



Item 7: Board Education – Load Forecasting

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Board of Directors Meeting

ERCOT Public

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Agenda

- Overview of Load Forecast Types
- Overview of the Midterm Load Forecast
- Impacts Demand Response

Load Forecasts

- Operational Load Forecasts
 - Midterm Load Forecast (MTLF) – hourly forecast for the next 168 hours (7 days) updated hourly
 - Short Term Forecast (STLF) – 5-minute forecast for next two hours, updated every 5 minutes
- Long-Term Load Forecast (LTLF)
 - Hourly demand forecast for next 10 years
- Forecasts are produced by weather zone

Key Takeaways:

- ERCOT has multiple types of load forecasts covering different time periods.
- Primary focus of this presentation is the MTLF

MTLF Base Load Forecast Models

- ERCOT uses internally-developed load forecast models, 2 forecast models that are part of the EMS, and is adding a vendor-supplied forecast this month
- The internally-developed models (used for the E, E1, E2, E3 forecasts):
 - Are based on neural network and linear regression models
 - Are specified as appropriate for season and expected conditions
 - Incorporate common weather variables (temperature, wind speed, cloud cover, solar irradiance, etc.) based on the particular month or season
 - Use 49 weather stations across ERCOT
 - Include other relevant variables (day of week and holidays)
- The M forecast is an average of the four internally-generated forecasts and the 2 EMS forecasts

Key Takeaway: ERCOT uses several models of load as a function of weather and other variables.

Weather Forecast Sources

- Weather is the base driver of overall demand in the operational timeframe
- ERCOT currently uses 4 global weather models (GFSO, GFS Ensemble, Euro, NAM) and 3 vendor-supplied forecasts
 - Have contracted for additional global weather model forecasts which would give us 14 weather forecasts in total
- These weather forecast models provide insight into the range of potential weather (and its impact on demand and renewable output) as well as inputs to the load forecast

Key Takeaway: ERCOT uses multiple weather forecasts to produce load forecasts and to provide insight into the range of potential weather.

MTLF Forecasts

- The internally developed forecasts (E, E1, E2, and E3) are produced using the same model
 - The only difference is the weather forecast that is used in each forecast model
- E and E1 use the same weather forecast for all Weather Zones
 - An example would be E using the GFS for all Weather Zones with E1 using the Euro for all Weather Zones.
- E2 uses the most extreme weather forecast for each Weather Zone for the Day Ahead
- E3 uses the most extreme weather forecasts for each Weather Zone for days 4+ in the future

Key Takeaway: ERCOT produces multiple load forecasts based on different weather forecasts.

Demand Response

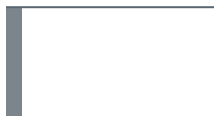
- Historically, most demand was passive; the demand in a particular hour of a season was primarily a function of weather, adjusted for time of day and day of week
- A large portion of the demand has become increasingly active and responsive, for example:
 - Transmission-connected loads that use demand response (DR) to lower their transmission charges which are based on coincident peak of 4 summer months (4CP)
 - Load-serving entities who use DR programs to lower their wholesale power costs (smart thermostat programs, cryptocurrency datacenters, etc.)
 - The control of this active demand response is widely distributed, different participants have different decision rules, and those decision rules change
 - This DR becomes a factor on high demand or low reserve/high price days

Key Takeaway: An increasing amount of demand has become responsive; particularly on high demand or low reserve/high price days.

Load Forecasting on Tight Days

- ERCOT posted operational forecasts do not generally account for reductions through DR
 - On days when sufficient resources are available, need to prepare to serve all demand
 - On days when scarcity may occur without the activation of DR, it is appropriate to show that scarcity:
 - In order to illustrate the need for the DR on that day
 - So that entities who control the DR are informed of the need to use it
- ERCOT may take potential DR into account when determining whether to issue a request for conservation

Key Takeaway: ERCOT posted load forecasts do not generally include DR reductions in order to signal the need for DR



Questions?