CALIFORNIA
TECHNICAL FORUM

Draft Memorandum
(subject to further Cal TF discussion and review)

To: CPUC Energy Division (ED)

Re: Summary of Cal TF Review of PG&E Residential Plug Load Portfolio

From: Cal TF Staff

Date: April 13, 2015

The California Technical Forum (TF) has been providing feedback on Pacific Gas and Electric's (PG&E) new Residential Plug Load Portfolio (RPP) measure throughout the workpaper development process. All together, the RPP measure has been presented to the TF for review and feedback at six in-person meetings and two conference calls. An additional in-person meeting has been scheduled for 5/28/2015 to review the outcomes of the incremental measure cost (IMC) research and to present the completed work paper.

The six completed meetings and key topics were:

- Initial presentation of RPP program design (7/23/2014)
- Proposed unit energy consumption (UEC) values for each product category and modified workpaper template to accommodate market transformation objectives (9/25/2014)
- Proposed methods for calculating net to gross ratios (NTGR), estimated useful lives (EUL), and incremental costs (IMC) (10/23/2014)
- Bass Diffusion Model for estimating NTGRs (11/21/2014)
- Web crawler (hereafter referred to as web harvester) approach for estimating IMCs (12/4/2014)
- Presentation of the interim workpaper (2/26/2015)

While it is not customary that new measures be presented for TF review so many times, the novelty and complexity of the RPP workpaper and supporting methods made such in depth discussion necessary[1]. The RPP workpaper has ambitious market

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[1] The RPP measure is a "market transformation" rather the "resource acquisition" suite of measures that is typically addressed through a workpaper. Furthermore, the methods used to develop key RPP measure parameters are novel, complex, and for the most part, are not DEER-based, and, as a result, required a heightened degree of scrutiny and review. The novel

transformations goals, uses innovative calculation and tracking methodologies, and could potentially be the source of 2% of the savings in PG&E's entire portfolio, thus making it a high impact measure (HIM). All of these factors necessitated the various TF meetings that were held to provide the RPP team with early and ongoing feedback.

This memorandum summarizes the recommendations made by the TF and begins to document how the RPP team has incorporated those recommendations into the measure plan and development process.

Key Parameter Methodologies

Incremental Measure Costs

- The TF requested further analysis of the applicability of the CPUC Measure Cost Studies to the proposed "web harvester" method. The RPP team was asked to review and assess whether the "web harvester" method in any way contravenes direction of CPUC studies.
  - **RPP Workpaper (WP) Team Response**: The workpaper will include a discussion of the methods used in the Measure Cost Study and how those methods, to the extent possible, will be used to estimate RPP IMCs. Furthermore, in addition to web harvesting of IMC information, IMCs will be developed using hedonic price modeling which is the same methodology that are employed by the CPUC's Measure Cost Studies. The RPP team reviewed the CPUC's Measure Cost Studies and found that the two methodologies were not in conflict with each other.
  - Hedonic price modeling identifies key drivers of price to determine the fraction of price that is explained by specific variables.

- The TF inquired about the feasibility of increasing the frequency of web crawls to update IMCs.
  - **RPP WP Team Response**: IMCs will be updated on at least an annual basis for each measure.
  - **TF Approval of Web Harvester Methodology:** All of the above questions and issues were answered to the TF's satisfaction during a conference call on December 4th, 2014 during which the TF approved the IMC web harvester methodology.

- The TF asked if the web harvester methodology collects retail or wholesale pricing and whether is collects online or brick and mortar pricing.
  - **RPP WP Team Response**: The web harvester methodology collects online retail pricing only. We'll do a shelf survey to determine difference

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methods included the Bass Diffusion Model for developing NTGR values, the unit energy savings calculation approaches, and the web harvester method for developing incremental measure costs.

between in-store and on-line prices and will develop an adjustment factor. We expect that this could be calculated annually.

Unit Energy Consumption and Unit Energy Savings (UEC and UES)

- During the first few presentations the RPP made to the TF, various TF members requested that the RPP team better describe how UES values will be calculated and updated.
    - o The TF requested that the RPP UEC/UES calculation approach use DEER values when available (freezers is the only product in the current RPP design that has DEER values) and use methods consistent with DEER approach when exact measure matches are not present.
        - ▪ **RPP WP Team Response:** the UES values were updated to use DEER values when available and use methods consistent with DEER approaches when exact measure matches are not available.
    - o At this juncture the RPP team also committed to performing sensitivity analyses on measure- vs. model-level approaches as data becomes available. This approach to be followed once 12 months of data is available is to be documented in the abstract and workpaper.
- TF Members asked how demand savings will be calculated.
    - o **RPP WP Team Response**: Demand savings will likely be small, but approach to calculating demand savings will be in final WP. We're using TVs as a proxy for products like sound bars and blu-ray players.
- TF Members had questions about using measure-level vs. model-level savings values. Originally the RPP Team had proposed to use model-level values and a sales-weighting approach. Later the RPP WP Team recommended using a measure-level approach due to the fact that model-level approaches were time and data intensive and appropriate data sources were not always available.
    - o **RPP WP Team Response**: RPP team committed to performing sensitivity analyses on measure- vs. model-level approaches as data becomes available. This analysis is to be documented in the workpaper.
- The TF requested that reasoning and analysis underlying the RPP WP Team's choices regarding each secondary data source be systematically documented in the workpaper.
    - o **RPP WP Team Response:** The final workpaper and any measure updates will include citations for all values that come from secondary sources and an explanation of why that source was chosen over other sources.
- The TF requested that the workpaper include a decision rule.
    - o **RPP WP Team Response**: The final workpaper will also include a discussion of this decision rule to describe the process that will be used when selecting from a range of values to ensure the values are neither overly optimistic nor overly conservative.
- **TF Approval of UES Value Development and Update Process:** The RPP team sufficiently answered the TF's questions during the January 22nd 2015 in-

person meeting and the TF was comfortable enough with the UEC/UES methodology for the RPP team to proceed with workpaper development.

Using Bass Diffusion Models to Determine Future Net to Gross Ratios (NTGR)

- The TF initially recommended that the RPP team use CPUC-provided NTGR values for the initial workpaper and adjust based on program monitoring instead of a NTGR based on Bass Diffusion Models.
  - **RPP WP Team Response**: The team explained to the TF that DEER does not have NTGR values for the majority of items in the RPP portfolio.
- The TF then requested further discussion/validation of using Bass Diffusion Models to determine NTGRs, including how the slope/shape of the curve would be determined for base case and treatment case and what analogous products were used to model the proposed curves.
  - The TF also recommended that instead of "illustrative" graphs, the RPP team provide a graph of what is actually expected to occur, and discuss all assumptions/evidence behind the expected outcomes.
    - **RPP WP Team Response**: The team provided an example curve for air cleaners and explained the assumptions and methodology used to create it.
  - The TF had extensive questions about how the Bass Diffusion Model would be calibrated/updated. TF requested that any data or studies used to calibrate the Bass Diffusion Model be provided as citations. Furthermore, the TF requested that the Bass Diffusions Model be recalibrated with actual values from field results after the first year and annually thereafter.
    - **RPP WP Team Response (calibrating model to ensure NTGRs are reasonable):** Final NTGRs will be based on the results of Monte Carlo simulations. The Monte Carlo simulations will set bounds within which families of possible diffusion curves might exist. For each product category, the NTGR that best represents the central tendency of the distribution of estimates will be presented in the final workpaper.
    - **RPP WP Team Response (initial model calibration):** Any studies, data, professional judgment, etc. used for each input value of the Bass Diffusion Model will be clearly cited.
  - **RPP WP Team Response (annual updating**): The RPP WP Team agreed to update all input values to the Bass Diffusion Model where possible using actual program data after the first year and annually thereafter. The workpaper will include a discussion of how the various parameters in the Generalized Bass Diffusion Model will be updated annually using best available recorded sales and incremental cost

information. The workpaper will also include a discussion of the methods to be used for estimating and annually updating the NTG ratios.

- o **TF Approval of Bass Diffusion Model Method for Estimating NTGR Values**: Questions about the Bass Diffusion Model and the model calibration approach were answered to the TF's satisfaction during a conference call on December 4th 2014, during which the TF approved the Bass Diffusion Model methodology with the requirement that the model be calibrated on a yearly basis.

Estimated Useful Life (EUL)

- The TF asked whether using the full EUL for each of these products is really appropriate given the fact that lighting is often replaced before the end of the EUL and these products could be considered similar to lighting in that respect.
  - o **RPP WP Team Response**: The EULs already take such replacements into account i.e., these replacements are treated as failures in the survival analyses that are used to estimate the EULs. We will revisit EULs as new persistence studies come out.

Other Recommendations

Overall Approach

- The TF requested that the abstract be explicit about the goal of creating a new platform for deemed measures in fast-moving markets and clearly document the market transformation rationale behind this goal.
  - o **RPP WP Team Response:** The RPP team will be sharing the program logic model with the full TF before requesting final approval of the workpaper.
- The TF recommended that the final workpaper be clear about the intention to re-set the baseline and key metrics every year: The RPP workpaper should include a requirement to recalibrate key metrics on at least an annual basis, and sooner if market indicates values are changing significantly (IMCs, baselines, NTGRs).
  - o **RPP WP Team Response:** UEC/UES values will be updated annually. Other parameters will be updated as data becomes available.
- The TF asked that the team include the ultimate savings potential as a percentage of PG&E's portfolio in the final workpaper presented to the Cal TF for approval.
  - o **RPP WP Team Response:** The final workpaper will include estimates of market potential for both the RPP portfolio and individual product categories.
  - o **RPP WP Team Response:** The workpaper will also address the likelihood that the RPP program will achieve High Impact Measure (HIM) status in the short-, mid-, and long-terms and the increased level of rigor that necessitates in the evaluation process.
- The TF requested a meeting to discuss the RPP Evaluation Plan.

- o **RPP WP Team Response**: The TF conducted a conference call on March 20, 2015 to discuss the 2015 evaluation plan. Many questions were asked by TF members but no flaws were identified during the call. The RPP WP Team posted a draft of the evaluation plan on the Cal TF webpage for TF review. We are awaiting comments.
- TF Members frequently asked questions about sources for values not coming from DEER but from other sources and asked for clear documentation of these values.
  - o **RPP WP Team Response**: The main body of the workpaper will include an overview of the RPP Program and a discussion of methods for estimating key parameters. There will be an appendix for each product category to include all the proposed parameters and sources used.

Particular Measures

- The TF requested that the team the change growth rate of sound bars and HTiB to 0.5%.
  - o **RPP WP Team Response**: The RPP team reduced these growth rates from 2% to 0.5%.
- TF member Tom Eckhart was particularly interested in the approach for clothes dryers and will be sharing a similar workpaper recently presented to the Northwest Regional Technical Forum. He would also like to see the assumption regarding the moisture content of the clothes going in to the dryer documented in the final version of the workpaper.
  - o **RPP WP Team Response**: The RPP team will document this assumption in the final version of the workpaper.

Summary

As conditions of interim RPP WP approval by TF, RPP team agrees to the following:

Workpaper Content and Methods

- Detailed Methodology on IMC Development: The workpaper will include a discussion of the methods used in the CPUC Measure Cost Study and how those methods, to the extent possible, will be used to estimate RPP IMCs.
- Hedonic Price Modeling for IMC: In addition to web harvesting of IMC information, IMCs will be developed using hedonic price modeling which is the same methodology that is employed by the CPUC's Measure Cost Study.
- UES Values Based On DEER Where Applicable: UES values were based on DEER when available and methods consistent with DEER approaches when exact measure matches are not available.
- Demand Savings and Approach to Calculating Them Will be Included
- Documentation of Measure-Level Approach for Each Measure Will be Included
- Detailed Documentation/Citation: The final workpaper and any measure updates will include citations for all values that come from secondary sources.

- Process for Avoiding Bias in Value Selection: Discussion of decision rule to describe the process that will be used when selecting from a range of values to ensure the values are neither overly optimistic nor overly conservative.
- Bass Diffusion Model Calibration and Updating: The workpaper will include a description of how the various parameters in the Generalized Bass Diffusion Model were initially calibrated, including specific data used, and how the model will be updated annually using best available recorded sales and incremental cost information.

Annual/Periodic Updating

- IMCs Updated on Annual Basis: IMCs will be updated on at least an annual basis for each measure.
- Sensitivity Analysis Comparing UES Values Using Measure- vs. Model-Level Approaches: A sensitivity analysis comparing the UES estimates calculated using measure- and model-level data will be performed as data becomes available.
- Bass Diffusion Model to Be Updated After First Year and Annually Thereafter Using Actual Program Data.