

Distribution Level Forecasts – Load Assumptions and Disaggregation Methodology

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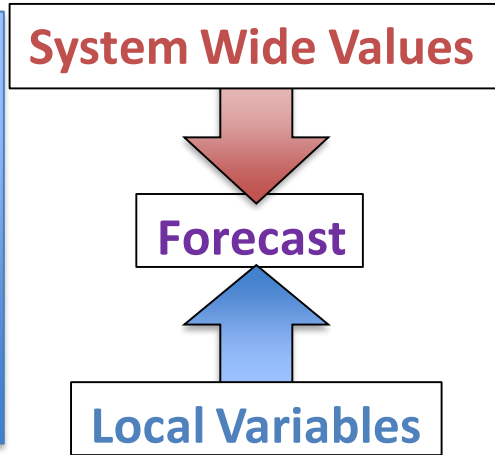


Distribution Forecasting: System vs Local

	Disaggregate System forecast down to circuit/bus level	Build forecast from circuit/bus level up
Pros	<ul style="list-style-type: none"> • Stays Consistent with TPP and IEPR • Values from stakeholder process • Straightforward using algorithms 	<ul style="list-style-type: none"> • Captures known local growth • Accurately represents “on the ground” conditions
Cons	<ul style="list-style-type: none"> • Does not capture known local growth • May be inaccurate on circuit level 	<ul style="list-style-type: none"> • Total forecast may differ from system values • Requires more experience and input from engineers

Ideal solution: disaggregate the system forecast and augment with local knowledge

- Stays consistent with TPP and IEPR
- Captures local conditions where different from system
- Accurately reflects circuit level load growth and temporal diversity



Distribution Forecasting: Challenges

- Forecasting methods rely on historical data
 - Circuit level DER adoption data is limited
- System changes can obviate previous forecasts
 - Circuits can change year to year
- Forecast error is generally not "fungible" across distribution circuits
 - Under-forecasting on one feeder generally cannot be offset by over-forecasting on another feeder
 - Distribution system is generally a radial, not a networked topology

Distribution Gross Load Assumptions

PG&E

Start with CEC load growth values from IEPR update

Adjust CEC load growth by

- Removing transmission level and “block” load growth.
- Removing embedded DER adoptions

Allocate remaining load growth by customer class to feeders

SCE

Utilize the corporate forecast to extract econometric and demographic information

Analyze historical substation load profiles and customer load growth by geographic region

Reconcile system-wide values with known future development plans

SDG&E

Start with CEC load growth values from IEPR update

Break into growth by customer class

Remove known future loads

Apply growth to feeder-level based on prior year’s consumption

Circuit level gross load is then modified by DERs by disaggregating system level DER forecasts

Disaggregation of Electric Vehicles

PG&E

Uses statistical analysis on available EV data at the zip code level and tie in to system-wide forecast.

SCE

Allocate existing EVs based on known locations and then use historical adoption and customer class information to estimate future adoption.

SDG&E

Use known large scale projects to apply to specific feeders. Use existing adoption rates at the zip code level to estimate future growth on feeders at the residential level.

Disaggregation of Energy Storage

PG&E

Monitor new interconnection requests and apply projections based on observed trends. Apply any observed correlation with PV and EV allocation.

SCE

Allocation will be based on the existing level of ES, amount of additional interconnection requests, and PV adoption rates.

SDG&E

Monitor new interconnection requests and apply projections based on observed trends. Apply any observed correlation with PV and EV adoption.

Disaggregation of Distributed Generation

PG&E

Allocate system level DG forecast distribution feeders based on the technical potential and probability of technology adoption of customers on each feeder. Customer probabilities of adoption are estimated using statistical methods developed using available customer characteristic information and usage data.

SCE

Split system-wide forecast into residential and non-residential installations. Residential will be forecast using Generalized Bass Diffusion model and Zero Net Energy model. Non-residential adoption will be allocated using historical adoption and economic patterns.

SDG&E

Use past adoption rates and local irradiance to predict future growth at the feeder level by customer class

Disaggregation of Demand Response

PG&E

Allocate out based on customer eligibility to participate

SCE

Estimate participation by grouping eligible customers with similar characteristics and marketing efforts. Disaggregate by applying propensity to average load impacts of past participation

SDG&E

Allocate based on past customer propensity scoring.

Disaggregation of Energy Efficiency

PG&E

Apply to bank and feeders using past adoption rates by customer class.
Values reconciled to WECC busbar values.

SCE

Applying two components, EE Programs and Codes & Standards.
Allocating to feeder level by historical energy consumption and customer class.

SDG&E

Apply to feeder level using past adoption rates by customer class.