Subcommittee Meeting #4
Appliance/Plug Load

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Objective

- Address existing Appliance/Plug Load measures that would migrate to the eTRM
  - Reconcile differences between IOU workpapers
  - Address issues with DEER values
  - Align IOU and POU methodologies/values
  - Look for opportunities to consolidate/simplify measures where appropriate.

Meeting #4 Agenda

- Recap previous meetings
- Provide update on closed measures
- Discuss follow-up items from prior meetings
- Review and (hopefully) close measures
  - Ozone Laundry
- Review draft consensus slides for CalTF (in appendix to this slide deck)

Meeting #1 follow-up items

- RPP
  - Do further research on multi-state aspects of program
  - Look at potential evaluation impacts if RPP is split into measures
  - Resolution:
    - Establish RPP as a delivery platform in eTRM
    - Establish individual measures, with RPP parameters
- ENERGY STAR Refrigerators
  - Resolution:
    - Use existing DEER basis factors
    - Continue to research applicability and factor determination mechanism

Meeting #1 follow-up items

- PC Power Management
  - Review evaluations, other research to inform position regarding annual savings degradation factor
  - Resolution:
    - Given short horizon and very narrow applicability, continue with decay factor
    - Decision to update UEC value would be on interested utilities who would have to fund study
    - Collapse Interactive Effects to single value for all climate zones
- Smart Power Strips
  - Review CalPlug specifications and test approach

Meeting #2 follow-up

- Review EAR disposition for Clothes Washer Recycling
  - Cycles/yr determinations for that measure
  - Potential applicability to ENERGY STAR Clothes Washer measure
  - Resolution:
    - Cycles/yr data from USDOE to be used for residential, multi-family common laundry and commercial laundry
      - Disposition appears to support residential cycles as part of USDOE methodology for new clothes washers
      - Non-residential values by USDOE rely in part on various California studies
      - Disposition neither supports nor refutes USDOE cycles for new clothes washers

7.09 – Ozone Laundry - Commercial

- PG&E Work Paper
- Technology uses Ozone (O_3) injection into wash water to reduce detergent and hot water needs
- Measure limited to nursing homes, correctional facilities, large hotels/motels and fitness centers. Tunnel washers not eligible for measure.
- Hot water reduction determined from prior projects.
  - 86% reduction in hot water usage
  - 39.3 therm savings annually per pound of laundry capacity
- Electric impacts not quantified in workpaper
  - Reduced hot water pumping requirement
  - Reduced washer cycle time
  - Decreased dryer requirement
  - Ozone generator increases electric energy required

7.09 – Ozone Laundry - Commercial

- Researched Ozone Laundry in other TRMs
  - Exists in Illinois TRM v6.0
  - Gas savings similar to PG&E workpaper
    - 81% hot water reduction in IL-TRM
    - 86% hot water reduction in PG&E work paper
    - Both based on existing projects in respective states
  - IL TRM quantifies electric impacts
    - 25% reduction in water per load (hot and cold)
    - 2.93 kWh pump savings per pound of laundry capacity (kWh/lb-cap)
    - Washer savings negligible (0.00082 kWh/lb-cap)
    - Ozone Generator electric use negligible (0.0021 kWh/lb-cap)
    - Dryer Load impacts not considered

7.09 – Ozone Laundry - Commercial

- Proposal:
  - Migrate PG&E work paper to eTRM
  - Review IL TRM measure for reliability of electric impact determination, and incorporate into measure

Measure Summaries

- Initial presentation of subcommittee findings at November 16 CalTF
  - Quick review today for disparities and misleading conclusions
  - Provide any offline feedback by next Thursday (November 9)

Measure Consensus
7.01 – ENERGY STAR Refrigerator

- Offering
  - Two tiers - ENERGY STAR qualified, and ENERGY STAR Most Efficient
- Stage 1 Issues
  - DEER methodology uses DOE UEC for base and efficient models
  - Then applies a “DEER Basis Factor” to savings
    - Reflects complex energy interactions between refrigerator and its environment
      - Refrigerator impacts HVAC energy use
      - Refrigerator performance varies by external temperature
    - Varies by climate zone and residential building type
    - Values used in work papers range from 0.64 to 1.45, average value = 0.94
- Measure Extension
  - Added POU TRM measure (note if it would be a new measure to POU or IOUs)
  - If nothing, then remove the category
- Stage 2 Issues
  - Research the DEER Basis factor further

Blue text = First time that item is mentioned
Italics text = Item that has not been completed

Measure Consensus
7.03 –Refrigerator Recycling

- Offering
  - Pick up and recycling of operable refrigerators and freezers
- Stage 1 Issues
  - Utilities have discontinued the program
    - Determined that market has transformed
    - Program is no longer cost effective
    - This could be tied to requirement that recycling be coupled with new refrigerator rebate
- Measure Extension
  - POUs still offer program
- Stage 2 Issues
  - Continue research into market design, particularly decoupling recycling from new refrigerator purchase

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Measure Consensus
7.04 – ENERGY STAR Clothes Dryer

- Offering
  - Two tiers – ENERGY STAR, ENERGY STAR Most Efficient
- Stage 1 Issues
  - Measure is part of RPP
  - Emerging Technology Award Clothes Dryer had unfavorable disposition by Staff in original RPP workpaper
    - Was replaced with ENERGY STAR Most Efficient Tier
- Stage 2 Issues
  - Conduct research into interactive effects
    - DEER team provides sensible and latent factors for appliances
    - Unsure how this addresses location of dryer, or treatment of interaction
      - Latent heat is usually removed by air conditioning system, but does not fully displace space heating

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Measure Consensus
7.05 – ENERGY STAR Clothes Washer

- Offering
  - Two tiers – ENERGY STAR and ENERGY STAR Most Efficient
- Stage 1 Issues
  - EAR disposition for clothes washer recycling raised concerns regarding use of USDOE wash cycle values
    - Disposition discussed values from RASS and SCE metering study
    - Same disposition acknowledged DEER relies on DOE methods for residential clothes washers to ensure consistent treatment of base case (Federal standard) and efficient case UEC
    - This same logic should be extensible to non-residential clothes washers subject to DOE methods
  - Measure savings attributable to clothes washers under DOE methods actually consist of water heating and dryer savings
    - DOE assumes all end uses are electric
    - Need to parse out savings value and convert to natural gas savings based on appropriate saturation values from RASS
- Measure Extension
  - POU TRM has clothes washers
  - Does not parse out savings by end use and fuel type
- Stage 2 Issues
  - Conduct research into interactive effects given multiple affected end uses and washer/dryer locations

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Measure Consensus
7.09 – Ozone Laundry Non-Residential

- Offering
  - Ozone system is add-on to existing commercial clothes washing machines
  - Reduces hot water requirement, partially displaces detergents and bleach requirements
  - Can reduce number of rinse cycles needed
- Stage 1 Issues
  - Certain values not available due to lack of data
    - Ozone generator energy use
    - Hot water pumping savings
    - Cothes dryer impacts (if any)
    - Washer energy savings (due to reduced rinse requirements)
- Measure Extension
  - Would be available to POU, not in POU TRM today
- Stage 2 Issues
  - Conduct additional evaluation to assess ancillary savings/impacts

Blue text = Prescriptive treatment as mentioned
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Measure Consensus
7.12 – ENERGY STAR Residential Dishwasher

- Offering
  - Three tiers under consideration, including ENERGY STAR qualified, ENERGY STAR Most Efficient, and "≤199 kWh"
- Stage 1 Issues
  - Unable to verify DEER measure determination
    - Work Paper interpolates between 260 kWh and 180 kWh standard-size
    - No 180 kWh models exist in market
  - Dishwasher savings from DOE largely inure to water heater
    - Machine energy use often increases while hot water use decreases
- Measure Extension
  - Added POU TRM measure (note if it would be a new measure to POU or IOUs)
  - If nothing, then remove the category
- Stage 2 Issues
  - *(List any activity that is recommended for future action to improve the measure in some way – typically these should be in italics, but not always.)*

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Measure Consensus
7.14 – Retail Products Platform

- Offering
  - Variety of ENERGY STAR products are incented at the retailer level by participating retailers on multi-jurisdictional level
  - Offerings include Freezers, Clothes Washers and Dryers, Room Air Conditioners, Room Air Cleaners, Refrigerators, Dehumidifiers (2018)
  - Offerings are updated annually
  - Two tiers generally available: ENERGY STAR and ENERGY STAR Most Efficient
- Stage 1 Issues
  - RPP is a platform that combines measure offerings with a delivery mechanism
  - Need to deconstruct into measures while preserving the unique aspects of RPP
- Measure Extension
  - Some measures already in POU TRM, any that are not will be designed to accommodate POU use
  - RPP itself, as a delivery platform, can be adopted by POU irrespective of eTRM
- Stage 2 Issues
  - Measure updates will occur annually for RPP; agile process needed to incorporate this in timely manner

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Measure Consensus
7.18 – Vending, Merch. Cooler Controller

- Offering
  - Controllers are add-on to existing equipment, including refrigerated beverage machines, snack machines, and refrigerated beverage coolers
- Stage 1 Issues
  - Work papers rely on DEER savings hours = 4 hours/day.
  - Equates to 16.7% annual energy savings of controlled load
  - This value does not comport with any other jurisdictional TRM
    - Annual savings closer to 86%
    - No evaluation or monitoring done in CA to support current value
  - No interactive savings, assumes all savings occur when building unoccupied
- Measure Extension
  - POU measure exists, relies on higher savings percent
- Stage 2 Issues
  - Evaluation research should inform an updated hours of savings, as well as potential interactive impacts

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Measure Consensus
7.15 – Networked PC Power Mgt

- Offering
  - Centralized power management control system for networked desktop computers and monitors in offices, schools
- Stage 1 Issues
  - Prior evaluation recommends first-year energy savings be decayed to reflect technological advances
    - Current work paper uses 5% decay value
    - Alternatively, evaluation recommends utilities update UEC value annually (using primary data collection), but this could prove costly
    - This measure probably has a shrinking window of opportunity due to advances in embedded PC power management, increased use of laptops and thin-clients
  - Attempt to “collapse” interactive effects from 16 climate zones to one statewide value
- Stage 2 Issues
  - Determine whether to sunset this measure altogether in next 3-5 years

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Measure Consensus
7.16, 7.17 – Smart, Advanced Power Strips

- Offering
  - Smart Strips (Tier 1) – shuts power off to designated devices when "master" device is shut off
  - Advanced Power Strips (Tier 2) – uses multiple sensor methods and algorithms to shut off devices when non-use is detected
- Stage 1 Issues
  - Looking to consolidate both categories of power strips
  - Develop savings methodology that is based on feature sets
    - Permits savings determination for control methods that are either newly on market or don't' exist today
      - Bluetooth
      - Networked control
      - Geo-fencing
- Stage 2 Issues
  - Develop appropriate estimation/documentation methodology for emerging control methods

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Next Call and Next Steps

- Next call will be kept on calendar as place holder
- Only convene if needed
  - Follow up on issues from today's call
  - Follow up on issues raised at CalTF November meeting