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# Energy Commission Staff Questions to NAVIGANT Regarding the California Municipal Utilities Association and Publicly Owned Utilities Goals and Potential Model

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## Background

In order to support the SB 350 energy efficiency target setting process, the Energy Commission requires the active participation of the publicly owned utility (POU) community. The Energy Commission expects that on March 15 POUs will submit the quadrennial AB 2021 10-year energy efficiency savings projections developed by Navigant Consulting (Navigant) for all POUs, irrespective of whether all POU governing boards have approved such projections.[1] We expect that these projections will be thoroughly documented so that basic methodology used, key input assumptions, and results are readily described for each POU.

In contrast to AB 2021, SB 350 focuses on enhancing energy efficiency savings over time. As a consequence, it is likely that additional information may be required compared to that which POUs anticipated providing when the contractual arrangements for the 2016 potential study were finalized. There are two groups of questions to which the Energy Commission requests POUs and their contractor respond. Group 1 questions request clarification of the POU savings projections expected on March 15, 2017. Group 2 questions involve details of the input assumptions, projection methodology, and the need for results likely to be at a more detailed level than contained within the March 15, 2017 submittals. The Energy Commission anticipates reaching a mutually acceptable due date for these Group 2 responses.

Energy Commission staff also ask CMUA to clarify the status of POU governing board adoption for the energy efficiency projections submitted on March 15, 2017, for each POU. For example, those POUs that have already considered and adopted 10-year targets, those currently scheduled to consider adoption, and those not yet scheduled to consider adoption.

**Group 1 Questions – Please respond by March 29, 2017 in anticipation of an Energy Commission workshop on utility savings projections in the second quarter of this year.**

Group 1 questions request clarification of the 2018-2027 electricity savings projections that are scheduled to be submitted to the Energy Commission on March 15, 2017. These projections were developed by Navigant under contract to CMUA for the purpose of satisfying the statutory requirement that POUs submit 10-year energy efficiency savings targets pursuant to Public Resources Code 25310(b).

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1 In the 2013 submission of POU 10-year savings projections, several large POU projections were labeled preliminary and final versions were submitted later.

1.  It is essential in the SB 350 target setting effort to understand what expected energy efficiency savings would be without the emphasis of SB 350 on increased energy efficiency savings, and what would be incremental savings due to SB 350. Please describe the principle ways in which the 2017 study increases expected POU savings as intended by SB 350.

    **Section 9615 of the Public Utilities Code states that "each local publicly owned electric utility, in procuring energy to serve the load of its retail end-use customers, shall first acquire all available energy efficiency and demand reduction resources that are cost effective, reliable, and feasible."  This section has for the past decade guided the establishment of "annual targets for energy efficiency savings and demand reduction for the next 10-year period," as required by Section 9505 of the Public Utilities Code,**

    **As such, the 2017 energy efficiency potential studies and annual targets for 2018-2027 do not reflect a "SB 350 emphasis" since they already seek to identify all "cost-effective, reliable, and feasible" energy efficiency and demand reduction.**

2.  Please provide a tabular comparison, for each individual POU, of the 2018-2027 study results submitted on March 15, 2017 with those submitted in 2013 for the 2014-2023 study.

    **Please see the '2013 v. 2017' tab in the attached Excel file, '_AppendixB'.**

    **The total 10-year MWh target for 2014-2023 is 7,402,928 MWh.**

    **The total 10-year MWh target for 2018-2027 is 7,968,571 MWh.**

3.  Please summarize the principal methodological and input assumption changes between the March 15, 2017 submittal and the previous one submitted in 2013.

    **Please see Chapter 2 of the Navigant document, "Energy Efficiency Potential Forecasting for California's Publicly Owned Utilities," which is included at the end of Appendix B in the annual EE report (pgs. 299-306).**

    **The annual EE report is available for download at: http://www.ncpa.com/wp-content/uploads/2015/02/2017_POU_EE_Reportv2.pdf**

4.  Of the principle changes described in response to question #4, which changes create the greatest difference in results between the two studies *in aggregate* across all POUs?

    **Please see Chapter 2 of the Navigant document, "Energy Efficiency Potential Forecasting for California's Publicly Owned Utilities," which is included at the end of Appendix B in the annual EE report (pg. 299).**

5.  Of the principle changes described in response to question #4, which changes create the greatest difference in results between the two studies *for each individual* POU?

    **Please see the individual POU narratives regarding their 2018-2027 targets, which are included in Appendix B of the annual EE report.**

6. The Energy Commission understands that individual POUs had an opportunity to create input assumptions specific to the analysis for that utility within the overall framework of the Navigant modeling tool. To what extent did individual utilities elect to customize assumptions specific to the analysis for their utility service area? Please provide a summary of the variables that each utility requesting customized assumptions selected to be used for their service area.

   **Please see the individual POU narratives regarding their 2018-2027 targets, which are included in Appendix B of the annual EE report.**


7. There are numerous alternative methods that SB 350 (listed in PRC 25310(d)) highlights as possible methods for achieving the statewide doubling target. Among these are conventional POU energy efficiency programs, but also fuel substitution and conservation voltage reduction efforts, among others. Please describe the extent that the Navigant study provided an opportunity to assess the possible savings from unconventional programs. To the extent that the Navigant study did not offer this opportunity, what supplemental analyses do POUs anticipate submitting? What is the preferred schedule for POUs to submit such supplemental information?

   **Fuel substitution and conservation voltage reduction (CVR) were not included in the modeling. There is no current schedule for POUs to collectively assess the energy impacts of fuel substitution or CVR.**


8. Please share the outputs from the Navigant's Electricity Resource Assessment Model (ELRAM) model at the measure/program level for each POU.

   **Please see the the attached Excel file, '_AppendixB'.**

   **The ELRAM output informed individual POU decisions regarding annual targets. Some POUs elected to adopt an ELRAM-generated metric (i.e., Net Incremental Market Potential). Some POUs included savings from Codes and Standards. Still others based their targets on the ELRAM output, but adopted/proposed targets that were not a direct output of the ELRAM model.**

   **Each utility tab provides the adopted/proposed energy efficiency and demand savings targets, as well as a description of the basis for the targets. Below these top rows, the ELRAM output data from the Final Run for Technical, Economic, Cumulative, and Incremental, net and gross, potential is displayed for the POU.**

   **The 'ENERGY' tab summarizes the adopted/proposed energy efficiency targets for all POUs.**

   **The 'DEMAND' tab summarizes the adopted/proposed demand savings targets for all POUs.**

   **The 'Summary – Market' tab compares the net v. gross, incremental v. cumulative market (MWh) potential for each POU. In addition, the tab also compares the impact of including Codes & Standards savings.**

   **Similarly, the 'Summary – Sectors' tab summarizes the Technical, Economic, Cumulative, and Incremental, net and gross, potential for all POUs.**

9. Please provide the detailed results from the ELRAM model for alternative scenarios that have greater aggregate energy efficiency savings through time, but were not submitted to the Energy Commission in compliance with PRC 25310(b).

   **This data was not provided to NCPA/SCPPA/CMUA and should be requested from individual POUs, not Navigant, on a case-by-case to ensure the correct data is provided.**

10. Please explain how POUs that have electric and natural gas end users, such as Palo Alto, are planning to establish targets for natural gas savings and demand reduction.

    **Please see the attached files, '_CPAUstaffreport', which contains the CPAU staff report proposing natural gas efficiency (therms) goals, and '_CPAUoverview', which provides background info from Navigant on the natural gas model.**

**Group 2 Questions**

Group 2 questions request details of the input assumptions, projection methodology, and results of the March 15, 2017 submittals. This group of questions is divided into two sections. To the extent that Navigant's Measure Input Characterization (MICs) spreadsheets and 2016 methodology report[2] and Navigant's presentation to the Demand Analysis Working Group (DAWG) on September 25, 2014[3] continue to be valid representations of the 2017 projections, POUs may respond accordingly without preparing a new, in-depth response.

Please confirm by May 5, 2017 that previous information presented at or following the January 9, 2017 meeting with Energy Commission staff constitutes valid representations of the 2017 projections. To the extent that the specific version of ELRAM used to generate final projections or model inputs are *different* than described at the January 9, 2017 meeting, a mutually agreeable due date for responses to these questions will be worked out.

**Navigant:** The data presented at the January 9, 2017 meeting provided information as it existed up to that point. Only a subset of utilities were considered complete at that point and several modified results after this workshop. However, the methodology is unchanged.

**Questions Regarding Usefulness of Methodology Descriptions and Inputs of ELRAM as Presented January 9, 2017**

1. Per the slide 5, the model inputs are mostly from DEER. Are there any additional non-DEER inputs in the 2017 model? If so, what are they? To what extent are TRM inputs considered? If TRM inputs are considered, for what conditions?

   **Navigant:** Slide 5 of the 2014 DAWG Presentation was related to measure inputs for the

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2 Navigant Consulting, *ELRAM Model Methodology*, February 2016.
3 NAVIGANT, CPUC Potential and Goals Study 2013 Update, Presentation to the Demand Analysis Working Group (DAWG), Sept. 25, 2014, available at
http://www.dawg.info/sites/default/files/meetings/4.2013%20CPUC%20PG%20Study%20for%20Sept%2025%20DAWG%20-%20DRAFT%20Final.pptx.

CPUC IOU potential study, which had primary measure level inputs from DEER. The 2012 CMUA model used the same inputs as the CPUC model since the CMUA TRM did not exist then. For the 2016/2017 CMUA model, we utilized the CMUA TRM as our main source for residential and commercial measures, with supplemental measures and emerging technologies from the CPUC Model (which came mostly from DEER). The TRM gave code conditions for ROB measures and as found conditions for retrofits. For ROB measures, Navigant utilized below code conditions from the 2015 CPUC Potential Goals Existing Baseline Update Report to achieve Dual Baseline savings.

2. Referring to the 2014 DAWG presentation slide 20, why cannot POUs claim streetlights?

   **Navigant:** The 2014 DAWG slide referred to the 2012 version of ELRAM. That version did not include Streetlighting. The current one does.

3. From Navigant's presentation slides to the DAWG on Sept. 25, 2014, codes and standards (C&S) assumptions were included, but not attributed to individual POUs. (The list is the same for IOUs and POUs.)

   **Navigant:** The 2014 DAWG presentation, referring to the 2012 model, accommodated changes to measure baselines over time if they are affected by C&S. In 2012, no claims were made for C&S. In the current model, changes in measure baselines over time if affected by C&S is maintained. However, in the current model, Navigant has estimated what level of C&S savings could be claimed by a POU if they thought they qualified (in some manner, helping in the development of C&S). The method used is essentially a pro-ratio, based on sales, of the C&S claims of the IOUs. Only about 1/3$^{rd}$ of the POUs claimed C&S savings.

4. According to the 2014 DAWG presentation, slide 9, risk factor is mentioned for emerging technologies. Where is that included in the process? How does that factor change the potential savings?

   **Navigant:** The 2014 DAWG presentation, slide 9, referred to the IOU Potentials Model. The POU models, both then and currently, include the emerging technology measures that were included in the IOU Potentials Model, but did not include a risk factor process. Risk factors were applied in the IOU potential model to satisfy some stakeholder concerns that ETs forecasts should be tempered due to their uncertain nature of savings and cost estimates.

5. Does "Retire" mean that the action is old? If so, why is it included? If not, what does it mean?

   **Navigant:** Retire refers to the subset of appliance measures where the appliance is removed. These are usually second refrigerators/freezers and are sometimes referred to as "appliance recycling programs"

6. We would like to better understand what generates the flat file worksheets. We would like the source information.

**Navigant:** We can provide the source MIC spreadsheets for residential and commercial, which are derived from the CMUA TRM. Individual characterizations of measures are in the tabs beginning at 001. Industrial/Ag/Streetlighting and supplemental measures from the CPUC study were pulled in directly from the latest CPUC IOU study MICS for each POU's specific climate zone.

7. The MIC folder provided to us was empty. Of the MIC files we saw by other means, it appears each measure's numbers are not impacted by the climate zone. How was climate zone and building type taken into account for POUs?

   a. How do you track the input files to the geographical boundaries of the POUs?

   b. Are you using the Energy Commission's building types?

   c. Would you be willing to share the POU inputs?

   **Navigant:** The source MIC files and CPUC MICS **do** have characterization by climate zone and building type for all climate zones. When creating individual MICS sheets for each POU, only the POU's specific climate zone was pulled in for climate sensitive measures. All POUs, except LADWP, reside within a single climate zone; LADWP's service territory resides in CZs 8 and 9.

   We do utilize CEC building types for this study.

8. What does Program "New-Com" and "New-Res" mean in MIC files? We could not find this in the ELRAM report.

   **Navigant:** These refer to potential new programs. When we identify the measures included within each utility's set of programs, there are a number of measures still within the MICS that are not within these programs. These, in the Program Name column, are given the identifier of "New-*sector name*". This does not refer to "new construction" programs.

9. Please let us know what column DB of ELRAM FORMATED (Utility) tab within MICS template means. It isn't titled.

   **Navigant:** Anything after column CW ("Cost Code to Eff Measure") in the MICS are not utilized in the model and are look ups to aggregate multiple characterization workbooks or are legacy mappings. Column DB appears to be a legacy program mapping that is not utilized at all.

10. There are columns in the MICS that are not defined in the ELRAM report methodology (e.g., pp. 23-25). Please define:

    a. Code Technology – The code required conditions of each measure – this is where current building codes are identified (relating to question 9 in the next set)

    b. Hard Code Incentive – This is filled in if the utility provides an exact incentive cost for a measure, which would override the default $/kwh saved incentive derived from E3 models.

c. Outside End Use Interactive Effects (Space Heat) – These account for space heat interactive effects of a measure (electric heat).
d. Outside End Use Interactive Effects (Space Cooling) – These account for space cooling interactive effects of a measure (electric)
e. Code or Standard Identifier – used to identify whether a future code vector applies to a measure.
f. Natural Gas Impact (therms)/unit – the Natural Gas interactive effect of a measure
g. Water Impact (Gallons)/unit – Water savings associated with a measure
h. Annual Efficient Tech Energy Use – the total consumption of the efficient technology (kWh)
i. Annual Current Stock Baseline Energy Use – the total consumption of the average existing conditions baseline technology (kWh)
j. Code Minimum Energy Use - the total consumption of the code conditions technology (kWh)
k. Efficient Tech Demand– the peak demand of the efficient technology (kW)
l. Current Stock Baseline Demand - the peak demand of the average existing conditions baseline technology (kW)
m. Current Minimum Demand - the peak demand code conditions technology (kW)
n. Efficient Technology Cost – The total cost of the efficient technology
o. Base Technology Cost - The total cost of the baseline conditions technology – As was the case with the AB802 Existing Conditions baseline update to the CPUC IOU study, these were set to equal code costs for dual baseline measures.
p. Savings Base to Code – the calculated kWh savings from baseline to code (base consumption – code consumption)
q. Savings Base of Efficiency Measure – the calculated kWh savings from baseline to efficient (base consumption – efficient consumption)
r. Savings Code to Efficiency Measure – the calculated kWh savings from code to efficient (code consumption – efficient consumption)
s. % Savings Base to Code – Savings from base to code expressed as a percentage of baseline consumption
t. % Savings Base to Efficiency Measure - Savings from base to efficient expressed as a percentage of baseline consumption
u. % Savings Code to Efficiency Measure - Savings from code to efficient expressed as a percentage of code consumption
v. Cost Base to Code – the incremental measure cost from base to code (code cost – base cost)
w. Cost Base to Efficiency Measure – the incremental measure cost from base to efficient (efficient cost – base cost)
x. Cost Code to Efficiency Measure – the incremental measure cost from code to efficient (efficient cost – code cost)

## Questions about New Methods and Assumptions of the 2017 Study

1. What new methods and/or input assumptions in the 2016 ELRAM methodology may be different than previous work? Do these changes invalidate previous information?

**Navigant:** The new methods do not invalidate previous information. They are an enhancement and include:

- Improved Calibration – for calibration purposes, the model now spreads historical program savings across end-use categories at the program level, using actual savings per end-use category/program as identified in E3. The prior model did not calibrate to this level of detail.
- Updated Measure Impact/Cost Information – the modeling team has significantly improved the measure level inputs using the Technical Reference Manual (TRM) recently developed by the POUs, as well as the most recent CPUC database of available measures with impacts and costs at the climate zone level.
- Increased Decision Type Flexibility and Existing Baseline Changes – the model structure now allows for dual baseline measures (early retirement). This function uses the existing condition baseline for a specified portion of the useful life of a measure, and the code baseline for the remaining portion of the useful life.
- Expanded Building Types – ELRAM provides model results at the building type level for both the residential and commercial segments. The prior model only provided a rolled up commercial sector result.
- Behavioral Programs Included – ELRAM now includes optional Behavioral Programs for the residential, commercial, and industrial sectors. The earlier model did not.

2. Do you use the Building Vintage from the Energy Commission for POUs?

   **Navigant:** The POU ELRAM only uses the distinction of existing and new buildings.

3. LADWP and SMUD are larger than the other POUs. Did Navigant use a different methodology for them compared to the other POUs?

   **Navigant:** The basic methodology used for LADWP and SMUD is the same as all POUs. However, using funding beyond the base CMUA contract, both SMUD and LADWP models included enhancements. SMUD wished to consider some fuel switching capabilities, which were added, and LADWP wished to add several modifications including:

   - An additional claim for C&S. LADWP conducts its planning at the Gross level and therefore does not utilize NTG for its program goals. The C&S claims of the IOUs include attribution adjustments, which are similar in effect as NTG adjustments. LADWP estimated a weighted average attribution factor of 0.6916 from previous C&S projections. The LADWP C&S claim essentially includes a proration of SCE C&S claims divided by 0.6916. LADWP has also requested a mechanism to avoid double counting of C&S potential from programs that use existing condition baselines.

   - Holding currently approved program goals through FY2019-2020 with some downward adjustments for C&S double counting. The model would then be fully functioning starting in FY2020-2021

   - No economic screening of measures

- Where data allowed, use full measure cost rather than incremental measure cost
- Utilize the optimization function of Excel to both maximize the savings available from the measures and programs and then once savings maximized, minimize incentive and administrative costs while holding savings constant. The optimization for both maximizing savings and minimizing cost adjusted incentive levels at the end-use level and administrative costs at the program level.

4. Have POUs considered using a societal cost test or modifying TRM and PAC to include social cost of carbon as an adder?

   **Navigant:** The POU models as published only utilize the TRC for economic screening with the option to use PAC but not a societal. The cost of carbon has not been considered as an adder to the avoided costs at this time. We leave it to the POUs to comment on if they have **considered** alternates to the TRC or PAC. With the exception of LADWP (See previous question above), all other POU models used TRC as the default C-E test.

5. How is the percentage of effective useful life equipment identified?

   **Navigant:** The remaining useful life is 1/3 of measure live, which came from a CPUC directive and is consistent with the IOU potential model.

6. The range of uncertainty around the electricity savings projections is quite large and varies among POUs. What are the primary drivers for the variability?

   **Navigant:** We are unsure about what you mean by uncertainty as the model doesn't quantify a range as published. The calibration process helps insure future expectations are based on historical experience. However, if what is meant by uncertainty is the differences between base case assessments and assessments that include many of the options available through ELRAM (such as Early Retirement, adding new measures, adjusting incentive and advertising, including Behavioral Programs), the difference can be large. In our consultations with individual utilities, these options to increase annual savings were identified. The ultimate decision of what to include was left to the utility.

7. What assumptions related to electricity savings and seasonal impact on local electricity demand were applied?

   **Navigant:** Climate sensitive measures, such as HVAC, have separate electric and demand savings estimates for each Climate Zone. (See response to question 7 on page 4 for more details). Energy savings are reported on an annual (not seasonal) basis. Demand savings represent peak demand (per the definition of peak by DEER and the POU TRM)

8. Is it technically feasible to run the model with each of the cost effectiveness tests that are itemized on page 11 of the 2016 ELRAM Methodology report? Could NAVIGANT undertake such supplemental analyses for the Energy Commission?

   - Please provide the Energy Commission staff with the various outputs from different cost-effectiveness tests.

**Navigant:** This is technically feasible but would require significant effort and expense. Some modifications to the model would be needed and model runs developed for each of the 39 POUs.

**POUS: No additional modeling of POU proprietary data, either individually or collectively, is authorized without the prior written consent of the POU(s) to be modeled.**

9. "C&S Base Consumption Vectors" only has four line items. What about all other building standards?

   - How did you come up with the vectors?
   - Where and how is this worksheet used?

   **Navigant:** The C&S consumption vectors are used for future codes only and are based on Navigant research into future, 'on the books' code changes. All *current* building standards are built into the individual measure characterization in the code technology column. There are three conditions for which consumption is calculated in each line item of the MICS: Existing Conditions, Code and Efficient. The code conditions includes all current building standards and the C&S vectors only for 'on the books' future codes and is used to adjust the code consumption down.

10. Calculations in MIC file shows zero below code savings per unit. Does the model ever look at below code savings? Under what conditions are below code savings evaluated? Does Navigant consider its ELRAM model to be compliant with AB 802 requirements for utilities to implement "below code" baselines?

    **Navigant:** Yes, the model is considered compliant with AB802 requirements to consider the implementation of below code baselines, which ELRAM models as dual baseline. The input sheets have consumption values for 'as found' conditions, 'code' conditions and 'efficient' measures, allowing for the implementation of dual baselines to account for below code savings for the remaining useful life of a measure. This data was not available for some ROB measures (which may be the reason for the original comment), but was input for most ROB measures based on research Navigant did for the 2015 Existing baseline update to the CPUC PG model.

    The line items that show zero savings for below code are mostly just for 'new' buildings (identified by the decision type 'new' in column z of the MICS), or where existing conditions baselines could not be identified and they are assumed to be same as code.

11. Does the model simulate code compliance over time using a factor, or a vector, or an algorithm? Please describe.

    **Navigant:** ELRAM has the capability to include code compliance by specific code and

year as a time vector. However, at this time, compliance is set to 95% for each code for all years.