

DOCKETED

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Energy Institute at Haas Comments on 12/11/18 Data Workshop

Additional submitted attachment is included below.



January 7, 2019

RE: Docket # 18-MISC-05
Title 20 Section 1353 "Disaggregating Demand Data"
Workshop re: Proposed Disaggregated Demand Data Collection and Processing Methods

Dear Commissioners:

Thank you for providing an opportunity to comment on the California Energy Commission's (CEC's) Disaggregated Demand Data Cleaning Workshop on December 11, 2018. We offer the following comments based on the extensive experience of researchers at the Energy Institute at Haas (Energy Institute) working with California utility data.

Question 1: Energy Efficiency participation

- a. *Are the proposed fields in the EnergyEfficiencyParticipation table appropriate for evaluating meter-level impacts of EE participation on energy demand? If not, what changes do you propose?*

Energy Institute researchers have conducted a number of studies that have used energy efficiency program data to evaluate the impacts of programs on energy demand.¹ Those studies have used interval meter data, measure installation dates and information about the measures to estimate program impacts. It appears the *EnergyEfficiencyParticipation* table requests this information. If this is not already the case, the data structure needs to allow for multiple measures being installed at a given premise during the same reporting period as it is common for multiple measures to be installed around the same time, especially in commercial and industrial facilities. The date of installation should be provided for each measure.

The table currently asks for several dates. The Energy Commission should strive to get the date that best corresponds to when the measure was installed and, thus, presumably, metered demand changed. The fields currently do that by requiring that a utility provide start date, end date *and* claim date, when available.

- b. *Linking with CEDARS data*

We have no comments on this topic at this time.

¹ Examples include Judson Boomhower and Lucas Davis, "Do Energy Efficiency Investments Deliver at the Right Time?" (Revised August 2017). Energy Institute at Haas Working Paper 271R. http://ei.haas.berkeley.edu/research/abstracts/abstract_wp271.html; Fiona Burlig, Christopher Knittel, David Rapson, Mar Reguant, and Catherine Wolfram, "Machine Learning from Schools about Energy Efficiency" (September 2017). Energy Institute at Haas Working Paper 283. https://ei.haas.berkeley.edu/research/abstracts/abstract_wp283.html

- c. *POUs report EE program-level data under Section 1311, but Section 1353 requires meter-level data. Which data from the POU are sufficient for CEC staff to estimate EE impacts on demand at the meter level? What is the most efficient and effective way for the Energy Commission to combine POU's EE data with IOU's EE data?*

The requirements for the POU should be the same as for the IOU so that similar analysis of energy efficiency impacts can be performed.

Question 2: Billing

- a. *During the workshop, staff suggested that a data flag indicating whether a bill is partial, in addition to the CCA and DA requirements above, would remove all ambiguity. Is this a reasonable solution?*
- b. *Please provide any other feedback on this proposal or alternate suggestions for resolving these billing data concerns.*

For electricity, including a data flag for customers served by a CCA or DA provider is important. A flag should also be provided for natural gas customers that have their natural gas provided by sources other than the utility. A flag to indicate when the Bill Charge Amount (*BillCharge*) does not include commodity charges is also valuable.

Additionally, we recommend that the utilities provide all billing determinants that would be needed to calculate the Bill Charge Amount, given a rate schedule. With that information the Energy Commission can confirm on its own whether the bill is partial by comparing the calculated Bill Charge Amount to the *BillCharge* provided by the utility. In the next section we expand on the kinds of billing determinants that are important.

Request All Billing Determinants

For demand forecasts and other policy research it can be important to know not just the total electricity or gas bill amounts, but also the individual components that make up the bill. For example, to understand the financial impact of energy efficiency on larger commercial and industrial customers, it is important to understand how much of their bill is due to volumetric charges, demand charges and fixed charges. For residential customers, information related to Demand Response SmartRate programs, CARE, NEM for net metering, climate zones, and Solar Choice program participation could be important.

The specific data requested should be based on a review of rate schedules. For some commercial and industrial customers maximum monthly demand, maximum on-peak summer demand and/or maximum on-peak winter demand are important. These billing determinants cannot necessarily be derived from the interval data, especially for customers with traditional demand meters instead of interval meters, as we understand is the case for many of Los Angeles Department of Water and Power's customers.

In addition, knowing whether a customer has opted for electronic billing can be an important feature of demand that the Energy Commission may consider requesting from utilities.

Question 3: Rate schedules

Please provide any feedback or suggestions on how to structure and collect rate schedules in a way that captures options and modifiers. Ideally, a solution will be appropriate for all utilities. However, staff will consider suggestions that handle rate schedules differently for each utility if necessary.

Establishing a way to systematically collect rate information, and identify which rate schedule a customer is on at a given point in time is challenging and important.

We recommend that the Energy Commission look to the US Utility Rate Database, which is hosted by the National Renewable Energy Lab (NREL).² The database is intended to be a machine-readable source of rate information to facilitate analysis. Professors Severin Borenstein and James Bushnell at the Energy Institute recently made use of this database for a project that analyzed residential electricity rates throughout the country.³

The database already contains California utility rates. However, updating the database has historically been a manual process, undertaken on an ad hoc basis for specific projects. Professors Borenstein and Bushnell are currently undertaking a project to update the residential rates in the database and to automate the update process as much as possible. The Energy Commission should consider undertaking a similar effort so that California commercial, industrial and agricultural rates are kept up-to-date. Then the utility rate schedule codes provided by the utilities to the CEC could refer to the US Utility Rate Database.

Question 4: Unmetered consumption

We have no comments on this topic at this time.

Question 5: Submeters

We have no comments on this topic at this time.

General Topics

Question 6:

Please provide any additional feedback or suggestions on the proposed source data schema, including which data fields should be reported and how they should be structured.

Meter Latitude and Longitude (Lat/Long)

We recommend that the Energy Commission request the meter location in the form of latitude and longitude, a data field that at least some utilities, including PG&E and SCE, store, and that Energy Institute researchers have found to be very important.

² <https://openei.org/apps/USURDB/>

³ Severin Borenstein and James Bushnell, "Do Two Electricity Pricing Wrongs Make a Right? Cost Recovery, Externalities, and Efficiency" (September 2018). Energy Institute at Haas Working Paper 294. http://ei.haas.berkeley.edu/research/abstracts/abstract_wp294.html

Under the current proposal, the Energy Commission will request the addresses of the premise, then geocode them to latitude and longitude (lat/long) in the ETL process. However, Energy Institute researchers have found the address is not precise enough for some analyses.

In one recent study, the researcher wanted to determine how small businesses respond to a demand response program. To do this he needed to relate meters to businesses (which he referred to as “establishments”). Using the meter lat/long information he was able to determine that almost 10% of establishments had multiple meters in the same location. This told him that the meters should be combined for the purposes of his analysis.⁴ The address information alone was too coarse to determine when to consolidate meters and when to keep them separate.

In projects looking at industrial facilities and schools we have also found meter location data helps to relate meters to businesses or particular structures. In large campus settings, addresses may not be specific enough.

NAICS Codes – Business versus Facility

Some utilities store multiple NAICS codes for each customer—one at the business level (NAICS1) and one for the specific facility (NAICS2). For example, the office space associated with a food packing plant could have a food packing NAICS1 code but an office-related NAICS2. We recommend that the Energy Commission request both of these, where available. We have found that understanding both levels is important for some types of demand analysis, e.g. in the example above, an analysis of industrial demand may want to exclude the food packing company’s office space.

Question 7:

Please provide any additional feedback or suggestions on the proposed ETL methods and transformation rules. Please attach a list of specific ETL rules that you recommend.

We have no comments on this topic at this time.

Question 8:

Do you have any other feedback or suggestions which were not addressed in the prompts above?

Additional Customer Characteristics Data May Be Needed to Join Datasets

The simplicity of the proposed data structure, with the additions we recommend above, addresses Title 20, Section 1353, but may not be sufficient for future projects. Inevitably, future projects will require requesting additional information from the utilities and/or additional institutions. It is important to consider how the currently requested utility data will be merged to other data used for future projects. For example, incorporating electric vehicle demand data from the Department of Motor Vehicles (DMV) into electricity usage data from the utilities may prove difficult without appropriate fields to match on. Many of these types of projects will involve “fuzzy” matching based on common characteristics in each dataset.

Addresses will often be sufficient for these joins, but may lose relevance over time when households and businesses move, or when businesses occupy multiple addresses. Attributes such as names and

⁴ Joshua A. Blonz, "Making the Best of the Second-Best: Welfare Consequences of Time-Varying Electricity Prices" (November 2016). Energy Institute at Haas Working Paper 275.
http://ei.haas.berkeley.edu/research/abstracts/abstract_wp275.html

phone numbers can be valuable information for these purposes, though this will bring about additional security concerns.

We thank the CEC for inviting our input and are excited to see the CEC move forward with the collection of disaggregated demand data.

Respectfully Submitted,

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