Annual Load Forecast:
Hourly Demand Side Load Impact

Presentation to CPUC
Resource Adequacy Workshop Agenda R.14-10-010
February 14th, 2017

Background and PG&E's General Comments

❖ **Energy Division Proposal**

- By March 15 of each year, each investor owned utility (IOU) provides historical hourly demand side load impacts for demand response, distributed generation, and energy efficiency to direct access providers and community choice aggregators (CCAs) that serve load in the IOU's service territory. The IOUs would also provide these load impacts to the California Energy Commission (CEC) and the Commission. Each of the IOUs, CCAs and direct access providers would then include these load impacts in its year-ahead load forecast submissions to the CEC and the Commission in April of each year.
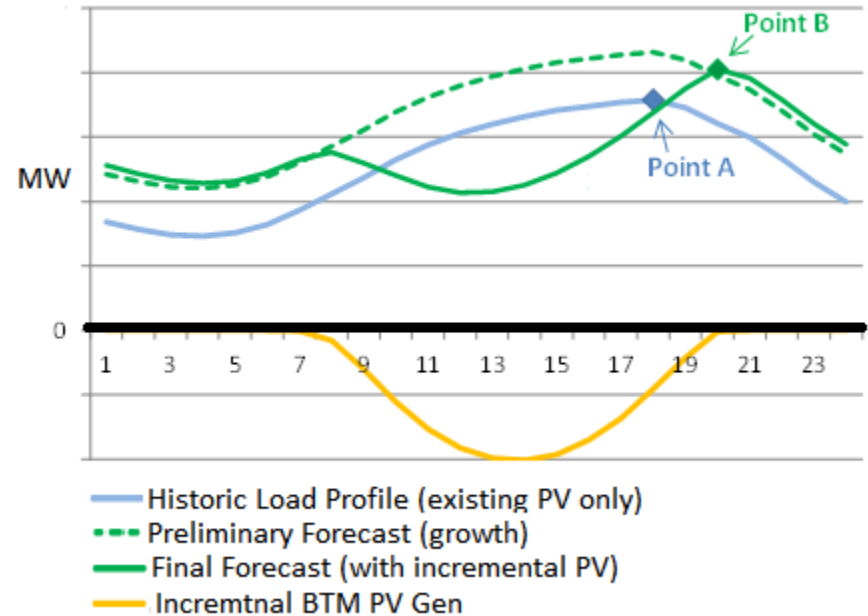
❖ **PG&E supports this proposal in general**

- The filing date for the report should be moved out after April 1, instead of mid-March.

- Until there are vetted approaches for developing the hourly distributed generation and energy efficiency profiles, the scope of the report should be limited to demand response, where a methodology already exists to develop the needed hourly profile.

- The Commission should schedule Energy Division-led workshops, with CEC involvement, to discuss methods for determining the hourly distributed generation and energy efficiency profiles.

Program		Historic Hourly	Forecast Hourly	Notes
EE	PG&E administered	Yes, but outdated	Testing phase	Could use CEC's hourly EE shapes, and PG&E would like to understand CEC's methodology.
	Non-PG&E administered	No	No	DA/CCA will provide directly to CEC/CPUC. No IOU requirement.
DG	PV	No	Yes (NREL PVWatts)	CPUC could use out California Solar Initiative (CSI) remaining Measurement and Evaluation funds to produce statewide geospatial Behind the Meter hourly generation PV profiles. CPUC may ask PV installers for generation data.
	Other	No	No	PG&E does not have access to BTM CHP data.
DR	PG&E administered	Yes	Non-event based only	Data provided in annual filing on April 1. Event-based (e.g., CPP) are for 1-in-2 monthly peaks, used as load modifiers or resources Non-event based (e.g., TOU) is embedded in the forecast
	Non-PG&E administered	No	No	Will provide directly to CEC/CPUC. No IOU requirement.

PG&E's Model of Hourly Load Profile

Method
1. Start from historic hourly profile
2. Shape to a regression-based forecast of energy with only economic and population growth
   - Peak is still at current peak hour (Point A)
3. Adjust forecast by hourly incremental PV generation shapes, resulting in
   - Mitigated hourly profile (green dash line)
   - A forecast of the future peak hour
4. Regression-based forecast of PV-mitigated peak at future peak hour (Point B)
5. Shape mitigated hourly profile to match the mitigated peak (green solid line)

Peak Day Hourly Shape (MW)

Historic Load Profile (existing PV only)
- - - Preliminary Forecast (growth)
—— Final Forecast (with incremental PV)
—— Incremtnal BTM PV Gen

Key Take-Aways:
- Model captures peak shifting (from HE18 to HE 20) after reflecting PV hourly shapes; primarily driven by less PV generation at HE 20.
- The lowest load of the day may occur during the middle of the day.

- Only PV hourly profile is sufficiently developed to be used for RA allocation process.