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Dynamic and Real Time Pricing

San Diego Gas & Electric GRC Phase 2

A.19-03-002

October 15, 2019 Workshop

Any New Rate Designs Should Be Pilot Tested

- Too little is known about the billing determinants of customers who will participate in these programs.
  - Using the general class billing determinants to design dynamic rates or RTP may lead to cost shifts that are not cost-based.
- RTP has the added problem that it is difficult to know how large a markup to apply to day-of RTPs in rate design for generation capacity costs and EPMC.
  - The combined markup (74% for SDG&E) could be recovered in a TOU volumetric rate, but the latter would have almost as much influence on the bill as the RTP component.
  - Recovering the authorized generation revenue requirement in an hourly RTP that cannot be known in advance is problematic, even with a TOU volumetric rate for the markup.

Unintended Consequences

- Conducting a pilot would avoid any unintended consequences, such as increased GHG emissions.
  - The latter could be avoided by requiring that energy management systems integrate a GHG signal into their dispatch algorithms.
  - D.19-08-001 requires future SGIP programs to use a GHG signal to reduce GHG emissions by five kg/kWh or be subject to incentive payment reductions.
  - WattTime provides such a signal.
- With programs in the Load Shift Working Group Report, incentives paid inadvertently could duplicate bill reductions customers receive from load shifting if both are based on the same marginal costs.
  - A concern is rate riders (e.g., DLS and MINTDS) added to NEM tariffs.
  - If the intent is for solar customers to install storage, such behavior could be incentivized by merely reducing the solar export compensation rate below the retail rate.
- Other unintended consequences include unexpected revenue shifts and low participation.

The Pilot Should Provide Information on Any Expected Revenue shortfall

- Participants should not be allowed to keep the benefits from revenue shortfalls that exceed grid benefits.
- Rates may have to be adjusted over time to reduce revenue shortfalls that are not cost based.
- The sample size in the pilot should be large enough to adequately assess the magnitude and type of revenue shortfall.

The Pilot Should Estimate the Ultimate Level of Participation

- Rates that change every 5 or 15 minutes to reflect grid needs, and which become negative during renewable curtailment, provide the greatest benefits to the grid.
  - But such rates may be difficult to predict in advance.
  - This may make it challenging for customers to determine whether the benefits of such rates would cover the cost of new technologies they might install.
  - The RTP price signal may be small compared to an accompanying TOU rate to recover the generation markup and the distribution rates.
- It also is unclear how many customers have sufficient operational flexibility to accommodate RTPs or even CPP.
- The study should assess what kind of education and outreach will be required once the rate progresses beyond the pilot phase.

Information that the Pilot Studies Should Collect

- The pilot tests should collect information on revenue shortfalls that are not cost-based, typical load profiles of participants, demand responses, technologies employed, and decreases (or increases) in GHG emissions.
  - The influence of non-coincident demand charges on GHG emissions and use of storage should be evaluated.
- The pilot should determine what level of granularity in the rate is possible given the utility customer billing system constraints.
- The pilot also should assess what load diversity benefits exist that can be used to reduce the rate.

The Pilot Should Evaluate Diversity Benefits

- Past demand charge discounts to solar and plug-in electric vehicle customers have been justified based on their loads being non-coincident with the rest of the class.
  - These discounts should not be permanent because, as such loads increase as a total percentage of class load, the diversity benefit decreases (e.g., solar and "duck curve" issues").
- No demand charges exists for residential and small commercial customers partly because of the load diversity within those classes.
  - But it is unclear at what customer size level these diversity benefits decrease sufficiently to justify demand charges.
  - The pilot study should investigate this.
  - In the interim, it is important that the class revenue requirements reduction, caused using Effective Demand Factors (EDFs) in revenue allocation, flow entirely to non-coincident demand charges in rate design (see example on next page).

Diversity Benefits

- Very large customers on dedicated feeders or circuits have almost no diversity at the distribution level.
  - Thus distribution non-coincident demand charges may remain relevant to them.
  - Though some diversity may exist at the substations, SDG&E's substations marginal costs are small ($19.61/kW-yr.) compared with the circuit marginal costs ($52.05/kW/yr.).
- Diversity benefit example:
  - Assume a class with only a school and church with equal non-coincident loads.
  - One peaks on weekdays and the other on weekends.
  - In this example, the EDF = 0.50.
  - The EDF, in this example, would be used to reduce the marginal distribution demand costs applied in revenue allocation by 50%.
  - In rate design, this discount should flow entirely to the non-coincident demand charges.

SDG&E's Distribution System Effective Demand Factors

Customer Class	Circuits	Substations
Residential	34.90%	31.95%
Small Commercial	47.24%	43.41%
Medium/Large Commercial & Industrial	73.37%	68.21%

- SDG&E's demand charges could more accurately reflect EDFs if the Medium/Large Commercial and Industrial class were split into two, as PG&E and SCE have done.