The following provides responses to Requestor’s WorkPaper Inquiry Intake Form in addition to documenting general meeting minutes for the “**IOU Responses to vendor concerns on workpaper update methods/process**” meeting held on May 28, 2019

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| **REQUESTOR’S NAME** | Will Baker, Google and Nest  Response by: Andres Fergadiotti/SCE on behalf of IOU  **Meeting Attendees**  **IOUs**  Chan Paek <CPaek@semprautilities.com>;  Jay Madden <Jay.Madden@sce.com>; Valenzuela, Kelvin <KValenzuela@semprautilities.com>; Mendoza, Matthew D [MMendoza2@semprautilities.com](mailto:MMendoza2@semprautilities.com) ;  Andres.Fergadiotti [Andres.Fergadiotti@sce.com](mailto:Andres.Fergadiotti@sce.com)  **Vendors**  Karen Herter <karen.h@ecobee.com>; Michael Blasnik <mblasnik@google.com>; Will Baker <jwillbaker@google.com>; | **TODAY’S DATE:** | **5/31/2019**  **(Meeting Date 5/28)** |

**WORKPAPER INFORMATION:**

|  |  |  |
| --- | --- | --- |
| **Workpaper Name:** | Residential Smart Thermostat |  |
| **Workpaper ID:** | **SCE17HC054** |  |
| **Revision Number:** | Revision 1 |  |
| **Revision Section in Workpaper:** | **Entire work paper** |  |

**STEP(S) TAKEN TO RESOLVE THIS ISSUE WITH THE PROGRAM ADMINISTRATOR (PA):**

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| --- | --- | --- | --- |
| EFFORTS | DATE(S) | COMMUNICATION METHOD(S) | DESCRIBE STEPS TAKEN TO RESOLVE ISSUE WITH PA: |
| 1st Attempt | 3/7/2019 | Memo | Initial Review of SCE17HC054.1 issues w/ cooling loads |
| 2nd Attempt | 3/18/2019 | Memo | Cooling set points for Nest thermostats in CA |
| 3rd Attempt | 3/25/2019 | Memo | Comparing cooling loads from old work paper to new work paper |
| ADDITIONAL COMMENTS:  Google wrote three memos addressing the DEER Thermostat Schedule 3 assumption | | | |

**WORKPAPER QUESTION OR CONCERN:**

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| Click here to enter your question(s) or concern(s).  The residential smart thermostat manufacturers have the following issues:   1. The use of DEER Thermostat Schedule 3 resulted in unrealistic cooling loads for some climate zones. 2. The extrapolation to multifamily homes produced unrealistic implied cooling capacities. 3. Heating savings from heat pumps aren’t included in the work paper. 4. It will be difficult for SCG to come up with a new heating gas savings study in the proposed timeline. 5. The full measure cost of $209.31 is too high. 6. This process has generally been confusing and not transparent. 7. The NTG and EUL values can be improved. |

**PROPOSED WORKPAPER CHANGES:** *(as needed)*

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| Click here to enter your proposed workpaper changes.  The residential smart thermostat manufacturers have the following recommendations:   1. Use a blended DEER Thermostat Schedule that more accurately reflects real-world set points for California climate zones. 2. Ensure that using the blended DEER Thermostat Schedule results in realistic cooling load assumptions for multifamily buildings. 3. Account for heat pump heating savings immediately, either by using gas heating savings as a proxy or relying on other studies until such time that California can produce its own residential smart thermostat energy savings evaluation for heat pumps. 4. Extend current gas savings through 2020 to allow time for SCG to design, implement, and evaluate a gas heating savings study or, alternatively, utilize the ENERGY STAR(R) heating metric in the update. 5. Reduce the full measure cost to $169 and the incremental cost to $102. 6. Continue to open up the work paper development process to interested third parties with valuable data and knowledge. 7. Work with the residential smart thermostat industry to improve NTG and EUL values in a future work paper revision. |

**SUPPORTING DATA, DOCUMENTATION, and/or ENGINEERING TOOLS:** *(as needed)*

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| Click here to attach any supporting documents.  We are attaching two heat pump studies. |

*Instructions for attaching documents in Microsoft Word 2010:*

First, click **Insert > Text > Object > Object…**

**REVISION HISTORY AND COMMENTS:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| REV | REQUEST DATE: | REQUESTOR: | REVIEWER: | REVIEW DATE: | Reviewers  Affiliation | REVIEWER COMMENTS: |
|  | **\* Requestor completes upon each submission** | | **\*ONLY – To be completed by the reviewer.** | | | |

**IOU Responses to Inquiry Intake Form and Meeting Minutes**

1. **[NEST/ecobee Concern] Use a blended DEER Thermostat Schedule that more accurately reflects real-world set points for California climate zones**

[**IOUs Response**] Workpaper update re-submission to include updated analysis using All DEER Tstat schedules and weights for all Residential building types. Energy simulations supporting this workpaper update were conducted using latest version of the measure analysis software (MASControl3) and DEER2020 T-Stats Schedule Weights [1].

Vendors’ supporting documentation (“**MFm cooling loads: Actual Set Points SFm vs. MFm**”), suggest (a) lower cooling setpoints for both SFm and MFm compare to DEER Residential T-stat Schedules and (b) lower cooling setpoints for MFm compare to that for SFm, under all California climates. Vendors’ data gathering procedures and assumptions, including demographic characterization of the data, were not provided and are unknown.

Per DEER2021 scoping**,** the statewide CEC Residential Appliance Saturation Study (RASS) and Commercial End Use Study (CEUS) sector characterization studies are currently underway. The data from these studies will be available mid-2020 and can include re-evaluation and/or updates to Residential DEER temp. setpoint schedules that can improve the accuracy of baseline energy performance.

Further, IOUs are considering evaluating vendors California’s temp. setpoint data for improving energy modeling inputs used for evaluating the measure. This evaluation would need to ensure that vendors’ data is representative for all California customers and corresponding “demographics” without limiting the data to only affluent customer likely using less efficient temp. setpoints. Demographics on Low-Income and disadvantages communities to be assessed as well.

1. **[NEST/ecobee Concern] Ensure that using the blended DEER Thermostat Schedule results in realistic cooling load assumptions for multifamily buildings.**

[**IOUs Response**] Measure evaluation is supported using Residential DEER prototypes. DEER baseline characterization as part of the MFm analysis was maintained defaulted with exception of the cooling design capacity, which was adjusted per cooling design capacity as seen by the 2018-2019 program year (which was higher than that in the prototype). Program’s MFm characterization including dwelling (occupied) square footage and operating schedules are unknown making difficult to accurately assess DEER’s MFm cooling loads. [1]

1. **[NEST/ecobee Concern] Account for heat pump heating savings immediately, either by using gas heating savings as a proxy or relying on other studies until such time that California can produce its own residential smart thermostat energy savings evaluation for heat pumps.**

[**IOUs Response**] At this time, there is no statistically significant data available from SCE and/or other IOU programs to support accurate EMV (e.g., NMEC or similar) studies on technology controlling heat pump equipment.

At this time, Vendors are not able to support the identification of customers using heat pump equipment needed to determine statistically significant experimental design and identification of “treatment” groups. Further, there are no independent California specific studies that can be leveraged to support evaluation of HP savings potentials. SCE and IOUs will continuo exploring other EMV methods that could potentially support the evaluation of energy efficiency savings potentials from technology.

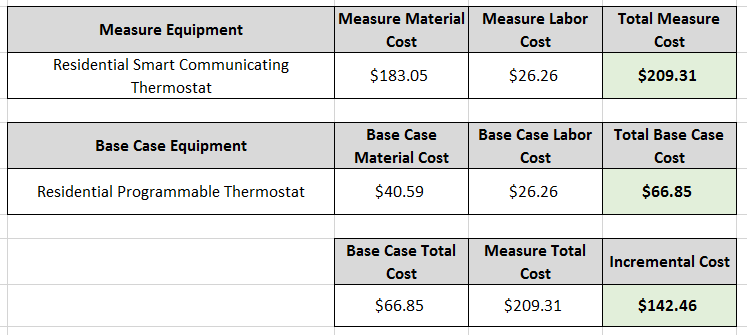
Other methods to demonstrate savings potentials (e.g., energy star) that exclude randomization of control and treatment groups and that rely on temp. setbacks are uncertain and are not recommended for an accurate evaluation of the measure.

1. **[NEST/ecobee Concern] Extend current gas savings through 2020 to allow time for SCG to design, implement, and evaluate a gas heating savings study or, alternatively, utilize the ENERGY STAR(R) heating metric in the update.**

[**IOUs Response**] Evaluation and/or reporting of gas savings beyond 2019 is being coordinated with CPUC and will follow their latest direction documented in latest workpaper disposition [2].

1. **[NEST/ecobee Concern] Reduce the full measure cost to $169 and the incremental cost to $102.**

[**IOUs Response**] Cost analysis conducted by IOUs is adequate and in alignment with technology’s features and product specifications with adjustments based on quantities of technology type (e.g., brand/model) as seen as part of program implementation. Measure cost evaluation excludes most expensive thermostats models. The ratios of the thermostat type/model were used to establish a weighted measure case cost.



Please note that:

1. The full measure cost of $209.31 is inclusive of material and labor cost. The labor cost of $26.26 is applied to both the base case and measure case and thus does not affect the incremental cost.
2. We agree that $169 is reflective of the retail price of popular smart thermostats in the market exclusive of more expensive models that contain non-energy saving features. Note that the $183.05 is inclusive of an 8.75% sales tax.

Additional data and specifics will be needed to better understand vendor’s concern on IOU supported 2019 cost analysis. Given pricing dynamics on the technology, measure cost is expected to be re-evaluated and updated as required as part of futures workpaper submittals, specifically by August 1, 2019, as part of gas savings submission.

1. **[NEST/ecobee Concern] Continue to open up the work paper development process to interested third parties with valuable data and knowledge.**

[**IOUs Response**] IOUs continue to facilitate reasonable level of communications and coordination on the workpaper update process with vendors [3]. All concerns as documented in SCE’s Workpaper Inquiry Intake Form have been reviewed, evaluated, and responses/justifications are being provided.

1. **[NEST/ecobee Concern] Work with the residential smart thermostat industry to improve NTG and EUL values in a future work paper revision.**

[**IOUs Response**] IOU evaluations of cost effectiveness parameters (both NTG and EUL) are adequate. Their determination and evaluation followed CPUC approved EMV methods and procedures.

**General Notes:**

**[1]** Refer to http://www.deeresources.com/index.php for DEER documentation leveraged as part of the evaluation and analysis of the workpaper. Residential DEER prototypes and temperature schedules used for estimating baseline energy and for deriving measure savings are documented herein. Refer to “Additional Resources” for supporting documentation and procedures on MASControl3 for enabling building performance evaluation and processing of results.

**[2]** Disposition for the Smart Communicating Thermostat SCE17HCO54 Rev 1 Workpaper – 04/05/2019

**[3]** Workpaper Inquiry Intake Form\_04.12.19\_REV4