Draft for Discussion Purposes Only

Distribution Forecasting Working Group

Energy Efficiency Uncertainty and Proposals to Improve DER Methods

Meeting 2: May 2, 2018

SOUTHERN CALIFORNIA EDISON®

An *EDISON INTERNATIONAL*® Company

Energy Efficiency

Key Uncertainties

1. Distribution of upstream EE measures and C&S
2. Allocation of WECC customer classes by CEC may be defined differently than actual PG&E customer classes
3. Impact shapes, which vary by measure

Lessons Learned

1. Need more systematic QC if using historical EE
2. Need assessment of impact shapes compared to local ad system level

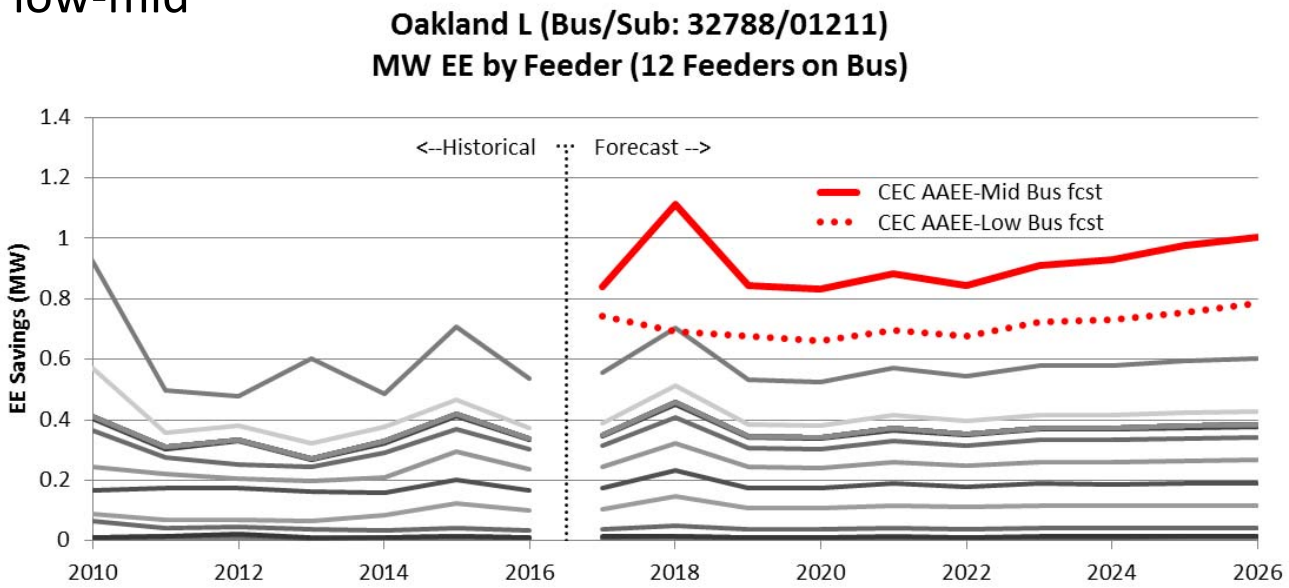
Proposed Improvements

1. Distribution challenges:
   - Collect and leverage historical downstream feeder EE to inform forecast allocation: useful but challenging
   - Work closely with Distribution planning to QC feeder forecasts
   - Connect with EE programs teams to include any anticipated large customer adoption
   - Work with CEC to align on customer definition an distribution
2. Impact Shapes:
   - Apply existing load shapes to historical EE and compare to AAEE MW and local peak coincidence
3. Long term:
   - Work with CEC to provide allocation at the appropriate distribution level (WECC/other), informed by historical EE
   - - and/or Consider developing propensity of adoption models (e.g. PG&E's "EE Recommender")
   - Leverage EPIC research funding to improve forecast allocations statewide

Energy Efficiency

CEC Bus and PG&E feeder-level aggregate allocations

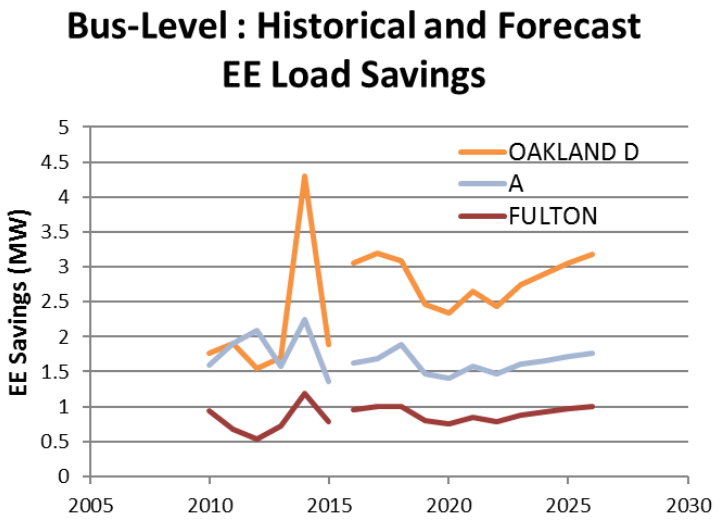
- Knowing where EE has occurred can inform 1/3 of the forecast allocation
  - Downstream EE is about 2/3 of EE programs
  - However, C&S is about half of total EE with unknown distribution (like Upstream EE)
- Leveraging historical EE indicates 40% less than CEC mid, 25% less than CEC low-mid

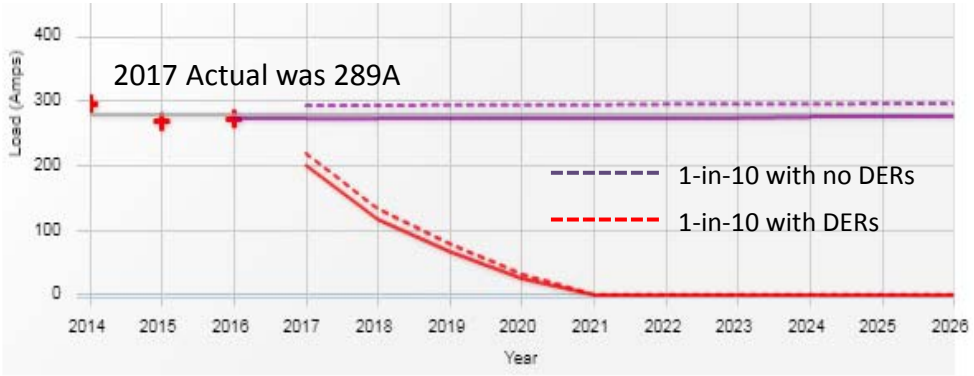


Energy Efficiency

EE Can be lumpy too

- QA/QC with both distribution planners and EE programs teams can help minimize erroneous forecast allocations
  - One-time events can lead to significant bias
  - This is an issue when a customer comprises the majority of load on their feeder (universities, hospitals, etc.)





SCE: Energy Efficiency

Key Uncertainties

- Data availability and quality
- Load shapes
- Customer behavior
- Unknown distribution of C&S and "upstream measures"

Lessons Learned

- Circuit level EM&V, EE, C&S data is needed
- Better 8760 Load Shapes are needed to aide in transition Annual Energy savings to time of circuit peak

Proposed Improvements

- **Improvement 1**
  - ➢ Start collecting required data at the circuit level, Sector and Segment levels of geography in order to increase disaggregation accuracy
  - ➢ Improvement efforts will need to seek to collect data in a manner that meets the needs of the host proceeding, and disaggregation efforts
- **Improvement 2**
  - ➢ Because Improvement 1 will likely not occur in short order:
    - o Take advantage of current disaggregated data sources like AAEE, EM&V and EE savings that are already disaggregated to the Building/Forecasting Climate Zone level of geography
      - ✓ EM&V data are current valid down to the Building/Forecasting Climate Zones.
      - ✓ EE savings are available at the Building Climate Zone
      - ✓ AAEE data are available at the Forecasting Climate Zone

Energy Efficiency

Key Uncertainties

- Lack of location data for upstream programs (accounts for roughly half of EE enrollment)
- "Lumpy" nature of large commercial EE projects

Lessons Learned

- Significant research from Potential and Goals studies could be leveraged
- Upstream lighting almost entirely residential

Proposed Improvements

- Incorporate newly defined Public sector from PG study
- Utilize countywide commercial density information to allocate system-wide commercial AAEE forecasts
- Identify larger relevant segment groups, e.g. hospitality, commercial office, for specific commercial AAEE measure allocation
- Target residential areas for upstream AAEE allocations