**Water-Energy Nexus (WEN)**

**SDG&E WEN Workpaper Proposal**

**Purpose**:

Over the past several years, the CPUC has expressed an overarching interest in determining the potential benefits of evaluating embedded energy impacts associated with water conservation measures. To that end, D.15-09-023, the “Decision Regarding Tools for Calculating the Embedded Energy in Water and an Avoided Capacity Cost Associated with Water Savings” was issued adopting tools to allow the Commission to better quantify energy benefits of water saving measures. The Water-Energy Calculator (W-E Calculator) addressed in this Decision evaluates energy benefits associated with moving and treating water, along with related indirect off-site energy impacts. It also evaluates the energy benefits associated with conservation of cold water savings measures as well as off-site hot water savings.

The purpose of this proposal is to present a strategy for an ex-ante workpaper and to solicit collaboration from both the CPUC Water-Energy team and the CPUC Ex-Ante team prior to development of a workpaper. This proposal sets the ground work to be incorporated into a workpaper using the W-E Calculator. The intent is to produce a workpaper that meets current CPUC Ex-Ante team requirements and quantifies the additional embedded energy savings associated with water conservation. Presently, these additional embedded energy benefits are not being accounted for in existing IOU programs.

**Proposal**:

In order to meet the expectations of the CPUC regarding use of the Water Energy Calculator, the current proposal is to create an incremental energy impacts ex-ante workpaper which utilizes both the W-E Calculator and the water savings values already developed by the Metropolitan Water District (MWD). The focus of the workpaper will be to develop energy impacts for specific, approved measures currently evaluated by the MWD. Energy impacts for these specific measures will be quantified using the W-E Calculator and expressed as incremental energy savings by hydrological zone, over and above the energy impacts which may be associated with existing workpapers or programs. Energy impacts will be an additive savings to any existing workpaper since these incremental savings are off-site and not already accounted for within existing workpapers.

The workpaper will also utilize ancillary parameters such as EUL and NTG, which have already been developed by MWD or otherwise fixed by D.15-09-023. Other parameters, such as installation rates, cost, RUL, and associated READI data, will be developed in collaboration with CPUC Ex-Ante staff such that a complete workpaper is produced that may be incorporated into READI. Note that D.15-09-023 currently sets a default NTG of 0.85.

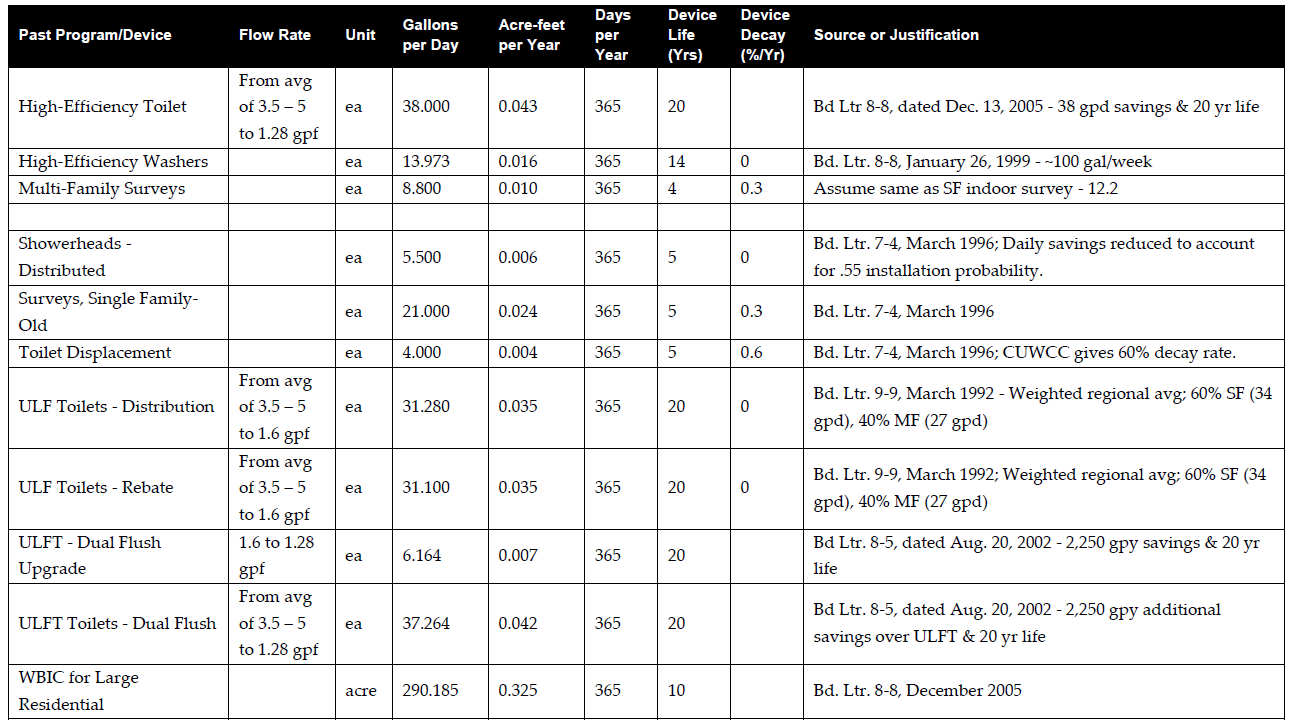
In generating this workpaper, the focus will be on an “incremental” workpaper which will supplement any other workpaper (or potential custom installation) to account for off-site and embedded energy effects. These incremental savings are only proposed within a workpaper for the specific measures already quantified and approved by the MWD. Other water saving measures may be incorporated at a later date as data becomes available, however, until those additional measures are quantified, the workpaper will be limited to the present MWD measures stated in Table A.9-3 in Appendix 9 of the [MWD Integrated Water Resources Plan](http://www.mwdh2o.com/PDF%202016%20Background%20Materials%20Part%202/003736360-1.pdf) (IRP), Draft 2015 Update, discussed as a part of the 1/12/2016 MWD Board Meeting.

**Water Savings Data**:

Water savings data proposed for use in this workpaper is contained in Appendix 9 of the MWD IRP. This appendix contains the methodology as well as the water savings values for a wide variety of both residential and commercial measures. Table A.9-3 quantifies the water savings as well as the EUL and device decay.

Table 1 below is an excerpt from Table A.9-3 for certain residential measures indicating the type of information contained in the appendix, provided here as an example. The complete Appendix 9 is embedded in this document as a .pdf file for Staff evaluation of measures and parameters.

**Table 1**



Within this table, water savings are expressed as “Gallons per Day” and “Days per Year”, which allows for calculation of annual energy impacts using the W-E Calculator. The “Device Life” column will be used to set the EUL for proposed measures, and the “Device Decay” parameter provides a basis for determination of RUL. Also provided is the source or justification for the values presented in the table.

The complete Appendix 9, with methodology, is embedded here for review and evaluation:



As an integral part of this workpaper, collaboration is proposed between the CPUC Water-Energy team, the CPCU Ex-Ante team, and the IOUs such that a complete ex-ante workpaper may be developed. Initial focus should be placed on determining which measures should be allowed to be incorporated into the workpaper, how the various parameters should be used, and differences between existing READI values and MWD data.

**Workpaper Parameters**:

In evaluating the embedded energy impacts due to water savings measures, where water savings has already been determined by MWD, there are several additional parameters that need to be addressed within any workpaper. These include:

* **EUL**: It is proposed to adopt the EUL that has already been evaluated and approved by MWD. These values may differ from existing workpapers or potential custom projects. Since the workpaper will be “incremental” to any existing savings values, the differences in EUL are expected to be minimal.
* **RUL**: Table A.9-3 provides a Device Decay parameter when MWD deemed it appropriate. This parameter may be used to evaluate any proposed measure RUL, otherwise the workpaper may be based on the default RUL of 1/3 the EUL, absent additional information.
* **NTG**: Decision D.15-09-023 locks in a default NTG ratio of 0.85 (OP-7). While there is agreement that this NTG is appropriate at present, an ex-post evaluation as an uncertain measure is a possibility in the future.
* **GRR**: Realization rates, GSIA values, and overall installation rates are presented in the appendix and are proposed to be incorporated as best available data. For each measure contained within the workpaper, collaboration on this parameter is warranted.
* **Delivery**: A goal of this proposal should be to minimize customer requirements to file multiple incentive applications with multiple parties. To realize this goal, appropriate delivery mechanisms should be evaluated and applied. An assessment of how to integrate the delivery mechanism between incentives offered by water agencies and those offered for energy efficiency needs to be discussed.
* **Code Impacts**: Appendix 9 as well as D.15-09-023 address code impacts with regard to Plumbing Code and certain Title 24 Energy Code ramifications. Additional evaluation of T-24 with respect to the proposed measures is warranted.
* **Proper ID**: Most of the measures being proposed do not have adequate cost, NTG, EUL, or other necessary ID parameters available in READI. As a part of the workpaper development, proper IDs should be developed in collaboration with the Ex-Ante team to address measures not previously considered as part of energy efficiency.
* **Measure Requirements**: For each measure contained in the workpaper, specific requirements will need to be developed to assure that ratepayer funds are being appropriately spent for rebates. Again, collaboration and further discussion is warranted.
* **Methodology**: Methodology for determining both water savings and energy impacts will not be addressed in the workpaper other than to adopt both the MWD water savings values and the W-E Calculator output. Should any modification to the default W-E Calculator inputs be required, then the methodology will be explained in the workpaper.
* **Cost Parameters**: All costs must be addressed, including baseline cost, measure cost, and incremental cost for ER or ROB measures. Discussion with MWD and other water agencies is expected to provide the cost elements necessary. It is not proposed herein that any IOU undertake an extensive study to justify costs. Rather, where MWD or another water agency does not have required cost data, the workpaper will rely on simple internet searches, contractor discussions, professional judgement, or other simplified means of determining appropriate cost parameters.

**Issues and Other Considerations**:

While not all-inclusive, the following topics have already been identified and should become the subject for further short term collaboration:

* **Differing Water Savings Values**: It is not proposed that any IOU develop specific water savings for any of the MWD measures. Savings values already quantified are proposed to be adopted. As a result, water savings may differ between some READI values as well as some existing workpapers.
* **EUL Concerns**: There may also be differing values between proposed MWD EUL parameters and those contained in READI or other workpapers. Being an incremental workpaper, an assessment of the differences relative to the overall energy impact accuracy may be warranted.
* **Hydrological vs. Climate Zones**: The W-E Calculator expresses embedded energy as a function of Hydrological Zones whereas, in general, EE measures are quantified in terms of Climate Zones. In certain cases, there is an overlap of hydrological zones and climate zones. This discrepancy needs to be addressed in that rebates are determined based on CZ for specific measures whereas savings occurs based on hydrological zone. Input as to whether to average savings across overlap locations, or otherwise divide embedded energy savings to appropriately address specific customers is necessary.
* **Reporting**: The intent is to report embedded energy as a separate line item rather than combine both embedded energy and existing WP/READI savings into one overall record. Discussion with CPUC Reporting and individual IOU reporting staff is necessary. If embedded energy is reported as a separate line item, individual measures may result in two or more reported records, and the gross and net savings for a single measure may not be directly viewed. Conversely, such reporting will allow specific determination of the benefits of embedded energy impacts.
* **Building Types**: Water savings varies between identical building types depending on the size and application of the water saving measure, particularly within the residential sector. While there is no differentiation in the MWD water savings values for building type or application within a particular building type, the initial workpaper proposes to accept the water savings values as-is and revise the workpaper at a future to be determined date, once additional data is available.
* **Measures**: With the distinct possibility that certain measures within Table A.9-3 are not necessarily supportable from an EE standpoint, an abbreviated list of measures which meet the criteria for ex-ante evaluation should be discussed.
* **Cost Parameters and IDs**: Cost is an important parameter within the ex-ante database as well as the CEDARS reporting requirements. Specific baseline and measure costs are not necessarily defined in the MWD IRP Appendix 9. The workpaper proposes to use simplified cost parameters where specific costs are unavailable, including basic internet searches, contractor discussions, professional judgement, and other easily accessible information, as opposed to any lengthy study to determine costs. Costs may be revised in the future as additional data becomes available.
* **Cost Effectiveness**: Both D.15-09-023 and the approved tools address cost effectiveness. At present, cost effectiveness is not proposed as a requirement in developing a workpaper. Once the energy impacts and ex-ante parameters are determined, cost effectiveness will be evaluated.
* **Conservation vs. Energy Efficiency**: The concept of conservation of energy as opposed to energy efficiency continues to be an issue. The water savings measures proposed are expected to conserve energy as opposed to generate energy efficiency. Conservation needs to be specifically addressed in the workpaper to explicitly allow these water measures to become EE measures.

**Request**:

In summary, the following aspects of this proposal are being requested from CPUC Water-Energy staff and Ex-Ante staff in order to proceed forward with workpaper development:

1. Request expedited collaboration from dedicated CPUC Water-Energy staff and Ex-Ante staff.
2. Request approval and adoption of the water savings values as presented in the MWD IRP Appendix 9 Table A.9-3 for direct incorporation into a workpaper.
3. Request adoption of the EUL values already being used by MWD and presented in Table A.9-3.
4. Request comment and adoption of the fixed NTG value of 0.85 per D.15-09-023 for an interim workpaper, to be re-evaluated two years after workpaper approval.
5. Request review and evaluation from CPUC staff regarding which measures are appropriate for inclusion within this workpaper and which should be presently excluded.
6. Request that the additional parameters contained in Appendix 9 be evaluated with comments on how they should be used within the workpaper.
7. Request confirmation that differing values for water savings between existing EE program measures and proposed MWD values be ignored since current perception is that these differences are within the expected accuracy of the workpaper.
8. Request recommendations on how to address overlap between hydrological zones in the W-E Calculator and typical CZ normally a part of EE measures.
9. Request that all Workpaper Parameters generated by MWD and contained in the Decision be stipulated to, up front, and that expedited discussion take place on how to implement these.
10. Request opinions on the “Issues” raised above and approval to the extent possible in order to expeditiously resolve.
11. Request Staff evaluation of this proposal prior to July 6, 2016, in order to provide meaningful discussion and answers as to the general workpaper direction in the July 11, 2016 Ex-Ante and Water Energy Nexus conference, being held at the CPUC, San Francisco.