-23	187	-63	0	170	2,546
2033	2,977	-708	-23	211	-69	0	183	2,572
2034	3,001	-736	-24	238	-73	0	196	2,603
2035	3,024	-762	-24	265	-77	0	209	2,635
2036	3,048	-787	-24	290	-81	0	221	2,667
2037	3,072	-813	-24	318	-84	0	234	2,702
2038	3,093	-837	-24	345	-87	0	247	2,737
2039	3,114	-860	-25	374	-89	0	260	2,775
2040	3,139	-886	-25	407	-91	0	273	2,816
2041	3,162	-909	-25	435	-93	0	286	2,857
2042	3,185	-929	-25	466	-95	0	300	2,901
2043	3,208	-948	-25	498	-97	0	312	2,948
2044	3,231	-966	-26	530	-99	0	325	2,996
2045	3,254	-985	-26	566	-101	0	339	3,048
2046	3,279	-1,003	-26	601	-103	0	352	3,101
2047	3,304	-1,019	-23	638	-105	0	365	3,159
2048	3,329	-1,034	-27	673	-106	0	377	3,211
2049	3,355	-1,050	-27	713	-109	0	390	3,273
2050	3,381	-1,065	-27	754	-111	0	403	3,335

Table A-89: Zone A Winter Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	2,487	-206	0	12	-12	0	35	2,317
2021-22	2,512	-267	0	17	-16	0	47	2,292
2022-23	2,538	-322	0	23	-23	0	58	2,274
2023-24	2,559	-376	0	30	-29	0	70	2,254
2024-25	2,575	-429	0	37	-38	0	84	2,229
2025-26	2,566	-460	0	49	-45	0	98	2,208
2026-27	2,588	-494	0	65	-53	0	111	2,216
2027-28	2,601	-523	0	83	-60	0	124	2,224
2028-29	2,608	-583	0	118	-47	0	140	2,236
2029-30	2,629	-618	0	139	-53	0	153	2,250
2030-31	2,648	-644	0	162	-57	0	166	2,275
2031-32	2,609	-627	0	187	-63	0	179	2,284
2032-33	2,628	-651	0	211	-69	0	192	2,312
2033-34	2,641	-673	0	238	-73	0	205	2,339
2034-35	2,648	-692	0	265	-77	0	218	2,361
2035-36	2,667	-711	0	290	-81	0	230	2,395
2036-37	2,657	-726	0	318	-84	0	243	2,407
2037-38	2,676	-744	0	345	-87	0	255	2,444
2038-39	2,684	-760	0	374	-89	0	268	2,477
2039-40	2,701	-780	0	407	-91	0	279	2,515
2040-41	2,707	-796	0	435	-93	0	292	2,545
2041-42	2,721	-811	0	466	-95	0	304	2,585
2042-43	2,710	-820	0	498	-97	0	316	2,607
2043-44	2,731	-833	0	530	-99	0	328	2,656
2044-45	2,740	-846	0	566	-101	0	340	2,700
2045-46	2,745	-856	0	601	-103	0	352	2,738
2046-47	2,758	-867	0	638	-105	0	363	2,787
2047-48	2,773	-876	0	673	-106	0	373	2,836
2048-49	2,771	-882	0	713	-109	0	384	2,878
2049-50	2,781	-889	0	754	-111	0	395	2,930
2050-51	2,791	-896	0	796	-113	0	406	2,984

Table A-90: Zone B Energy – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	10,225	-450	-122	24	0	0	47	9,724
2021	10,258	-719	-148	31	1	0	71	9,495
2022	10,370	-968	-172	44	2	0	95	9,371
2023	10,469	-1,202	-194	57	3	0	118	9,252
2024	10,579	-1,434	-285	75	3	0	143	9,081
2025	10,626	-1,658	-379	94	4	0	171	8,857
2026	10,694	-1,810	-391	123	5	0	199	8,820
2027	10,760	-1,953	-401	163	6	0	227	8,802
2028	10,854	-2,088	-412	208	7	0	256	8,825
2029	10,893	-2,211	-422	254	7	0	282	8,802
2030	10,975	-2,362	-429	299	8	0	309	8,799
2031	11,051	-2,472	-434	348	9	0	336	8,838
2032	11,152	-2,580	-441	401	9	0	364	8,905
2033	11,194	-2,678	-446	450	11	0	390	8,921
2034	11,262	-2,774	-450	507	11	0	418	8,974
2035	11,328	-2,864	-455	563	12	0	445	9,028
2036	11,423	-2,955	-459	619	12	0	473	9,113
2037	11,455	-3,034	-465	675	13	0	499	9,144
2038	11,511	-3,112	-470	734	13	0	526	9,202
2039	11,565	-3,187	-473	797	13	0	554	9,270
2040	11,666	-3,285	-476	868	14	0	582	9,368
2041	11,700	-3,351	-481	926	14	0	608	9,416
2042	11,761	-3,417	-485	993	14	0	635	9,500
2043	11,820	-3,480	-489	1,061	14	0	662	9,588
2044	11,907	-3,544	-493	1,132	14	0	692	9,707
2045	11,934	-3,594	-496	1,205	14	0	717	9,779
2046	11,992	-3,645	-501	1,280	14	0	743	9,884
2047	12,049	-3,691	-505	1,357	15	0	770	9,994
2048	12,135	-3,739	-510	1,437	15	0	798	10,137
2049	12,160	-3,773	-514	1,519	15	0	822	10,229
2050	12,215	-3,808	-518	1,605	15	0	848	10,357

Table A-91: Zone B Summer Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,112	-84	-11	3	-1	0	14	2,033
2021	2,138	-134	-35	7	-5	0	23	1,994
2022	2,170	-216	-17	13	-6	0	31	1,976
2023	2,163	-233	-19	18	-10	0	39	1,958
2024	2,188	-282	-28	23	-11	0	46	1,936
2025	2,237	-358	-37	29	-15	0	56	1,912
2026	2,236	-422	-8	43	-13	0	65	1,901
2027	2,257	-454	-8	57	-14	0	74	1,913
2028	2,279	-483	-8	73	-17	0	83	1,927
2029	2,301	-513	-9	89	-18	0	92	1,943
2030	2,325	-547	-9	105	-21	0	101	1,955
2031	2,348	-572	-9	122	-23	0	110	1,977
2032	2,308	-530	-9	141	-24	0	119	2,005
2033	2,331	-554	-9	159	-27	0	128	2,027
2034	2,353	-577	-9	179	-28	0	137	2,055
2035	2,375	-599	-9	198	-31	0	146	2,081
2036	2,396	-619	-9	217	-31	0	155	2,109
2037	2,421	-641	-9	238	-34	0	164	2,140
2038	2,442	-660	-10	259	-34	0	173	2,170
2039	2,462	-680	-10	281	-34	0	183	2,202
2040	2,484	-701	-10	305	-35	0	192	2,236
2041	2,506	-720	-10	326	-35	0	202	2,269
2042	2,527	-737	-10	350	-35	0	211	2,306
2043	2,553	-754	-10	374	-36	0	220	2,347
2044	2,574	-769	-10	398	-36	0	230	2,386
2045	2,596	-786	-10	425	-36	0	240	2,428
2046	2,619	-801	-10	451	-37	0	249	2,472
2047	2,641	-815	-9	478	-37	0	259	2,517
2048	2,665	-828	-10	505	-37	0	267	2,562
2049	2,692	-843	-10	535	-38	0	277	2,614
2050	2,716	-856	-11	565	-38	0	286	2,664

Table A-92: Zone B Winter Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	1,649	-136	0	9	-5	0	24	1,541
2021-22	1,668	-178	0	13	-6	0	32	1,530
2022-23	1,687	-214	0	18	-10	0	40	1,521
2023-24	1,702	-250	0	23	-11	0	48	1,513
2024-25	1,717	-286	0	29	-15	0	58	1,502
2025-26	1,719	-308	0	38	-19	0	67	1,496
2026-27	1,737	-332	0	50	-20	0	77	1,512
2027-28	1,749	-352	0	63	-24	0	86	1,522
2028-29	1,753	-399	0	89	-18	0	97	1,523
2029-30	1,769	-423	0	105	-21	0	106	1,537
2030-31	1,784	-441	0	122	-23	0	116	1,558
2031-32	1,756	-422	0	141	-24	0	125	1,575
2032-33	1,772	-439	0	159	-27	0	134	1,599
2033-34	1,782	-454	0	179	-28	0	143	1,622
2034-35	1,787	-467	0	198	-31	0	153	1,640
2035-36	1,802	-480	0	217	-31	0	161	1,669
2036-37	1,803	-493	0	238	-34	0	170	1,685
2037-38	1,820	-506	0	259	-34	0	179	1,717
2038-39	1,828	-518	0	281	-34	0	188	1,745
2039-40	1,839	-532	0	305	-35	0	197	1,775
2040-41	1,844	-542	0	326	-35	0	206	1,799
2041-42	1,857	-554	0	350	-35	0	215	1,832
2042-43	1,857	-562	0	374	-36	0	223	1,856
2043-44	1,875	-572	0	398	-36	0	232	1,896
2044-45	1,882	-581	0	425	-36	0	241	1,930
2045-46	1,885	-588	0	451	-37	0	249	1,960
2046-47	1,897	-596	0	478	-37	0	257	1,999
2047-48	1,910	-603	0	505	-37	0	265	2,039
2048-49	1,918	-610	0	535	-38	0	273	2,078
2049-50	1,927	-616	0	565	-38	0	281	2,119
2050-51	1,936	-622	0	597	-38	0	289	2,162

Table A-93: Zone C Energy – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	16,256	-716	-310	35	2	0	78	15,343
2021	16,267	-1,140	-381	45	3	0	116	14,910
2022	16,397	-1,531	-452	63	4	0	154	14,636
2023	16,507	-1,895	-515	83	6	0	192	14,378
2024	16,637	-2,256	-771	109	8	0	231	13,959
2025	16,666	-2,601	-1,029	135	11	0	276	13,459
2026	16,731	-2,833	-1,065	178	13	0	322	13,345
2027	16,794	-3,049	-1,098	236	15	0	366	13,265
2028	16,902	-3,252	-1,128	303	18	0	411	13,252
2029	16,925	-3,436	-1,157	372	19	0	452	13,176
2030	17,018	-3,663	-1,176	439	22	0	494	13,134
2031	17,103	-3,826	-1,190	511	24	0	536	13,159
2032	17,226	-3,986	-1,206	591	26	0	581	13,232
2033	17,260	-4,129	-1,219	666	29	0	622	13,228
2034	17,332	-4,270	-1,232	751	31	0	665	13,277
2035	17,401	-4,400	-1,243	835	32	0	708	13,332
2036	17,511	-4,530	-1,255	919	34	0	752	13,430
2037	17,526	-4,643	-1,266	1,003	35	0	792	13,448
2038	17,578	-4,753	-1,278	1,088	36	0	834	13,505
2039	17,625	-4,858	-1,288	1,182	37	0	878	13,576
2040	17,742	-4,997	-1,299	1,288	38	0	921	13,694
2041	17,761	-5,088	-1,311	1,373	39	0	961	13,736
2042	17,819	-5,178	-1,322	1,472	40	0	1,003	13,833
2043	17,874	-5,263	-1,333	1,574	41	0	1,045	13,938
2044	17,970	-5,350	-1,344	1,679	41	0	1,091	14,087
2045	17,977	-5,415	-1,355	1,788	42	0	1,129	14,167
2046	18,029	-5,480	-1,366	1,900	43	0	1,171	14,296
2047	18,079	-5,539	-1,378	2,014	44	0	1,211	14,431
2048	18,172	-5,600	-1,390	2,132	45	0	1,255	14,615
2049	18,175	-5,640	-1,401	2,254	45	0	1,293	14,726
2050	18,223	-5,681	-1,413	2,382	46	0	1,333	14,890

Table A-94: Zone C Summer Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,853	-114	-26	4	-6	0	23	2,734
2021	2,877	-181	-86	9	-11	0	36	2,644
2022	2,909	-264	-42	18	-15	0	48	2,654
2023	2,921	-314	-48	24	-22	0	60	2,621
2024	2,945	-379	-72	32	-29	0	71	2,569
2025	2,978	-454	-95	39	-37	0	86	2,517
2026	2,993	-535	-20	60	-31	0	100	2,567
2027	3,014	-575	-21	79	-37	0	114	2,574
2028	3,036	-613	-22	101	-42	0	127	2,588
2029	3,058	-651	-22	125	-47	0	141	2,605
2030	3,084	-694	-23	147	-53	0	154	2,616
2031	3,108	-726	-23	172	-57	0	168	2,642
2032	3,089	-709	-23	198	-63	0	180	2,671
2033	3,113	-740	-23	224	-69	0	194	2,699
2034	3,138	-769	-24	252	-73	0	208	2,732
2035	3,161	-797	-24	280	-77	0	222	2,765
2036	3,185	-822	-24	307	-82	0	234	2,798
2037	3,209	-849	-24	337	-85	0	248	2,835
2038	3,230	-874	-25	365	-87	0	262	2,871
2039	3,251	-897	-25	397	-89	0	276	2,912
2040	3,275	-925	-25	431	-91	0	289	2,955
2041	3,298	-948	-25	461	-93	0	304	2,997
2042	3,320	-968	-25	494	-95	0	318	3,043
2043	3,343	-988	-26	528	-97	0	331	3,092
2044	3,365	-1,006	-26	562	-99	0	345	3,142
2045	3,388	-1,026	-26	601	-101	0	360	3,196
2046	3,412	-1,043	-26	637	-103	0	374	3,251
2047	3,436	-1,060	-23	676	-105	0	388	3,311
2048	3,460	-1,075	-27	713	-107	0	401	3,366
2049	3,486	-1,091	-27	757	-109	0	415	3,430
2050	3,511	-1,106	-27	799	-111	0	429	3,495

Table A-95: Zone C Winter Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	2,648	-219	0	13	-11	0	37	2,469
2021-22	2,674	-284	0	18	-15	0	49	2,442
2022-23	2,701	-343	0	24	-22	0	62	2,422
2023-24	2,724	-400	0	32	-29	0	74	2,401
2024-25	2,740	-456	0	39	-37	0	89	2,375
2025-26	2,728	-489	0	52	-44	0	103	2,350
2026-27	2,750	-525	0	69	-52	0	117	2,359
2027-28	2,763	-556	0	88	-60	0	131	2,366
2028-29	2,771	-620	0	125	-47	0	148	2,377
2029-30	2,792	-657	0	147	-53	0	162	2,392
2030-31	2,812	-684	0	172	-57	0	176	2,418
2031-32	2,768	-665	0	198	-63	0	189	2,426
2032-33	2,788	-691	0	224	-69	0	203	2,455
2033-34	2,801	-713	0	252	-73	0	217	2,484
2034-35	2,807	-733	0	280	-77	0	231	2,508
2035-36	2,828	-754	0	307	-82	0	244	2,543
2036-37	2,814	-769	0	337	-85	0	257	2,554
2037-38	2,833	-788	0	365	-87	0	270	2,593
2038-39	2,841	-805	0	397	-89	0	284	2,627
2039-40	2,858	-826	0	431	-91	0	296	2,668
2040-41	2,864	-842	0	461	-93	0	310	2,699
2041-42	2,877	-858	0	494	-95	0	323	2,741
2042-43	2,863	-866	0	528	-97	0	335	2,763
2043-44	2,883	-880	0	562	-99	0	348	2,814
2044-45	2,892	-893	0	601	-101	0	361	2,860
2045-46	2,895	-903	0	637	-103	0	373	2,900
2046-47	2,908	-914	0	676	-105	0	386	2,951
2047-48	2,922	-923	0	713	-107	0	396	3,002
2048-49	2,917	-928	0	757	-109	0	408	3,045
2049-50	2,926	-935	0	799	-111	0	420	3,099
2050-51	2,935	-943	0	844	-113	0	432	3,156

Table A-96: Zone D Energy – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	4,417	-195	-33	5	0	0	25	4,220
2021	4,384	-307	-42	6	0	0	37	4,079
2022	4,396	-411	-49	9	0	0	50	3,996
2023	4,410	-506	-58	12	1	0	62	3,921
2024	4,431	-601	-89	16	1	0	75	3,833
2025	4,415	-689	-123	20	1	0	90	3,714
2026	4,410	-747	-131	26	1	0	105	3,664
2027	4,408	-800	-139	34	1	0	120	3,624
2028	4,427	-852	-147	43	2	0	134	3,607
2029	4,416	-897	-156	53	2	0	148	3,566
2030	4,420	-952	-162	62	2	0	162	3,533
2031	4,424	-990	-167	73	2	0	176	3,518
2032	4,446	-1,029	-172	84	2	0	190	3,522
2033	4,435	-1,061	-176	95	3	0	204	3,500
2034	4,440	-1,094	-178	107	3	0	217	3,496
2035	4,446	-1,125	-182	118	4	0	231	3,492
2036	4,466	-1,156	-185	130	4	0	245	3,504
2037	4,451	-1,179	-187	142	4	0	257	3,489
2038	4,450	-1,204	-190	153	4	0	270	3,485
2039	4,447	-1,226	-193	167	4	0	284	3,483
2040	4,464	-1,257	-195	181	4	0	297	3,494
2041	4,444	-1,273	-196	193	4	0	309	3,481
2042	4,440	-1,291	-198	207	4	0	322	3,484
2043	4,436	-1,307	-199	221	4	0	335	3,491
2044	4,447	-1,324	-201	236	4	0	348	3,511
2045	4,426	-1,333	-203	251	4	0	360	3,505
2046	4,422	-1,345	-204	267	5	0	372	3,518
2047	4,419	-1,354	-206	283	5	0	385	3,531
2048	4,432	-1,366	-207	300	5	0	397	3,561
2049	4,414	-1,370	-209	317	5	0	408	3,565
2050	4,413	-1,376	-212	336	5	0	419	3,586

Table A-97: Zone D Summer Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	538	-21	-2	1	0	0	7	521
2021	533	-33	-8	1	-1	0	11	503
2022	536	-47	-4	2	-1	0	15	502
2023	538	-58	-4	3	-1	0	19	496
2024	541	-70	-7	4	-2	0	22	488
2025	546	-86	-9	5	-3	0	27	481
2026	543	-93	-2	7	-2	0	31	485
2027	544	-100	-2	10	-2	0	36	485
2028	546	-106	-2	13	-3	0	40	488
2029	548	-113	-3	16	-3	0	44	490
2030	550	-120	-3	18	-4	0	49	490
2031	551	-125	-3	21	-4	0	53	494
2032	550	-126	-3	24	-4	0	57	498
2033	552	-131	-3	28	-6	0	61	500
2034	554	-136	-3	31	-7	0	66	505
2035	556	-140	-3	34	-7	0	70	510
2036	558	-144	-3	38	-7	0	73	515
2037	560	-148	-3	41	-7	0	78	520
2038	561	-152	-3	45	-8	0	82	525
2039	563	-155	-3	48	-8	0	86	531
2040	564	-159	-3	52	-8	0	90	536
2041	565	-162	-3	56	-8	0	94	541
2042	566	-165	-3	60	-8	0	98	547
2043	567	-168	-3	64	-8	0	102	554
2044	568	-170	-3	68	-8	0	106	561
2045	569	-172	-3	73	-9	0	110	568
2046	570	-174	-3	77	-9	0	114	576
2047	572	-176	-3	82	-9	0	118	584
2048	574	-178	-3	87	-9	0	122	592
2049	576	-180	-3	92	-9	0	126	601
2050	578	-182	-4	98	-9	0	130	610

Table A-98: Zone D Winter Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	552	-46	0	2	-1	0	12	519
2021-22	556	-59	0	2	-1	0	15	513
2022-23	558	-71	0	3	-1	0	19	508
2023-24	560	-82	0	4	-2	0	23	503
2024-25	561	-93	0	5	-3	0	28	498
2025-26	559	-100	0	6	-3	0	32	494
2026-27	559	-107	0	8	-4	0	37	495
2027-28	561	-113	0	11	-4	0	41	496
2028-29	561	-122	0	16	-3	0	47	498
2029-30	562	-129	0	18	-4	0	51	499
2030-31	564	-133	0	21	-4	0	56	503
2031-32	560	-135	0	24	-4	0	60	505
2032-33	562	-139	0	28	-6	0	64	508
2033-34	563	-143	0	31	-7	0	68	513
2034-35	564	-147	0	34	-7	0	73	517
2035-36	566	-151	0	38	-7	0	76	522
2036-37	565	-154	0	41	-7	0	80	525
2037-38	566	-157	0	45	-8	0	84	530
2038-39	566	-160	0	48	-8	0	88	535
2039-40	567	-164	0	52	-8	0	92	540
2040-41	567	-167	0	56	-8	0	96	544
2041-42	568	-169	0	60	-8	0	100	550
2042-43	566	-171	0	64	-8	0	103	554
2043-44	567	-173	0	68	-8	0	107	561
2044-45	567	-175	0	73	-9	0	111	567
2045-46	567	-177	0	77	-9	0	114	573
2046-47	568	-178	0	82	-9	0	118	580
2047-48	569	-180	0	87	-9	0	120	587
2048-49	568	-181	0	92	-9	0	124	594
2049-50	569	-182	0	98	-9	0	127	602
2050-51	570	-183	0	103	-9	0	130	611

Table A-99: Zone E Energy – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	7,900	-348	-157	17	1	0	37	7,451
2021	7,907	-554	-192	22	2	0	56	7,240
2022	7,972	-744	-226	30	2	0	74	7,108
2023	8,027	-922	-258	40	3	0	93	6,983
2024	8,092	-1,097	-386	53	4	0	111	6,777
2025	8,108	-1,265	-515	65	6	0	133	6,531
2026	8,141	-1,378	-533	86	7	0	155	6,477
2027	8,174	-1,484	-550	114	8	0	176	6,438
2028	8,228	-1,583	-565	146	9	0	198	6,433
2029	8,242	-1,673	-579	179	10	0	218	6,396
2030	8,289	-1,784	-589	212	11	0	238	6,376
2031	8,332	-1,864	-596	247	12	0	258	6,389
2032	8,394	-1,942	-604	285	13	0	280	6,425
2033	8,412	-2,013	-611	322	14	0	299	6,424
2034	8,449	-2,081	-617	362	15	0	320	6,448
2035	8,485	-2,146	-623	403	16	0	341	6,476
2036	8,541	-2,210	-629	443	17	0	362	6,524
2037	8,551	-2,265	-635	484	18	0	381	6,534
2038	8,579	-2,320	-641	524	18	0	401	6,563
2039	8,605	-2,372	-646	570	19	0	422	6,598
2040	8,665	-2,441	-651	621	19	0	443	6,656
2041	8,677	-2,486	-657	662	20	0	462	6,678
2042	8,708	-2,531	-663	709	20	0	482	6,727
2043	8,738	-2,573	-668	759	20	0	503	6,779
2044	8,789	-2,617	-674	809	21	0	524	6,853
2045	8,796	-2,649	-679	861	21	0	543	6,892
2046	8,825	-2,682	-685	915	22	0	562	6,957
2047	8,852	-2,712	-691	970	22	0	582	7,024
2048	8,901	-2,743	-697	1,028	22	0	603	7,115
2049	8,906	-2,764	-703	1,086	23	0	621	7,170
2050	8,933	-2,785	-708	1,148	23	0	640	7,251

Table A-100: Zone E Summer Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	1,359	-54	-13	2	-4	0	11	1,301
2021	1,370	-86	-43	4	-6	0	17	1,257
2022	1,386	-128	-21	9	-8	0	23	1,261
2023	1,390	-150	-24	11	-11	0	28	1,245
2024	1,402	-181	-35	15	-14	0	34	1,220
2025	1,421	-219	-47	19	-19	0	41	1,195
2026	1,426	-253	-10	28	-16	0	47	1,223
2027	1,436	-273	-10	38	-18	0	54	1,226
2028	1,447	-291	-11	48	-21	0	60	1,233
2029	1,458	-309	-11	59	-23	0	67	1,241
2030	1,471	-330	-11	70	-26	0	73	1,246
2031	1,483	-345	-11	81	-28	0	79	1,259
2032	1,476	-339	-11	94	-31	0	85	1,273
2033	1,488	-354	-12	106	-34	0	92	1,286
2034	1,500	-368	-12	119	-36	0	98	1,302
2035	1,512	-381	-12	133	-39	0	105	1,318
2036	1,523	-393	-12	145	-41	0	111	1,334
2037	1,535	-406	-12	159	-42	0	117	1,351
2038	1,546	-418	-12	173	-43	0	124	1,369
2039	1,556	-430	-12	187	-44	0	130	1,388
2040	1,568	-443	-12	204	-45	0	136	1,408
2041	1,580	-454	-12	218	-46	0	143	1,429
2042	1,591	-464	-13	233	-47	0	150	1,451
2043	1,603	-474	-13	250	-48	0	156	1,474
2044	1,614	-483	-13	266	-49	0	163	1,498
2045	1,626	-492	-13	284	-50	0	170	1,524
2046	1,638	-501	-13	301	-51	0	176	1,551
2047	1,650	-509	-12	319	-52	0	183	1,580
2048	1,662	-516	-13	337	-53	0	189	1,606
2049	1,676	-525	-13	358	-54	0	195	1,637
2050	1,689	-532	-13	378	-55	0	202	1,668

Table A-101: Zone E Winter Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	1,246	-103	0	6	-6	0	18	1,161
2021-22	1,258	-134	0	9	-8	0	23	1,148
2022-23	1,271	-161	0	11	-11	0	29	1,139
2023-24	1,282	-188	0	15	-14	0	35	1,129
2024-25	1,290	-215	0	19	-19	0	42	1,117
2025-26	1,285	-231	0	24	-22	0	49	1,106
2026-27	1,296	-247	0	33	-26	0	56	1,110
2027-28	1,302	-262	0	42	-30	0	62	1,114
2028-29	1,306	-292	0	59	-23	0	70	1,120
2029-30	1,316	-310	0	70	-26	0	77	1,127
2030-31	1,326	-322	0	81	-28	0	83	1,139
2031-32	1,306	-314	0	94	-31	0	89	1,144
2032-33	1,316	-326	0	106	-34	0	96	1,158
2033-34	1,322	-337	0	119	-36	0	103	1,171
2034-35	1,325	-346	0	133	-39	0	109	1,182
2035-36	1,335	-356	0	145	-41	0	115	1,199
2036-37	1,330	-363	0	159	-42	0	122	1,205
2037-38	1,339	-373	0	173	-43	0	128	1,224
2038-39	1,343	-381	0	187	-44	0	134	1,240
2039-40	1,352	-391	0	204	-45	0	140	1,259
2040-41	1,355	-399	0	218	-46	0	146	1,274
2041-42	1,362	-406	0	233	-47	0	152	1,294
2042-43	1,356	-410	0	250	-48	0	158	1,305
2043-44	1,366	-417	0	266	-49	0	164	1,330
2044-45	1,371	-423	0	284	-50	0	170	1,351
2045-46	1,373	-428	0	301	-51	0	176	1,371
2046-47	1,380	-434	0	319	-52	0	182	1,395
2047-48	1,387	-438	0	337	-53	0	187	1,420
2048-49	1,386	-441	0	358	-54	0	192	1,441
2049-50	1,391	-445	0	378	-55	0	198	1,467
2050-51	1,396	-448	0	399	-56	0	203	1,494

Table A-102: Zone F Energy – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	12,326	-543	-254	26	2	0	58	11,614
2021	12,337	-864	-310	34	3	0	86	11,285
2022	12,442	-1,162	-365	47	4	0	115	11,081
2023	12,530	-1,439	-416	62	6	0	143	10,886
2024	12,635	-1,713	-622	81	7	0	172	10,560
2025	12,663	-1,976	-830	100	9	0	206	10,172
2026	12,719	-2,153	-860	132	11	0	239	10,088
2027	12,774	-2,319	-887	176	13	0	272	10,028
2028	12,863	-2,475	-912	225	14	0	305	10,020
2029	12,887	-2,616	-935	276	16	0	336	9,963
2030	12,964	-2,791	-951	326	18	0	367	9,933
2031	13,035	-2,916	-963	380	19	0	398	9,953
2032	13,136	-3,039	-977	439	21	0	431	10,010
2033	13,167	-3,150	-988	495	23	0	461	10,009
2034	13,229	-3,259	-998	557	25	0	493	10,048
2035	13,289	-3,361	-1,007	619	26	0	524	10,091
2036	13,382	-3,462	-1,017	681	28	0	557	10,168
2037	13,402	-3,550	-1,026	743	29	0	587	10,184
2038	13,452	-3,637	-1,036	806	29	0	617	10,231
2039	13,498	-3,720	-1,044	875	30	0	649	10,287
2040	13,598	-3,830	-1,053	953	31	0	681	10,380
2041	13,622	-3,902	-1,063	1,016	31	0	711	10,416
2042	13,677	-3,975	-1,072	1,089	32	0	742	10,493
2043	13,730	-4,043	-1,081	1,164	33	0	773	10,576
2044	13,817	-4,113	-1,089	1,242	33	0	806	10,695
2045	13,833	-4,167	-1,098	1,322	34	0	834	10,758
2046	13,885	-4,221	-1,107	1,405	35	0	864	10,861
2047	13,935	-4,269	-1,117	1,490	35	0	893	10,967
2048	14,020	-4,320	-1,127	1,577	36	0	925	11,112
2049	14,033	-4,354	-1,136	1,667	37	0	952	11,199
2050	14,082	-4,390	-1,146	1,762	37	0	982	11,327

Table A-103: Zone F Summer Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,497	-100	-25	4	-7	0	20	2,389
2021	2,517	-158	-81	8	-12	0	31	2,305
2022	2,547	-239	-40	16	-16	0	42	2,310
2023	2,550	-274	-45	21	-23	0	52	2,280
2024	2,573	-331	-67	27	-28	0	62	2,235
2025	2,614	-408	-90	34	-37	0	75	2,188
2026	2,619	-462	-19	51	-30	0	86	2,246
2027	2,638	-498	-20	69	-36	0	98	2,252
2028	2,659	-531	-20	88	-40	0	110	2,265
2029	2,680	-565	-21	108	-44	0	122	2,280
2030	2,704	-603	-21	127	-50	0	133	2,290
2031	2,727	-631	-21	148	-54	0	145	2,312
2032	2,719	-624	-22	171	-60	0	156	2,339
2033	2,742	-652	-22	193	-65	0	167	2,363
2034	2,764	-678	-22	218	-69	0	179	2,392
2035	2,786	-702	-23	242	-73	0	191	2,421
2036	2,808	-725	-23	265	-77	0	202	2,450
2037	2,831	-749	-23	290	-80	0	214	2,483
2038	2,852	-771	-23	315	-82	0	225	2,515
2039	2,872	-793	-23	341	-84	0	237	2,550
2040	2,895	-817	-23	371	-86	0	249	2,588
2041	2,917	-838	-24	397	-88	0	261	2,625
2042	2,939	-857	-24	425	-90	0	273	2,666
2043	2,962	-875	-24	454	-92	0	285	2,710
2044	2,984	-892	-24	483	-93	0	296	2,754
2045	3,006	-910	-25	517	-95	0	309	2,802
2046	3,030	-927	-25	548	-97	0	321	2,851
2047	3,054	-942	-22	582	-99	0	333	2,905
2048	3,078	-956	-25	614	-101	0	343	2,953
2049	3,104	-972	-25	651	-103	0	355	3,010
2050	3,129	-986	-26	687	-105	0	367	3,067

Table A-104: Zone F Winter Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	2,263	-187	0	11	-12	0	32	2,108
2021-22	2,286	-243	0	16	-16	0	43	2,085
2022-23	2,309	-293	0	21	-23	0	53	2,068
2023-24	2,328	-342	0	27	-28	0	64	2,050
2024-25	2,344	-390	0	34	-37	0	77	2,028
2025-26	2,338	-419	0	45	-43	0	89	2,009
2026-27	2,357	-450	0	59	-51	0	101	2,017
2027-28	2,370	-477	0	76	-57	0	113	2,025
2028-29	2,377	-531	0	108	-44	0	128	2,036
2029-30	2,396	-563	0	127	-50	0	140	2,049
2030-31	2,413	-587	0	148	-54	0	152	2,072
2031-32	2,379	-572	0	171	-60	0	163	2,082
2032-33	2,398	-594	0	193	-65	0	175	2,107
2033-34	2,409	-614	0	218	-69	0	187	2,132
2034-35	2,416	-631	0	242	-73	0	199	2,152
2035-36	2,434	-649	0	265	-77	0	210	2,183
2036-37	2,426	-663	0	290	-80	0	222	2,194
2037-38	2,444	-680	0	315	-82	0	233	2,229
2038-39	2,452	-695	0	341	-84	0	244	2,259
2039-40	2,467	-713	0	371	-86	0	255	2,294
2040-41	2,474	-728	0	397	-88	0	267	2,322
2041-42	2,488	-742	0	425	-90	0	278	2,359
2042-43	2,479	-750	0	454	-92	0	288	2,380
2043-44	2,499	-763	0	483	-93	0	299	2,425
2044-45	2,508	-775	0	517	-95	0	310	2,465
2045-46	2,513	-784	0	548	-97	0	320	2,500
2046-47	2,526	-794	0	582	-99	0	331	2,545
2047-48	2,541	-802	0	614	-101	0	340	2,591
2048-49	2,541	-809	0	651	-103	0	350	2,630
2049-50	2,551	-816	0	687	-105	0	360	2,678
2050-51	2,561	-823	0	726	-107	0	370	2,728

Table A-105: Zone G Energy – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	9,957	-438	-354	33	2	0	46	9,246
2021	10,024	-702	-414	43	3	0	68	9,022
2022	10,166	-949	-466	60	5	0	91	8,907
2023	10,296	-1,182	-507	80	8	0	114	8,809
2024	10,444	-1,416	-730	104	10	0	138	8,551
2025	10,525	-1,642	-944	131	13	0	166	8,249
2026	10,626	-1,799	-955	172	15	0	194	8,253
2027	10,727	-1,947	-968	227	18	0	222	8,278
2028	10,860	-2,089	-984	288	20	0	250	8,346
2029	10,937	-2,219	-998	351	21	0	276	8,368
2030	11,058	-2,380	-1,007	413	24	0	303	8,412
2031	11,174	-2,499	-1,016	480	26	0	331	8,496
2032	11,315	-2,618	-1,027	553	29	0	360	8,613
2033	11,397	-2,726	-1,033	621	31	0	387	8,677
2034	11,505	-2,834	-1,042	698	34	0	415	8,777
2035	11,614	-2,936	-1,049	776	36	0	444	8,884
2036	11,753	-3,040	-1,059	854	38	0	474	9,020
2037	11,826	-3,132	-1,067	934	39	0	501	9,102
2038	11,928	-3,224	-1,076	1,014	40	0	530	9,212
2039	12,027	-3,314	-1,084	1,104	41	0	560	9,334
2040	12,176	-3,429	-1,093	1,203	42	0	591	9,490
2041	12,257	-3,510	-1,103	1,282	43	0	619	9,588
2042	12,366	-3,593	-1,112	1,375	44	0	649	9,728
2043	12,473	-3,672	-1,122	1,470	45	0	679	9,873
2044	12,614	-3,754	-1,131	1,569	46	0	711	10,054
2045	12,691	-3,822	-1,141	1,669	47	0	738	10,183
2046	12,803	-3,891	-1,151	1,774	48	0	768	10,351
2047	12,915	-3,956	-1,160	1,882	49	0	797	10,526
2048	13,060	-4,023	-1,170	1,992	50	0	828	10,737
2049	13,136	-4,075	-1,179	2,105	51	0	855	10,893
2050	13,248	-4,130	-1,187	2,224	52	0	885	11,092

Table A-106: Zone G Summer Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,314	-92	-31	4	-7	0	14	2,202
2021	2,381	-149	-97	9	-11	0	22	2,155
2022	2,425	-221	-45	18	-17	0	30	2,190
2023	2,450	-264	-49	24	-28	0	37	2,171
2024	2,489	-320	-71	31	-35	0	45	2,139
2025	2,498	-351	-91	40	-45	0	54	2,104
2026	2,561	-482	-19	60	-37	0	63	2,146
2027	2,595	-520	-19	79	-44	0	72	2,163
2028	2,631	-556	-20	101	-49	0	81	2,189
2029	2,668	-592	-20	123	-54	0	90	2,214
2030	2,707	-634	-20	145	-61	0	99	2,236
2031	2,746	-666	-20	168	-66	0	108	2,270
2032	2,711	-623	-20	193	-73	0	117	2,304
2033	2,749	-654	-21	217	-78	0	126	2,340
2034	2,788	-683	-21	244	-85	0	136	2,378
2035	2,826	-712	-21	271	-90	0	145	2,419
2036	2,864	-739	-21	298	-95	0	154	2,461
2037	2,902	-768	-21	327	-98	0	164	2,506
2038	2,940	-795	-22	355	-100	0	174	2,551
2039	2,977	-822	-22	386	-102	0	184	2,600
2040	3,018	-852	-22	420	-105	0	193	2,653
2041	3,058	-879	-22	449	-107	0	204	2,703
2042	3,098	-904	-22	481	-110	0	214	2,758
2043	3,139	-928	-22	514	-112	0	224	2,815
2044	3,180	-951	-23	547	-114	0	234	2,874
2045	3,221	-975	-23	585	-117	0	245	2,936
2046	3,266	-999	-23	620	-119	0	256	3,001
2047	3,309	-1,021	-21	658	-122	0	266	3,070
2048	3,354	-1,042	-23	694	-124	0	276	3,135
2049	3,400	-1,064	-24	736	-127	0	286	3,208
2050	3,446	-1,085	-24	778	-129	0	297	3,282

Table A-107: Zone G Winter Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	1,649	-136	0	13	-10	0	23	1,538
2021-22	1,675	-178	0	18	-17	0	31	1,528
2022-23	1,701	-216	0	24	-28	0	38	1,520
2023-24	1,721	-253	0	31	-35	0	46	1,511
2024-25	1,739	-289	0	40	-45	0	56	1,500
2025-26	1,743	-313	0	52	-52	0	65	1,495
2026-27	1,765	-337	0	69	-63	0	74	1,508
2027-28	1,783	-359	0	87	-70	0	83	1,525
2028-29	1,797	-404	0	123	-54	0	95	1,556
2029-30	1,816	-429	0	145	-61	0	104	1,574
2030-31	1,836	-449	0	168	-66	0	113	1,603
2031-32	1,817	-437	0	193	-73	0	122	1,622
2032-33	1,838	-455	0	217	-78	0	132	1,654
2033-34	1,855	-472	0	244	-85	0	142	1,684
2034-35	1,866	-488	0	271	-90	0	151	1,711
2035-36	1,886	-503	0	298	-95	0	160	1,746
2036-37	1,889	-516	0	327	-98	0	170	1,771
2037-38	1,909	-531	0	355	-100	0	179	1,812
2038-39	1,925	-545	0	386	-102	0	189	1,852
2039-40	1,944	-562	0	420	-105	0	198	1,896
2040-41	1,955	-575	0	449	-107	0	208	1,930
2041-42	1,973	-588	0	481	-110	0	218	1,973
2042-43	1,976	-598	0	514	-112	0	227	2,007
2043-44	2,001	-611	0	547	-114	0	236	2,059
2044-45	2,017	-623	0	585	-117	0	246	2,108
2045-46	2,028	-633	0	620	-119	0	255	2,152
2046-47	2,045	-643	0	658	-122	0	265	2,203
2047-48	2,064	-652	0	694	-124	0	273	2,256
2048-49	2,075	-660	0	736	-127	0	282	2,306
2049-50	2,093	-669	0	778	-129	0	291	2,363
2050-51	2,111	-678	0	821	-132	0	300	2,422

Table A-108: Zone H Energy – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,765	-122	-35	6	0	0	13	2,627
2021	2,767	-194	-42	7	0	0	20	2,558
2022	2,788	-260	-50	10	1	0	26	2,515
2023	2,807	-322	-57	13	1	0	33	2,475
2024	2,832	-384	-85	18	1	0	40	2,421
2025	2,840	-443	-113	22	2	0	48	2,354
2026	2,853	-483	-117	29	2	0	56	2,339
2027	2,866	-520	-120	38	2	0	63	2,329
2028	2,887	-555	-124	48	2	0	71	2,330
2029	2,893	-587	-127	59	3	0	79	2,320
2030	2,908	-626	-128	70	3	0	86	2,313
2031	2,921	-653	-130	81	3	0	94	2,316
2032	2,941	-680	-132	93	4	0	102	2,328
2033	2,946	-705	-133	105	4	0	109	2,327
2034	2,958	-729	-134	118	4	0	117	2,335
2035	2,971	-751	-135	131	5	0	125	2,345
2036	2,990	-774	-136	144	5	0	133	2,363
2037	2,994	-793	-138	158	5	0	141	2,368
2038	3,005	-813	-139	171	5	0	149	2,379
2039	3,015	-831	-140	186	5	0	157	2,393
2040	3,034	-854	-141	203	5	0	165	2,412
2041	3,037	-870	-142	217	6	0	173	2,420
2042	3,047	-885	-143	232	6	0	181	2,437
2043	3,057	-900	-145	248	6	0	189	2,455
2044	3,074	-915	-146	265	6	0	198	2,482
2045	3,077	-927	-147	282	6	0	205	2,496
2046	3,088	-939	-148	300	6	0	213	2,520
2047	3,099	-949	-150	318	6	0	221	2,545
2048	3,117	-960	-151	336	6	0	230	2,579
2049	3,120	-968	-152	356	6	0	238	2,600
2050	3,131	-976	-153	376	7	0	246	2,630

Table A-109: Zone H Summer Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	634	-25	-4	1	-1	0	5	609
2021	641	-40	-12	2	-2	0	8	596
2022	648	-63	-6	4	-2	0	10	591
2023	647	-70	-7	5	-4	0	13	584
2024	653	-84	-10	6	-5	0	15	575
2025	663	-103	-14	8	-6	0	18	566
2026	664	-122	-3	12	-5	0	21	567
2027	669	-131	-3	16	-6	0	24	569
2028	675	-139	-3	20	-7	0	27	572
2029	680	-148	-3	24	-8	0	30	575
2030	685	-157	-3	29	-9	0	33	578
2031	691	-164	-3	34	-10	0	36	582
2032	682	-157	-3	39	-11	0	39	588
2033	687	-163	-3	44	-12	0	42	594
2034	693	-170	-3	49	-13	0	45	600
2035	698	-176	-3	55	-14	0	48	607
2036	703	-182	-3	60	-14	0	51	614
2037	709	-188	-3	65	-15	0	54	622
2038	714	-193	-3	71	-15	0	57	630
2039	719	-198	-3	77	-16	0	60	639
2040	724	-204	-3	84	-16	0	63	647
2041	729	-209	-4	90	-16	0	66	656
2042	734	-214	-4	96	-17	0	70	665
2043	739	-219	-4	103	-17	0	73	676
2044	744	-223	-4	110	-17	0	76	686
2045	750	-227	-4	117	-18	0	79	698
2046	755	-231	-4	124	-18	0	83	710
2047	761	-235	-3	132	-18	0	86	722
2048	767	-238	-4	139	-19	0	89	734
2049	773	-242	-4	148	-19	0	92	748
2050	779	-245	-4	156	-19	0	96	762

Table A-110: Zone H Winter Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	533	-44	0	3	-2	0	8	497
2021-22	537	-57	0	4	-2	0	10	492
2022-23	543	-69	0	5	-4	0	13	488
2023-24	547	-80	0	6	-5	0	15	483
2024-25	550	-92	0	8	-6	0	19	479
2025-26	549	-98	0	10	-8	0	22	475
2026-27	553	-106	0	14	-9	0	25	477
2027-28	556	-112	0	17	-11	0	28	479
2028-29	557	-126	0	24	-8	0	32	479
2029-30	561	-133	0	29	-9	0	35	482
2030-31	564	-139	0	34	-10	0	38	487
2031-32	554	-133	0	39	-11	0	40	489
2032-33	558	-138	0	44	-12	0	44	495
2033-34	561	-143	0	49	-13	0	47	501
2034-35	561	-147	0	55	-14	0	50	505
2035-36	565	-151	0	60	-14	0	53	512
2036-37	563	-154	0	65	-15	0	56	516
2037-38	567	-158	0	71	-15	0	59	524
2038-39	569	-161	0	77	-16	0	62	531
2039-40	571	-165	0	84	-16	0	65	539
2040-41	572	-168	0	90	-16	0	68	545
2041-42	574	-171	0	96	-17	0	71	553
2042-43	572	-173	0	103	-17	0	74	559
2043-44	576	-176	0	110	-17	0	76	569
2044-45	578	-178	0	117	-18	0	80	578
2045-46	578	-180	0	124	-18	0	83	587
2046-47	581	-183	0	132	-18	0	85	597
2047-48	583	-184	0	139	-19	0	88	608
2048-49	584	-186	0	148	-19	0	91	617
2049-50	586	-187	0	156	-19	0	94	629
2050-51	587	-189	0	165	-20	0	97	640

Table A-111: Zone I Energy – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	6,099	-269	-38	11	0	0	28	5,832
2021	6,104	-428	-43	14	1	0	43	5,691
2022	6,152	-574	-50	20	1	0	57	5,606
2023	6,201	-712	-56	26	2	0	72	5,533
2024	6,263	-849	-83	35	2	0	87	5,456
2025	6,293	-982	-109	44	3	0	104	5,354
2026	6,333	-1,072	-112	58	4	0	122	5,332
2027	6,373	-1,157	-115	75	4	0	140	5,321
2028	6,431	-1,237	-118	95	5	0	158	5,334
2029	6,458	-1,311	-120	115	5	0	175	5,322
2030	6,490	-1,397	-122	135	6	0	192	5,304
2031	6,520	-1,458	-123	156	6	0	209	5,311
2032	6,565	-1,519	-124	180	7	0	228	5,336
2033	6,579	-1,574	-125	202	8	0	245	5,335
2034	6,611	-1,628	-126	226	8	0	263	5,354
2035	6,645	-1,680	-126	251	9	0	282	5,379
2036	6,697	-1,732	-127	276	9	0	301	5,423
2037	6,716	-1,779	-128	301	10	0	319	5,439
2038	6,751	-1,825	-129	327	10	0	338	5,472
2039	6,786	-1,870	-130	356	10	0	357	5,510
2040	6,830	-1,923	-131	388	10	0	377	5,551
2041	6,842	-1,959	-132	414	10	0	395	5,570
2042	6,872	-1,997	-133	444	11	0	415	5,611
2043	6,903	-2,032	-134	474	11	0	435	5,657
2044	6,954	-2,070	-135	506	11	0	456	5,722
2045	6,972	-2,100	-137	539	11	0	475	5,761
2046	7,010	-2,131	-138	572	11	0	495	5,821
2047	7,048	-2,159	-139	607	12	0	515	5,884
2048	7,104	-2,189	-140	643	12	0	537	5,967
2049	7,125	-2,210	-141	679	12	0	557	6,021
2050	7,164	-2,233	-142	718	12	0	577	6,096

Table A-112: Zone I Summer Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	1,370	-55	-3	1	-1	0	9	1,321
2021	1,392	-87	-11	3	-3	0	14	1,308
2022	1,408	-153	-5	6	-5	0	19	1,270
2023	1,387	-149	-6	8	-7	0	24	1,258
2024	1,402	-181	-8	11	-9	0	29	1,245
2025	1,441	-236	-11	14	-12	0	36	1,232
2026	1,432	-267	-2	21	-9	0	42	1,216
2027	1,445	-287	-2	28	-11	0	48	1,220
2028	1,459	-306	-2	35	-12	0	54	1,227
2029	1,474	-325	-3	42	-14	0	60	1,234
2030	1,486	-346	-3	49	-15	0	65	1,237
2031	1,497	-361	-3	57	-17	0	71	1,245
2032	1,473	-338	-3	66	-18	0	77	1,257
2033	1,485	-353	-3	74	-20	0	83	1,267
2034	1,498	-367	-3	83	-22	0	90	1,279
2035	1,510	-381	-3	92	-23	0	96	1,292
2036	1,523	-393	-3	101	-24	0	102	1,306
2037	1,538	-407	-3	110	-25	0	109	1,323
2038	1,551	-420	-3	120	-26	0	116	1,339
2039	1,564	-432	-3	131	-26	0	123	1,357
2040	1,576	-445	-3	142	-27	0	129	1,373
2041	1,588	-456	-3	152	-27	0	137	1,390
2042	1,600	-467	-3	163	-28	0	144	1,409
2043	1,615	-477	-3	174	-28	0	150	1,431
2044	1,628	-487	-3	185	-29	0	158	1,452
2045	1,642	-497	-3	198	-29	0	165	1,476
2046	1,657	-507	-3	210	-30	0	173	1,500
2047	1,672	-516	-3	223	-30	0	180	1,526
2048	1,688	-524	-3	235	-31	0	187	1,552
2049	1,706	-534	-3	249	-31	0	195	1,581
2050	1,722	-542	-3	263	-32	0	203	1,610

Table A-113: Zone I Winter Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	944	-78	0	4	-3	0	15	883
2021-22	951	-101	0	6	-5	0	20	872
2022-23	960	-122	0	8	-7	0	25	865
2023-24	966	-142	0	11	-9	0	30	857
2024-25	973	-162	0	14	-12	0	37	850
2025-26	977	-175	0	18	-13	0	43	849
2026-27	987	-188	0	24	-15	0	49	856
2027-28	993	-200	0	30	-18	0	55	861
2028-29	995	-229	0	42	-14	0	63	857
2029-30	1,000	-242	0	49	-15	0	69	861
2030-31	1,004	-251	0	57	-17	0	75	869
2031-32	985	-237	0	66	-18	0	81	877
2032-33	992	-246	0	74	-20	0	87	888
2033-34	995	-253	0	83	-22	0	94	897
2034-35	996	-260	0	92	-23	0	100	905
2035-36	1,002	-267	0	101	-24	0	107	918
2036-37	1,005	-275	0	110	-25	0	113	929
2037-38	1,014	-282	0	120	-26	0	120	946
2038-39	1,018	-288	0	131	-26	0	126	960
2039-40	1,021	-295	0	142	-27	0	132	973
2040-41	1,020	-300	0	152	-27	0	139	984
2041-42	1,024	-305	0	163	-28	0	146	1,000
2042-43	1,027	-311	0	174	-28	0	152	1,014
2043-44	1,036	-316	0	185	-29	0	159	1,035
2044-45	1,039	-321	0	198	-29	0	166	1,052
2045-46	1,040	-324	0	210	-30	0	172	1,068
2046-47	1,046	-329	0	223	-30	0	179	1,088
2047-48	1,052	-332	0	235	-31	0	185	1,109
2048-49	1,060	-337	0	249	-31	0	192	1,132
2049-50	1,065	-341	0	263	-32	0	199	1,154
2050-51	1,071	-344	0	278	-33	0	205	1,178

Table A-114: Zone J Energy – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	53,504	-2,355	-335	93	3	0	249	51,158
2021	53,545	-3,750	-377	122	6	0	373	49,919
2022	53,966	-5,037	-438	174	11	0	500	49,176
2023	54,398	-6,244	-495	232	16	0	628	48,535
2024	54,943	-7,448	-727	306	21	0	761	47,857
2025	55,206	-8,614	-959	388	27	0	916	46,966
2026	55,553	-9,402	-984	505	31	0	1,073	46,776
2027	55,907	-10,147	-1,007	659	36	0	1,229	46,677
2028	56,414	-10,852	-1,031	835	42	0	1,385	46,793
2029	56,652	-11,496	-1,056	1,008	46	0	1,534	46,688
2030	56,931	-12,252	-1,070	1,183	51	0	1,684	46,527
2031	57,192	-12,791	-1,077	1,371	57	0	1,837	46,588
2032	57,586	-13,321	-1,088	1,575	61	0	1,998	46,811
2033	57,715	-13,805	-1,096	1,769	67	0	2,150	46,799
2034	57,993	-14,283	-1,104	1,980	72	0	2,309	46,967
2035	58,287	-14,736	-1,109	2,200	76	0	2,470	47,189
2036	58,744	-15,194	-1,115	2,417	80	0	2,639	47,571
2037	58,912	-15,602	-1,122	2,642	84	0	2,797	47,711
2038	59,220	-16,009	-1,130	2,872	86	0	2,962	48,000
2039	59,527	-16,402	-1,139	3,126	88	0	3,132	48,331
2040	59,916	-16,871	-1,149	3,405	89	0	3,306	48,696
2041	60,020	-17,189	-1,159	3,631	91	0	3,468	48,863
2042	60,281	-17,514	-1,169	3,891	93	0	3,641	49,223
2043	60,556	-17,827	-1,179	4,161	95	0	3,815	49,620
2044	60,998	-18,156	-1,188	4,439	96	0	4,002	50,191
2045	61,161	-18,419	-1,199	4,725	98	0	4,166	50,532
2046	61,495	-18,689	-1,208	5,020	100	0	4,343	51,061
2047	61,828	-18,938	-1,219	5,324	102	0	4,521	51,619
2048	62,317	-19,198	-1,230	5,637	103	0	4,714	52,344
2049	62,502	-19,391	-1,239	5,958	105	0	4,883	52,819
2050	62,844	-19,589	-1,248	6,297	107	0	5,064	53,474

Table A-115: Zone J Summer Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	11,345	-453	-29	12	-10	0	75	10,941
2021	11,528	-723	-87	26	-24	0	120	10,839
2022	11,662	-1,272	-42	52	-38	0	161	10,524
2023	11,493	-1,237	-47	70	-57	0	202	10,423
2024	11,615	-1,496	-70	92	-73	0	242	10,310
2025	11,937	-1,958	-92	116	-96	0	295	10,203
2026	11,859	-2,208	-19	175	-78	0	344	10,073
2027	11,970	-2,376	-20	228	-89	0	394	10,108
2028	12,088	-2,533	-20	289	-103	0	443	10,163
2029	12,207	-2,692	-21	349	-114	0	494	10,223
2030	12,307	-2,867	-21	410	-127	0	542	10,244
2031	12,404	-2,994	-21	474	-141	0	592	10,314
2032	12,203	-2,803	-21	544	-152	0	640	10,412
2033	12,305	-2,926	-22	612	-165	0	692	10,496
2034	12,407	-3,042	-22	686	-178	0	745	10,597
2035	12,511	-3,153	-22	761	-189	0	798	10,706
2036	12,616	-3,257	-22	834	-198	0	849	10,821
2037	12,742	-3,372	-22	914	-208	0	904	10,959
2038	12,849	-3,475	-22	995	-212	0	959	11,092
2039	12,956	-3,577	-23	1,082	-217	0	1,015	11,237
2040	13,052	-3,685	-23	1,176	-220	0	1,070	11,370
2041	13,151	-3,779	-23	1,257	-225	0	1,131	11,512
2042	13,252	-3,865	-23	1,346	-230	0	1,189	11,670
2043	13,376	-3,953	-23	1,440	-234	0	1,246	11,851
2044	13,486	-4,032	-23	1,532	-238	0	1,306	12,031
2045	13,602	-4,117	-24	1,637	-243	0	1,370	12,225
2046	13,728	-4,198	-24	1,737	-247	0	1,431	12,427
2047	13,851	-4,273	-21	1,844	-252	0	1,493	12,641
2048	13,979	-4,342	-24	1,945	-255	0	1,551	12,854
2049	14,131	-4,424	-25	2,063	-260	0	1,616	13,100
2050	14,265	-4,493	-25	2,179	-265	0	1,679	13,340

Table A-116: Zone J Winter Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	7,821	-647	0	37	-22	0	124	7,312
2021-22	7,882	-839	0	52	-38	0	165	7,223
2022-23	7,950	-1,009	0	70	-57	0	208	7,162
2023-24	8,002	-1,174	0	92	-73	0	250	7,096
2024-25	8,057	-1,341	0	116	-96	0	303	7,040
2025-26	8,093	-1,452	0	151	-111	0	355	7,036
2026-27	8,174	-1,560	0	198	-127	0	406	7,091
2027-28	8,224	-1,655	0	250	-147	0	457	7,129
2028-29	8,241	-1,898	0	349	-114	0	519	7,097
2029-30	8,282	-2,003	0	410	-127	0	570	7,132
2030-31	8,320	-2,077	0	474	-141	0	621	7,198
2031-32	8,164	-1,962	0	544	-152	0	672	7,265
2032-33	8,220	-2,037	0	612	-165	0	724	7,355
2033-34	8,244	-2,100	0	686	-178	0	779	7,431
2034-35	8,251	-2,156	0	761	-189	0	832	7,499
2035-36	8,299	-2,213	0	834	-198	0	883	7,605
2036-37	8,328	-2,276	0	914	-208	0	937	7,696
2037-38	8,397	-2,336	0	995	-212	0	990	7,833
2038-39	8,434	-2,389	0	1,082	-217	0	1,045	7,955
2039-40	8,456	-2,444	0	1,176	-220	0	1,097	8,064
2040-41	8,451	-2,486	0	1,257	-225	0	1,154	8,152
2041-42	8,484	-2,530	0	1,346	-230	0	1,209	8,280
2042-43	8,511	-2,575	0	1,440	-234	0	1,261	8,402
2043-44	8,578	-2,618	0	1,532	-238	0	1,316	8,571
2044-45	8,604	-2,657	0	1,637	-243	0	1,374	8,715
2045-46	8,615	-2,688	0	1,737	-247	0	1,429	8,846
2046-47	8,661	-2,722	0	1,844	-252	0	1,484	9,015
2047-48	8,711	-2,751	0	1,945	-255	0	1,535	9,184
2048-49	8,780	-2,794	0	2,063	-260	0	1,590	9,379
2049-50	8,825	-2,821	0	2,179	-265	0	1,645	9,563
2050-51	8,869	-2,848	0	2,302	-269	0	1,701	9,754

Table A-117: Zone K Energy – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	21,568	-949	-692	138	3	0	99	20,167
2021	21,597	-1,512	-742	245	5	0	146	19,738
2022	21,778	-2,032	-755	361	8	0	195	19,554
2023	21,943	-2,519	-762	489	11	0	243	19,406
2024	22,157	-3,003	-1,036	643	14	0	292	19,066
2025	22,255	-3,472	-1,291	793	17	0	348	18,650
2026	22,415	-3,793	-1,266	954	20	0	404	18,734
2027	22,578	-4,097	-1,256	1,164	23	0	460	18,872
2028	22,795	-4,384	-1,255	1,398	26	0	523	19,103
2029	22,904	-4,647	-1,259	1,652	29	0	583	19,261
2030	23,020	-4,953	-1,259	1,930	32	0	647	19,416
2031	23,140	-5,174	-1,285	2,240	35	0	714	19,670
2032	23,315	-5,392	-1,295	2,548	39	0	785	19,999
2033	23,391	-5,594	-1,301	2,871	42	0	853	20,262
2034	23,527	-5,793	-1,309	3,227	45	0	928	20,625
2035	23,670	-5,983	-1,320	3,631	47	0	1,007	21,051
2036	23,879	-6,175	-1,331	4,058	50	0	1,092	21,573
2037	23,969	-6,347	-1,343	4,540	52	0	1,173	22,045
2038	24,121	-6,520	-1,356	5,070	53	0	1,264	22,632
2039	24,275	-6,687	-1,370	5,562	54	0	1,341	23,174
2040	24,455	-6,885	-1,382	6,025	55	0	1,440	23,710
2041	24,525	-7,022	-1,392	6,423	56	0	1,524	24,115
2042	24,659	-7,163	-1,403	6,885	57	0	1,611	24,647
2043	24,793	-7,297	-1,416	7,362	58	0	1,700	25,200
2044	25,002	-7,440	-1,429	7,854	59	0	1,793	25,838
2045	25,097	-7,556	-1,442	8,361	60	0	1,884	26,403
2046	25,262	-7,676	-1,455	8,884	61	0	1,977	27,054
2047	25,430	-7,787	-1,464	9,421	62	0	2,073	27,735
2048	25,666	-7,905	-1,476	9,974	63	0	2,172	28,494
2049	25,774	-7,994	-1,491	10,542	64	0	2,261	29,156
2050	25,955	-8,089	-1,506	11,141	65	0	2,357	29,924

Table A-118: Zone K Summer Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	5,606	-224	-60	18	-11	0	30	5,359
2021	5,726	-359	-173	52	-19	0	47	5,274
2022	5,812	-583	-73	109	-29	0	63	5,299
2023	5,791	-623	-73	148	-39	0	78	5,282
2024	5,866	-755	-100	193	-50	0	94	5,248
2025	5,960	-911	-124	239	-61	0	113	5,216
2026	6,014	-1,186	-25	332	-50	0	130	5,216
2027	6,087	-1,274	-25	406	-57	0	149	5,285
2028	6,161	-1,356	-25	486	-65	0	169	5,370
2029	6,235	-1,438	-25	575	-72	0	189	5,464
2030	6,305	-1,531	-25	673	-80	0	210	5,552
2031	6,374	-1,599	-26	780	-87	0	232	5,673
2032	6,205	-1,425	-26	885	-97	0	253	5,796
2033	6,277	-1,492	-26	1,000	-105	0	276	5,930
2034	6,350	-1,557	-26	1,126	-112	0	301	6,082
2035	6,424	-1,619	-26	1,265	-117	0	327	6,254
2036	6,500	-1,678	-27	1,409	-124	0	353	6,433
2037	6,580	-1,741	-27	1,581	-130	0	382	6,645
2038	6,655	-1,800	-27	1,767	-132	0	412	6,875
2039	6,731	-1,858	-27	1,937	-134	0	438	7,086
2040	6,807	-1,922	-27	2,094	-137	0	469	7,284
2041	6,883	-1,978	-28	2,239	-139	0	500	7,477
2042	6,959	-2,030	-28	2,398	-142	0	530	7,688
2043	7,042	-2,081	-28	2,564	-144	0	559	7,911
2044	7,122	-2,129	-28	2,729	-147	0	589	8,136
2045	7,206	-2,181	-29	2,916	-149	0	623	8,386
2046	7,296	-2,231	-29	3,094	-152	0	656	8,634
2047	7,385	-2,278	-26	3,284	-154	0	689	8,899
2048	7,478	-2,322	-29	3,464	-156	0	719	9,152
2049	7,576	-2,372	-30	3,674	-159	0	753	9,442
2050	7,671	-2,417	-30	3,881	-162	0	787	9,730

Table A-119: Zone K Winter Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	3,393	-281	0	74	-18	0	49	3,217
2021-22	3,421	-364	0	109	-29	0	65	3,203
2022-23	3,455	-438	0	148	-39	0	81	3,206
2023-24	3,475	-510	0	193	-50	0	97	3,205
2024-25	3,493	-581	0	239	-61	0	116	3,206
2025-26	3,497	-627	0	288	-71	0	134	3,221
2026-27	3,531	-674	0	351	-82	0	153	3,279
2027-28	3,554	-715	0	421	-93	0	174	3,341
2028-29	3,567	-820	0	575	-72	0	198	3,449
2029-30	3,579	-864	0	673	-80	0	220	3,529
2030-31	3,593	-895	0	780	-87	0	243	3,634
2031-32	3,519	-846	0	885	-97	0	265	3,727
2032-33	3,541	-877	0	1,000	-105	0	289	3,848
2033-34	3,557	-906	0	1,126	-112	0	315	3,980
2034-35	3,560	-930	0	1,265	-117	0	341	4,119
2035-36	3,580	-954	0	1,409	-124	0	367	4,278
2036-37	3,580	-978	0	1,581	-130	0	395	4,449
2037-38	3,607	-1,003	0	1,767	-132	0	425	4,664
2038-39	3,624	-1,027	0	1,937	-134	0	450	4,850
2039-40	3,637	-1,051	0	2,094	-137	0	481	5,024
2040-41	3,634	-1,069	0	2,239	-139	0	511	5,175
2041-42	3,646	-1,087	0	2,398	-142	0	539	5,354
2042-43	3,646	-1,103	0	2,564	-144	0	566	5,529
2043-44	3,673	-1,121	0	2,729	-147	0	593	5,728
2044-45	3,689	-1,139	0	2,916	-149	0	625	5,942
2045-46	3,693	-1,152	0	3,094	-152	0	655	6,138
2046-47	3,708	-1,165	0	3,284	-154	0	685	6,357
2047-48	3,727	-1,177	0	3,464	-156	0	712	6,569
2048-49	3,743	-1,191	0	3,674	-159	0	741	6,808
2049-50	3,762	-1,203	0	3,881	-162	0	771	7,049
2050-51	3,782	-1,215	0	4,099	-165	0	801	7,303

Table A-120: NYCA Energy – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	160,724	-7,077	-2,647	420	15	0	755	152,190
2021	160,908	-11,271	-3,077	612	28	0	1,126	148,327
2022	162,276	-15,148	-3,479	878	43	0	1,505	146,075
2023	163,550	-18,776	-3,838	1,176	63	0	1,883	144,058
2024	165,107	-22,384	-5,590	1,543	80	0	2,270	141,026
2025	165,724	-25,861	-7,329	1,922	103	0	2,722	137,281
2026	166,671	-28,211	-7,491	2,430	121	0	3,176	136,696
2027	167,623	-30,427	-7,648	3,111	141	0	3,624	136,424
2028	169,035	-32,519	-7,814	3,878	161	0	4,083	136,824
2029	169,606	-34,421	-7,977	4,674	178	0	4,513	136,572
2030	170,566	-36,710	-8,081	5,488	200	0	4,952	136,416
2031	171,475	-38,353	-8,182	6,373	219	0	5,400	136,932
2032	172,783	-39,973	-8,284	7,313	240	0	5,869	137,947
2033	173,242	-41,441	-8,360	8,230	261	0	6,313	138,245
2034	174,127	-42,888	-8,434	9,249	280	0	6,779	139,113
2035	175,029	-44,255	-8,508	10,322	296	0	7,249	140,134
2036	176,394	-45,628	-8,581	11,415	312	0	7,742	141,653
2037	176,834	-46,834	-8,656	12,577	324	0	8,202	142,446
2038	177,685	-48,038	-8,735	13,795	332	0	8,684	143,722
2039	178,514	-49,192	-8,810	15,048	339	0	9,168	145,068
2040	179,814	-50,636	-8,885	16,361	346	0	9,679	146,679
2041	180,181	-51,603	-8,960	17,442	353	0	10,143	147,556
2042	180,989	-52,587	-9,036	18,695	360	0	10,634	149,054
2043	181,801	-53,524	-9,112	19,991	367	0	11,128	150,651
2044	183,098	-54,502	-9,189	21,325	374	0	11,654	152,761
2045	183,506	-55,268	-9,266	22,703	381	0	12,122	154,178
2046	184,416	-56,050	-9,344	24,122	388	0	12,620	156,152
2047	185,318	-56,765	-9,423	25,580	395	0	13,118	158,224
2048	186,690	-57,517	-9,502	27,083	402	0	13,651	160,807
2049	187,125	-58,056	-9,581	28,624	409	0	14,115	162,636
2050	188,043	-58,618	-9,662	30,253	416	0	14,614	165,046

Table A-121: NYCA Summer Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	33,345	-1,330	-228	56	-57	0	227	32,013
2021	33,842	-2,124	-718	131	-107	0	365	31,389
2022	34,276	-3,442	-336	265	-154	0	487	31,096
2023	34,109	-3,672	-370	355	-225	0	608	30,806
2024	34,475	-4,439	-539	464	-285	0	728	30,404
2025	35,137	-5,524	-706	579	-368	0	881	30,001
2026	35,197	-6,533	-149	847	-301	0	1,024	30,083
2027	35,527	-7,031	-152	1,084	-351	0	1,170	30,247
2028	35,875	-7,495	-156	1,349	-400	0	1,315	30,488
2029	36,225	-7,962	-159	1,628	-443	0	1,462	30,751
2030	36,565	-8,488	-161	1,913	-498	0	1,605	30,936
2031	36,894	-8,872	-163	2,220	-545	0	1,751	31,285
2032	36,369	-8,352	-165	2,541	-596	0	1,893	31,690
2033	36,706	-8,727	-167	2,867	-650	0	2,044	32,073
2034	37,045	-9,082	-168	3,226	-697	0	2,201	32,525
2035	37,384	-9,421	-170	3,595	-737	0	2,356	33,008
2036	37,725	-9,740	-171	3,964	-775	0	2,505	33,508
2037	38,100	-10,081	-172	4,380	-807	0	2,667	34,087
2038	38,433	-10,395	-174	4,808	-827	0	2,829	34,674
2039	38,764	-10,702	-176	5,241	-844	0	2,991	35,275
2040	39,102	-11,039	-177	5,686	-859	0	3,153	35,866
2041	39,437	-11,331	-179	6,079	-879	0	3,329	36,456
2042	39,771	-11,600	-180	6,511	-897	0	3,497	37,103
2043	40,146	-11,865	-181	6,963	-914	0	3,659	37,807
2044	40,496	-12,106	-183	7,411	-929	0	3,827	38,515
2045	40,860	-12,369	-184	7,918	-949	0	4,011	39,288
2046	41,252	-12,614	-186	8,402	-966	0	4,185	40,072
2047	41,634	-12,843	-167	8,915	-984	0	4,360	40,915
2048	42,032	-13,054	-189	9,405	-999	0	4,521	41,717
2049	42,474	-13,297	-191	9,975	-1,019	0	4,701	42,643
2050	42,886	-13,509	-193	10,537	-1,036	0	4,877	43,563

Table A-122: NYCA Winter Peaks – Policy Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	25,185	-2,083	0	185	-100	0	376	23,563
2021-22	25,420	-2,705	0	265	-154	0	501	23,327
2022-23	25,673	-3,258	0	355	-225	0	628	23,172
2023-24	25,865	-3,796	0	464	-285	0	752	23,001
2024-25	26,037	-4,334	0	579	-368	0	907	22,823
2025-26	26,053	-4,674	0	733	-432	0	1,057	22,737
2026-27	26,298	-5,019	0	939	-503	0	1,206	22,920
2027-28	26,455	-5,322	0	1,168	-573	0	1,354	23,082
2028-29	26,532	-6,025	0	1,628	-443	0	1,537	23,229
2029-30	26,703	-6,371	0	1,913	-498	0	1,686	23,432
2030-31	26,865	-6,621	0	2,220	-545	0	1,838	23,756
2031-32	26,417	-6,350	0	2,541	-596	0	1,986	23,998
2032-33	26,614	-6,594	0	2,867	-650	0	2,140	24,377
2033-34	26,731	-6,807	0	3,226	-697	0	2,301	24,753
2034-35	26,781	-6,997	0	3,595	-737	0	2,457	25,099
2035-36	26,965	-7,189	0	3,964	-775	0	2,606	25,571
2036-37	26,960	-7,368	0	4,380	-807	0	2,764	25,931
2037-38	27,172	-7,559	0	4,808	-827	0	2,922	26,515
2038-39	27,285	-7,729	0	5,241	-844	0	3,078	27,031
2039-40	27,413	-7,923	0	5,686	-859	0	3,232	27,549
2040-41	27,445	-8,072	0	6,079	-879	0	3,398	27,970
2041-42	27,573	-8,221	0	6,511	-897	0	3,554	28,522
2042-43	27,565	-8,340	0	6,963	-914	0	3,702	28,977
2043-44	27,786	-8,480	0	7,411	-929	0	3,857	29,645
2044-45	27,887	-8,613	0	7,918	-949	0	4,024	30,267
2045-46	27,933	-8,714	0	8,402	-966	0	4,179	30,833
2046-47	28,078	-8,824	0	8,915	-984	0	4,333	31,518
2047-48	28,240	-8,919	0	9,405	-999	0	4,473	32,201
2048-49	28,344	-9,019	0	9,975	-1,019	0	4,627	32,908
2049-50	28,476	-9,103	0	10,537	-1,036	0	4,778	33,652
2050-51	28,609	-9,188	0	11,131	-1,054	0	4,934	34,431

A-4: CLCPA Case

Table A-123: Zone A Energy – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	15,707	-692	-316	33	2	0	389	15,123
2021	15,720	-1,101	-386	43	3	0	493	14,772
2022	15,851	-1,480	-456	60	5	0	596	14,575
2023	15,962	-1,833	-520	80	7	0	692	14,387
2024	16,093	-2,182	-777	104	9	0	787	14,033
2025	16,126	-2,517	-1,037	129	11	0	1,007	13,719
2026	16,195	-2,742	-1,074	169	13	0	1,229	13,790
2027	16,261	-2,952	-1,108	225	16	0	1,456	13,899
2028	16,372	-3,150	-1,139	288	18	0	1,686	14,075
2029	16,400	-3,329	-1,168	354	20	0	1,916	14,193
2030	16,495	-3,551	-1,187	418	22	0	2,151	14,348
2031	16,583	-3,710	-1,202	487	24	0	2,387	14,570
2032	16,708	-3,866	-1,219	563	27	0	2,623	14,836
2033	16,746	-4,006	-1,232	635	29	0	2,858	15,029
2034	16,821	-4,144	-1,245	715	31	0	3,095	15,274
2035	16,895	-4,272	-1,257	795	33	0	4,521	16,714
2036	17,009	-4,401	-1,269	874	35	0	4,751	17,000
2037	17,031	-4,511	-1,280	954	36	0	4,981	17,210
2038	17,090	-4,621	-1,292	1,035	37	0	5,209	17,457
2039	17,144	-4,725	-1,303	1,124	38	0	5,447	17,725
2040	17,268	-4,863	-1,314	1,224	38	0	6,838	19,191
2041	17,295	-4,954	-1,325	1,305	39	0	7,063	19,423
2042	17,359	-5,045	-1,337	1,399	40	0	7,289	19,706
2043	17,423	-5,130	-1,348	1,496	41	0	7,513	19,994
2044	17,527	-5,218	-1,359	1,595	42	0	7,738	20,325
2045	17,543	-5,284	-1,370	1,699	43	0	7,956	20,586
2046	17,605	-5,351	-1,381	1,805	43	0	8,059	20,779
2047	17,663	-5,411	-1,394	1,914	44	0	8,161	20,977
2048	17,765	-5,474	-1,405	2,026	45	0	8,263	21,220
2049	17,778	-5,516	-1,417	2,142	46	0	8,363	21,396
2050	17,835	-5,560	-1,429	2,264	47	0	8,462	21,618

Table A-124: Zone A Summer Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,718	-108	-26	4	-7	0	77	2,658
2021	2,740	-172	-86	9	-13	0	103	2,582
2022	2,772	-257	-42	17	-16	0	122	2,597
2023	2,778	-299	-48	23	-23	0	142	2,573
2024	2,803	-361	-71	30	-29	0	159	2,531
2025	2,842	-440	-95	37	-38	0	204	2,511
2026	2,851	-505	-20	56	-31	0	246	2,596
2027	2,872	-544	-21	75	-37	0	289	2,634
2028	2,894	-581	-22	96	-42	0	332	2,678
2029	2,916	-617	-22	118	-47	0	378	2,726
2030	2,941	-659	-22	139	-53	0	422	2,769
2031	2,965	-689	-23	162	-57	0	466	2,825
2032	2,952	-678	-23	187	-63	0	507	2,882
2033	2,977	-708	-23	211	-69	0	552	2,940
2034	3,001	-736	-24	238	-73	0	596	3,003
2035	3,024	-762	-24	265	-77	0	867	3,292
2036	3,048	-787	-24	290	-81	0	902	3,347
2037	3,072	-813	-24	318	-84	0	944	3,412
2038	3,093	-837	-24	345	-87	0	984	3,473
2039	3,114	-860	-25	374	-89	0	1,024	3,539
2040	3,139	-886	-25	407	-91	0	1,275	3,819
2041	3,162	-909	-25	435	-93	0	1,319	3,889
2042	3,185	-929	-25	466	-95	0	1,356	3,957
2043	3,208	-948	-25	498	-97	0	1,389	4,025
2044	3,231	-966	-26	530	-99	0	1,420	4,091
2045	3,254	-985	-26	566	-101	0	1,462	4,171
2046	3,279	-1,003	-26	601	-103	0	1,475	4,224
2047	3,304	-1,019	-23	638	-105	0	1,488	4,282
2048	3,329	-1,034	-27	673	-106	0	1,493	4,327
2049	3,355	-1,050	-27	713	-109	0	1,510	4,393
2050	3,381	-1,065	-27	754	-111	0	1,522	4,454

Table A-125: Zone A Winter Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	2,487	-206	0	12	-12	0	189	2,471
2021-22	2,512	-267	0	17	-16	0	229	2,474
2022-23	2,538	-322	0	23	-23	0	267	2,482
2023-24	2,559	-376	0	30	-29	0	302	2,486
2024-25	2,575	-429	0	37	-38	0	389	2,535
2025-26	2,566	-460	0	49	-45	0	475	2,585
2026-27	2,588	-525	0	75	-37	0	579	2,680
2027-28	2,601	-554	0	96	-42	0	669	2,769
2028-29	2,608	-583	0	118	-47	0	765	2,861
2029-30	2,629	-618	0	139	-53	0	860	2,957
2030-31	2,648	-644	0	162	-57	0	956	3,065
2031-32	2,609	-627	0	187	-63	0	1,046	3,152
2032-33	2,628	-651	0	211	-69	0	1,145	3,265
2033-34	2,641	-673	0	238	-73	0	1,244	3,378
2034-35	2,648	-753	0	269	-52	0	1,855	3,967
2035-36	2,667	-773	0	295	-54	0	1,942	4,076
2036-37	2,657	-785	0	322	-56	0	2,044	4,182
2037-38	2,676	-804	0	350	-58	0	2,141	4,304
2038-39	2,684	-820	0	380	-59	0	2,242	4,426
2039-40	2,701	-937	0	385	0	0	2,888	5,037
2040-41	2,707	-954	0	412	0	0	3,003	5,168
2041-42	2,721	-971	0	441	0	0	3,104	5,296
2042-43	2,710	-972	0	472	0	0	3,196	5,406
2043-44	2,731	-989	0	502	0	0	3,289	5,533
2044-45	2,740	-1,003	0	536	0	0	3,406	5,680
2045-46	2,745	-1,014	0	569	0	0	3,456	5,756
2046-47	2,758	-1,028	0	604	0	0	3,507	5,841
2047-48	2,773	-1,039	0	637	0	0	3,538	5,908
2048-49	2,771	-1,039	0	676	0	0	3,597	6,005
2049-50	2,781	-1,049	0	714	0	0	3,647	6,093
2050-51	2,791	-1,058	0	754	0	0	3,697	6,184

Table A-126: Zone B Energy – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	10,225	-450	-122	24	0	0	249	9,926
2021	10,258	-719	-148	31	1	0	316	9,740
2022	10,370	-968	-172	44	2	0	383	9,659
2023	10,469	-1,202	-194	57	3	0	446	9,579
2024	10,579	-1,434	-285	75	3	0	509	9,447
2025	10,626	-1,658	-379	94	4	0	653	9,340
2026	10,694	-1,810	-391	123	5	0	800	9,420
2027	10,760	-1,953	-401	163	6	0	950	9,524
2028	10,854	-2,088	-412	208	7	0	1,102	9,671
2029	10,893	-2,211	-422	254	7	0	1,254	9,775
2030	10,975	-2,362	-429	299	8	0	1,410	9,901
2031	11,051	-2,472	-434	348	9	0	1,568	10,071
2032	11,152	-2,580	-441	401	9	0	1,725	10,266
2033	11,194	-2,678	-446	450	11	0	1,883	10,414
2034	11,262	-2,774	-450	507	11	0	2,042	10,598
2035	11,328	-2,864	-455	563	12	0	2,986	11,569
2036	11,423	-2,955	-459	619	12	0	3,143	11,783
2037	11,455	-3,034	-465	675	13	0	3,299	11,943
2038	11,511	-3,112	-470	734	13	0	3,455	12,131
2039	11,565	-3,187	-473	797	13	0	3,617	12,333
2040	11,666	-3,285	-476	868	14	0	4,547	13,333
2041	11,700	-3,351	-481	926	14	0	4,702	13,510
2042	11,761	-3,417	-485	993	14	0	4,858	13,723
2043	11,820	-3,480	-489	1,061	14	0	5,012	13,937
2044	11,907	-3,544	-493	1,132	14	0	5,168	14,183
2045	11,934	-3,594	-496	1,205	14	0	5,319	14,381
2046	11,992	-3,645	-501	1,280	14	0	5,393	14,534
2047	12,049	-3,691	-505	1,357	15	0	5,466	14,690
2048	12,135	-3,739	-510	1,437	15	0	5,540	14,879
2049	12,160	-3,773	-514	1,519	15	0	5,613	15,019
2050	12,215	-3,808	-518	1,605	15	0	5,684	15,193

Table A-127: Zone B Summer Peak – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,112	-84	-11	3	-1	0	52	2,071
2021	2,138	-134	-35	7	-5	0	70	2,040
2022	2,170	-216	-17	13	-6	0	83	2,028
2023	2,163	-233	-19	18	-10	0	97	2,016
2024	2,188	-282	-28	23	-11	0	109	1,999
2025	2,237	-358	-37	29	-15	0	140	1,996
2026	2,236	-422	-8	43	-13	0	169	2,005
2027	2,257	-454	-8	57	-14	0	200	2,038
2028	2,279	-483	-8	73	-17	0	230	2,074
2029	2,301	-513	-9	89	-18	0	262	2,113
2030	2,325	-547	-9	105	-21	0	293	2,147
2031	2,348	-572	-9	122	-23	0	324	2,191
2032	2,308	-530	-9	141	-24	0	353	2,239
2033	2,331	-554	-9	159	-27	0	385	2,284
2034	2,353	-577	-9	179	-28	0	416	2,334
2035	2,375	-599	-9	198	-31	0	606	2,541
2036	2,396	-619	-9	217	-31	0	632	2,586
2037	2,421	-641	-9	238	-34	0	662	2,638
2038	2,442	-660	-10	259	-34	0	691	2,687
2039	2,462	-680	-10	281	-34	0	720	2,739
2040	2,484	-701	-10	305	-35	0	898	2,942
2041	2,506	-720	-10	326	-35	0	930	2,997
2042	2,527	-737	-10	350	-35	0	956	3,051
2043	2,553	-754	-10	374	-36	0	981	3,107
2044	2,574	-769	-10	398	-36	0	1,004	3,160
2045	2,596	-786	-10	425	-36	0	1,035	3,223
2046	2,619	-801	-10	451	-37	0	1,045	3,267
2047	2,641	-815	-9	478	-37	0	1,055	3,313
2048	2,665	-828	-10	505	-37	0	1,059	3,353
2049	2,692	-843	-10	535	-38	0	1,073	3,409
2050	2,716	-856	-11	565	-38	0	1,082	3,460

Table A-128: Zone B Winter Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	1,649	-136	0	9	-5	0	128	1,645
2021-22	1,668	-178	0	13	-6	0	156	1,654
2022-23	1,687	-214	0	18	-10	0	182	1,663
2023-24	1,702	-250	0	23	-11	0	207	1,672
2024-25	1,717	-286	0	29	-15	0	268	1,712
2025-26	1,719	-308	0	38	-19	0	327	1,756
2026-27	1,737	-359	0	57	-14	0	400	1,821
2027-28	1,749	-380	0	73	-17	0	463	1,889
2028-29	1,753	-399	0	89	-18	0	531	1,956
2029-30	1,769	-423	0	105	-21	0	597	2,028
2030-31	1,784	-441	0	122	-23	0	665	2,108
2031-32	1,756	-422	0	141	-24	0	729	2,179
2032-33	1,772	-439	0	159	-27	0	799	2,264
2033-34	1,782	-454	0	179	-28	0	869	2,348
2034-35	1,787	-512	0	201	-20	0	1,297	2,752
2035-36	1,802	-527	0	221	-21	0	1,360	2,835
2036-37	1,803	-537	0	242	-22	0	1,433	2,919
2037-38	1,820	-551	0	263	-23	0	1,503	3,012
2038-39	1,828	-563	0	285	-23	0	1,576	3,103
2039-40	1,839	-651	0	289	0	0	2,033	3,511
2040-41	1,844	-663	0	309	0	0	2,117	3,607
2041-42	1,857	-675	0	331	0	0	2,190	3,703
2042-43	1,857	-679	0	354	0	0	2,257	3,789
2043-44	1,875	-691	0	377	0	0	2,325	3,886
2044-45	1,882	-701	0	402	0	0	2,410	3,993
2045-46	1,885	-709	0	427	0	0	2,448	4,051
2046-47	1,897	-719	0	453	0	0	2,486	4,116
2047-48	1,910	-729	0	478	0	0	2,510	4,169
2048-49	1,918	-732	0	507	0	0	2,555	4,247
2049-50	1,927	-740	0	535	0	0	2,592	4,315
2050-51	1,936	-747	0	566	0	0	2,631	4,385

Table A-129: Zone C Energy – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	16,256	-716	-310	35	2	0	407	15,673
2021	16,267	-1,140	-381	45	3	0	516	15,310
2022	16,397	-1,531	-452	63	4	0	624	15,105
2023	16,507	-1,895	-515	83	6	0	724	14,910
2024	16,637	-2,256	-771	109	8	0	824	14,552
2025	16,666	-2,601	-1,029	135	11	0	1,056	14,238
2026	16,731	-2,833	-1,065	178	13	0	1,289	14,313
2027	16,794	-3,049	-1,098	236	15	0	1,528	14,426
2028	16,902	-3,252	-1,128	303	18	0	1,769	14,611
2029	16,925	-3,436	-1,157	372	19	0	2,010	14,734
2030	17,018	-3,663	-1,176	439	22	0	2,258	14,898
2031	17,103	-3,826	-1,190	511	24	0	2,507	15,129
2032	17,226	-3,986	-1,206	591	26	0	2,754	15,406
2033	17,260	-4,129	-1,219	666	29	0	3,002	15,609
2034	17,332	-4,270	-1,232	751	31	0	3,252	15,864
2035	17,401	-4,400	-1,243	835	32	0	4,752	17,376
2036	17,511	-4,530	-1,255	919	34	0	4,995	17,673
2037	17,526	-4,643	-1,266	1,003	35	0	5,237	17,893
2038	17,578	-4,753	-1,278	1,088	36	0	5,479	18,150
2039	17,625	-4,858	-1,288	1,182	37	0	5,731	18,429
2040	17,742	-4,997	-1,299	1,288	38	0	7,194	19,967
2041	17,761	-5,088	-1,311	1,373	39	0	7,433	20,209
2042	17,819	-5,178	-1,322	1,472	40	0	7,673	20,503
2043	17,874	-5,263	-1,333	1,574	41	0	7,911	20,803
2044	17,970	-5,350	-1,344	1,679	41	0	8,149	21,146
2045	17,977	-5,415	-1,355	1,788	42	0	8,382	21,420
2046	18,029	-5,480	-1,366	1,900	43	0	8,494	21,619
2047	18,079	-5,539	-1,378	2,014	44	0	8,605	21,825
2048	18,172	-5,600	-1,390	2,132	45	0	8,715	22,075
2049	18,175	-5,640	-1,401	2,254	45	0	8,824	22,258
2050	18,223	-5,681	-1,413	2,382	46	0	8,932	22,489

Table A-130: Zone C Summer Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,853	-114	-26	4	-6	0	81	2,792
2021	2,877	-181	-86	9	-11	0	109	2,717
2022	2,909	-264	-42	18	-15	0	129	2,735
2023	2,921	-314	-48	24	-22	0	150	2,710
2024	2,945	-379	-72	32	-29	0	168	2,666
2025	2,978	-454	-95	39	-37	0	216	2,646
2026	2,993	-535	-20	60	-31	0	260	2,726
2027	3,014	-575	-21	79	-37	0	306	2,766
2028	3,036	-613	-22	101	-42	0	351	2,812
2029	3,058	-651	-22	125	-47	0	400	2,863
2030	3,084	-694	-23	147	-53	0	447	2,909
2031	3,108	-726	-23	172	-57	0	493	2,968
2032	3,089	-709	-23	198	-63	0	537	3,028
2033	3,113	-740	-23	224	-69	0	584	3,089
2034	3,138	-769	-24	252	-73	0	631	3,155
2035	3,161	-797	-24	280	-77	0	918	3,462
2036	3,185	-822	-24	307	-82	0	955	3,519
2037	3,209	-849	-24	337	-85	0	1,001	3,588
2038	3,230	-874	-25	365	-87	0	1,043	3,652
2039	3,251	-897	-25	397	-89	0	1,086	3,722
2040	3,275	-925	-25	431	-91	0	1,352	4,018
2041	3,298	-948	-25	461	-93	0	1,399	4,092
2042	3,320	-968	-25	494	-95	0	1,438	4,163
2043	3,343	-988	-26	528	-97	0	1,474	4,235
2044	3,365	-1,006	-26	562	-99	0	1,507	4,304
2045	3,388	-1,026	-26	601	-101	0	1,552	4,388
2046	3,412	-1,043	-26	637	-103	0	1,567	4,444
2047	3,436	-1,060	-23	676	-105	0	1,581	4,504
2048	3,460	-1,075	-27	713	-107	0	1,586	4,552
2049	3,486	-1,091	-27	757	-109	0	1,606	4,621
2050	3,511	-1,106	-27	799	-111	0	1,619	4,685

Table A-131: Zone C Winter Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	2,648	-219	0	13	-11	0	200	2,631
2021-22	2,674	-284	0	18	-15	0	242	2,634
2022-23	2,701	-343	0	24	-22	0	282	2,642
2023-24	2,724	-400	0	32	-29	0	319	2,646
2024-25	2,740	-456	0	39	-37	0	411	2,697
2025-26	2,728	-489	0	52	-44	0	502	2,748
2026-27	2,750	-558	0	79	-37	0	612	2,847
2027-28	2,763	-589	0	101	-42	0	708	2,941
2028-29	2,771	-620	0	125	-47	0	810	3,039
2029-30	2,792	-657	0	147	-53	0	910	3,140
2030-31	2,812	-684	0	172	-57	0	1,012	3,254
2031-32	2,768	-665	0	198	-63	0	1,108	3,345
2032-33	2,788	-691	0	224	-69	0	1,212	3,464
2033-34	2,801	-713	0	252	-73	0	1,318	3,585
2034-35	2,807	-799	0	285	-52	0	1,965	4,206
2035-36	2,828	-821	0	312	-55	0	2,057	4,322
2036-37	2,814	-832	0	342	-56	0	2,166	4,434
2037-38	2,833	-852	0	371	-58	0	2,269	4,563
2038-39	2,841	-869	0	403	-60	0	2,377	4,692
2039-40	2,858	-994	0	408	0	0	3,062	5,334
2040-41	2,864	-1,012	0	437	0	0	3,186	5,473
2041-42	2,877	-1,030	0	468	0	0	3,294	5,608
2042-43	2,863	-1,030	0	500	0	0	3,392	5,724
2043-44	2,883	-1,047	0	532	0	0	3,491	5,859
2044-45	2,892	-1,062	0	569	0	0	3,616	6,016
2045-46	2,895	-1,073	0	604	0	0	3,671	6,097
2046-47	2,908	-1,087	0	640	0	0	3,726	6,188
2047-48	2,922	-1,098	0	676	0	0	3,760	6,259
2048-49	2,917	-1,097	0	717	0	0	3,824	6,361
2049-50	2,926	-1,107	0	757	0	0	3,878	6,455
2050-51	2,935	-1,116	0	800	0	0	3,933	6,552

Table A-132: Zone D Energy – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	4,417	-195	-33	5	0	0	130	4,325
2021	4,384	-307	-42	6	0	0	166	4,208
2022	4,396	-411	-49	9	0	0	201	4,147
2023	4,410	-506	-58	12	1	0	235	4,093
2024	4,431	-601	-89	16	1	0	268	4,025
2025	4,415	-689	-123	20	1	0	345	3,968
2026	4,410	-747	-131	26	1	0	422	3,981
2027	4,408	-800	-139	34	1	0	500	4,004
2028	4,427	-852	-147	43	2	0	579	4,051
2029	4,416	-897	-156	53	2	0	658	4,076
2030	4,420	-952	-162	62	2	0	740	4,111
2031	4,424	-990	-167	73	2	0	822	4,164
2032	4,446	-1,029	-172	84	2	0	901	4,233
2033	4,435	-1,061	-176	95	3	0	983	4,279
2034	4,440	-1,094	-178	107	3	0	1,063	4,342
2035	4,446	-1,125	-182	118	4	0	1,551	4,812
2036	4,466	-1,156	-185	130	4	0	1,624	4,884
2037	4,451	-1,179	-187	142	4	0	1,702	4,933
2038	4,450	-1,204	-190	153	4	0	1,776	4,990
2039	4,447	-1,226	-193	167	4	0	1,853	5,052
2040	4,464	-1,257	-195	181	4	0	2,316	5,513
2041	4,444	-1,273	-196	193	4	0	2,390	5,562
2042	4,440	-1,291	-198	207	4	0	2,461	5,624
2043	4,436	-1,307	-199	221	4	0	2,532	5,688
2044	4,447	-1,324	-201	236	4	0	2,600	5,762
2045	4,426	-1,333	-203	251	4	0	2,671	5,816
2046	4,422	-1,345	-204	267	5	0	2,701	5,847
2047	4,419	-1,354	-206	283	5	0	2,731	5,878
2048	4,432	-1,366	-207	300	5	0	2,758	5,921
2049	4,414	-1,370	-209	317	5	0	2,784	5,942
2050	4,413	-1,376	-212	336	5	0	2,810	5,976

Table A-133: Zone D Summer Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	538	-21	-2	1	0	0	25	539
2021	533	-33	-8	1	-1	0	34	526
2022	536	-47	-4	2	-1	0	40	527
2023	538	-58	-4	3	-1	0	47	524
2024	541	-70	-7	4	-2	0	53	519
2025	546	-86	-9	5	-3	0	68	521
2026	543	-93	-2	7	-2	0	82	535
2027	544	-100	-2	10	-2	0	97	546
2028	546	-106	-2	13	-3	0	111	558
2029	548	-113	-3	16	-3	0	126	571
2030	550	-120	-3	18	-4	0	141	583
2031	551	-125	-3	21	-4	0	156	596
2032	550	-126	-3	24	-4	0	169	610
2033	552	-131	-3	28	-6	0	184	623
2034	554	-136	-3	31	-7	0	199	638
2035	556	-140	-3	34	-7	0	289	729
2036	558	-144	-3	38	-7	0	299	741
2037	560	-148	-3	41	-7	0	313	756
2038	561	-152	-3	45	-8	0	325	769
2039	563	-155	-3	48	-8	0	338	783
2040	564	-159	-3	52	-8	0	419	865
2041	565	-162	-3	56	-8	0	433	880
2042	566	-165	-3	60	-8	0	444	893
2043	567	-168	-3	64	-8	0	454	906
2044	568	-170	-3	68	-8	0	462	917
2045	569	-172	-3	73	-9	0	476	933
2046	570	-174	-3	77	-9	0	479	940
2047	572	-176	-3	82	-9	0	482	948
2048	574	-178	-3	87	-9	0	482	952
2049	576	-180	-3	92	-9	0	487	962
2050	578	-182	-4	98	-9	0	489	970

Table A-134: Zone D Winter Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	552	-46	0	2	-1	0	62	569
2021-22	556	-59	0	2	-1	0	75	573
2022-23	558	-71	0	3	-1	0	88	577
2023-24	560	-82	0	4	-2	0	100	580
2024-25	561	-93	0	5	-3	0	129	599
2025-26	559	-100	0	6	-3	0	158	620
2026-27	559	-110	0	10	-2	0	193	650
2027-28	561	-116	0	13	-3	0	223	677
2028-29	561	-122	0	16	-3	0	255	707
2029-30	562	-129	0	18	-4	0	287	736
2030-31	564	-133	0	21	-4	0	320	767
2031-32	560	-135	0	24	-4	0	349	795
2032-33	562	-139	0	28	-6	0	382	826
2033-34	563	-143	0	31	-7	0	415	859
2034-35	564	-153	0	35	-5	0	618	1,059
2035-36	566	-157	0	38	-5	0	644	1,087
2036-37	565	-160	0	42	-5	0	678	1,120
2037-38	566	-163	0	45	-5	0	708	1,151
2038-39	566	-166	0	49	-5	0	740	1,184
2039-40	567	-180	0	50	0	0	948	1,385
2040-41	567	-183	0	53	0	0	985	1,422
2041-42	568	-186	0	57	0	0	1,016	1,455
2042-43	566	-187	0	61	0	0	1,044	1,483
2043-44	567	-190	0	65	0	0	1,071	1,513
2044-45	567	-192	0	69	0	0	1,108	1,552
2045-46	567	-194	0	73	0	0	1,122	1,569
2046-47	568	-196	0	78	0	0	1,136	1,586
2047-48	569	-197	0	82	0	0	1,143	1,597
2048-49	568	-198	0	87	0	0	1,159	1,617
2049-50	569	-199	0	92	0	0	1,172	1,634
2050-51	570	-201	0	98	0	0	1,185	1,652

Table A-135: Zone E Energy – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	7,900	-348	-157	17	1	0	197	7,610
2021	7,907	-554	-192	22	2	0	249	7,433
2022	7,972	-744	-226	30	2	0	301	7,335
2023	8,027	-922	-258	40	3	0	349	7,240
2024	8,092	-1,097	-386	53	4	0	397	7,063
2025	8,108	-1,265	-515	65	6	0	509	6,907
2026	8,141	-1,378	-533	86	7	0	621	6,943
2027	8,174	-1,484	-550	114	8	0	736	6,998
2028	8,228	-1,583	-565	146	9	0	852	7,087
2029	8,242	-1,673	-579	179	10	0	968	7,147
2030	8,289	-1,784	-589	212	11	0	1,087	7,226
2031	8,332	-1,864	-596	247	12	0	1,207	7,338
2032	8,394	-1,942	-604	285	13	0	1,326	7,472
2033	8,412	-2,013	-611	322	14	0	1,445	7,570
2034	8,449	-2,081	-617	362	15	0	1,565	7,694
2035	8,485	-2,146	-623	403	16	0	2,287	8,422
2036	8,541	-2,210	-629	443	17	0	2,404	8,566
2037	8,551	-2,265	-635	484	18	0	2,520	8,672
2038	8,579	-2,320	-641	524	18	0	2,636	8,797
2039	8,605	-2,372	-646	570	19	0	2,756	8,932
2040	8,665	-2,441	-651	621	19	0	3,460	9,674
2041	8,677	-2,486	-657	662	20	0	3,575	9,791
2042	8,708	-2,531	-663	709	20	0	3,689	9,934
2043	8,738	-2,573	-668	759	20	0	3,803	10,079
2044	8,789	-2,617	-674	809	21	0	3,918	10,246
2045	8,796	-2,649	-679	861	21	0	4,029	10,378
2046	8,825	-2,682	-685	915	22	0	4,081	10,476
2047	8,852	-2,712	-691	970	22	0	4,134	10,575
2048	8,901	-2,743	-697	1,028	22	0	4,186	10,697
2049	8,906	-2,764	-703	1,086	23	0	4,237	10,786
2050	8,933	-2,785	-708	1,148	23	0	4,288	10,899

Table A-136: Zone E Summer Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	1,359	-54	-13	2	-4	0	38	1,329
2021	1,370	-86	-43	4	-6	0	51	1,291
2022	1,386	-128	-21	9	-8	0	61	1,299
2023	1,390	-150	-24	11	-11	0	71	1,287
2024	1,402	-181	-35	15	-14	0	80	1,266
2025	1,421	-219	-47	19	-19	0	102	1,256
2026	1,426	-253	-10	28	-16	0	123	1,298
2027	1,436	-273	-10	38	-18	0	145	1,317
2028	1,447	-291	-11	48	-21	0	166	1,339
2029	1,458	-309	-11	59	-23	0	189	1,363
2030	1,471	-330	-11	70	-26	0	211	1,385
2031	1,483	-345	-11	81	-28	0	233	1,413
2032	1,476	-339	-11	94	-31	0	254	1,442
2033	1,488	-354	-12	106	-34	0	276	1,470
2034	1,500	-368	-12	119	-36	0	298	1,502
2035	1,512	-381	-12	133	-39	0	434	1,647
2036	1,523	-393	-12	145	-41	0	451	1,674
2037	1,535	-406	-12	159	-42	0	473	1,707
2038	1,546	-418	-12	173	-43	0	492	1,737
2039	1,556	-430	-12	187	-44	0	513	1,770
2040	1,568	-443	-12	204	-45	0	639	1,910
2041	1,580	-454	-12	218	-46	0	660	1,946
2042	1,591	-464	-13	233	-47	0	679	1,979
2043	1,603	-474	-13	250	-48	0	695	2,013
2044	1,614	-483	-13	266	-49	0	711	2,046
2045	1,626	-492	-13	284	-50	0	732	2,087
2046	1,638	-501	-13	301	-51	0	739	2,113
2047	1,650	-509	-12	319	-52	0	745	2,142
2048	1,662	-516	-13	337	-53	0	748	2,165
2049	1,676	-525	-13	358	-54	0	757	2,198
2050	1,689	-532	-13	378	-55	0	763	2,228

Table A-137: Zone E Winter Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	1,246	-103	0	6	-6	0	95	1,238
2021-22	1,258	-134	0	9	-8	0	115	1,239
2022-23	1,271	-161	0	11	-11	0	133	1,243
2023-24	1,282	-188	0	15	-14	0	151	1,245
2024-25	1,290	-215	0	19	-19	0	195	1,270
2025-26	1,285	-231	0	24	-22	0	238	1,294
2026-27	1,296	-263	0	38	-18	0	290	1,342
2027-28	1,302	-278	0	48	-21	0	335	1,387
2028-29	1,306	-292	0	59	-23	0	383	1,433
2029-30	1,316	-310	0	70	-26	0	430	1,481
2030-31	1,326	-322	0	81	-28	0	478	1,535
2031-32	1,306	-314	0	94	-31	0	524	1,578
2032-33	1,316	-326	0	106	-34	0	573	1,635
2033-34	1,322	-337	0	119	-36	0	623	1,691
2034-35	1,325	-377	0	135	-26	0	928	1,986
2035-36	1,335	-387	0	148	-27	0	972	2,041
2036-37	1,330	-393	0	162	-28	0	1,023	2,094
2037-38	1,339	-402	0	175	-29	0	1,072	2,155
2038-39	1,343	-411	0	190	-30	0	1,122	2,216
2039-40	1,352	-469	0	193	0	0	1,446	2,521
2040-41	1,355	-478	0	206	0	0	1,504	2,587
2041-42	1,362	-486	0	221	0	0	1,554	2,651
2042-43	1,356	-487	0	236	0	0	1,600	2,706
2043-44	1,366	-495	0	251	0	0	1,647	2,770
2044-45	1,371	-502	0	269	0	0	1,706	2,843
2045-46	1,373	-508	0	285	0	0	1,731	2,881
2046-47	1,380	-514	0	303	0	0	1,756	2,924
2047-48	1,387	-520	0	319	0	0	1,772	2,958
2048-49	1,386	-520	0	339	0	0	1,802	3,006
2049-50	1,391	-525	0	358	0	0	1,827	3,050
2050-51	1,396	-529	0	378	0	0	1,852	3,096

Table A-138: Zone F Energy – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	12,326	-543	-254	26	2	0	304	11,860
2021	12,337	-864	-310	34	3	0	385	11,584
2022	12,442	-1,162	-365	47	4	0	465	11,431
2023	12,530	-1,439	-416	62	6	0	540	11,283
2024	12,635	-1,713	-622	81	7	0	614	11,002
2025	12,663	-1,976	-830	100	9	0	786	10,752
2026	12,719	-2,153	-860	132	11	0	959	10,807
2027	12,774	-2,319	-887	176	13	0	1,136	10,891
2028	12,863	-2,475	-912	225	14	0	1,314	11,029
2029	12,887	-2,616	-935	276	16	0	1,493	11,121
2030	12,964	-2,791	-951	326	18	0	1,676	11,242
2031	13,035	-2,916	-963	380	19	0	1,860	11,415
2032	13,136	-3,039	-977	439	21	0	2,044	11,623
2033	13,167	-3,150	-988	495	23	0	2,227	11,774
2034	13,229	-3,259	-998	557	25	0	2,411	11,966
2035	13,289	-3,361	-1,007	619	26	0	3,521	13,088
2036	13,382	-3,462	-1,017	681	28	0	3,700	13,312
2037	13,402	-3,550	-1,026	743	29	0	3,878	13,476
2038	13,452	-3,637	-1,036	806	29	0	4,056	13,669
2039	13,498	-3,720	-1,044	875	30	0	4,240	13,878
2040	13,598	-3,830	-1,053	953	31	0	5,322	15,021
2041	13,622	-3,902	-1,063	1,016	31	0	5,497	15,202
2042	13,677	-3,975	-1,072	1,089	32	0	5,672	15,424
2043	13,730	-4,043	-1,081	1,164	33	0	5,846	15,650
2044	13,817	-4,113	-1,089	1,242	33	0	6,020	15,909
2045	13,833	-4,167	-1,098	1,322	34	0	6,189	16,113
2046	13,885	-4,221	-1,107	1,405	35	0	6,268	16,265
2047	13,935	-4,269	-1,117	1,490	35	0	6,346	16,420
2048	14,020	-4,320	-1,127	1,577	36	0	6,424	16,610
2049	14,033	-4,354	-1,136	1,667	37	0	6,501	16,748
2050	14,082	-4,390	-1,146	1,762	37	0	6,577	16,923

Table A-139: Zone F Summer Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,497	-100	-25	4	-7	0	70	2,440
2021	2,517	-158	-81	8	-12	0	94	2,367
2022	2,547	-239	-40	16	-16	0	112	2,380
2023	2,550	-274	-45	21	-23	0	130	2,358
2024	2,573	-331	-67	27	-28	0	146	2,319
2025	2,614	-408	-90	34	-37	0	187	2,300
2026	2,619	-462	-19	51	-30	0	224	2,384
2027	2,638	-498	-20	69	-36	0	265	2,418
2028	2,659	-531	-20	88	-40	0	304	2,459
2029	2,680	-565	-21	108	-44	0	345	2,503
2030	2,704	-603	-21	127	-50	0	386	2,542
2031	2,727	-631	-21	148	-54	0	426	2,594
2032	2,719	-624	-22	171	-60	0	463	2,647
2033	2,742	-652	-22	193	-65	0	504	2,699
2034	2,764	-678	-22	218	-69	0	544	2,757
2035	2,786	-702	-23	242	-73	0	791	3,021
2036	2,808	-725	-23	265	-77	0	823	3,071
2037	2,831	-749	-23	290	-80	0	862	3,131
2038	2,852	-771	-23	315	-82	0	898	3,187
2039	2,872	-793	-23	341	-84	0	934	3,247
2040	2,895	-817	-23	371	-86	0	1,164	3,503
2041	2,917	-838	-24	397	-88	0	1,203	3,567
2042	2,939	-857	-24	425	-90	0	1,236	3,629
2043	2,962	-875	-24	454	-92	0	1,266	3,692
2044	2,984	-892	-24	483	-93	0	1,295	3,752
2045	3,006	-910	-25	517	-95	0	1,333	3,826
2046	3,030	-927	-25	548	-97	0	1,344	3,874
2047	3,054	-942	-22	582	-99	0	1,356	3,928
2048	3,078	-956	-25	614	-101	0	1,360	3,969
2049	3,104	-972	-25	651	-103	0	1,376	4,030
2050	3,129	-986	-26	687	-105	0	1,386	4,086

Table A-140: Zone F Winter Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	2,263	-187	0	11	-12	0	173	2,249
2021-22	2,286	-243	0	16	-16	0	210	2,252
2022-23	2,309	-293	0	21	-23	0	244	2,258
2023-24	2,328	-342	0	27	-28	0	276	2,262
2024-25	2,344	-390	0	34	-37	0	356	2,307
2025-26	2,338	-419	0	45	-43	0	434	2,354
2026-27	2,357	-478	0	69	-36	0	529	2,442
2027-28	2,370	-505	0	88	-40	0	612	2,524
2028-29	2,377	-531	0	108	-44	0	699	2,608
2029-30	2,396	-563	0	127	-50	0	786	2,695
2030-31	2,413	-587	0	148	-54	0	873	2,794
2031-32	2,379	-572	0	171	-60	0	956	2,874
2032-33	2,398	-594	0	193	-65	0	1,046	2,977
2033-34	2,409	-614	0	218	-69	0	1,136	3,080
2034-35	2,416	-686	0	245	-49	0	1,693	3,619
2035-36	2,434	-705	0	269	-51	0	1,773	3,719
2036-37	2,426	-716	0	294	-53	0	1,865	3,816
2037-38	2,444	-734	0	319	-55	0	1,954	3,928
2038-39	2,452	-749	0	347	-56	0	2,046	4,039
2039-40	2,467	-854	0	351	0	0	2,634	4,599
2040-41	2,474	-870	0	376	0	0	2,740	4,720
2041-42	2,488	-886	0	402	0	0	2,831	4,836
2042-43	2,479	-888	0	430	0	0	2,915	4,937
2043-44	2,499	-903	0	458	0	0	2,999	5,053
2044-45	2,508	-916	0	489	0	0	3,105	5,186
2045-46	2,513	-927	0	519	0	0	3,150	5,255
2046-47	2,526	-939	0	551	0	0	3,195	5,333
2047-48	2,541	-950	0	581	0	0	3,223	5,394
2048-49	2,541	-951	0	616	0	0	3,276	5,482
2049-50	2,551	-960	0	651	0	0	3,321	5,563
2050-51	2,561	-969	0	688	0	0	3,366	5,646

Table A-141: Zone G Energy – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	9,957	-438	-354	33	2	0	241	9,441
2021	10,024	-702	-414	43	3	0	305	9,259
2022	10,166	-949	-466	60	5	0	370	9,186
2023	10,296	-1,182	-507	80	8	0	431	9,126
2024	10,444	-1,416	-730	104	10	0	493	8,906
2025	10,525	-1,642	-944	131	13	0	634	8,717
2026	10,626	-1,799	-955	172	15	0	777	8,836
2027	10,727	-1,947	-968	227	18	0	925	8,982
2028	10,860	-2,089	-984	288	20	0	1,077	9,172
2029	10,937	-2,219	-998	351	21	0	1,230	9,322
2030	11,058	-2,380	-1,007	413	24	0	1,386	9,495
2031	11,174	-2,499	-1,016	480	26	0	1,545	9,711
2032	11,315	-2,618	-1,027	553	29	0	1,705	9,959
2033	11,397	-2,726	-1,033	621	31	0	1,866	10,157
2034	11,505	-2,834	-1,042	698	34	0	2,030	10,393
2035	11,614	-2,936	-1,049	776	36	0	2,980	11,420
2036	11,753	-3,040	-1,059	854	38	0	3,146	11,693
2037	11,826	-3,132	-1,067	934	39	0	3,314	11,915
2038	11,928	-3,224	-1,076	1,014	40	0	3,482	12,164
2039	12,027	-3,314	-1,084	1,104	41	0	3,658	12,432
2040	12,176	-3,429	-1,093	1,203	42	0	4,614	13,514
2041	12,257	-3,510	-1,103	1,282	43	0	4,788	13,758
2042	12,366	-3,593	-1,112	1,375	44	0	4,962	14,042
2043	12,473	-3,672	-1,122	1,470	45	0	5,136	14,330
2044	12,614	-3,754	-1,131	1,569	46	0	5,311	14,654
2045	12,691	-3,822	-1,141	1,669	47	0	5,480	14,924
2046	12,803	-3,891	-1,151	1,774	48	0	5,571	15,154
2047	12,915	-3,956	-1,160	1,882	49	0	5,661	15,390
2048	13,060	-4,023	-1,170	1,992	50	0	5,750	15,659
2049	13,136	-4,075	-1,179	2,105	51	0	5,839	15,877
2050	13,248	-4,130	-1,187	2,224	52	0	5,928	16,135

Table A-142: Zone G Summer Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,314	-92	-31	4	-7	0	50	2,238
2021	2,381	-149	-97	9	-11	0	67	2,200
2022	2,425	-221	-45	18	-17	0	80	2,240
2023	2,450	-264	-49	24	-28	0	93	2,227
2024	2,489	-320	-71	31	-35	0	105	2,199
2025	2,498	-351	-91	40	-45	0	135	2,186
2026	2,561	-482	-19	60	-37	0	163	2,246
2027	2,595	-520	-19	79	-44	0	193	2,285
2028	2,631	-556	-20	101	-49	0	223	2,331
2029	2,668	-592	-20	123	-54	0	255	2,379
2030	2,707	-634	-20	145	-61	0	286	2,423
2031	2,746	-666	-20	168	-66	0	317	2,479
2032	2,711	-623	-20	193	-73	0	347	2,535
2033	2,749	-654	-21	217	-78	0	379	2,593
2034	2,788	-683	-21	244	-85	0	411	2,654
2035	2,826	-712	-21	271	-90	0	600	2,874
2036	2,864	-739	-21	298	-95	0	628	2,934
2037	2,902	-768	-21	327	-98	0	661	3,003
2038	2,940	-795	-22	355	-100	0	691	3,069
2039	2,977	-822	-22	386	-102	0	723	3,140
2040	3,018	-852	-22	420	-105	0	905	3,364
2041	3,058	-879	-22	449	-107	0	940	3,439
2042	3,098	-904	-22	481	-110	0	970	3,514
2043	3,139	-928	-22	514	-112	0	998	3,589
2044	3,180	-951	-23	547	-114	0	1,024	3,664
2045	3,221	-975	-23	585	-117	0	1,059	3,749
2046	3,266	-999	-23	620	-119	0	1,072	3,817
2047	3,309	-1,021	-21	658	-122	0	1,085	3,889
2048	3,354	-1,042	-23	694	-124	0	1,092	3,951
2049	3,400	-1,064	-24	736	-127	0	1,108	4,030
2050	3,446	-1,085	-24	778	-129	0	1,121	4,106

Table A-143: Zone G Winter Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	1,649	-136	0	13	-10	0	123	1,639
2021-22	1,675	-178	0	18	-17	0	150	1,647
2022-23	1,701	-216	0	24	-28	0	175	1,656
2023-24	1,721	-253	0	31	-35	0	199	1,664
2024-25	1,739	-289	0	40	-45	0	258	1,702
2025-26	1,743	-313	0	52	-52	0	316	1,745
2026-27	1,765	-360	0	79	-44	0	387	1,827
2027-28	1,783	-382	0	101	-49	0	450	1,902
2028-29	1,797	-404	0	123	-54	0	517	1,978
2029-30	1,816	-429	0	145	-61	0	583	2,054
2030-31	1,836	-449	0	168	-66	0	651	2,140
2031-32	1,817	-437	0	193	-73	0	716	2,216
2032-33	1,838	-455	0	217	-78	0	786	2,308
2033-34	1,855	-472	0	244	-85	0	858	2,400
2034-35	1,866	-529	0	275	-60	0	1,285	2,838
2035-36	1,886	-545	0	302	-63	0	1,352	2,932
2036-37	1,889	-556	0	332	-65	0	1,430	3,029
2037-38	1,909	-572	0	360	-67	0	1,505	3,136
2038-39	1,925	-587	0	392	-68	0	1,583	3,245
2039-40	1,944	-679	0	398	0	0	2,049	3,712
2040-41	1,955	-693	0	425	0	0	2,140	3,827
2041-42	1,973	-708	0	455	0	0	2,222	3,941
2042-43	1,976	-714	0	487	0	0	2,297	4,047
2043-44	2,001	-729	0	518	0	0	2,373	4,163
2044-45	2,017	-743	0	554	0	0	2,466	4,294
2045-46	2,028	-754	0	587	0	0	2,511	4,373
2046-47	2,045	-766	0	623	0	0	2,556	4,458
2047-48	2,064	-778	0	658	0	0	2,587	4,531
2048-49	2,075	-783	0	697	0	0	2,640	4,628
2049-50	2,093	-795	0	736	0	0	2,685	4,719
2050-51	2,111	-806	0	778	0	0	2,731	4,813

Table A-144: Zone H Energy – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	2,765	-122	-35	6	0	0	69	2,683
2021	2,767	-194	-42	7	0	0	88	2,626
2022	2,788	-260	-50	10	1	0	106	2,595
2023	2,807	-322	-57	13	1	0	124	2,566
2024	2,832	-384	-85	18	1	0	142	2,523
2025	2,840	-443	-113	22	2	0	182	2,489
2026	2,853	-483	-117	29	2	0	223	2,506
2027	2,866	-520	-120	38	2	0	265	2,530
2028	2,887	-555	-124	48	2	0	308	2,566
2029	2,893	-587	-127	59	3	0	351	2,592
2030	2,908	-626	-128	70	3	0	395	2,621
2031	2,921	-653	-130	81	3	0	439	2,661
2032	2,941	-680	-132	93	4	0	484	2,710
2033	2,946	-705	-133	105	4	0	528	2,746
2034	2,958	-729	-134	118	4	0	574	2,792
2035	2,971	-751	-135	131	5	0	840	3,061
2036	2,990	-774	-136	144	5	0	886	3,115
2037	2,994	-793	-138	158	5	0	931	3,158
2038	3,005	-813	-139	171	5	0	977	3,207
2039	3,015	-831	-140	186	5	0	1,025	3,261
2040	3,034	-854	-141	203	5	0	1,290	3,537
2041	3,037	-870	-142	217	6	0	1,336	3,583
2042	3,047	-885	-143	232	6	0	1,383	3,639
2043	3,057	-900	-145	248	6	0	1,430	3,696
2044	3,074	-915	-146	265	6	0	1,477	3,761
2045	3,077	-927	-147	282	6	0	1,523	3,815
2046	3,088	-939	-148	300	6	0	1,548	3,855
2047	3,099	-949	-150	318	6	0	1,573	3,897
2048	3,117	-960	-151	336	6	0	1,598	3,947
2049	3,120	-968	-152	356	6	0	1,623	3,985
2050	3,131	-976	-153	376	7	0	1,648	4,031

Table A-145: Zone H Summer Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	634	-25	-4	1	-1	0	17	622
2021	641	-40	-12	2	-2	0	23	612
2022	648	-63	-6	4	-2	0	27	608
2023	647	-70	-7	5	-4	0	31	603
2024	653	-84	-10	6	-5	0	35	595
2025	663	-103	-14	8	-6	0	45	593
2026	664	-122	-3	12	-5	0	55	601
2027	669	-131	-3	16	-6	0	65	610
2028	675	-139	-3	20	-7	0	75	619
2029	680	-148	-3	24	-8	0	85	630
2030	685	-157	-3	29	-9	0	95	640
2031	691	-164	-3	34	-10	0	105	652
2032	682	-157	-3	39	-11	0	115	664
2033	687	-163	-3	44	-12	0	125	677
2034	693	-170	-3	49	-13	0	136	691
2035	698	-176	-3	55	-14	0	198	757
2036	703	-182	-3	60	-14	0	206	770
2037	709	-188	-3	65	-15	0	217	785
2038	714	-193	-3	71	-15	0	226	799
2039	719	-198	-3	77	-16	0	236	815
2040	724	-204	-3	84	-16	0	295	879
2041	729	-209	-4	90	-16	0	306	895
2042	734	-214	-4	96	-17	0	315	911
2043	739	-219	-4	103	-17	0	323	927
2044	744	-223	-4	110	-17	0	332	942
2045	750	-227	-4	117	-18	0	342	961
2046	755	-231	-4	124	-18	0	346	973
2047	761	-235	-3	132	-18	0	350	987
2048	767	-238	-4	139	-19	0	353	998
2049	773	-242	-4	148	-19	0	358	1,014
2050	779	-245	-4	156	-19	0	362	1,028

Table A-146: Zone H Winter Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	533	-44	0	3	-2	0	42	531
2021-22	537	-57	0	4	-2	0	50	532
2022-23	543	-69	0	5	-4	0	59	534
2023-24	547	-80	0	6	-5	0	67	535
2024-25	550	-92	0	8	-6	0	87	546
2025-26	549	-98	0	10	-8	0	106	559
2026-27	553	-114	0	16	-6	0	130	579
2027-28	556	-120	0	20	-7	0	150	599
2028-29	557	-126	0	24	-8	0	172	620
2029-30	561	-133	0	29	-9	0	194	641
2030-31	564	-139	0	34	-10	0	216	665
2031-32	554	-133	0	39	-11	0	237	686
2032-33	558	-138	0	44	-12	0	260	711
2033-34	561	-143	0	49	-13	0	283	737
2034-35	561	-160	0	55	-9	0	423	871
2035-36	565	-164	0	61	-10	0	444	896
2036-37	563	-167	0	66	-10	0	469	922
2037-38	567	-171	0	72	-10	0	492	950
2038-39	569	-174	0	79	-10	0	517	979
2039-40	571	-199	0	80	0	0	667	1,120
2040-41	572	-202	0	85	0	0	696	1,151
2041-42	574	-205	0	91	0	0	721	1,181
2042-43	572	-206	0	98	0	0	744	1,209
2043-44	576	-209	0	104	0	0	768	1,239
2044-45	578	-212	0	111	0	0	798	1,275
2045-46	578	-214	0	118	0	0	812	1,294
2046-47	581	-217	0	125	0	0	826	1,315
2047-48	583	-219	0	132	0	0	836	1,332
2048-49	584	-219	0	140	0	0	853	1,357
2049-50	586	-221	0	148	0	0	867	1,379
2050-51	587	-223	0	156	0	0	882	1,402

Table A-147: Zone I Energy – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	6,099	-269	-38	11	0	0	149	5,953
2021	6,104	-428	-43	14	1	0	190	5,838
2022	6,152	-574	-50	20	1	0	231	5,779
2023	6,201	-712	-56	26	2	0	270	5,731
2024	6,263	-849	-83	35	2	0	309	5,678
2025	6,293	-982	-109	44	3	0	399	5,649
2026	6,333	-1,072	-112	58	4	0	490	5,700
2027	6,373	-1,157	-115	75	4	0	585	5,766
2028	6,431	-1,237	-118	95	5	0	680	5,857
2029	6,458	-1,311	-120	115	5	0	778	5,925
2030	6,490	-1,397	-122	135	6	0	877	5,989
2031	6,520	-1,458	-123	156	6	0	979	6,080
2032	6,565	-1,519	-124	180	7	0	1,080	6,189
2033	6,579	-1,574	-125	202	8	0	1,183	6,273
2034	6,611	-1,628	-126	226	8	0	1,287	6,378
2035	6,645	-1,680	-126	251	9	0	1,891	6,989
2036	6,697	-1,732	-127	276	9	0	1,999	7,121
2037	6,716	-1,779	-128	301	10	0	2,108	7,228
2038	6,751	-1,825	-129	327	10	0	2,217	7,352
2039	6,786	-1,870	-130	356	10	0	2,332	7,484
2040	6,830	-1,923	-131	388	10	0	2,944	8,118
2041	6,842	-1,959	-132	414	10	0	3,058	8,233
2042	6,872	-1,997	-133	444	11	0	3,175	8,371
2043	6,903	-2,032	-134	474	11	0	3,291	8,513
2044	6,954	-2,070	-135	506	11	0	3,409	8,675
2045	6,972	-2,100	-137	539	11	0	3,525	8,811
2046	7,010	-2,131	-138	572	11	0	3,593	8,918
2047	7,048	-2,159	-139	607	12	0	3,661	9,030
2048	7,104	-2,189	-140	643	12	0	3,730	9,160
2049	7,125	-2,210	-141	679	12	0	3,799	9,264
2050	7,164	-2,233	-142	718	12	0	3,868	9,386

Table A-148: Zone I Summer Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	1,370	-55	-3	1	-1	0	32	1,344
2021	1,392	-87	-11	3	-3	0	44	1,338
2022	1,408	-153	-5	6	-5	0	52	1,303
2023	1,387	-149	-6	8	-7	0	61	1,295
2024	1,402	-181	-8	11	-9	0	69	1,284
2025	1,441	-236	-11	14	-12	0	89	1,285
2026	1,432	-267	-2	21	-9	0	108	1,282
2027	1,445	-287	-2	28	-11	0	128	1,301
2028	1,459	-306	-2	35	-12	0	148	1,321
2029	1,474	-325	-3	42	-14	0	169	1,343
2030	1,486	-346	-3	49	-15	0	190	1,361
2031	1,497	-361	-3	57	-17	0	210	1,384
2032	1,473	-338	-3	66	-18	0	230	1,409
2033	1,485	-353	-3	74	-20	0	251	1,435
2034	1,498	-367	-3	83	-22	0	273	1,462
2035	1,510	-381	-3	92	-23	0	399	1,595
2036	1,523	-393	-3	101	-24	0	418	1,621
2037	1,538	-407	-3	110	-25	0	440	1,654
2038	1,551	-420	-3	120	-26	0	461	1,684
2039	1,564	-432	-3	131	-26	0	483	1,716
2040	1,576	-445	-3	142	-27	0	604	1,848
2041	1,588	-456	-3	152	-27	0	629	1,882
2042	1,600	-467	-3	163	-28	0	650	1,915
2043	1,615	-477	-3	174	-28	0	670	1,950
2044	1,628	-487	-3	185	-29	0	689	1,983
2045	1,642	-497	-3	198	-29	0	713	2,023
2046	1,657	-507	-3	210	-30	0	724	2,051
2047	1,672	-516	-3	223	-30	0	734	2,080
2048	1,688	-524	-3	235	-31	0	742	2,106
2049	1,706	-534	-3	249	-31	0	755	2,141
2050	1,722	-542	-3	263	-32	0	766	2,173

Table A-149: Zone I Winter Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	944	-78	0	4	-3	0	80	948
2021-22	951	-101	0	6	-5	0	98	950
2022-23	960	-122	0	8	-7	0	115	954
2023-24	966	-142	0	11	-9	0	131	957
2024-25	973	-162	0	14	-12	0	170	983
2025-26	977	-175	0	18	-13	0	209	1,015
2026-27	987	-207	0	28	-11	0	256	1,053
2027-28	993	-218	0	35	-12	0	297	1,094
2028-29	995	-229	0	42	-14	0	342	1,136
2029-30	1,000	-242	0	49	-15	0	386	1,179
2030-31	1,004	-251	0	57	-17	0	432	1,225
2031-32	985	-237	0	66	-18	0	474	1,270
2032-33	992	-246	0	74	-20	0	522	1,322
2033-34	995	-253	0	83	-22	0	570	1,373
2034-35	996	-284	0	93	-15	0	854	1,644
2035-36	1,002	-291	0	102	-16	0	899	1,696
2036-37	1,005	-298	0	112	-17	0	952	1,755
2037-38	1,014	-306	0	122	-17	0	1,003	1,816
2038-39	1,018	-312	0	133	-17	0	1,056	1,877
2039-40	1,021	-350	0	134	0	0	1,368	2,174
2040-41	1,020	-355	0	144	0	0	1,431	2,240
2041-42	1,024	-361	0	154	0	0	1,488	2,305
2042-43	1,027	-365	0	165	0	0	1,541	2,368
2043-44	1,036	-371	0	175	0	0	1,595	2,435
2044-45	1,039	-376	0	187	0	0	1,661	2,511
2045-46	1,040	-380	0	199	0	0	1,696	2,554
2046-47	1,046	-385	0	211	0	0	1,731	2,602
2047-48	1,052	-389	0	222	0	0	1,758	2,642
2048-49	1,060	-394	0	236	0	0	1,798	2,700
2049-50	1,065	-397	0	249	0	0	1,834	2,751
2050-51	1,071	-401	0	263	0	0	1,871	2,803

Table A-150: Zone J Energy – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	53,504	-2,355	-335	93	3	0	1,308	52,217
2021	53,545	-3,750	-377	122	6	0	1,664	51,210
2022	53,966	-5,037	-438	174	11	0	2,023	50,698
2023	54,398	-6,244	-495	232	16	0	2,367	50,274
2024	54,943	-7,448	-727	306	21	0	2,712	49,808
2025	55,206	-8,614	-959	388	27	0	3,502	49,552
2026	55,553	-9,402	-984	505	31	0	4,302	50,004
2027	55,907	-10,147	-1,007	659	36	0	5,129	50,577
2028	56,414	-10,852	-1,031	835	42	0	5,967	51,375
2029	56,652	-11,496	-1,056	1,008	46	0	6,826	51,979
2030	56,931	-12,252	-1,070	1,183	51	0	7,697	52,541
2031	57,192	-12,791	-1,077	1,371	57	0	8,585	53,337
2032	57,586	-13,321	-1,088	1,575	61	0	9,475	54,289
2033	57,715	-13,805	-1,096	1,769	67	0	10,376	55,025
2034	57,993	-14,283	-1,104	1,980	72	0	11,293	55,950
2035	58,287	-14,736	-1,109	2,200	76	0	16,587	61,305
2036	58,744	-15,194	-1,115	2,417	80	0	17,533	62,464
2037	58,912	-15,602	-1,122	2,642	84	0	18,490	63,404
2038	59,220	-16,009	-1,130	2,872	86	0	19,451	64,490
2039	59,527	-16,402	-1,139	3,126	88	0	20,455	65,654
2040	59,916	-16,871	-1,149	3,405	89	0	25,821	71,210
2041	60,020	-17,189	-1,159	3,631	91	0	26,828	72,223
2042	60,281	-17,514	-1,169	3,891	93	0	27,847	73,430
2043	60,556	-17,827	-1,179	4,161	95	0	28,869	74,674
2044	60,998	-18,156	-1,188	4,439	96	0	29,907	76,096
2045	61,161	-18,419	-1,199	4,725	98	0	30,923	77,290
2046	61,495	-18,689	-1,208	5,020	100	0	31,516	78,234
2047	61,828	-18,938	-1,219	5,324	102	0	32,114	79,212
2048	62,317	-19,198	-1,230	5,637	103	0	32,723	80,353
2049	62,502	-19,391	-1,239	5,958	105	0	33,328	81,264
2050	62,844	-19,589	-1,248	6,297	107	0	33,930	82,340

Table A-151: Zone J Summer Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	11,345	-453	-29	12	-10	0	269	11,135
2021	11,528	-723	-87	26	-24	0	361	11,080
2022	11,662	-1,272	-42	52	-38	0	432	10,796
2023	11,493	-1,237	-47	70	-57	0	504	10,726
2024	11,615	-1,496	-70	92	-73	0	571	10,639
2025	11,937	-1,958	-92	116	-96	0	738	10,646
2026	11,859	-2,208	-19	175	-78	0	893	10,622
2027	11,970	-2,376	-20	228	-89	0	1,060	10,773
2028	12,088	-2,533	-20	289	-103	0	1,222	10,943
2029	12,207	-2,692	-21	349	-114	0	1,399	11,128
2030	12,307	-2,867	-21	410	-127	0	1,570	11,272
2031	12,404	-2,994	-21	474	-141	0	1,743	11,466
2032	12,203	-2,803	-21	544	-152	0	1,904	11,676
2033	12,305	-2,926	-22	612	-165	0	2,082	11,886
2034	12,407	-3,042	-22	686	-178	0	2,260	12,112
2035	12,511	-3,153	-22	761	-189	0	3,305	13,213
2036	12,616	-3,257	-22	834	-198	0	3,459	13,431
2037	12,742	-3,372	-22	914	-208	0	3,644	13,699
2038	12,849	-3,475	-22	995	-212	0	3,818	13,951
2039	12,956	-3,577	-23	1,082	-217	0	3,997	14,219
2040	13,052	-3,685	-23	1,176	-220	0	5,006	15,306
2041	13,151	-3,779	-23	1,257	-225	0	5,208	15,589
2042	13,252	-3,865	-23	1,346	-230	0	5,383	15,864
2043	13,376	-3,953	-23	1,440	-234	0	5,547	16,152
2044	13,486	-4,032	-23	1,532	-238	0	5,704	16,429
2045	13,602	-4,117	-24	1,637	-243	0	5,906	16,761
2046	13,728	-4,198	-24	1,737	-247	0	5,995	16,991
2047	13,851	-4,273	-21	1,844	-252	0	6,084	17,233
2048	13,979	-4,342	-24	1,945	-255	0	6,143	17,446
2049	14,131	-4,424	-25	2,063	-260	0	6,255	17,739
2050	14,265	-4,493	-25	2,179	-265	0	6,343	18,003

Table A-152: Zone J Winter Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	7,821	-647	0	37	-22	0	664	7,852
2021-22	7,882	-839	0	52	-38	0	808	7,866
2022-23	7,950	-1,009	0	70	-57	0	949	7,903
2023-24	8,002	-1,174	0	92	-73	0	1,083	7,929
2024-25	8,057	-1,341	0	116	-96	0	1,408	8,144
2025-26	8,093	-1,452	0	151	-111	0	1,728	8,409
2026-27	8,174	-1,715	0	228	-89	0	2,120	8,719
2027-28	8,224	-1,809	0	289	-103	0	2,463	9,064
2028-29	8,241	-1,898	0	349	-114	0	2,835	9,412
2029-30	8,282	-2,003	0	410	-127	0	3,201	9,763
2030-31	8,320	-2,077	0	474	-141	0	3,574	10,151
2031-32	8,164	-1,962	0	544	-152	0	3,930	10,524
2032-33	8,220	-2,037	0	612	-165	0	4,321	10,951
2033-34	8,244	-2,100	0	686	-178	0	4,719	11,372
2034-35	8,251	-2,354	0	773	-126	0	7,073	13,617
2035-36	8,299	-2,414	0	847	-132	0	7,449	14,049
2036-37	8,328	-2,471	0	928	-139	0	7,887	14,535
2037-38	8,397	-2,533	0	1,010	-141	0	8,310	15,042
2038-39	8,434	-2,587	0	1,098	-144	0	8,751	15,552
2039-40	8,456	-2,897	0	1,113	0	0	11,335	18,006
2040-41	8,451	-2,941	0	1,191	0	0	11,858	18,558
2041-42	8,484	-2,989	0	1,275	0	0	12,328	19,098
2042-43	8,511	-3,022	0	1,363	0	0	12,765	19,617
2043-44	8,578	-3,072	0	1,451	0	0	13,212	20,169
2044-45	8,604	-3,113	0	1,551	0	0	13,759	20,800
2045-46	8,615	-3,147	0	1,645	0	0	14,047	21,160
2046-47	8,661	-3,188	0	1,746	0	0	14,339	21,558
2047-48	8,711	-3,225	0	1,842	0	0	14,559	21,887
2048-49	8,780	-3,260	0	1,953	0	0	14,896	22,369
2049-50	8,825	-3,293	0	2,063	0	0	15,194	22,790
2050-51	8,869	-3,326	0	2,180	0	0	15,499	23,222

Table A-153: Zone K Energy – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	21,568	-949	-692	138	3	0	517	20,585
2021	21,597	-1,512	-742	245	5	0	650	20,242
2022	21,778	-2,032	-755	361	8	0	789	20,148
2023	21,943	-2,519	-762	489	11	0	915	20,079
2024	22,157	-3,003	-1,036	643	14	0	1,040	19,814
2025	22,255	-3,472	-1,291	793	17	0	1,328	19,631
2026	22,415	-3,793	-1,266	954	20	0	1,619	19,949
2027	22,578	-4,097	-1,256	1,164	23	0	1,921	20,333
2028	22,795	-4,384	-1,255	1,398	26	0	2,254	20,833
2029	22,904	-4,647	-1,259	1,652	29	0	2,592	21,271
2030	23,020	-4,953	-1,259	1,930	32	0	2,955	21,725
2031	23,140	-5,174	-1,285	2,240	35	0	3,337	22,294
2032	23,315	-5,392	-1,295	2,548	39	0	3,722	22,936
2033	23,391	-5,594	-1,301	2,871	42	0	4,118	23,527
2034	23,527	-5,793	-1,309	3,227	45	0	4,536	24,233
2035	23,670	-5,983	-1,320	3,631	47	0	6,759	26,804
2036	23,879	-6,175	-1,331	4,058	50	0	7,252	27,733
2037	23,969	-6,347	-1,343	4,540	52	0	7,756	28,628
2038	24,121	-6,520	-1,356	5,070	53	0	8,300	29,668
2039	24,275	-6,687	-1,370	5,562	54	0	8,759	30,592
2040	24,455	-6,885	-1,382	6,025	55	0	11,249	33,518
2041	24,525	-7,022	-1,392	6,423	56	0	11,792	34,383
2042	24,659	-7,163	-1,403	6,885	57	0	12,325	35,361
2043	24,793	-7,297	-1,416	7,362	58	0	12,868	36,367
2044	25,002	-7,440	-1,429	7,854	59	0	13,395	37,441
2045	25,097	-7,556	-1,442	8,361	60	0	13,981	38,500
2046	25,262	-7,676	-1,455	8,884	61	0	14,349	39,425
2047	25,430	-7,787	-1,464	9,421	62	0	14,723	40,386
2048	25,666	-7,905	-1,476	9,974	63	0	15,075	41,397
2049	25,774	-7,994	-1,491	10,542	64	0	15,432	42,327
2050	25,955	-8,089	-1,506	11,141	65	0	15,790	43,358

Table A-154: Zone K Summer Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	5,606	-224	-60	18	-11	0	107	5,436
2021	5,726	-359	-173	52	-19	0	142	5,369
2022	5,812	-583	-73	109	-29	0	170	5,406
2023	5,791	-623	-73	148	-39	0	196	5,399
2024	5,866	-755	-100	193	-50	0	220	5,374
2025	5,960	-911	-124	239	-61	0	282	5,385
2026	6,014	-1,186	-25	332	-50	0	338	5,424
2027	6,087	-1,274	-25	406	-57	0	400	5,536
2028	6,161	-1,356	-25	486	-65	0	465	5,666
2029	6,235	-1,438	-25	575	-72	0	535	5,810
2030	6,305	-1,531	-25	673	-80	0	607	5,949
2031	6,374	-1,599	-26	780	-87	0	682	6,124
2032	6,205	-1,425	-26	885	-97	0	753	6,296
2033	6,277	-1,492	-26	1,000	-105	0	832	6,485
2034	6,350	-1,557	-26	1,126	-112	0	914	6,695
2035	6,424	-1,619	-26	1,265	-117	0	1,355	7,282
2036	6,500	-1,678	-27	1,409	-124	0	1,440	7,520
2037	6,580	-1,741	-27	1,581	-130	0	1,539	7,803
2038	6,655	-1,800	-27	1,767	-132	0	1,640	8,103
2039	6,731	-1,858	-27	1,937	-134	0	1,723	8,371
2040	6,807	-1,922	-27	2,094	-137	0	2,195	9,010
2041	6,883	-1,978	-28	2,239	-139	0	2,304	9,281
2042	6,959	-2,030	-28	2,398	-142	0	2,398	9,556
2043	7,042	-2,081	-28	2,564	-144	0	2,489	9,841
2044	7,122	-2,129	-28	2,729	-147	0	2,572	10,118
2045	7,206	-2,181	-29	2,916	-149	0	2,688	10,450
2046	7,296	-2,231	-29	3,094	-152	0	2,747	10,725
2047	7,385	-2,278	-26	3,284	-154	0	2,808	11,018
2048	7,478	-2,322	-29	3,464	-156	0	2,848	11,281
2049	7,576	-2,372	-30	3,674	-159	0	2,915	11,603
2050	7,671	-2,417	-30	3,881	-162	0	2,971	11,915

Table A-155: Zone K Winter Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	3,393	-281	0	74	-18	0	261	3,430
2021-22	3,421	-364	0	109	-29	0	317	3,455
2022-23	3,455	-438	0	148	-39	0	369	3,494
2023-24	3,475	-510	0	193	-50	0	418	3,527
2024-25	3,493	-581	0	239	-61	0	537	3,628
2025-26	3,497	-627	0	288	-71	0	654	3,741
2026-27	3,531	-738	0	406	-57	0	799	3,941
2027-28	3,554	-780	0	486	-65	0	936	4,132
2028-29	3,567	-820	0	575	-72	0	1,083	4,334
2029-30	3,579	-864	0	673	-80	0	1,237	4,545
2030-31	3,593	-895	0	780	-87	0	1,399	4,789
2031-32	3,519	-846	0	885	-97	0	1,554	5,016
2032-33	3,541	-877	0	1,000	-105	0	1,726	5,285
2033-34	3,557	-906	0	1,126	-112	0	1,908	5,573
2034-35	3,560	-1,021	0	1,284	-78	0	2,901	6,646
2035-36	3,580	-1,047	0	1,431	-83	0	3,101	6,982
2036-37	3,580	-1,066	0	1,606	-86	0	3,330	7,363
2037-38	3,607	-1,093	0	1,794	-88	0	3,569	7,789
2038-39	3,624	-1,117	0	1,967	-90	0	3,772	8,156
2039-40	3,637	-1,288	0	1,983	0	0	4,970	9,302
2040-41	3,634	-1,306	0	2,120	0	0	5,246	9,694
2041-42	3,646	-1,326	0	2,271	0	0	5,492	10,082
2042-43	3,646	-1,334	0	2,428	0	0	5,727	10,467
2043-44	3,673	-1,356	0	2,585	0	0	5,956	10,858
2044-45	3,689	-1,376	0	2,761	0	0	6,261	11,335
2045-46	3,693	-1,390	0	2,930	0	0	6,437	11,669
2046-47	3,708	-1,407	0	3,109	0	0	6,617	12,028
2047-48	3,727	-1,422	0	3,280	0	0	6,751	12,336
2048-49	3,743	-1,430	0	3,479	0	0	6,942	12,734
2049-50	3,762	-1,446	0	3,675	0	0	7,117	13,109
2050-51	3,782	-1,461	0	3,882	0	0	7,297	13,500

Table A-156: NYCA Energy – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	160,724	-7,077	-2,647	420	15	0	3,961	155,396
2021	160,908	-11,271	-3,077	612	28	0	5,022	152,222
2022	162,276	-15,148	-3,479	878	43	0	6,088	150,659
2023	163,550	-18,776	-3,838	1,176	63	0	7,094	149,269
2024	165,107	-22,384	-5,590	1,543	80	0	8,096	146,851
2025	165,724	-25,861	-7,329	1,922	103	0	10,402	144,961
2026	166,671	-28,211	-7,491	2,430	121	0	12,731	146,251
2027	167,623	-30,427	-7,648	3,111	141	0	15,131	147,931
2028	169,035	-32,519	-7,814	3,878	161	0	17,587	150,328
2029	169,606	-34,421	-7,977	4,674	178	0	20,076	152,135
2030	170,566	-36,710	-8,081	5,488	200	0	22,633	154,096
2031	171,475	-38,353	-8,182	6,373	219	0	25,237	156,769
2032	172,783	-39,973	-8,284	7,313	240	0	27,840	159,918
2033	173,242	-41,441	-8,360	8,230	261	0	30,469	162,401
2034	174,127	-42,888	-8,434	9,249	280	0	33,149	165,483
2035	175,029	-44,255	-8,508	10,322	296	0	48,675	181,560
2036	176,394	-45,628	-8,581	11,415	312	0	51,432	185,343
2037	176,834	-46,834	-8,656	12,577	324	0	54,217	188,462
2038	177,685	-48,038	-8,735	13,795	332	0	57,037	192,075
2039	178,514	-49,192	-8,810	15,048	339	0	59,872	195,772
2040	179,814	-50,636	-8,885	16,361	346	0	75,594	212,594
2041	180,181	-51,603	-8,960	17,442	353	0	78,463	215,876
2042	180,989	-52,587	-9,036	18,695	360	0	81,335	219,755
2043	181,801	-53,524	-9,112	19,991	367	0	84,210	223,732
2044	183,098	-54,502	-9,189	21,325	374	0	87,092	228,198
2045	183,506	-55,268	-9,266	22,703	381	0	89,978	232,034
2046	184,416	-56,050	-9,344	24,122	388	0	91,574	235,106
2047	185,318	-56,765	-9,423	25,580	395	0	93,174	238,279
2048	186,690	-57,517	-9,502	27,083	402	0	94,761	241,917
2049	187,125	-58,056	-9,581	28,624	409	0	96,344	244,865
2050	188,043	-58,618	-9,662	30,253	416	0	97,917	248,349

Table A-157: NYCA Summer Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020	33,345	-1,330	-228	56	-57	0	819	32,604
2021	33,842	-2,124	-718	131	-107	0	1,096	32,121
2022	34,276	-3,442	-336	265	-154	0	1,310	31,919
2023	34,109	-3,672	-370	355	-225	0	1,521	31,718
2024	34,475	-4,439	-539	464	-285	0	1,716	31,392
2025	35,137	-5,524	-706	579	-368	0	2,207	31,326
2026	35,197	-6,533	-149	847	-301	0	2,661	31,720
2027	35,527	-7,031	-152	1,084	-351	0	3,147	32,223
2028	35,875	-7,495	-156	1,349	-400	0	3,627	32,800
2029	36,225	-7,962	-159	1,628	-443	0	4,142	33,431
2030	36,565	-8,488	-161	1,913	-498	0	4,647	33,978
2031	36,894	-8,872	-163	2,220	-545	0	5,157	34,690
2032	36,369	-8,352	-165	2,541	-596	0	5,631	35,427
2033	36,706	-8,727	-167	2,867	-650	0	6,155	36,183
2034	37,045	-9,082	-168	3,226	-697	0	6,679	37,003
2035	37,384	-9,421	-170	3,595	-737	0	9,761	40,413
2036	37,725	-9,740	-171	3,964	-775	0	10,212	41,215
2037	38,100	-10,081	-172	4,380	-807	0	10,756	42,175
2038	38,433	-10,395	-174	4,808	-827	0	11,268	43,112
2039	38,764	-10,702	-176	5,241	-844	0	11,776	44,060
2040	39,102	-11,039	-177	5,686	-859	0	14,752	47,465
2041	39,437	-11,331	-179	6,079	-879	0	15,331	48,458
2042	39,771	-11,600	-180	6,511	-897	0	15,826	49,432
2043	40,146	-11,865	-181	6,963	-914	0	16,286	50,434
2044	40,496	-12,106	-183	7,411	-929	0	16,719	51,408
2045	40,860	-12,369	-184	7,918	-949	0	17,297	52,573
2046	41,252	-12,614	-186	8,402	-966	0	17,532	53,418
2047	41,634	-12,843	-167	8,915	-984	0	17,768	54,323
2048	42,032	-13,054	-189	9,405	-999	0	17,904	55,100
2049	42,474	-13,297	-191	9,975	-1,019	0	18,199	56,141
2050	42,886	-13,509	-193	10,537	-1,036	0	18,423	57,109

Table 158: NYCA Winter Peaks – CLCPA Case

Year	(a) Baseline SAE Model	(b) New Energy Efficiency, Codes & Standards	(c) Solar PV, BTM	(d) Electric Vehicles	(e) Storage	(f) Other Distributed Energy Resources	(g) Electrification	(h) Final Forecast
2020-21	25,185	-2,083	0	185	-100	0	2,016	25,203
2021-22	25,420	-2,705	0	265	-154	0	2,449	25,275
2022-23	25,673	-3,258	0	355	-225	0	2,862	25,406
2023-24	25,865	-3,796	0	464	-285	0	3,255	25,503
2024-25	26,037	-4,334	0	579	-368	0	4,208	26,123
2025-26	26,053	-4,674	0	733	-432	0	5,146	26,826
2026-27	26,298	-5,426	0	1,084	-351	0	6,295	27,900
2027-28	26,455	-5,732	0	1,349	-400	0	7,306	28,979
2028-29	26,532	-6,025	0	1,628	-443	0	8,392	30,084
2029-30	26,703	-6,371	0	1,913	-498	0	9,472	31,219
2030-31	26,865	-6,621	0	2,220	-545	0	10,576	32,495
2031-32	26,417	-6,350	0	2,541	-596	0	11,623	33,635
2032-33	26,614	-6,594	0	2,867	-650	0	12,771	35,008
2033-34	26,731	-6,807	0	3,226	-697	0	13,944	36,396
2034-35	26,781	-7,628	0	3,650	-491	0	20,892	43,204
2035-36	26,965	-7,831	0	4,025	-517	0	21,993	44,635
2036-37	26,960	-7,981	0	4,448	-538	0	23,278	46,167
2037-38	27,172	-8,181	0	4,881	-551	0	24,526	47,847
2038-39	27,285	-8,355	0	5,322	-563	0	25,783	49,471
2039-40	27,413	-9,497	0	5,384	0	0	33,400	56,701
2040-41	27,445	-9,658	0	5,757	0	0	34,905	58,449
2041-42	27,573	-9,824	0	6,166	0	0	36,241	60,157
2042-43	27,565	-9,884	0	6,594	0	0	37,479	61,753
2043-44	27,786	-10,051	0	7,018	0	0	38,725	63,477
2044-45	27,887	-10,195	0	7,498	0	0	40,295	65,484
2045-46	27,933	-10,311	0	7,956	0	0	41,080	66,659
2046-47	28,078	-10,446	0	8,443	0	0	41,875	67,950
2047-48	28,240	-10,568	0	8,906	0	0	42,436	69,014
2048-49	28,344	-10,624	0	9,446	0	0	43,341	70,507
2049-50	28,476	-10,730	0	9,979	0	0	44,135	71,859
2050-51	28,609	-10,838	0	10,541	0	0	44,943	73,256

Appendix B: SAE Modeling Framework

B-1 Residential Sector

The traditional approach to forecasting monthly sales for a customer class is to develop an econometric model that relates monthly sales to weather, seasonal variables, and economic conditions. From a forecasting perspective, econometric models are well suited to identify historical trends and to project these trends into the future. In contrast, the strength of the end-use modeling approach is the ability to identify the end-use factors that drive energy use. By incorporating an end-use structure into an econometric model, the statistically adjusted end-use (SAE) modeling framework exploits the strengths of both approaches.

There are several advantages to this approach.

- The equipment efficiency and saturation trends, dwelling square footage, and thermal shell integrity changes embodied in the long-run end-use forecasts are introduced explicitly into the short-term monthly sales forecast. This provides a strong bridge between the two forecasts.
- By explicitly introducing trends in equipment saturations, equipment efficiency, dwelling square footage, and thermal integrity levels, it is easier to explain changes in usage levels and changes in weather-sensitivity over time.
- Data for short-term models are often not sufficiently robust to support estimation of a full set of price, economic, and demographic effects. By bundling these factors with equipment-oriented drivers, a rich set of elasticities can be incorporated into the final model.

This section describes the SAE approach, the associated supporting SAE spreadsheets, and the *MetrixND* project files that are used in the implementation. The initial source for the SAE spreadsheets is the 2019 Annual Energy Outlook (AEO) database provided by the Energy Information Administration (EIA), with further adjustments to data specific to New York when that is available.

B-1.1 Residential Statistically Adjusted End-Use Modeling Framework

The statistically adjusted end-use modeling framework begins by defining energy use ($USE_{y,m}$) in year (y) and month (m) as the sum of energy used by heating equipment ($Heat_{y,m}$), cooling equipment ($Cool_{y,m}$), and other equipment ($Other_{y,m}$). Formally,

$$\mathrm{USE}_{y,m} = \mathrm{Heat}_{y,m} + \mathrm{Cool}_{y,m} + \mathrm{Other}_{y,m} \quad (1)$$

Although monthly sales are measured for individual customers, the end-use components are not. Substituting estimates for the end-use elements gives the following econometric equation.

$$\mathrm{USE}_m = a + b_1 \times \mathrm{XHeat}_m + b_2 \times \mathrm{XCool}_m + b_3 \times \mathrm{XOther}_m + \varepsilon_m \qquad (2)$$

XHeat$_m$, *XCool*$_m$, and *XOther*$_m$ are explanatory variables constructed from end-use information, dwelling data, weather data, and market data. As will be shown below, the equations used to construct these X-variables are simplified end-use models, and the X-variables are the estimated usage levels for each of the major end uses based on these models. The estimated model can then be thought of as a statistically adjusted end-use model, where the estimated slopes are the adjustment factors.

B-1.2 Constructing XHeat

As represented in the SAE spreadsheets, energy use by space heating systems depends on the following types of variables.

- Heating degree days
- Heating equipment saturation levels
- Heating equipment operating efficiencies
- Average number of days in the billing cycle for each month
- Thermal integrity and footage of homes
- Average household size, household income, and energy prices

The heating variable is represented as the product of an annual equipment index and a monthly usage multiplier. That is,

$$XHeat_{y,m} = HeatIndex_{y,m} \times HeatUse_{y,m} \qquad (3)$$

Where:

- *XHeat*$_{y,m}$ is estimated heating energy use in year (*y*) and month (*m*)
- *HeatIndex*$_{y,m}$ is the monthly index of heating equipment
- *HeatUse*$_{y,m}$ is the monthly usage multiplier

The heating equipment index is defined as a weighted average across equipment types of equipment saturation levels normalized by operating efficiency levels. Given a set of fixed weights, the index will change over time with changes in equipment saturations (*Sat*), operating efficiencies (*Eff*), building structural index (*StructuralIndex*), and energy prices. Formally, the equipment index is defined as:

$$HeatIndex_y = StructuralIndex_y \times \sum_{Type} Weight^{Type} \times \frac{\left(Sat_y^{Type} \Big/ Eff_y^{Type} \right)}{\left(Sat_{15}^{Type} \Big/ Eff_{15}^{Type} \right)} \quad (4)$$

The *StructuralIndex* is constructed by combining the EIA's building shell efficiency index trends with surface area estimates, and then it is indexed to the 2015 value:

$$StructuralIndex_y = \frac{BuildingShellEfficiencyIndex_y \times SurfaceArea_y}{BuildingShellEfficiencyIndex_{15} \times SurfaceArea_{15}} \quad (5)$$

The *StructuralIndex* is defined on the *StructuralVars* tab of the SAE spreadsheets. Surface area is derived to account for roof and wall area of a standard dwelling based on the regional average square footage data obtained from EIA. The relationship between the square footage and surface area is constructed assuming an aspect ratio of 0.75 and an average of 25% two-story and 75% single-story. Given these assumptions, the approximate linear relationship for surface area is:

$$SurfaceArea_y = 892 + 1.44 \times Footage_y \quad (6)$$

In Equation 4, 2015 is used as a base year for normalizing the index. As a result, the ratio on the right is equal to 1.0 in 2015. In other years, it will be greater than 1.0 if equipment saturation levels are above their 2015 level. This will be counteracted by higher efficiency levels, which will drive the index downward. The weights are defined as follows.

$$Weight^{Type} = \frac{Energy_{15}^{Type}}{HH_{15}} \times HeatShare_{15}^{Type} \quad (7)$$

In the SAE spreadsheets, these weights are referred to as *Intensities* and are defined on the *EIAData* tab. With these weights, the *HeatIndex* value in 2015 will be equal to estimated annual heating intensity per household in that year. Variations from this value in other years will be proportional to saturation and efficiency variations around their base values.

For electric heating equipment, the SAE spreadsheets contain several equipment types including electric resistance furnaces, secondary heating equipment (such as portable heaters), and electric space heating heat pumps.

Data for the equipment saturation and efficiency trends are presented on the *Shares* and *Efficiencies* tabs of the SAE spreadsheets. The efficiency for electric space heating heat pumps is given in terms of Heating Seasonal Performance Factor [BTU/Wh], and the efficiencies for electric furnaces and room units are estimated as 100%, which is equivalent to 3.41 BTU/Wh.

Heating system usage levels are impacted on a monthly basis by several factors, including weather, household size, income levels, prices, and billing days. The estimates for space heating equipment usage levels are computed as follows:

$$HeatUse_{y,m} = \left(\frac{RHD_{y,m}}{RHD_{15}}\right) \times \left(\frac{HHSize_{y}}{HHSize_{15}}\right)^{0.10} \times \left(\frac{Income_{y}}{Income_{15}}\right)^{0.10} \quad (8)$$

Where:

- *RHD* is the number of heating degree days in year (*y*) and month (*m*) for the residential model.
- *HHSize* is average persons per household in a year (*y*)
- *Income* is average real income per household in year (*y*)

By construction, the $HeatUse_{y,m}$ variable has an annual sum that is close to 1.0 in the base year (2015). The heating degree days serve to allocate annual values to months of the year. The remaining terms average to 1.0 in the base year. In other years, the values will reflect changes in the economic drivers, as transformed through the end-use elasticity parameters. The income impacts captured by the Usage equation represent short-term income response.

B-1.3 Constructing XCool

The explanatory variable for cooling loads is constructed in a similar manner. The amount of energy used by cooling systems depends on the following types of variables.

- Cooling degree days
- Cooling equipment saturation levels
- Cooling equipment operating efficiencies
- Average number of days in the billing cycle for each month
- Thermal integrity and footage of homes

- Average household size, household income, and energy prices

The cooling variable is represented as the product of an equipment-based index and monthly usage multiplier. That is,

$$XCool_{y,m} = CoolIndex_{y} \times CoolUse_{y,m} \tag{9}$$

Where

- $XCool_{y,m}$ is estimated cooling energy use in year (y) and month (m)
- $CoolIndex_{y}$ is an index of cooling equipment
- $CoolUse_{y,m}$ is the monthly usage multiplier

As with heating, the cooling equipment index is defined as a weighted average across equipment types of equipment saturation levels normalized by operating efficiency levels. Formally, the cooling equipment index is defined as:

$$CoolIndex_{y} = StructuralIndex_{y} \times \sum_{Type} Weight^{Type} \times \frac{\left(Sat_{y}^{Type} \Big/ Eff_{y}^{Type} \right)}{\left(Sat_{15}^{Type} \Big/ Eff_{15}^{Type} \right)} \tag{10}$$

Data values in 2015 are used as a base year for normalizing the index, and the ratio on the right is equal to 1.0 in 2015. In other years, it will be greater than 1.0 if equipment saturation levels are above their 2015 level. This will be counteracted by higher efficiency levels, which will drive the index downward. The weights are defined as follows.

$$Weight^{Type} = \frac{Energy_{15}^{Type}}{HH_{15}} \times CoolShare_{15}^{Type} \tag{11}$$

In the SAE spreadsheets, these weights are referred to as *Intensities* and are defined on the *EIAData* tab. With these weights, the *CoolIndex* value in 2015 will be equal to estimated annual cooling intensity per household in that year. Variations from this value in other years will be proportional to saturation and efficiency variations around their base values.

For cooling equipment, the SAE spreadsheets contain several equipment types including central air conditioners, space cooling heat pumps, and room air conditioners.

The equipment saturation and efficiency trends data are presented on the *Shares* and *Efficiencies* tabs of the SAE spreadsheets. The efficiency for space cooling heat pumps and central air conditioning (A/C) units are given in terms of Seasonal Energy Efficiency Ratio [BTU/Wh], and room A/C units efficiencies are given in terms of Energy Efficiency Ratio [BTU/Wh].

Cooling system usage levels are impacted on a monthly basis by several factors, including weather, household size, income levels, and prices. The estimates of cooling equipment usage levels are computed as follows:

$$CoolUse_{y,m} = \left(\frac{RCD_{y,m}}{RCD_{15}}\right) \times \left(\frac{HHSize_{y}}{HHSize_{15}}\right)^{0.10} \times \left(\frac{Income_{y}}{Income_{15}}\right)^{0.10} \quad (12)$$

Where:

- *RCD* is the number of cooling degree days in year (*y*) and month (*m*).

By construction, the *CoolUse* variable has an annual sum that is close to 1.0 in the base year (2015). The cooling degree days serve to allocate annual values to months of the year. The remaining terms average to 1.0 in the base year. In other years, the values will change to reflect changes in the economic driver changes.

B-1.4 Constructing XOther

Monthly estimates of non-weather sensitive sales can be derived in a similar fashion to space heating and cooling. Based on end-use concepts, other sales are driven by:

- Appliance and equipment saturation levels
- Appliance efficiency levels
- Average number of days in the billing cycle for each month
- Average household size, real income, and real prices

The explanatory variable for other uses is defined as follows:

$$XOther_{y,m} = OtherEqpIndex_{y,m} \times OtherUse_{y,m} \quad (13)$$

The first term on the right hand side of this expression ($OtherEqpIndex_y$) embodies information about appliance saturation and efficiency levels and monthly usage multipliers. The second term (*OtherUse*) captures the impact of changes in prices, income, household size, and number of billing-days on appliance utilization.

End-use indices are constructed in the SAE models. A separate end-use index is constructed for each end-use equipment type using the following function form.

$$ApplianceIndex_{y,m} = Weight^{Type} \times \frac{\left(Sat_y^{Type} \Big/ \frac{1}{UEC_y^{Type}} \right)}{\left(Sat_{15}^{Type} \Big/ \frac{1}{UEC_{15}^{Type}} \right)} \times MoMult_m^{Type} \quad (14)$$

Where:

- *Weight* is the weight for each appliance type
- *Sat* represents the fraction of households, who own an appliance type
- $MoMult_m$ is a monthly multiplier for the appliance type in month (*m*)
- *Eff* is the average operating efficiency the appliance
- *UEC* is the unit energy consumption for appliances

This index combines information about trends in saturation levels and efficiency levels for the main appliance categories with monthly multipliers for lighting, water heating, and refrigeration.

The appliance saturation and efficiency trends data are presented on the *Shares* and *Efficiencies* tabs of the SAE spreadsheets.

Further monthly variation is introduced by multiplying by usage factors that cut across all end uses, constructed as follows:

$$ApplianceUse_{y,m} = \left(\frac{Days_{y,m}}{30.5} \right) \times \left(\frac{HHSize_y}{HHSize_{15}} \right)^{0.10} \times \left(\frac{Income_y}{Income_{15}} \right)^{0.10} \quad (15)$$

Where:

- *Days* is the number of days in year (*y*) and month (*m*).

The index for other uses is derived then by summing across the appliances:

$$OtherEqpIndex_{y,m} = \sum_{k} ApplianceIndex_{y,m} \times ApplianceUse_{y,m} \quad (16)$$

B-2 Commercial Sector

The traditional approach to forecasting monthly sales for a customer class is to develop an econometric model that relates monthly sales to weather, seasonal variables, and economic conditions. From a forecasting perspective, the strength of econometric models is that they are well suited to identifying historical trends and to projecting these trends into the future. In contrast, the strength of the end-use modeling approach is the ability to identify the end-use factors that are driving energy use. By incorporating an end-use structure into an econometric model, the statistically adjusted end-use (SAE) modeling framework exploits the strengths of both approaches.

There are several advantages to this approach.

- The equipment efficiency trends and saturation changes embodied in the long-run end-use forecasts are introduced explicitly into the short-term monthly sales forecast. This provides a strong bridge between the two forecasts.
- By explicitly introducing trends in equipment saturations and equipment efficiency levels, it is easier to explain changes in usage levels and changes in weather-sensitivity over time.
- Data for short-term models are often not sufficiently robust to support estimation of a full set of price, economic, and demographic effects. By bundling these factors with equipment-oriented drivers, a rich set of elasticities can be built into the final model.

This document describes this approach, the associated supporting Commercial SAE spreadsheets, and *MetrixND* project files that are used in the implementation. The source for the commercial SAE spreadsheets is the 2019 Annual Energy Outlook (AEO) database provided by the Energy Information Administration (EIA), with further adjustments to data specific to New York when that is available.

B-2.1 Commercial Statistically Adjusted End-Use Model Framework

The commercial statistically adjusted end-use model framework begins by defining energy use ($USE_{y,m}$) in year (y) and month (m) as the sum of energy used by heating equipment ($Heat_{y,m}$), cooling equipment ($Cool_{y,m}$) and other equipment ($Other_{y,m}$). Formally,

$$\mathrm{USE}_{y,m} = \mathrm{Heat}_{y,m} + \mathrm{Cool}_{y,m} + \mathrm{Other}_{y,m} \quad (1)$$

Although monthly sales are measured for individual customers, the end-use components are not. Substituting estimates for the end-use elements gives the following econometric equation.

$$\mathrm{USE}_{m} = a + b_1 \times \mathrm{XHeat}_{m} + b_2 \times \mathrm{XCool}_{m} + b_3 \times \mathrm{XOther}_{m} + \varepsilon_{m} \quad (2)$$

Here, $XHeat_m$, $XCool_m$, and $XOther_m$ are explanatory variables constructed from end-use information, weather data, and market data. As will be shown below, the equations used to construct these X-variables are simplified end-use models, and the X-variables are the estimated usage levels for each of the major end uses based on these models. The estimated model can then be thought of as a statistically adjusted end-use model, where the estimated slopes are the adjustment factors.

B-2.2 Constructing XHeat

As represented in the Commercial SAE spreadsheets, energy use by space heating systems depends on the following types of variables.

- Heating degree days,
- Heating equipment saturation levels,
- Heating equipment operating efficiencies,
- Average number of days in the billing cycle for each month, and
- Commercial output and energy price.

The heating variable is represented as the product of an annual equipment index and a monthly usage multiplier. That is,

$$\mathrm{XHeat}_{y,m} = \mathrm{HeatIndex}_{y} \times \mathrm{HeatUse}_{y,m} \quad (3)$$

where, $XHeat_{y,m}$ is estimated heating energy use in year (y) and month (m),
$HeatIndex_y$ is the annual index of heating equipment, and

HeatUse$_{y,m}$ is the monthly usage multiplier.

The heating equipment index is composed of electric space heating equipment saturation levels normalized by operating efficiency levels. The index will change over time with changes in heating equipment saturations (*HeatShare*) and operating efficiencies (*Eff*). Formally, the equipment index is defined as:

$$HeatIndex_y = HeatSales_{13} \times \frac{\left(HeatShare_y / Eff_y \right)}{\left(HeatShare_{13} / Eff_{13} \right)} \quad (4)$$

In this expression, 2013 is used as a base year for normalizing the index. The ratio on the right is equal to 1.0 in 2013. In other years, it will be greater than one if equipment saturation levels are above their 2013 level. This will be counteracted by higher efficiency levels, which will drive the index downward. Base year space heating sales are defined as follows.

$$HeatSales_{13} = \left(\frac{kWh}{Sqft} \right)_{Heating} \times \left(\frac{CommercialSales_{13}}{\sum_e kWh / Sqft_e} \right) \quad (5)$$

Here, base-year sales for space heating is the product of the average space heating intensity value and the ratio of total commercial sales in the base year over the sum of the end-use intensity values. In the Commercial SAE Spreadsheets, the space heating sales value is defined on the *BaseYrInput* tab. The resulting *HeatIndex*$_y$ value in 2013 will be equal to the estimated annual heating sales in that year. Variations from this value in other years will be proportional to saturation and efficiency variations around their base values.

Heating system usage levels are impacted on a monthly basis by several factors, including weather, commercial level economic activity, prices and billing days. Using the EPRI COMMEND model's default elasticity parameters, the estimates for space heating equipment usage levels are computed as follows:

$$HeatUse_{y,m} = \left(\frac{CHD_{y,m}}{CHD_{13}} \right) \times \left(\frac{CEcon_y}{CEcon_{13}} \right) \quad (6)$$

where, CH*D* is the number of heating degree days in year (y) and month (m),

CEcon is a commercial economic driver, combining real commercial output and employment in year (y). Output is assigned a weight of 0.30 and employment of 0.70. (These values may also be modified by the individual user.)

By construction, the $HeatUse_{y,m}$ variable has an annual sum that is close to one in the base year (2013). The heating degree days serve to allocate annual values to months of the year. The remaining terms average to one in the base year. In other years, the values will reflect changes in commercial economic driver.

B-2.3 Constructing XCool

The explanatory variable for cooling loads is constructed in a similar manner. The amount of energy used by cooling systems depends on the following types of variables.

- Cooling degree days,
- Cooling equipment saturation levels,
- Cooling equipment operating efficiencies,
- Average number of days in the billing cycle for each month, and
- Commercial output and energy price.

The cooling variable is represented as the product of an equipment-based index and monthly usage multiplier. That is,

$$\mathrm{XCool}_{y,m} = \mathrm{CoolIndex}_{y} \times \mathrm{CoolUse}_{y,m} \tag{7}$$

where, $XCool_{y,m}$ is estimated cooling energy use in year (y) and month (m),
$CoolIndex_y$ is an index of cooling equipment, and
$CoolUse_{y,m}$ is the monthly usage multiplier.

As with heating, the cooling equipment index depends on equipment saturation levels (*CoolShare*) normalized by operating efficiency levels (*Eff*). Formally, the cooling equipment index is defined as:

$$CoolIndex_{y} = CoolSales_{13} \times \frac{\left(CoolShare_{y} / Eff_{y} \right)}{\left(CoolShare_{13} / Eff_{13} \right)} \tag{8}$$

Data values in 2013 are used as a base year for normalizing the index, and the ratio on the right is equal to 1.0 in 2013. In other years, it will be greater than one if equipment saturation levels are above their 2013 level. This will be counteracted by higher efficiency levels, which will drive the index downward. Estimates of base year cooling sales are defined as follows.

$$CoolSales_{13} = \left(\frac{kWh}{Sqft}\right)_{Cooling} \times \left(\frac{CommercialSales_{13}}{\sum_{e} kWh/Sqft_{e}}\right) \quad (9)$$

Here, base-year sales for space cooling is the product of the average space cooling intensity value and the ratio of total commercial sales in the base year over the sum of the end-use intensity values. In the Commercial SAE Spreadsheets, the space cooling sales value is defined on the *BaseYrInput* tab. The resulting *CoolIndex* value in 2013 will be equal to the estimated annual cooling sales in that year. Variations from this value in other years will be proportional to saturation and efficiency variations around their base values.

Cooling system usage levels are impacted on a monthly basis by several factors, including weather, economic activity levels and prices. Using the COMMEND default parameters, the estimates of cooling equipment usage levels are computed as follows:

$$CoolUse_{y,m} = \left(\frac{CCD_{y,m}}{CCD_{13}}\right) \times \left(\frac{CEcon_{y}}{CEcon_{13}}\right) \quad (10)$$

where, *CCD* is the number of cooling degree days in year (y) and month (m).

By construction, the *CoolUse* variable has an annual sum that is close to one in the base year (2013). The first two terms, which involve billing days and cooling degree days, serve to allocate annual values to months of the year. The remaining terms average to one in the base year. In other years, the values will change to reflect changes in commercial output and prices.

B-2.4 Constructing XOther

Monthly estimates of non-weather sensitive sales can be derived in a similar fashion to space heating and cooling. Based on end-use concepts, other sales are driven by:

- Equipment saturation levels,

- Equipment efficiency levels,
- Average number of days in the billing cycle for each month, and
- Real commercial output and real prices.

The explanatory variable for other uses is defined as follows:

$$\mathrm{XOther}_{y,m} = \mathrm{OtherIndex}_{y,m} \times \mathrm{OtherUse}_{y,m} \tag{11}$$

The second term on the right hand side of this expression embodies information about equipment saturation levels and efficiency levels. The equipment index for other uses is defined as follows:

$$OtherIndex_{y,m} = \sum_{Type} Weight_{13}^{Type} \times \left(\frac{Share_{y}^{Type} \Big/ Eff_{y}^{Type}}{Share_{13}^{Type} \Big/ Eff_{13}^{Type}} \right) \tag{12}$$

where, *Weight* is the weight for each equipment type,
Share represents the fraction of floor stock with an equipment type, and
Eff is the average operating efficiency.

This index combines information about trends in saturation levels and efficiency levels for the main equipment categories. The weights are defined as follows.

$$Weight_{13}^{Type} = \left(\frac{kWh}{Sqft} \right)_{Type} \times \left(\frac{CommercialSales_{13}}{\sum_{e} kWh \Big/ Sqft_{e}} \right) \tag{13}$$

Further monthly variation is introduced by multiplying by usage factors that cut across all end uses, constructed as follows:

$$OtherUse_{y,m} = \left(\frac{Days_{y,m}}{30.5} \right) \times \left(\frac{CEcon_{y}}{CEcon_{13}} \right) \tag{14}$$

where, *Days* is the number of days in year (y) and month (m).

Appendix C: Weather Station Weights & State Maps

A set of weights were used to allocate weather stations to each Transmission District (TD) and system.

Table C-1 summarizes these weights for the TD's and Table C-2 for the system.

Table C-1: Transmission District Weather Station Weights

Transmission District	Weight	STNID
Central Hudson	0.2000	ALB
Central Hudson	0.6000	POU
Central Hudson	0.2000	SWF
Consolidated Edison	0.0800	HPN
Consolidated Edison	0.2600	JFK
Consolidated Edison	0.1200	LGA
Consolidated Edison	0.5200	NYC
Consolidated Edison	0.0200	POU
Long Island Power Authority	0.3500	FRG
Long Island Power Authority	0.6500	ISP
National Grid	0.2000	ALB
National Grid	0.0700	BGM
National Grid	0.2300	BUF
National Grid	0.0700	ELM
National Grid	0.0300	ELZ
National Grid	0.0400	GFL
National Grid	0.0200	MSV
National Grid	0.0400	PLB
National Grid	0.0300	POU
National Grid	0.1100	ROC
National Grid	0.0600	SYR
National Grid	0.1000	UCA

Transmission District	Weight	STNID
New York Power Authority	0.2000	MSS
New York Power Authority	0.8000	PLB
New York State Electric & Gas	0.0300	ALB
New York State Electric & Gas	0.1600	BGM
New York State Electric & Gas	0.1300	BUF
New York State Electric & Gas	0.1800	ELM
New York State Electric & Gas	0.0200	ELZ
New York State Electric & Gas	0.0100	GFL
New York State Electric & Gas	0.0500	HPN
New York State Electric & Gas	0.0100	MSS
New York State Electric & Gas	0.0200	MSV
New York State Electric & Gas	0.0400	PLB
New York State Electric & Gas	0.0500	POU
New York State Electric & Gas	0.0400	ROC
New York State Electric & Gas	0.1600	SYR
New York State Electric & Gas	0.1000	UCA
Orange & Rockland	0.2000	HPN
Orange & Rockland	0.1000	MSV
Orange & Rockland	0.7000	SWF
Rochester Gas & Electric	0.1200	ELZ
Rochester Gas & Electric	0.8300	ROC
Rochester Gas & Electric	0.0500	SYR

Table C-2: System Weather Station Weights

Station Name	Weight	StationID
Albany	0.0560	ALB
Binghampton	0.0340	BGM
Buffalo	0.0690	BUF
Elmira	0.0380	ELM
Wellsville Muni	0.0160	ELZ
Farmingdale	0.0470	FRG
Glens Falls	0.0110	GFL
White Plains	0.0420	HPN
Islip	0.0870	ISP
JFK Airport	0.0990	JFK
La Guardia Airport	0.0460	LGA
Massena	0.0060	MSS
Monticello	0.0100	MSV
Central Park	0.1940	NYC
Plattsburgh	0.0330	PLB
Poughkeepsie	0.0400	POU
Rochester	0.0720	ROC
Newburgh	0.0280	SWF
Syracuse	0.0360	SYR
Utica	0.0360	UCA

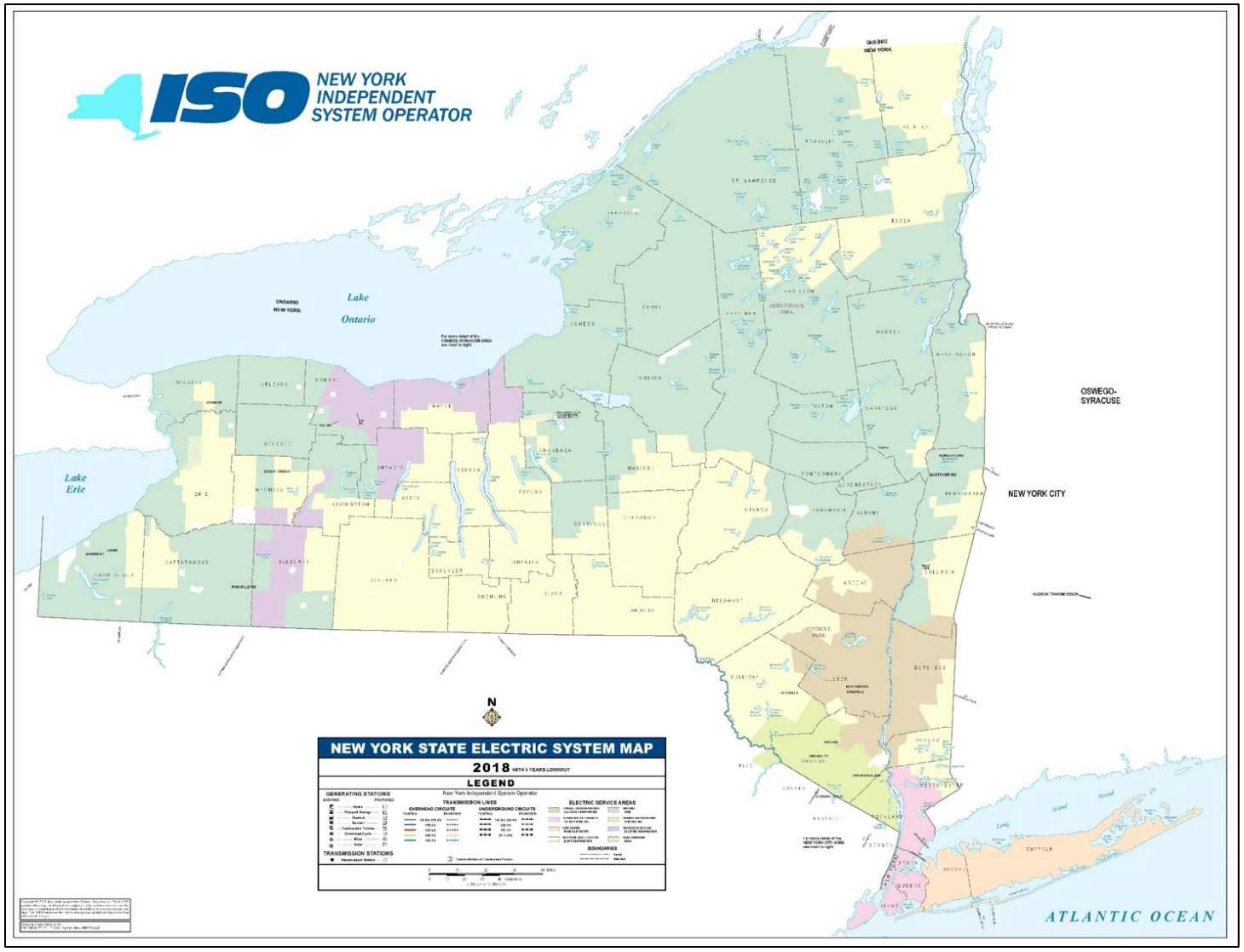


Fig. C-1: New York State Electric System Map – Transmission District Boundaries

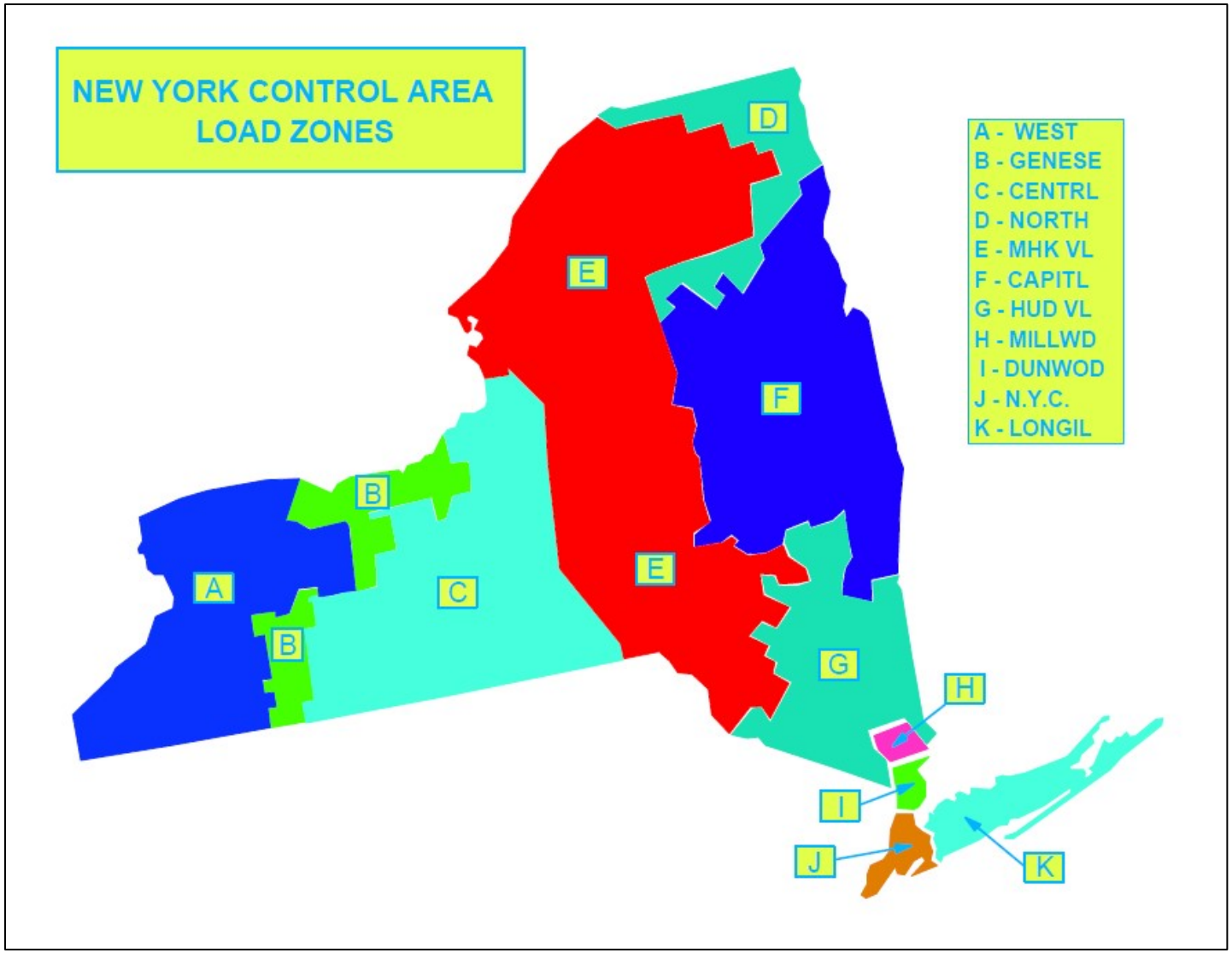


Fig. C-2: New York State Electric System Map – Zone Boundaries

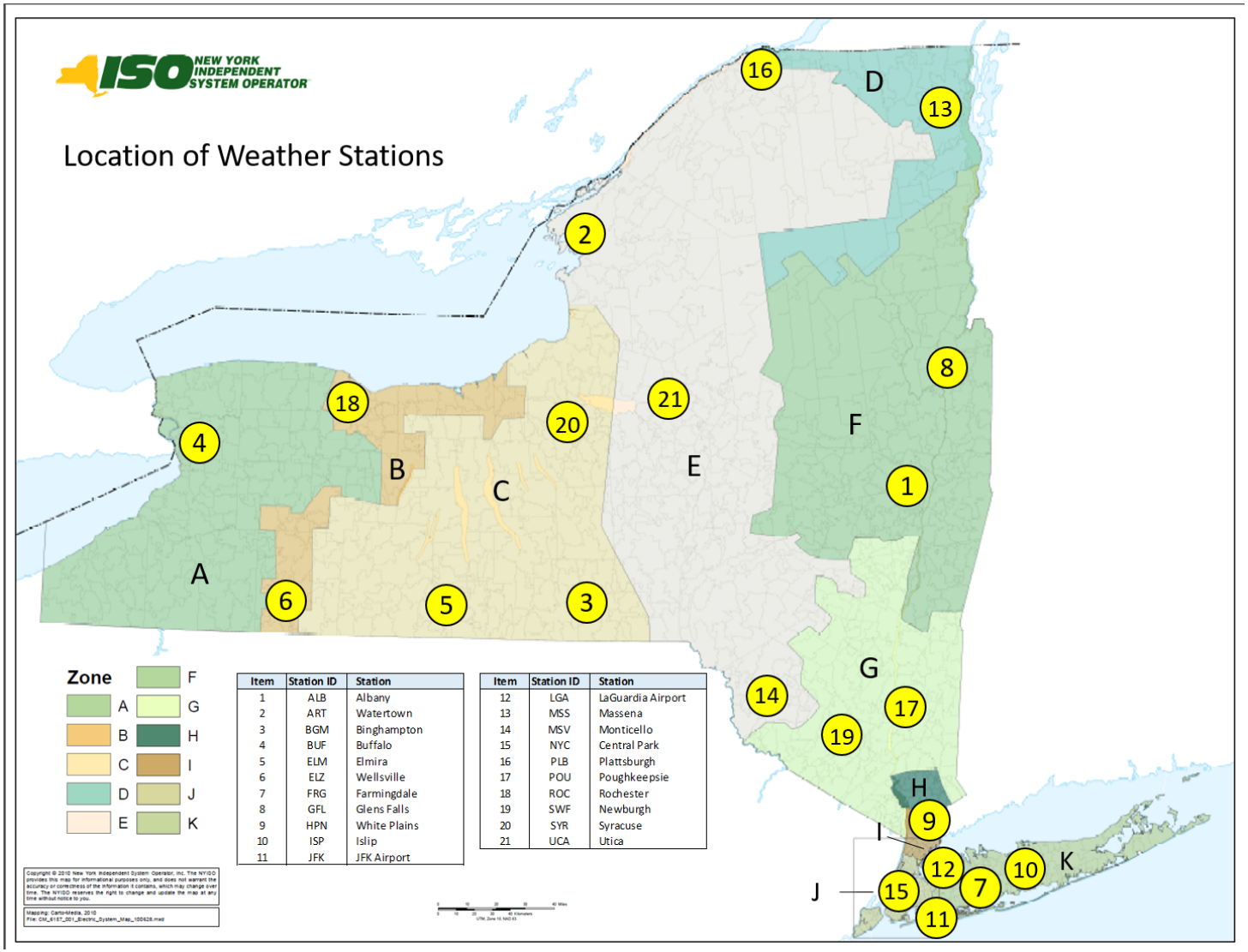


Fig. C-3: New York State Electric System Map – Weather Station Locations