

Transformer/Circuit Load Forecast Scenarios for Grid Needs

Objective

Recommend the most appropriate transformer/circuit load forecast scenario to determine the grid needs that drive the scope and timing of capital expansion projects.

Background

Historically, Distribution Planning (DP) created one load forecast for each substation transformer and distribution circuit annually. The forecasts were created using historical data and forecasted load growth based on known customer service requests and forecasted load growth percentage by area. With the new LoadSEER forecast tool, load forecasts also include separate layers for Distributed Energy Resource (DER), Energy Efficiency (EE), and Electric Vehicle (EV) forecasted growth.

As part of Integrated Grid Planning (IGP), DP submitted three transformer/circuit load forecast scenarios in 2021 (Base Load, High Load, and Low Load). See Table 1-1 below.

Table 1-1: Forecast Layer Mapping of Modeling Scenarios and Sensitivities

No.	Modeling Case	DER Forecast	EV Forecast	EE Forecast	TOU Load Shape
1	Base	Base Forecast	Base Forecast	Base Forecast	Managed EV Charging
2	High Load Customer Technology Adoption Bookend	Low Forecast	High Forecast	Low Forecast	Unmanaged EV Charging
3	Low Load Customer Technology Adoption Bookend	High Forecast	Low Forecast	High Forecast	Managed EV Charging

Issue

The Company has an obligation to serve new load and DP initiates capital expansion projects to solve projected system overload conditions and voltage violations based on load growth forecasts. All Company projects (including DP-initiated projects and Asset Management project) are prioritized to develop an annual Company budget.

The capital expansion project timing will depend on the load forecast scenario used in the analysis to determine grid needs. The project scope of work can also depend on the forecast scenario used.

The following is a list of pros/cons for using the bookend forecast scenarios (Low Load and High Load) with the Base Load falling between the two bookends.

Load Forecast Scenario	Pros	Cons
High Load Case	<ul style="list-style-type: none"> Projects completed earlier 	<ul style="list-style-type: none"> Earlier cost expenses

	<ul style="list-style-type: none"> • Less system risk / Greater reliability 	<ul style="list-style-type: none"> • Risk of overbuilding if EV forecasts are too high; or DER and EE forecasts are too low
Low Load Case	<ul style="list-style-type: none"> • Later cost expenses 	<ul style="list-style-type: none"> • Greater system risk / Less reliability • Risk of underbuilding if DER and EE forecasts are too high; or EV forecasts are too low

Question

What is the most appropriate transformer/circuit load forecast scenario that should be used to analyze distribution system criteria violations and determine associated distribution grid needs (scope and timing of capital expansion projects or non-wire alternatives)?