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# Memo

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| *to:* | Department of Energy | *via email:* | expartecommunications@hq.doe.gov |
| *from:* | Jennifer Cleary | | |
| *date:* | February 9, 2016 | | |
| *subject:* | Ex parte Communication, NOPR for Energy Conservation Standards for Residential Conventional Cooking Products, Docket No. EERE-2014-BT-STD-0005 | | |

This memo memorializes the meeting between the Association of Home Appliance Manufacturers (AHAM) and the Department of Energy (DOE) on December 22, 2015, for inclusion in the public docket on the Notice of Proposed Rulemaking (NOPR) for Energy Conservation Standards for Residential Conventional Cooking Products, Docket No. EERE-2014-BT-STD-0005; RIN 1904-AD51,80 Fed. Reg. 33030 (June 10, 2015) (June 2015 NOPR). AHAM requested a meeting with DOE to discuss supplemental comments AHAM filed on November 20, 2015, which propose revised standards for electric standard clean ovens.

The attendees at the meeting were as follows:

John Cymbalsky, DOE
Judith Reich, Navigant

Jennifer Cleary, AHAM
Rehan Ehsan, AHAM
Everett Shorey, Shorey Consulting (on behalf of AHAM)

In our September 2015 comments, AHAM commented that DOE did not provide sufficient time after finalizing the amended oven test procedure for stakeholders to evaluate the June 2015 proposed standards. We also commented on DOE's lack of sufficient data to support the proposed rule. AHAM has continued to review the June 2015 NOPR and, as discussed below, is particularly concerned with the lack of data for electric standard ovens. AHAM believes DOE lacks the data necessary to justify its proposed rule for electric standard ovens. Based on our review of DOE's analysis and industry data, however, AHAM recommends the Trial Standard Levels (TSLs) for electric standard clean ovens be based on subtracting the self-clean energy of 32.8 kWh/year from the corresponding standard for electric self-clean ovens. Specifically, AHAM proposes a standard for electric standard clean ovens of:

- Freestanding: 163.2 + 34.7 * volume kWh/year
- Built-in/Drop-in: 169.1 + 34.7 * volume kWh/year

AHAM believes this would mitigate the uncertainties of the analysis, and avoid discriminating against consumers of electric standard clean ovens. Furthermore, our proposed standard for electric standard clean ovens results in minimal change in energy use so that adjustment of the standard level will have negligible effects on the total energy savings from the proposed standards (shifting electric standard clean oven standards from TSL 2 to TSL 1, for example, would result in decreased energy savings of 0.036 quads, or only 5 percent of the total savings projected from the standards).

## I. DOE Did Not Provide Sufficient Time After Finalizing The Oven Test Procedure For Stakeholders To Evaluate The Proposed Standards

As we commented previously, AHAM is concerned about DOE's recent practice to proceed with standards analysis and development in the absence of a final test procedure. Minimally acceptable engineering analysis and sound policy conclusions can only be based on a known and final test procedure which DOE, manufacturers, and other stakeholders have had the opportunity to use in evaluating design options and proposed standard levels. In this case, DOE published the proposed rule on energy conservation standards for residential ovens on June 10, 2015, only one day after issuing a pre-publication version of the final amended oven test procedure (which was later published in the Federal Register on July 2, 2015). That is hardly enough time to understand the potential impacts of test procedure final rule on proposed standards.

Because manufacturers were without sufficient data to fully analyze DOE's proposed rule, AHAM requested a 60-day extension of the comment period on the proposed rule on energy conservation standards for residential ovens. We appreciate that DOE granted our request, in part, by extending the comment period by 30 days. But, as we previously commented, a 30-day extension of the comment period was not sufficient to fully evaluate the proposed standards. After submitting our September 2015 comments, we compared the DOE data to manufacturer data and offered subsequent comments which were the focus of the ex parte meeting. We appreciate DOE's willingness to discuss those comments with us and we provide this detailed ex parte memorandum in order to ensure our comments are on the record.

## II. DOE Lacks Sufficient Data To Support Its Proposed Rule

DOE's analysis is based on 15 units DOE tested and tore down and outdated models from the previous rulemaking analysis. DOE based its analysis of electric standard ovens on only two data points. That is far from passing any data quality or statistical analysis standards. On the other hand, the engineering analysis for electric self-clean ovens was based on five data points. We are particularly concerned with the lack of data for electric standard clean ovens. We believe DOE lacks the data necessary to justify its proposed rule for that product class.

The two tested electric standard ovens include a 2.4 $ft^3$ free standing range/oven and a 4.3 $ft^3$ built-in/slide-in oven. The 2.4 $ft^3$ standard oven is much smaller than typical size. Even though the vast majority of electric standard ovens are freestanding, the 4.3 $ft^3$ electric standard oven is more representative of a baseline unit. So, essentially, DOE based the engineering analysis for electric standard ovens on only one unit that could be considered representative of most electric standard ovens.

The baseline energy use for electric self-cleaning ovens, on the other hand, is based on testing of five units, three 4.3 $ft^3$, one 5.9 $ft^3$ and one, 2.7 $ft^3$. AHAM compared the DOE data for these five units to manufacturer data. The data show that the five DOE data points are more representative of electric self-cleaning ovens than the one representative DOE data point for electric standard ovens. The data AHAM reviewed included data from companies representing nearly the entire cooking product market. These data are much more representative of oven performance than the DOE data.

We believe that DOE's analysis of electric standard ovens is flawed due to its reliance on data from only one representative electric standard oven; whereas the engineering analysis for electric self-cleaning ovens includes a slightly wider set of input data. The limited data for electric standard ovens impacts the Department's engineering analysis. DOE's engineering analysis also overly simplified electric oven design factors, and, because it considered many of the same design options when evaluating the improvements to electric standard and electric self-cleaning ovens, the resulting maximum technologically feasible levels have very little differences in design. Using these data, DOE created Efficiency Levels (ELs) and TSLs where the Department seemed to combine electric standard and electric self-clean ovens in a way that fails to distinguish between the two classes and impacts the subsequent economic analysis.

## III. The Proposed Standards Levels For Electric Standard Ovens Are Significantly Stricter Than Those Proposed For Electric Self-Cleaning Ovens

Due to the manner in which DOE conducted the engineering analysis and created ELs and TSLs, the proposed energy use analysis for electric ovens appears to have an unexpected relationship between electric standard and electric self-cleaning ovens, where the electric standard oven proposed standard levels are significantly stricter than those for electric self-cleaning ovens (122.5 + 31.8∗volume versus 163.2+42.3∗volume, or 11.98% versus 3.92% reduction in energy use compared to the baseline). These relationships are counterintuitive from the standpoint of oven operation. Excessively strict standards for electric standard clean ovens could result in manufacturers adding a self-clean cycle as a more attractive option than having to significantly improve the oven's efficiency, thus eliminating or reducing the availability of electric standard clean products. While this would be a reasonable and appropriate manufacturer approach to meet standards, it is an unintended consequence of DOE's proposal.

Electric standard ovens are the lowest priced products in the retail market so that eliminating them will provide a hardship for low income and other consumers who rely on low purchase prices. While the Energy Policy and Conservation Act of 1975, as amended (EPCA) does not specifically require DOE to consider the impacts of proposed standards on different income groups, it does consider impacts on low-income consumers as part of the Consumer Subgroup Analysis.[1] **AHAM believes, however, that DOE has underestimated the impacts of standards on low-income consumers and should give those impacts more weight than it appears to in the June 2015 NOPR**. Low-income households are those earning less than twice

[1] Technical Support Document Residential Conventional Ovens, May 2015, EERE-2014-BT-STD-0005-0018.pdf, p. 11-i

the federal poverty level.[2] In 2015, the low-income threshold for a family of four with two children was $48,500. Stevenson TraQline reports that approximately 56 percent of the electric standard clean ovens are purchased by low-income consumers, whereas, only about 37 percent of electric self-cleaning ovens are purchased by low-income consumers.[3]

| Income Level | Self-Cleaning | Self-Cleaning cumulative | Standard Cleaning | Standard Cleaning Cumulative |
|---|---|---|---|---|
| $ 14,999 or less | 4.1 | 4.1 | 7.1 | 7.1 |
| $ 15,000 to $24,999 | 9.4 | 13.5 | 18.9 | 26 |
| $ 25,000 to $34,999 | 9.0 | 22.5 | 15.2 | 41.2 |
| $ 35,000 to $49,999 | 14.1 | 36.6 | 14.6 | 55.8 |
| $ 50,000 to $74,999 | 22.5 | 59.1 | 19.5 | 75.3 |
| $ 75,000 to $99,999 | 14.1 | 73.2 | 7.6 | 82.9 |
| $100,000 to $124,999 | 12.2 | 85.4 | 9.1 | 92.3 |
| $125,000 to $149,999 | 6.7 | 92.1 | 5.5 | 97.5 |
| $150,000 to $199,999 | 5.2 | 97.3 | 0.8 | 98.3 |
| $200,000 to $249,999 | 1.9 | 99.2 | 1.1 | 99.4 |
| $250,000 or more | 0.8 | 100 | 0.6 | 100 |

DOE estimates that 11 percent of low-income consumers will experience an increase in life-cycle-cost.[4] We believe DOE's proposed standards are likely to result in manufacturers adding a self-clean cycle and eliminating or reducing the availability of electric standard clean products. Therefore, we expect the increase in total installed cost low-income consumers will experience in purchasing a new electric oven will not be the $1-10 incremental increase DOE estimates for electric standard clean ovens, but, instead, will be approximately $50 - the difference in the purchase price and installation costs of electric standard clean and electric self-cleaning ovens. This increase is substantial and, as we stated above, will result in low-income consumers experiencing an increase in life-cycle-cost because of the forced switch to electric self-cleaning ovens.

DOE asked for data regarding shipments of electric standard ovens versus electric self-cleaning ovens. Based on AHAM shipment data from January through October 2015, 72% of electric free standing shipments and 100 percent of electric slide-in and drop-in range shipments were self-cleaning. Similarly, 95 percent of built-in electric oven shipments were self-cleaning.

[2] *Annual Update of the HHS Poverty Guidelines*, the Department of Health and Human Services (HHS) defines the federal poverty level as $24,250 for a family of four. (80 FR 3236, January 22, 2015)
[3] Data pulled from Stevenson TraQline on November 2, 2015
[4] *ibid*, pp. 11-14 and 15

## IV. Baseline Energy Consumption

DOE proposed the following baseline energy consumption for electric ovens:

| Class | Baseline Energy Consumption (IAEC) (kWh)[5] |
|---|---|
| Electric Standard Oven | 294.5 |
| Electric Self-cleaning Oven | 355.0 |

There are three basic differences between the energy consumption of electric standard clean and self-clean ovens:

- Self-cleaning energy ($E_{SC}$);
- Increased baking energy due to reduced insulation on most standard clean ovens ($E_{CO}$); and
- Increased baking energy due to higher assumed cooking cycles ($N_{OE}$) for standard clean ovens.[6]

The energy needed for the self-cleaning feature would tend to increase the energy consumption of electric self-clean ovens relative to electric standard ovens while the reduced insulation and the extra cycles tend to increase the consumption of electric standard clean ovens.

The June 2015NOPR analysis determined that electric standard clean ovens had lower baseline energy consumption than electric self-cleaning ones (294.5 kWh vs. 355.0 kWh)[7] rather than the reverse relationship in the 2014 Request for Information (370.0 kWh for electric standard ovens and 360.0 kWh for electric self- cleaning ovens).[8]

As discussed above, the baseline energy use for electric standard clean ovens seems to be derived largely from two data points (TSD Figure 5.5.2).[9] These two tested ovens include a 2.4 $ft^3$ freestanding range/oven and a 4.3 $ft^3$ built-in/slide-in oven. Neither of these is particularly representative of actual electric standard clean ovens in the marketplace, but the 2.4 $ft^3$ oven is particularly unrepresentative. The 2.4 $ft^3$ oven is much smaller than typical sizes and the vast

[5] Technical Support Document Residential Conventional Ovens, May 2015, EERE-2014-BT-STD-0005-0018.pdf, p. 5-5

[6] DOE's EL 3 for Electric Standard Ovens is EL 2 + improved insulation. The reduction in cooking energy, $E_{CO,}$ is due to the improved thermal performance of the cavity of the baseline electric self-clean ovens as DOE does not consider improved insulation for Electric Self-Clean Ovens. Technical Support Document Residential Conventional Ovens, May 2015, EERE-2014-BT-STD-0005-0018.pdf , Tables 5.3.5 and 5.3.5

[7] Technical Support Document Residential Conventional Ovens, May 2015, EERE-2014-BT-STD-0005-0018.pdf, p. 5-5

[8] *ibid*. p. 5-4

[9] *ibid*. p. 5-25

majority of electric standard clean ovens are freestanding. The built-in/drop-in oven product category is largely made up of specialty products at substantially higher price points than freestanding range/ovens. For example, the lowest priced built-in wall oven offered on the Home Depot web site is priced at $949 and seven of the 43 single electric wall ovens listed are standard clean. In contrast, the lowest priced combined freestanding range/oven is $349 and 90 of the 166 models are priced below that of the lowest priced built-in oven.[10]

DOE also seems to have relied on data from NRCan, which shows that the energy use for electric standard clean ovens will be lower than that for electric self-cleaning ovens. But ovens with capacities of 1 to 2.5 $ft^3$ heavily dominate the NRCan data.[11] Virtually all of the freestanding ovens listed for sale at Home Depot have capacities in the 4.2 to 5.3 $ft^3$ range, demonstrating that the NRCan data is not particularly relevant to this rulemaking.

Based on the engineering logic and the previous testing data, the original values seem to be more relevant and the expected energy use for baseline electric standard ovens should remain higher than that for electric self-cleaning ovens.

## V. Trial Standard Levels

DOE proposes three TSLs for electric standard clean ovens and one TSL for electric self-clean ovens. The TSLs are based on the ELs considered in the Engineering Analysis and shown in the proposed rule and are presented in the following Table.[12]

| TSL | Electric standard clean oven | | | Electric self- cleaning oven | | |
|---|---|---|---|---|---|---|
| | Engineering Efficiency Level (EL) | IAEC | Percent change | Engineering Efficiency Level (EL) | IAEC | Percent change |
| baseline | 0 | 294.5 | - | 0 | 355.0 | - |
| 1 | 1 | 284.6 | 3.36 | 1 | 345.1 | 2.79 |
| 2 | 3 | 259.2 | 11.98 | 1 | 345.1 | 3.92 |
| 3 | 7 | 207.3 | 29.6 | 4 | 278.1 | 21.67 |

By this configuration of TSLs, DOE essentially assumes electric standard clean ovens to be identical to electric self- cleaning ovens at TSL 2. The only substantive difference between the two classes in the DOE Engineering Analysis at TSL 2 are the door seals, which are estimated to account for approximately 4 kWh of energy.[13] At the maximum technologically feasible level, TSL 3, the DOE design options of the two classes of electric ovens are identical, and the differences in energy consumption are estimated to be approximately 70 kWh per year, which would be the net effect of the energy needed for the self-cleaning feature and the extra cycles of electric standard clean ovens. [14] DOE has, in effect, created an analysis structure that, while it recognizes the utility and differences in energy use of the standard oven, it has assumed design

[10] Homedepot.com, accessed 10/31/2015
[11] TSD, pp. 3-38 & 3-39
[12] Notice of Proposed Rulemaking, 80 FR 33029, June 10, 2015, p. 33069, Table V-1.
[13] Notice of Proposed Rulemaking, 80 FR 33029, June 10, 2015, p. 33052, Table IV-15
[14] *ibid*.

options (i.e., product improvements) for the standard oven that effectively eliminate electric standard clean ovens as a separate class since the design of the two ovens would be virtually identical.

## VI. AHAM's Proposed Electric Standard Oven Standards

DOE proposes maximum energy consumption for electric standard clean ovens based around a set of product improvements that include increasing the insulation levels on the electric standard clean ovens to those of electric self- cleaning ovens, plus other improvements (TSL 2 (EL 3)).[15] As discussed above, this essentially makes an electric standard clean oven equivalent to an electric self- cleaning oven without the self-clean feature. A reasonable basis of establishing an energy consumption relationship for electric standard clean ovens would, therefore, be to reduce the energy consumption of the electric standard clean oven by the amount of energy used in the self-cleaning cycle of the electric standard clean oven. DOE estimates that self-cleaning energy is 32.8 kWh/year, or 7.63 kWh/year/cubic foot for a normalized 4.3 $ft^3$ oven.[16] Subtracting the self-clean energy from the proposed self- cleaning standard yields a formula of:

- Freestanding: 163.2 + (42.3 - 7.63 or 34.7) * volume kWh/year
- Built-in/Drop-in: 169.1 + 34.7 * volume kWh/year

The principal advantage of using the proposed standard approach is that it avoids discriminating against low-priced electric standard clean ovens while having a slight effect on the total energy saved through the overall standard program. Electric standard clean freestanding ranges/ovens are the lowest priced cooking product available in the marketplace. The proposed standard has the intent to encourage the use of additional insulation in the oven, therefore reducing the cooking energy without materially raising the manufacturing cost of the range/oven. This will result in most of the energy savings anticipated in the NOPR without creating a substantial incentive to convert all freestanding oven designs to self-clean.

The June 2015 NOPR predicts that improving the insulation on an electric standard clean oven results in savings of 12 kWh per year and has a manufacturing cost of approximately $5 ($7.25 at retail using DOE's proposed markups).[17] Such a cost increase will be hard to detect at the retail level, where pricing is usually in $5 dollar increments. The cost premium to bring cooking energy to parity between electric self-clean and electric standard clean ovens will be negligible. AHAM's proposed standard formula will create a reasonable reduction in the maximum energy consumption for electric standard clean ovens that is commensurate with the cleaning energy.

Without full access to the National Impact Model, it is difficult to determine how much less energy is saved by using the proposed standard equation and DOE will not release a modifiable version of that model. Simply assuming that the proposed approach has the effect of moving from TSL 2 to TSL 1 (which is not the actual effect but provides a bounding) would reduce the energy savings by 0.032-0.041 quads out of the total 0.653-0.786 quads anticipated for the total standard.[18]

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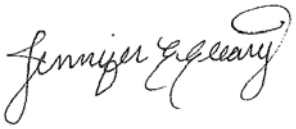
[15] *ibid.*, Table V-3
[16] TSD, p. 7A-3
[17] TSD pp. 5-8, 5-30 and 6-10
[18] TSD pp. 10-D3 and 10-D4

Accordingly, we recommend the TSLs for electric standard clean ovens be based on subtracting the self-clean energy of 32.8 kWh/year from the corresponding electric self- cleaning standard. So, for example, given the Integrated Annual Energy Consumption Level (IAEC) energy conservation standard level proposed in DOE's June 10, 2015 NOPR for electric self- cleaning ovens would yield a formula for electric standard clean ovens of:

- Freestanding: 163.2 + 34.7 * volume kWh/year
- Built-in/Drop-in: 169.1 + 34.7 * volume kWh/year

Specifically, AHAM proposes that DOE adopt the above formulas for electric standard clean ovens—this approach would mitigate the uncertainties of the analysis, have a slight impact on the energy saved, and avoid discriminating against low-income consumers.

Respectfully Submitted,



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