

## CHAPTER 9. TRIAL STANDARD LEVELS

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## CHAPTER 9. TRIAL STANDARD LEVELS

### 9.1 INTRODUCTION

DOE generated NES and NPV results based on trial standard levels (TSLs). The TSLs are based on the following: (1) candidate standard (efficiency) levels identified in the Advance Notice of Proposed Rulemaking (ANOPR) published in November 15, 2007,<sup>1</sup> (2) the candidate standard level identified with the maximum efficiency, and (3) a combination of candidate standard levels for different equipment classes that have potentially positive impacts on consumers and the Nation.

### 9.2 COOKING PRODUCTS – COOKTOPS AND OVENS

Table 9.2.1 shows the TSLs for conventional cooking products. As discussed in Chapter 4, Screening Analysis, DOE conducts a screening analysis to determine the design options that are technologically feasible and can be considered as measures to improve product efficiency. However, there are few design options available for improving the efficiency of these cooking products due to physical limitations on energy transfer to the food load. This is particularly the case for all cooktop and self-cleaning oven product classes. For electric cooktops, DOE was able to identify only a single design change for analysis. For gas cooktops and electric self-cleaning ovens, DOE was able to identify two design options for analysis. And for gas self-cleaning ovens, DOE was able to identify three design options for analysis. Although DOE considered several design options for standard ovens, with the exception of eliminating standing pilots for gas standard ovens, none significantly increased product efficiency. Specifically, eliminating standing pilots reduces overall gas consumption by over 50 percent while all other design options reduce gas consumption by approximately two percent. Therefore, DOE gave further consideration to only four TSLs for conventional cooking products.

TSL 1 represents the elimination of standing pilot ignition systems from gas cooking products. All other product classes are unaffected by TSL 1, including gas self-cleaning ovens, which are not allowed to use standing pilot ignition systems because they already use electricity and come equipped with power cords to enable the self-cleaning cycle. Under TSL 1, DOE's current prescriptive standard of disallowing the use of standing pilot ignition systems in gas cooking pilots equipped with power cords would be extended to all gas cooking products, regardless of whether the appliance is equipped with a power cord. Also, under TSL 1, there would be no need for DOE to regulate the EF of any of the conventional cooking product classes because only standing pilot ignition systems are being affected.

TSL 2 for conventional cooking products consists of the candidate standard levels from each of the product classes that provide a majority of consumers (who are impacted by the standard) with an economic benefit. Based on this criterion, only electric coil cooktops and electric standard ovens have candidate standard levels that differ from those in TSL 1. In other

words, for the remaining five product classes (electric smooth cooktops, electric self-cleaning ovens, and all gas cooking product classes), analytical results indicate there is no candidate standard level that provides an economic benefit to a majority of consumers.

TSL 3 for conventional cooking products consists of the same candidate standard levels as TSL 2, with the exception of the gas self-cleaning oven product class. For gas self-cleaning ovens, the design option that provides, on average, a small level of economic benefit to consumers is included.

TSL 4 is the maximum technologically feasible level.

Table 9.2.1 summarizes the four TSLs for cooktops and ovens.

**Table 9.2.1 Trial Standard Levels for Cooktops and Ovens**

Product classes	Trial standard levels (EF)			
	TSL 1	TSL 2	TSL 3	TSL 4
Electric Coil Cooktops	No Standard (Baseline)	0.769	0.769	0.769
Electric Smooth Cooktops	No Standard (Baseline)	No Standard (Baseline)	No Standard (Baseline)	0.753
Gas Cooktops	No Pilot	No Pilot	No Pilot	0.420
Electric Standard Ovens	No Standard (Baseline)	0.1163	0.1163	0.1209
Electric Self-Cleaning Ovens	No Standard (Baseline)	No Standard (Baseline)	No Standard (Baseline)	0.1123
Gas Standard Ovens	No Pilot	No Pilot	No Pilot	0.0600
Gas Self-Cleaning Ovens	No New Standard* (Baseline)	No New Standard* (Baseline)	0.0625	0.0632

\* Gas self-cleaning ovens are already required to use pilotless ignition systems because they are equipped with power cords.

### 9.3 COOKING PRODUCTS – MICROWAVE OVENS

Because it is technically infeasible to combine cooking efficiency (or EF) into a new efficiency metric with standby power consumption, DOE established two sets of TSLs—one set consisting solely of EF levels (TSLs 1a–4a) and a second set comprised solely of standby power levels (TSLs 1b–4b).

Table 9.3.1 shows the TSLs for the regulation of cooking efficiency or EF. TSLs 1a through 4a correspond to candidate standard levels 1a through 4a, respectively, and affect only the EF. For TSLs 1a through 4a, no standard to limit standby power is specified. TSL 4a

corresponds to the maximum feasible EF level. None of these first four TSLs have a life-cycle cost (LCC) lower than the baseline level.

**Table 9.3.1 Trial Standard Levels for Microwave Oven EF**

	Trial standard levels			
	TSL 1a	TSL 2a	TSL 3a	TSL 4a
EF	0.586	0.588	0.597	0.602

Table 9.3.2 shows the TSLs for the regulation of standby power. TSLs 1b through 4b correspond to candidate standard levels 1b through 4b, respectively, and affect only the standby power. For TSLs 1b through 4b, no standard on EF is specified. All four of these TSLs yield LCC savings relative to the baseline level. TSL 3b corresponds to the maximum feasible level for the regulation of standby power which does not affect the appliance’s capability to continually display the time. TSL 4b corresponds to the maximum technologically feasible level for the regulation of standby power but results in the inability of the appliance to continually display the time. TSL 4b also represents the level with the minimum LCC.

**Table 9.3.2 Trial Standard Levels for Microwave Oven Standby Power**

	Trial standard levels			
	TSL 1b	TSL 2b	TSL 3b	TSL4b
Standby Power (W)	2.0	1.5	1.0	0.02

## 9.4 COMMERCIAL CLOTHES WASHERS

Table 9.4.1 shows the TSLs for commercial clothes washers. TSLs consist of a combination of modified energy factor (MEF) and water factor (WF). In all, DOE has considered five TSLs. TSL 1 corresponds to the first candidate standard level from each product class and represents the efficiency level for each class with the least significant design change. For TSL 2, the candidate standard levels for each class are simply incremented to the second candidate standard level and represent the next technological design change for each class. TSL 3 represents the third candidate standard level for top-loading washers (the maximum efficiency level for this class) while keeping front-loading washers at its second candidate standard level. For TSL 3, front-loading washers were held to the second candidate standard level in order to minimize the equipment price difference between the two product classes. For TSL 4, top-loading washers are retained at their maximum efficiency level while front-loading washers are incremented to their third candidate standard level. Finally, TSL 5 corresponds to the maximum technologically feasible level for each product class.

**Table 9.4.1 Trial Standard Levels for Commercial Clothes Washers**

	<b>Trial Standard Levels</b>				
	<b>TSL 1</b>	<b>TSL 2</b>	<b>TSL 3</b>	<b>TSL 4</b>	<b>TSL 5</b>
<b>Top-Loading</b>					
MEF	1.42	1.60	1.76	1.76	1.76
WF	9.5	8.5	8.3	8.3	8.3
<b>Front-Loading</b>					
MEF	1.80	2.00	2.00	2.20	2.35
WF	7.5	5.5	5.5	5.1	4.4

## REFERENCES

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- <sup>1</sup> U.S. Department of Energy-Office of Energy Efficiency and Renewable Energy, Energy Conservation Program: Energy Conservation Standards for Certain Consumer Products (Dishwashers, Dehumidifiers, Electric and Gas Kitchen Ranges and Ovens, and Microwave Ovens) and for Certain Commercial and Industrial Equipment (Commercial Clothes Washers); Advance Notice of Proposed Rulemaking and Notice of Public Meeting. *Federal Register*, 2007. 72(220): pp. 64432-64515.