

DETAILED REVIEW:

SCE17CS014 REVISION 1 TIER 2 ADVANCED SMART CONNECTED POWER STRIPS

California Public Utilities Commission, Energy Division

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1. Review Summary and Covered Workpapers

This detailed review covers the following:

- Detailed prospective review of “Work Paper SCE17CS014 Revision 0 Tier 2 Advanced Smart Connected Power Strips” (official submission date October 16, 2017)
- Detailed review of “Work Paper SCE17CS014 Revision 1 Tier 2 Advanced Smart Connected Power Strips” (official submission date May 5, 2018)

The first workpaper covering Tier 2 Advanced Power Strips was submitted by SDG&E and approved by CPUC staff in 2016. The latest version of the SDG&E workpaper¹ was submitted and approved in the fall of 2017 with approved savings values of 130 kWh for each power strip. Savings were developed through a collaborative approach between CPUC staff, the EAR team and staff from SDG&E. SCE submitted a workpaper², covering a similar single technology with updated savings values, in the fall of 2017. This workpaper was not reviewed by the EAR team and therefore was given interim approval according to CPUC direction. The SCE workpaper was not discussed with, or subject to any collaborative exchanges between SCE and CPUC staff or consultants nor was it (or is it) clear that the statewide lead in this work was (or has) being transferred from SDG&E to SCE. The SCE workpaper added the following measure technology requirements that were specific to a single manufacturer’s product:

1. Power monitoring capability of all connected devices, and
2. Blue tooth connectivity that supported remote data collection of connected device usage and collective power consumption of all connected devices.

SCE included a report³ covering a field study of this specific technology and used the results included in that report to support a savings value for the studied technology of 240 kWh for each power strip, or an 85% increase in the ex ante savings value over the value previously approved for the SDG&E workpaper. SCE recently posted a revision to their workpaper⁴ that removed the requirement to monitor all connected devices, however, the dramatically higher savings values were kept in the revised workpaper.

¹ “Work Paper WPSDGEREHE0004 Revision 1.1 Tier 2 Audio Visual (AV) Advanced Power Strip”, San Diego Gas and Electric, August 10, 2017

² “Work Paper SCE17CS014 Revision 0 Tier 2 Advanced Smart Connected Power Strips”, Southern California Edison, October 12, 2017

³ “Tier 2 Advanced Power Strips with Bluetooth® in Multifamily Residential Applications” prepared for Southern California Edison Emerging Technologies Program, prepared by Alternative Energy Solutions, Inc. April, 2017

⁴ “Work Paper SCE17CS014 Revision 1 Tier 2 Advanced Smart Connected Power Strips”, Southern California Edison, May 3, 2018

2. Critical Review Issues

As discussed below in Section 3 Direction, additional information and analysis is required to support the ex ante savings values in both workpapers for those values to remain approved after June 30, 2018.

Critical review issues are described below:

2.1. More Information is Needed to Support the Ex Ante Savings Values:

The submitted report from AESC³ does not include adequate information or analysis to support the savings increase from 130 kWh approved in WPSDGEREHE0004 to 240 kWh. The EAR team notes the following concerns with the submitted report:

- There is no discussion of the research plan, sampling approach, demographics of the study participants, or documentation of the what devices were connected to each power strip. The report specifically states, “AESC did not have visibility into test participant demographics or plug load device conditions.” Workpaper submissions are required to include all data utilized in the analysis as well as all calculation methods such that the submitted information allow reviews to reproduce the results.
- There is no information in the report about who selected the participants, how participants were selected, demographics of the participant, details of all the audio/video equipment at each participant site and the equipment selected for use via the installed power strip, who collected the data, what methods were used to collect that data, the chain of custody of the data between the party who collected the data and the party responsible for analyzing the data (AESC). Workpaper values are required to represent the typical savings expected from the implementation of the measure. Without information on the sample it is not possible to compare the sample use to typical use and make any necessary adjustment to the analysis to ensure the results are typical.
- Data collection occurred during a two to three week period around the Thanksgiving holiday. This may not be representative of a typical viewing period, yet the monitored results were assumed to be typical and extended to a full year for calculating the baseline measure consumption. Again, workpaper values are required to represent the typical savings expected from the implementation of the measure; the methods and timing used for the same may not support typical savings values.
- The AESC report shows an average baseline usage of about 8.9 hours per day and a measure usage of 5.1 hours per day. However, a 2010 study carried out by Nielson of 2,540 California homes showed that the most watched TV in multi-set homes was used about 7.7 hours per day while the typical usage of TV’s un multi-set homes was 5.1 hours per day⁵ (about the same as the measure usage in the AESC report). In single TV set California homes they typical usage was 6.2 hours per day. Again, workpaper values are required to represent the typical

⁵ “Understanding Television Set Usage: An investigation into average TV- set usage patterns in California” prepared by Nielson for Pacific Gas & Electric Company, May 16, 201

savings expected from the implementation of the measure; obviously the sample does not represent typical use.

- The measurement group originally included 92 homes, but only 46 of those homes were used in the final analysis. Furthermore the report discusses how large portions of the data were missing from what was provided to AESC and post-processing was required to create a modified data stream representing a continuous usage period through the pre and post periods. It is not clear how the final 46 participants and associated data are representative of typical baseline and measure usage, particularly since the usage values are so much higher than those observed in the Nielson study.
- During a CPUC & SCE Workpaper Coordination Meeting on May 17 CPUC Ex Ante Review staff asked SCE who selected the sample and conducted the measurement work. SCE staff indicated that the product vendor designed and conducted the field work on their own and provided the data for analysis. If this is correct it represents a very problematic SCE practice that was previously pointed out to SCE staff by Commission staff as inappropriate.

2.2. The AESC Study Does Not Support Savings for Technologies Other Than Those Covered by the Study

The AESC study was carried out on a single vendor's model that uses infrared only occupant sensing as well as sensing true RMS power consumption of all connected devices. The requirement to sense power consumption of all devices has been revised to allow RMS power sensing of power of a single device plugged into a control outlet. However, the AESC study only included devices that sense RMS power on all connected devices. A similar field study of devices that use a control outlet design was completed in support of the SDG&E workpaper and showed much lower savings.

3. Direction

3.1. Revise AESC Report and Submit Supporting Data

The AESC report shall be revised to address the critical review concerns listed in Section 2.1. All raw data shall be included in the submission. All information on the participant sample shall be provided, including their demographic information (home type, occupant profile, etc.) the sample home total audio/video device inventory, and the audio/video devices connected to the installed power strips.

CPUC staff is particularly concerned with the justification for the baseline daily usage of 8.9 hours, when a more robust study (Nielson) from 2012 shows a typical usage of 5.1 hours. Alternatively, if all the required information cannot be supplied and SCE desires to continue to utilize the previously submitted analysis, the savings shall be reduced by the ratio of the Nielson typical usage to the AESC report baseline usage. (Savings Multiplier = $5.1/8.9 = 0.57$).

3.2. Remove the Revision that Allows for Control Outlet Devices

As discussed in Section 2.2, the AESC report does not support the use of higher savings values for "control outlet" devices, and an earlier study shows that savings for these devices are likely much

lower. Therefore, this workpaper cannot be used to support the savings claims of these devices, and the added text to allow them shall be removed from revision 1 of the workpaper.

3.3. Timeline

Savings submitted with revision 0 of the SCE workpaper (“Work Paper SCE17CS014 Revision 0 Tier 2 Advanced Smart Connected Power Strips”) are allowed to be claimed until June 30, 2018. After June 30, savings for all Tier 2 power strips, including those with wireless connectivity, shall be those approved for the SDG&E workpaper (“Work Paper WPSDGEREHE0004 Revision 1.1 Tier 2 Audio Visual (AV) Advanced Power Strip”). SCE shall submit a revised workpaper along with a revised AESC report meeting the requirements of Sections 3.1 and 3.2 which shall be subject to CPUC staff review and approval following the CPUC adopted workpaper review process.