DOCKETED	
Docket Number:	19-IEPR-03
Project Title:	Electricity and Natural Gas Demand Forecast
TN #:	227693
Document Title:	Glendale IEPR 2019 Demand Forecast Forms 4 6 explaination
Description:	Preliminary Methodology explaination
Filer:	Tracy Fu
Organization:	Glendale Water and Power
Submitter Role:	Public Agency
Submission Date:	4/15/2019 3:49:59 PM
Docketed Date:	4/15/2019

City of Glendale
CEC 2019 IEPR – Demand Forecast

4. Demand Forecast Methods and Models

Demand Forecast Methodology

The City of Glendale Demand Forecast is developed based on the methodology used by the consultant hired by Glendale Water and Power to assist the City in the preparation of the 2019 Integrated Resource Plan covering the 20-year planning period from 2019 to 2038. The forecasting approach took into consideration the historical relationship between weather and demand, as well as newly developed statewide goal of electric vehicles and NREL developed LA basin EV charging profile.

The forecast process included the following major steps:

- Develop historical weather scenarios that included 30+ years of actual historical weather variables.
- Plug in the 2017 CEC IEPR forecast as the starting point of net customer load. Plug in the 2017 CEC IEPR Peak forecast as the starting point of the GWP net peak forecast.
- Plotting hourly load for each forecast interval using 30+ weather scenario and develop a range of forecasts for each forecast interval and average out the sample regression outputs and develop the baseline forecast for each hour.
- Develop an electric vehicle load forecast based on the CEC EV calculator projecting 5 million cars by 2030, and develop the EV hourly charging load per the CEC provided NERL LA charging profile.
- Summing the baseline forecast with the EV forecast and derives the final Peak MW and MWh forecast for supply side forecast.

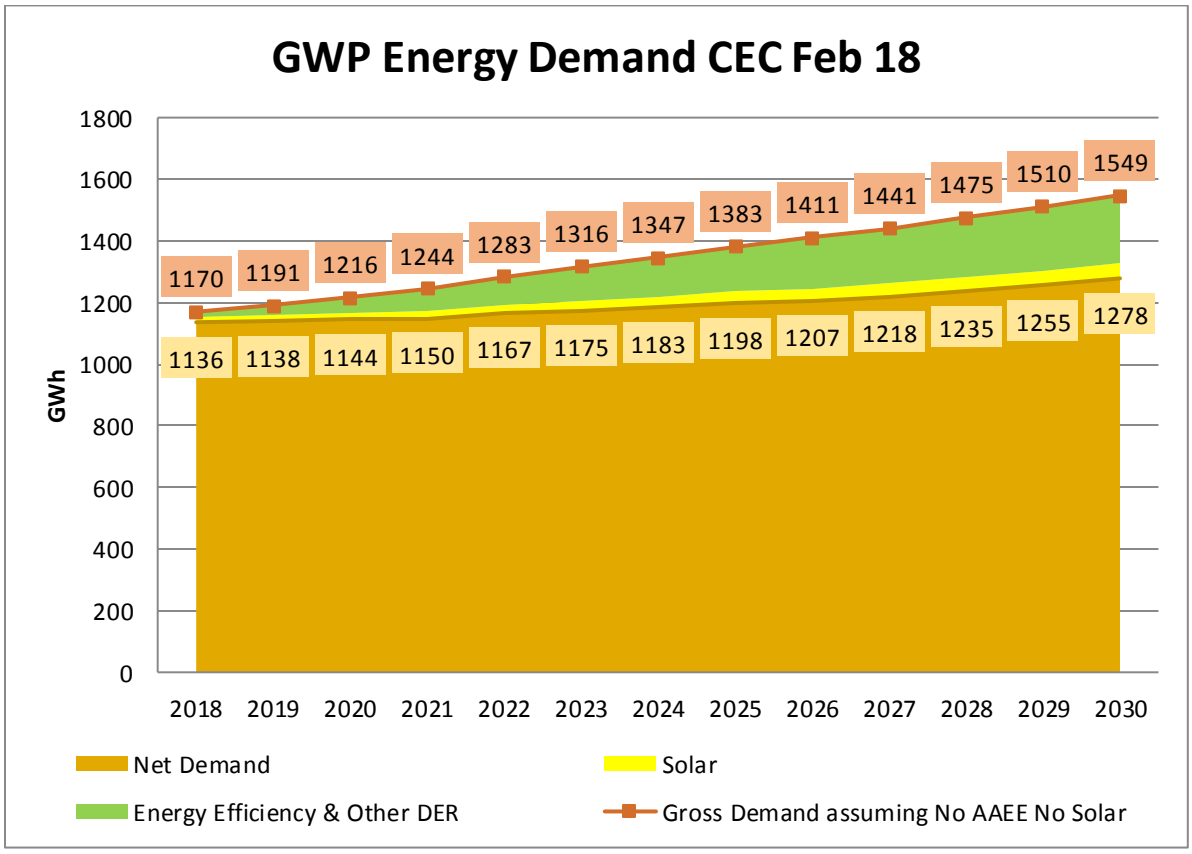
For this IERP, GWP used the California Energy Commission's Mid-Demand Mid-Additional Achievable Energy Efficiency (AAEE) Mid-Additional Achievable Photovoltaic (AAPV) forecast. This forecast has assumed aggressive future demand savings. The additional savings from energy efficiency, solar PV savings and other DERs assumed in our forecast is shown in the table below:

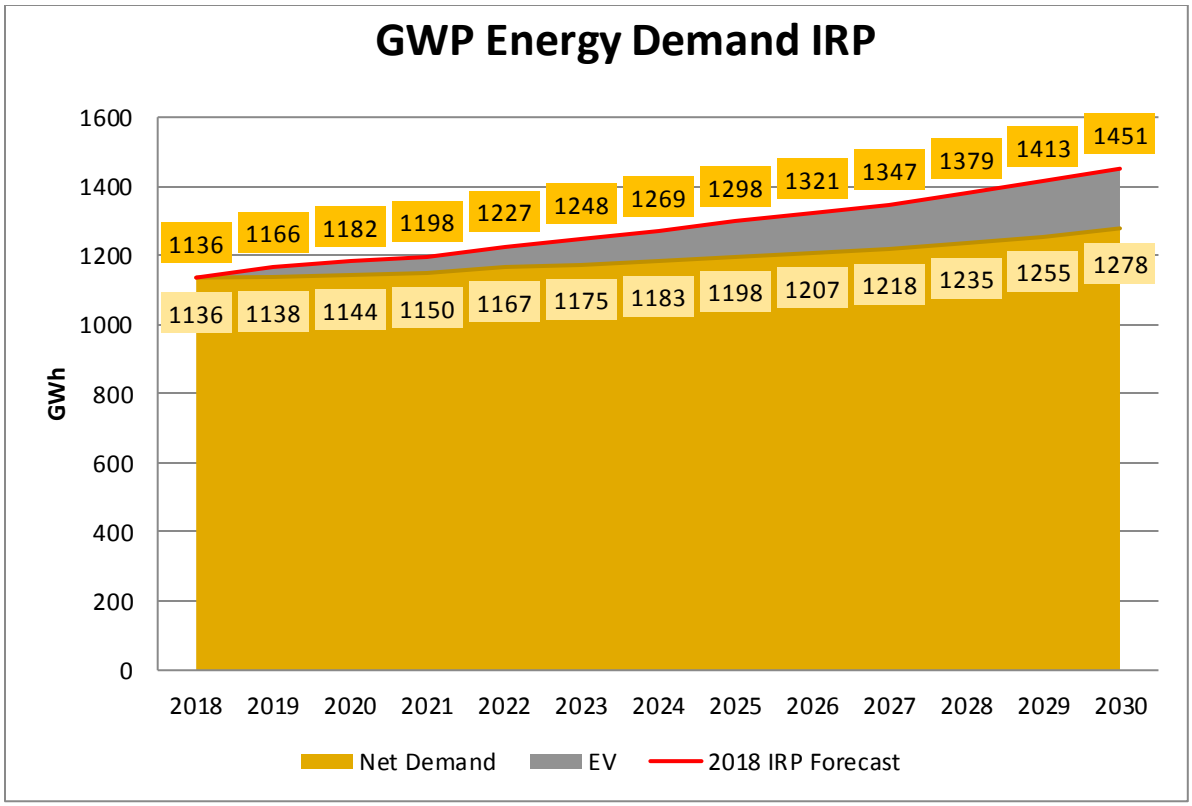
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Energy Savings (GWh)	17	33	50	69	88	110	130	148	165	181	195	208	221
Demand Savings (MW)	3	7	11	16	21	28	34	39	45	50	55	59	64

The forecast we used also includes the CEC's projection of additional rooftop solar in our territory, as detailed in the California Energy Demand 2018-2030 Revised Forecast (17-IEPR-03).

Glendale demand growth is near 0% if we exclude transportation electrification penetration. Almost all load growth is driven by load growth from electricity vehicles charging. And electricity vehicles projections are according to CEC's projection incorporated the state wide 2030 goal set by Governor Brown in 2nd half of 2018.

The CEC's projection of Glendale gross demand and net demand, and the IERP's demand forecast including electricity vehicles load forecast are shown in below. The demand forecast GWP's 2019 IERP uses is identical to the CEC 2018 Feb forecast with one adjustment, which is the EV load addition thanks to the latest statewide EV goal development. The growth rate of EV load is also from CEC EV calculator.





There will be additional Demand Response and Solar projects submitted as part of the Clean Energy RFP, so all discussion of DER forecasts and implementation will be presented in the Revised IERP forms after the RFP projects have been fully analyzed.

Data Input and Assumptions:

- Hourly temperature data from 1997-present for the Burbank airport weather station was used to come up with a monthly weather normalized load forecast
- Hourly load data for GWP service territory from 1999-present was used for this analysis.
- Historical load shape is used in the model to come up with the hourly load profile.
- Peak Annual Demand is calculated by taking the average of the scenario runs' annual peak forecasts' top forecasts from the annual scenarios, so the annual forecaste d peak MW varies from the hourly scenarios and the hourly load forecasts are hourly average of the scenario plots of each hour.
- Monthly historical energy (MWh) by class (Residential, Commercial and Industrial) data for recent years is used to set for ratio of each class's consumptions to derive the future forecast. Extrapolated the trends in customer count for each of the classes.
- Loss estimates forecast is based on historical average.

6. UNCOMMITTED DEMAND-SIDE PROGRAM METHODOLOGY

GWP's planning to procure additional energy efficiency, demand response, solar PV and small scale storage projects through Glendale's Clean Energy RFP. The final contracts or those programs are still pending negotiation. GWP will revise its IEPR forms and disclose detailed Peak MW impact of those programs. Current data reported in this form is preliminary.

GWP will also present the Peak Impact of the large scale Battery system once the clean energy RFP outcome is clear.