



Fitchburg Gas and Electric Light Company

GMAC Load Forecasting Presentation

May 9, 2023

Load Forecasting

- System Peak Load Forecasts
 - Overall FG&E System Load
- Distribution Peak Load Forecasts
 - Individual Distribution Substation and Distribution Circuit Forecasts
- Minimum Daytime Load / Net Power Flow Forecasts

System Peak Load Forecasts

Performed Annually

- “Base” System Peak Load Forecasts
 - 10-Year Overall System Peak Load Forecasts
 - Utilizes 10 Year Historical Peak Loads and Weighted Temperature-Humidity Index (WTHI)
 - Monte Carlo Simulations to Produce Random Peak Loads for each WTHI
 - Yearly Regression Analysis Performed to Correlate Daily Peak Loads with Daily WTHI (Utilizing Boltzmann Curve)
 - Results in Peak Design Load Forecast (1-in-10 years) and Extreme Peak Load Forecast (1-in-25 years)
- “Overall” System Peak Forecasts
 - Incorporation of EV, Electrification and DER Forecasts into “Base” System Load Forecasts
 - Hourly Profiles are Developed for each Forecast “Type”
 - Inherency Factors are Applied and each Forecast “Type” are Combined for each Hour to Determine an “Overall” Forecasted Peak Day Hourly Profile along with an “Overall” System Load Forecast.

Distribution Peak Load Forecasting

Performed Annually

- “Base” Distribution Peak Load Forecasts
 - 10-Year Peak Load Forecast for Each Distribution Substation Transformer and Circuit Terminal
 - Utilizes 5 Year Historical Peak Loads and Known Load Additions and Circuit Reconfigurations
 - Linear +1 Standard Deviations if Certain Conditions are Met
 - Otherwise engineering judgement is utilized to determine growth rate
 - Yearly Regression Analysis Performed to Correlate Daily Peak Loads with Daily WTHI (Utilizing Boltzmann Curve)
 - Results in Peak Design Load Forecast (1-in-10 years) and Extreme Peak Load Forecast (1-in-25 years)
- “Overall” Distribution Peak Load Forecasts
 - Incorporation of EV, Electrification and DER Forecasts into “Base” System Load Forecasts in a Similar Fashion to their Incorporation into System Peak Load Forecasts.

Minimum Daytime Load / Net Power Flow Forecasts

Performed Annually

- System Minimum Daytime Load Forecasts
 - 10-Year Overall System Peak Load Forecasts
 - 3 Years or Historical Minimum Daytime Load Data Utilized to Develop a Minimum Daytime Load Hourly Profile
 - Hourly Profile of Forecasted DER is Added to the Minimum Daytime Load Hourly Profile to determine an Forecasted Minimum Daytime Load Hourly Profile along with a Minimum Daytime Load Forecast.
- Distribution Net Power Flow Forecasts
 - 10-Year New Power Flow Forecasts are Developed for Each Distribution Substation Transformer and Circuit Terminal
 - Developed Utilizing Historical Known or Assumed Minimum Daytime Load and DER Forecasts
 - Forecasts Include Net Power Flow Forecasts for Distribution Substation Transformers under N-1 Conditions.