**WORKPAPER DISPOSITION FOR**

**Energy Efficient Televisions**

**California Public Utilities Commission, Energy Division**

March 1, 2013

Refer to Table 1 for a list of currently submitted IOU workpapers that cover refrigerator recycling.

Table 1 – Television

|  |  |  |
| --- | --- | --- |
| **Workpaper ID** | **Workpaper Title** | **Date** |
| **SDG&E** |  |  |
| WPSDGEREHE0001 | Energy Efficient Televisions | 6/14/2012 |
| **SCE** |  |  |
| SCE13OE002 | Residential Use Energy Efficient Televisions | 6/5/2012 |
| **PG&E** |  |  |
| PGECOAPP104 | Energy Efficient Televisions | 6/14/2012 |

**Workpaper Disposition:**

**2013-2014 Disposition Summary**

PG&E and SCE workpapers use the same technology and measure definitions. SDG&E uses technology definitions and savings values from the 2010-2012 cycle. Savings calculations across all workpapers use the same assumptions including identical direct savings. Whole building savings are calculated by multiplying the direct savings and applicable HVAC interactive effects.

The following revisions are required:

1. SDG&E technology and measure definitions shall be updated to match PG&E and SCE workpapers. Savings values shall be update according to this disposition.
2. Reduce demand impacts to reflect latest PG&E research:

**PG&E Usage Study: Daily Usage Pattern**

PG&E engaged The Nielsen Company in 2011 to investigate television characteristics and usage in California[[1]](#footnote-1). Nielson also investigated television usage during the DEER peak demand period of 2-5pm on weekdays. shows the daily usage in minutes by television primacy. shows the peak period usage in minutes use by primacy and age. Demand benefits are the overall power reduction (for televisions, this is the reduction in on-mode power) multiplied by the coincident demand factor. The coincident demand factor is the fraction of daily use that occurs during the peak period. lists coincident demand factors for all categories of televisions from and along with value used in the original PG&E workpaper. Regardless of how the Nielson data is analyzed, coincident demand factors are much lower than the value used in the PG&E workpaper by a factor of five or more. Savings values for demand shall be revised to assume a CDF of 0.031, which is the average value across all televisions.

Figure - Daily Television Usage in Minutes



Figure - Television Usage During Peak Period



Table - Coincident Demand Factors by Primacy and Age

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Category | | Peak Period Usage (minutes) | Peak Period Usage (hours) | Average Daily Usage (hours) | Coincident Demand Factor |
| By Primacy | Average Across all TVs | 28.5 | 0.475 | 5.1 | 0.031 |
| Most Watched TV | 49.3 | 0.822 | 7.7 | 0.036 |
| Second Most Watched TV | 19.5 | 0.325 | 4.0 | 0.027 |
| Third Most Watched TV | 12.4 | 0.207 | 2.9 | 0.024 |
| Fourth Most Watched TV | 9.2 | 0.153 | 2.4 | 0.021 |
| Fifth Most Watched TV | 7.2 | 0.120 | 2.0 | 0.020 |
| Sixth Most Watched TV | 6.0 | 0.100 | 1.6 | 0.021 |
| By Age | 2010+ | 33.9 | 0.566 | 5.7 | 0.033 |
| 2005-2009 | 29.2 | 0.487 | 5.2 | 0.031 |
| 2000-2004 | 26.8 | 0.446 | 4.8 | 0.031 |
| 1995-1999 | 23.4 | 0.391 | 4.4 | 0.030 |
| <= 1994 | 21.5 | 0.359 | 4.1 | 0.029 |
| All | PG&E Workpaper Value |  |  |  | 0.153 |

1. Revise EUL to 7 years:

**PG&E Usage Study: Effective Useful Life**

During the 2010-2012 cycle, Energy Division staff expressed concern that the 10 year EUL proposed for televisions did not take into account the following:

* annual television usage may decrease with age
* older televisions may eventually get displaced to locations in the home where they see little usage

To address this concern, the Nielson study examined usage of televisions by age and primacy. Energy Division staff believes if a television is eventually placed in a location where it gets little or no use, those years of service should not be considered in the determination of the EUL. The Nielsen study shows that approximately 80% of televisions in California are 10 years old or less, and a little more than 50% of televisions are 6 years old or less. These results indicate that most televisions are removed from service before 10 years.

[[2]](#footnote-2) shows that about 52% of all televisions were purchased after 2004. Since the EUL is the number of years at which the median of measures is expected to still be in service, would indicate that the EUL for televisions is in the neighborhood of 7 years.

Figure – Television Population, Age and Usage



1. Revise NTG to 0.10

**Workorder 34 Business and Consumer Electronics Impact Evaluation**

The draft Workorder 34 report[[3]](#footnote-3) provides NTG recommendations that look backward at the accomplishments from the 2010-2012 cycle for energy efficient televisions. In order to develop forward looking NTG estimates, Energy Division staff examined several alternative scenarios that utilized the data from WO34 report, projecting through the end of the 2012 program cycle. These options are presented in the attached spreadsheet TV-NTG-V3.xlsx.

To develop NTG estimates KEMA relied on a delphi panel to provide estimates of the overall program impact for the 2010 to 2011 period. There was a very wide range in opinions resulting in a low NTG value of 0.22 based on the median of panel inputs and a higher value of 0.50 based on the mean of panel inputs. The mean is driven higher than the median by the fact that the panel contained two groups of opposite opinions: one group who believed the program had a substantial impact and one group who believed the program had little or no impact. It should be noted that three panel members who expressed the opinion that the program had little or no impact chose not to provide quantitative values and thus their opinions were effectively not contained in the numerical NTG estimates. Similarly, one panel member who believed the program had substantial impact did not provide numerical values. For these reasons one might choose to put more weight on the median values that represent the “less” influence view. However, staff used both the mean and median inputs for program attributable sales to develop a range of forward looking NTG values.

The most interesting outcome from this delphi panel analysis is that using the mean and median values from Q3 2011 (the latest quarter examined in the WO34 analysis) and projecting out through the end of 2012 results in mean and median NTG values of 0.06 and 0.07 respectively. This possibly indicates that, over time, the mean and median representing the divergence between the two somewhat opposite opinions of program influence, converge over time to a very low NTG value.

It is observed that the panel members who provided estimates of substantial program impact during 2010 agreed that little program influence was possible once the Energy Star standard in place required a shift from fluorescent to LED back or edge lighting. As efficiency requirements increase, the size “break point” at which LED back or edge lighting must be used becomes smaller. As noted in the workpaper discussion of incremental measure costs, the need arises for LED back or edge lighting in larger TVs in order to meet program efficiency requirements past Energy Star 5. This requirement also raises a substantial barrier for program influence beyond that point as the market fully shifts to that technology. Energy Star 4 televisions, which were the primary program drivers during 2010, do not require LED back or edge lighting. According to workpaper estimates the breakpoint at which the switch to LED must take place is at a 40 inch screen size for Energy Star 5 and that all televisions require LED back or edge lighting to achieve an Energy Star +20% level of energy efficiency. A the time Energy Star 5 became effective in late 2011, the popular television sizes exceeded 40 inches, and the market move to the LED technology limited the program effect.

Based upon the NTG projections, Energy Division staff believes that the NTG for television measures is likely less than 0.10. This value is based on using the second and third quarters of 2011 (which are the last two quarters analyzed in the WO34 report) to project expected program accomplishments through the remainder of the 2010-2012 cycle. Refer to the attached workbook, TV-NTG-V3.xlsx, for complete details of the NTG analysis.

NTG Analysis Spreadsheet



Approved Savings Values



1. Understanding Television Set Usage: “An investigation into average TV- set usage patterns in California”, prepared for Pacific Gas & Electric, Nielsen, May 2012 [↑](#footnote-ref-1)
2. Understanding Television Set Usage: “An investigation into average TV- set usage patterns in California”, prepared for Pacific Gas & Electric, Nielsen, May 2012, [↑](#footnote-ref-2)
3. Impact Evaluation Report Business and Consumer Electronics Program (WO34) (DRAFT), KEMA, January 2013 [↑](#footnote-ref-3)