STATE OF CALIFORNIA Edmund G. Brown Jr., Governor

PUBLIC UTILITIES COMMISSION



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TO: All Parties in R.13-11-005

FROM: Robert Hansen, Utilities Engineer

DATE: December 22, 2016

**SUBJECT: Final 2017 Efficiency Savings and Performance Incentive (ESPI) Uncertain Measures List**

To All Parties in R.13-11-005:

Commission Staff has completed an assessment of current and projected measure savings uncertainty in order to produce the uncertain measures list, included as an attachment to this letter. The uncertain measures list is compiled on an annual basis in accordance to Commission Decision D.13-09-023.

The 2017 Uncertain Measures List in Appendix A provides a list of measure groups which are to be claimed through ex-post analysis, and are recommended for upcoming evaluation studies. Since program administrators define non-standard measure names, measures assignenment to measure groups was performed by Energy Division. The list of measure groups varies slightly year-to-year, but in a given year of claims, each measure associated with one or more claims will be mapped to a measure group. Because the list of measures is extensive and varies across programs and years, a current version of the mapping is available from Energy Division upon request. In preparing the uncertain measures list in Appendix A, Energy Division performed a parameterized uncertainty analysis of all deemed energy savings claims from 2015, producing a sortable table, which shows the percent contributions to total uncertainty in kWh, kW, and Therm savings by measure group at the statewide level as well as at each program administrator’s portfolio. The percent contributions to portfolio/statewide uncertainty are disaggregated into five parameters: installation rate, unit energy savings, gross realization rate, net-to-gross ratio, and expected useful life. The measure groups on the list contribute to 43%, 84%, and 51% of the uncertainty in statewide kWh, kW, and therm savings claimed in 2015.

The uncertainty analysis was published to Energy Division’s Public Document Area on October 3 as a preliminary list of uncertain measures, followed by a public review period and a public webinar on October 12. Energy Division staff proceeded to refine the list based on evaluator comments and deeper analysis of the uncertainty calculations. The language in Decision D.13-09-023 is unclear regarding a threshold for including a measure, but contributions to portfolio variance show which measure groups are both substantially uncertain and are associated with significant savings. The uncertain measures list in Appendix A generally includes measure groups which contribute more than 0.1% of any program administrator’s portfolio savings for any resource, i.e., kW, kWh, or therms. Additional measure groups are listed where staff expects substantial growth in savings claims, despit current less significant uncertainty, as is expected with newer measures such as outdoor LED lighting. Although measure groups will be applied statewide for the purposes of ex-post savings calculations, we will also provide a more detailed ranked list of measures to inform EM&V studies based on specific parameters identified by program administrator, market sector, and energy resource. Specific plans for studying measure groups on the uncertainty list will be determined through the public EM&V study vetting process.

Energy Division published the uncertainty calculations as a draft uncertain measures list on October 3, 2016, and conducted a public webinar to present both the tool and the list for review and comment on October 14. Written comments were made due on October 19, and Staff reviewed both written comments and those expressed during the webinar in preparing the final list.

During the webinar, it was noted that uncertainties attributed to the net-to-gross ratio largely arise from sampling errors generated in the evaluation process, rather than from the programs and measures themselves. Staff and its advisors agreed that the different nature of the net-to-gross parameter warranted further consideration. In response, staff ran the uncertainty calculation tool on data where the uncertainty from net-to-gross ratio was set to zero. Staff observed that particular values of the total uncertainties and contributions to portfolio uncertainties changed in some cases considerably; however , the order of uncertain measures was generally unaffected. Furthermore, the tool displays the parameterized contributions to variance, so a user can easily see when net-to-gross ratio contributes disproportionately to the measure group uncertainty. Thus, Staff decided to keep net-to-gross ratio in the calculations.

Southern California Gas Company (SoCalGas) submitted two comments in response to the draft uncertainty list. First, SoCalGas recommends that “the most recent and complete claim data” be used in the uncertainty calculations. The most recent claim data at the time of this letter’s writing would include the first two quarters of 2016 claims, with the most recent estimations of unit energy savings, however the 2016 data has not been fully processed and, e.g., new measures have not been assigned measure groups. SoCalGas continues to propose using the 2015 claim data with updated unit energy savings (UES). Staff agrees that this method potentially would yield a more accurate indication of both savings and uncertainties across portfolios, the process of incorporating and verifying updated UES values was determined to take more time than was available for the publication of this list, thus the uncertainty calculations were performed using 2015 claim data with its original UES values. Staff asserts that the updates would not yield substantial changes to the final uncertain measures list, but nevertheless will pursue improvements to the Uncertainty Analysis Tool according to SoCalGas’ comment for future use.

SoCalGas’ second comment references the definition of “sufficiently uncertain” presented in CPUC Decision D.13-09-023. Staff maintains that this definition is intended to be illustrative rather than serve as a fixed threshold for a measure’s inclusion, as evinced in the Decision’s language: “as much as 50% or more under- or over-estimated.” This definition offers a guiding example and deference to Staff rather than a fixed threshold for the uncertain measures list. By comparing individual measure groups to portfolio or state-wide savings and uncertainty instead of evaluating each measure uncertainty in isolation, it is possible to identify highly uncertain measures efficiently while constraining the list to a practical length for the purpose of driving future evaluation studies.

The Commission appreciates SoCalGas’ comments and those provided during the webinar, and trusts the final uncertainty list presented in Appendix A has satisfactorily addressed all.

Upcoming Decisions in early 2017 regarding baselines for energy use in calculating energy savings are expected to impact the uncertainty calculations, and may necessitate a re-evaluation of uncertain measures. For this reason, staff may update this list within the first quarter of 2017.

Please direct any questions regarding the uncertain measures list or the Uncertainty Analysis Tool to Robert Hansen at robert.hansen@cpuc.ca.gov or 415-703-1794.

Sincerely,

Robert Hansen

Utilities Engineer,

Energy Division

California Public Utilities Commission

| **Measure Group** | **Energy Resource** | **Parameter** |
| --- | --- | --- |
| AG IRRIGATION | Electric | Gross Realization Rate, Net-to-Gross Ratio |
| APPLIANCE CLOTHES WASHER | Electric, Gas | Installation Rate, Unit Energy Savings, Net-to-Gross Ratio, Expected Useful Life |
| FOOD SERVICE | Gas | Installation Rate, Unit Energy Savings, Net-to-Gross Ratio, Expected Useful Life |
| HVAC BOILER | Electric, Gas | Gross Realization Rate, Unit Energy Savings, Net-to-Gross Ratio |
| HVAC CHILLER WATER COOLED | Electric | Installation Rate, Gross Realization Rate, Net-to-Gross Ratio |
| HVAC COIL CLEANING | Electric, Gas | Gross Realization Rate, Net-to-Gross Ratio |
| HVAC CONTROLS FAN | Electric, Gas | Net-to-Gross Ratio, Unit Energy Savings |
| HVAC CONTROLS THERMOSTAT | Electric, Gas | Installation Rate, Unit Energy Savings, Net-to-Gross Ratio, Expected Useful Life |
| HVAC FAN VFD | Electric | Gross Realization Rate, Net-to-Gross Ratio |
| HVAC FURNACE | Gas | Gross Realization Rate, Net-to-Gross Ratio |
| HVAC MAINTENANCE | Electric | Gross Realization Rate, Net-to-Gross Ratio |
| HVAC MINI-SPLIT SYSTEM | Electric, Gas | Gross Realization Rate, Net-to-Gross Ratio |
| HVAC MOTOR REPLACEMENT | Electric | Gross Realization Rate, Net-to-Gross Ratio |
| HVAC PUMP VFD | Electric | Installation Rate, Unit Energy Savings, Net-to-Gross Ratio, Expected Useful Life |
| HVAC RCA | Electric | Gross Realization Rate, Net-to-Gross Ratio |
| HVAC ROOFTOP OR SPLIT SYSTEM | Electric, Gas | Gross Realization Rate, Net-to-Gross Ratio, Unit Energy Savings |
| HVAC VRF/MINI SPLIT | Electric | Net-to-Gross Ratio, Gross Realization Rate |
| LIGHTING INDOOR LED FIXTURE | Electric, Gas | Installation Rate, Unit Energy Savings, Net-to-Gross Ratio, Expected Useful Life |
| LIGHTING INDOOR LED HIGH BAY FIXTURE | Electric, Gas | Installation Rate, Unit Energy Savings, Net-to-Gross Ratio, Expected Useful Life |
| LIGHTING INDOOR LED LAMP | Electric, Gas | Gross Realization Rate, Net-to-Gross Ratio |
| LIGHTING INDOOR LED REFLECTOR LAMP | Electric, Gas | Gross Realization Rate, Net-to-Gross Ratio |
| LIGHTING OUTDOOR LED FIXTURE | Electric, Gas | Installation Rate, Unit Energy Savings, Net-to-Gross Ratio, Expected Useful Life |
| PIPE INSULATION HOT APPLICATION | Gas | Gross Realization Rate, Net-to-Gross Ratio |
| POOL PUMP | Electric | Gross Realization Rate, Net-to-Gross Ratio |
| PROCESS BOILER | Gas | Gross Realization Rate |
| REFRIGERATION CASE LED LIGHTING | Electric, Gas | Installation Rate, Unit Energy Savings, Net-to-Gross Ratio, Expected Useful Life |
| REFRIGERATION CASE REPLACEMENT | Gas | Installation Rate, Unit Energy Savings, Net-to-Gross Ratio, Expected Useful Life |
| REFRIGERATION EVAPORATOR EC MOTORS | Electric | Net-to-Gross Ratio, Expected Useful Life, Unit Energy Savings, Installation Rate |
| TANK INSULATION HOT APPLICATION | Gas | Installation Rate, Unit Energy Savings, Net-to-Gross Ratio, Expected Useful Life |
| WATER HEATING BOILER | Gas | Installation Rate, Unit Energy Savings, Net-to-Gross Ratio, Expected Useful Life |
| WATER HEATING CONTROLS | Electric, Gas | Installation Rate, Unit Energy Savings, Net-to-Gross Ratio, Expected Useful Life |
| WATER HEATING SHOWERHEAD | Gas | Installation Rate, Net-to-Gross Ratio |
| WATER HEATING STORAGE WATER HEATER | Gas | Installation Rate, Unit Energy Savings, Net-to-Gross Ratio, Expected Useful Life |
| WATER HEATING TANKLESS WATER HEATER | Gas | Installation Rate, Unit Energy Savings, Net-to-Gross Ratio, Expected Useful Life |