

DEMAND ANALYSIS WORKING GROUP (DAWG)

Energy Savings Pup CPUC Energy Efficiency Potential – 2018 and Beyond – Measure List

Monday, August 29, 2016
10:00 am – 3:15 pm

Address:

California Public Utilities Commission – Courtyard Room
505 Van Ness Avenue
San Francisco, CA

Meeting Website: http://demandanalysisworkinggroup.org/event/energy-savings-pup-cpuc-ee-potential-measure-list/?instance_id=356

Notes

Duration	Topic
10:00 - 10:20	Introduction and Meeting Objectives
10:20 - 10:50	Residential and Commercial - Measure Selection Process Overview - Measure Characterization Data Sources
10:50 – 11:00	Break
11:00 - 12:00	Res/Com Measures Database Review
12:00 - 1:00	Lunch Break
1:00 - 1:30	Agriculture, Industrial, Mining, Streetlighting (AIMS) - Measure Selection Process Overview - Measure Characterization Data Sources
1:30 – 2:00	AIMS Measures Database Review
2:00 – 2:10	Break
2:10 – 2:50	AIMS Measures Database Review (cont.)
2:50 - 3:15	Next Steps and Closing

Introduction and Meeting Objectives

CPUC

There will be several more full-day meetings regarding the CPUC 2018 and Beyond Energy Efficiency Potential Study, with the possibility of shorter webinars on specific topics if needed.

- In late September or early October 2016 there will be a workshop on nonconventional savings (behavioral, retrocommissioning/operational “BRO” savings) and bundled measures/whole building measures and approaches.
- In November/December 2016 there will be a workshop on market potential, also relating to issues in the cost-effectiveness rulemaking and the SB 350 mandate.
- The draft report is planned for March 2017.

The Study it will reflect as much SB350 implementation as possible. However, given uncertainties about interpretation and implementation of the mandate, some refinements will need to occur in the next update of the study. Indeed, updating study methodologies to reflect AB 802/SB 350 is probably an ongoing process inasmuch as decisions interpreting and implementing the law will roll out over time. One option for this study is to build in several broad categories of “scenarios” or “uncertainties” to help bound different assumptions. That issue can be discussed toward the end of the year. Technical potential for traditional energy efficiency in buildings (today’s topic) will remain the same, but determining “achievable potential” may be where the scenarios would be implemented. This will be discussed later in the year.

The utilities/program implementers would appreciate having some of the cost-effectiveness information by measure early on if possible. This could help to inform development of their business plans, especially since recent changes in cost-effectiveness will affect the construction of their portfolios. The utilities/implementers have been provided the new avoided costs for use in the business plans, but a webinar to aid preparation of the plans would be useful.

Note: the 2018 and Beyond Energy Efficiency Potential and Goals study traditionally has a 10-year forecast horizon, as does the Energy Commission’s California Energy Demand forecast for the Integrated Energy Policy Report. That would be through 2028. However, since SB 350 sets goals for 2030, the Study team will probably just add two extra years, forecasting plan is for 10 years, that is 2028. So they will just add two years and go to 2030 in this report.

See: <http://www.cpuc.ca.gov/General.aspx?id=2013>

Note: the new avoided costs (as of 2016) are so significantly different than prior avoided costs that the “calibration” step in modeling the results this year will be difficult. “Calibration” involves providing essentially a “sanity check” on the achievable potential results by comparing them to prior program accomplishments. Calibration will be discussed in a future DAWG meeting – today’s meeting is just to focus on the measure list that will be used to calculate technical potential (the energy efficiency potential that is theoretically available, without considering the costs of capturing that potential).

Residential and Commercial

- Measure Selection Process Overview

- Measure Characterization Data Sources

Today the focus is on specific technologies/widgets. The goal of the meeting is to make sure that the measure list of technologies selected for inclusion in the study is complete and has been reviewed by interested stakeholders. In particular, the study team would like to make sure that measures implementers are planning to/considering including in their portfolios are all reflected in the study.

The big difference this year is that with the rolling portfolio cycles and with AB 802, there are more measures than usual. The team wants to get the measure list done early. They have proposed 1500 measures, and are deprioritizing niche measures this year as compared with previous studies. Instead, they are planning to focus on higher impact measures (HIMs).

A MS Excel list with the selected measures was distributed with the DAWG meeting announcement (and is posted on the DAWG site). The workbook contains a sheet with the measures that were selected for inclusion as well as a sheet with measures that were considered but at this time are not planned for inclusion in the modeling (pending stakeholder comments). Both lists are quite comprehensive.

This step is to identify measures used to estimate technical potential. (Economic and achievable potential will be modeled in subsequent steps.) Note that measures likely to represent some technical potential may not pass subsequent screens (for economic and achievable potential). An example is refrigerator recycling – there is likely to be technical potential for this “measure” (in this particular case the “measure” is the act of recycling). However, the net to gross ratio (NTG) is known to be so low that the measure is unlikely to pass the economic screen.

The analysis primarily focuses on resource programs (hardware as opposed to savings arising from activities such as audits). However, BROs will be included and will be addressed specifically in a future DAWG meeting.

Savings from Codes & Standards support are modeled for a whole code, not created from individual measures.

Stakeholders have until September 9, 2016 to provide comments / suggest new measures to add to the list (see the end of this document for instructions for emailing comments).

The purpose of the study is for goalsetting and as a byproduct, the results can be used for program planning. However, the utilities/program administrators note that program planning is a more refined process that relies loosely on the study results.

“Repair cost” is a new variable introduced in technical analysis this year, in response to AB 802.

Res/Com Measures Database Review

The measure list is intended to be a “no regrets” approach – to include all measures that are likely to account for savings in the portfolios, leaving aside niche measures that may contribute a *de minimus* savings. (Note that these savings are welcome – every bit counts! But it is not necessary to model every niche measure in the study.) Lighting has traditionally accounted for 80% of the savings in the energy efficiency potential studies. The percentage will likely be similar this time. The new avoided costs will likely change the mix of measures that pass the economic potential screen, though it is likely that most of the savings will still come from lighting.

The study team reviewed a wide variety of sources to identify measures:

1. DEER
2. IOU Workpapers
 - i. With CPUC Disposition
 - ii. Other Workpapers
3. California Municipal Utility Association (CMUA) TRM (from Cal TF)
4. CA IOU Emerging Technology Database
5. IOU Program Data
6. Non-California source examples:
 - Regional Technical Forum (RTF) from Pacific Northwest
 - Navigant’s Internal Database

To provide context for the current proposed measure list: 98% of the savings came from only 30 measure groups in the last study. A measure group is loosely defined as an identifiable technology: e.g., indoor, or lighting indoor CFL reflector, lighting indoor > 30 watts. The measure groups come from the CPUC’s

EE stats database:

<http://eestats.cpuc.ca.gov/Views/AnnualReport/AnnualReport.aspx>

Stakeholders at the meeting requested that the measures/measure groups have more information. E.g., instead of just “high” or “low” wattage lighting, can there be some information about the wattage range, or other identifying characteristics? Navigant agrees to work through the list and add some more clarifying information.

This list is different enough from the list from the last Study cycle that it doesn’t really compare one for one.

Fuel Switching/Fuel Substitution

There was significant discussion of fuel switching/fuel substitution during this meeting.

- Some of the measures included in the current list are for fuel substitution (fuel switching). The measures modeled in this study represent energy use *in buildings and related uses*. Fuel switching from e.g., gasoline to electric vehicles/transportation in general is *not* addressed in this study.
- Note that whether fuel switching e.g., from gasoline to electric vehicles in the transportation sector *may* be within the purview of SB 350 – that has yet to be determined.
- Note that per SCG, fuel substitution from electric to gas for some space and water heating measures may represent a lot of savings in the upcoming cycle.
- The “three pronged test” has traditionally been used in CA to determine whether “fuel switching/fuel substitution” represents “energy efficiency” vs. “load building” (for the fuel that is being used by the new technology). This can be discussed at a later DAWG meeting – today the goal is just to review/obtain agreement on the measure list.
- The impacts of fuel switching depend on the location of the installation. As electricity supplied by the grid becomes cleaner (e.g., via renewables) switching from gas to electric technologies can be a viable GHG reduction approach. Fully modeling fuel switching would require modeling electrification on grid, by location, etc. This would represent significant effort not currently envisioned for this study. For today we note that this is an issue that could be considered at a later time if needed. One option, for this study, might be to at least discuss in-text what steps would be necessary to do this modeling. In any event, this issue can be discussed at a later DAWG meeting, in particular when the implications of SB 350 are discussed *vis a vis* the “achievable potential” step in the analysis.

The DEER database was most recently updated August 2016. The last measure cost study was in the 2010-2012 cycle. Measure costs in DEER stay the same but the programs do update the workpapers. Sometimes the workpapers use DEER costs, sometimes they use previous DEER; this is not done consistently in the workpapers.

<http://www.energy.ca.gov/deer/>

Navigant has access to the workpapers. There is also the READI database where workpapers are stored (use the link to the DEER website provided above).

Navigant will model emerging technologies individually. If there is a draft workpaper they will use it. Feel free to recommend workpapers where appropriate.

Measures included in the list are for both SF/MF; and for all building types in the commercial sector. That is: a measure/measure group is modeled for all building types in the sector (the residential and commercial lists are separate), but when the energy savings are modeled, there will be different savings values where appropriate by building type and climate zone.

The list contains plug loads – and more consumer electronics than in previous studies. Note: refrigerator and freezer are end uses in the CEC model. Right now in the proposed list they are in an appliance/plugload list. Navigant will either separate the category nomenclature and/or provide mapping information to Energy Commission for producing the Additional Achievable Energy Efficiency (AAEE) analysis.

Note: EPA has a new paper out on vacuum cleaner efficiency – Navigant can review the paper and consider whether vacuum cleaners should be added to the list.

Solar water heating does not go into the energy efficiency proceeding since it used to be in the California Solar Initiative (CSI) program. In the 2001 it represented the biggest “slice” of energy efficiency potential (technical potential) but out due to costs during the economic potential analysis. Solar hot water heating will be included in this year’s study to at least give information about how much technical potential there is, even if it eventually does not pass the economic potential screen. This might be useful, in particular, for the SB 350 analysis being conducted by Energy Commission.

Cool roofs – right now cool roofs are in the reach code.

Stakeholders request that low flow aerators and showerheads should be included in technical potential analysis. They may not pass the economic screen, but since there are now joint programs with water agencies, it is worth identifying the

technical potential. It may be the case that later some entity may wish to conduct an economic analysis considering joint funding.

There is a new piece of technology – a heat exchanger – which uses warm water coming out of the shower to preheats the cold water going into your hot water heater. This technology may be worth including in the list.

During the meeting, participants agreed to skip the specific review of commercial measures. Based on the nature of discussion of residential measures, participants feel comfortable reviewing the commercial measures on their own and providing any comments by September 9, 2016.

Agriculture, Industrial, Mining, Streetlighting (AIMS)

- Measure Selection Process Overview

- Measure Characterization Data Sources

The AIMS analysis is more complex due to the variation and uniqueness of facilities and technologies in the AIMS sectors. Navigant is using the DOE Industrial Assessment Centers (IAC) database for industrial measures; it informs some agricultural measures as well. Data from 1000 assessments and 9000 implementation recommendations resulted in 167 supply curves (subsector, end use fuel, measure type). The database covers all 50 states but it is possible to query this database for CA only. <https://iac.university/searchAssessments>

Energy Commission

CA has declining energy use in the industrial sector over the 10 year forecast horizon. If industrial energy use is dropping, that is reflected in population/building stock? Yes: the industrial sector is characterized in terms of customer segment consumption and there would be an adjustment by subsector. However, Navigant is still deciding how to implement this analysis.

In industrial, the “other” category covers about 12% of the electric consumption and about 19% of the gas consumption based on the 2015 CED/IEPR forecast. The measures are individualized/unique/niche and therefore difficult to model. In this energy efficiency potential study, Navigant is not planning to model measures that would occur in the “other” category – these are essentially by definition niche measures. So there will not be identified “potential” in the “other” category per se. Program administrators can achieve some of their goals by using measures in this category – however the study is not going to include such measures – forecasting savings from unique measures is simply not particularly reliable.

Meeting participants expressed concern about savings information from other states being used to represent California industries. California has a unique regulatory, cost/price/labor markets, age and mix of facilities, etc. At a minimum

Navigant will make their assumptions transparent for review when the draft report becomes available. It's likely that for certain technologies or end uses most of the energy efficiency potential (e.g., 40-50%) might be in the large facilities which have already upgraded. Then the remaining potential is distributed in small and medium facilities. The cost structures are different and when at a given facility a measure only uses a relatively small amount of energy, it might not be as inviting to upgrade efficiency levels – the margins are smaller. So while there is technically some potential available it is more distributed This issue is largely an economic issue to be captured by the economic screen. However the study should reflect that when a measure uses such a small amount of energy, relative to other sources at a facility, it is simply unlikely to be upgraded to a more efficient technology. If needed, a webinar on this topic can be held earlier.

Meeting participants recommend looking through workpapers in the READI database to identify measures for the AIMS sectors. However, Navigant requests that folks recommend specific papers if they are aware of pertinent ones – attempting to look through all of the papers would be exceptionally time consuming.

PG&E recommends reviewing results from integrated audits of industrial facilities to identify available potential based on these careful inspections. First, it would be helpful if program administrators identify whether this information is available and whether it is searchable, or in .pdf format, etc. Also, if stakeholders can estimate the order of magnitude of the task of reviewing these reports – how many of these audits have been conducted over the last number of relevant/recent years? PG&E makes a guess that in terms of really large facilities there might be 40-80 – however this is a guess. The utilities will follow up with better information. Also, it will be necessary to aggregate the information and/or develop other processes to avoid disclosing data that identifies particular customers (and publishing data that makes the customers identifiable, e.g., if there might be only one or two such facilities in the state). Navigant, CPUC and the utilities will discuss this opportunity offline to see whether it is worth pursuing and if so, how to go about obtaining the information.

CARB did a nice characterization of refineries in 2013. Here is a link to a presentation, and additional information about the report.
<https://www.arb.ca.gov/cc/energyaudits/meetings/070913/presentation.pdf>

Note: based on a recent Decision in the CPUC's energy efficiency proceeding, office portions of industrial buildings can apply for rebates.

Adjourn

Please send additional informal comments by COB 09/09/2016 to:

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