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ASAP ACEEE Commercial Ovens RFI Comments

Additional submitted attachment is included below.

Appliance Standards Awareness Project
American Council for an Energy-Efficient Economy

October 25, 2024

Junhui Huang
California Energy Commission
Docket Unit
715 P Street, Sacramento, CA 95814

RE: Docket No. 23-AAER-01: Commercial Food Service Equipment

Dear Dr. Huang:

This letter constitutes the comments of the Appliance Standards Awareness Project (ASAP) and American Council for an Energy-Efficient Economy (ACEEE) on the California Energy Commission (CEC) request for information (RFI) for commercial ovens. We appreciate the opportunity to provide input to the Commission.

We are pleased that CEC is moving forward with rulemakings for various types of commercial food service (CFS) equipment. For commercial ovens, we encourage CEC to adopt standard levels consistent with the latest version of ENERGY STAR (v3.0) for the equipment categories included within scope of that specification. We also encourage CEC to cover additional oven types beyond those covered by ENERGY STAR v3.0. The rationale for each of these recommendations is outlined in more detail below.

Adopting standard levels equivalent to ENERGY STAR v3.0 would provide substantial additional savings in comparison to less stringent levels. In comparison to ENERGY STAR v2.2, v3.0 increases efficiency requirements for full-size gas and electric convection ovens as well as gas and electric combination ovens (i.e., ovens with steamer and convection cooking functionality). ENERGY STAR v3.0 also sets efficiency requirements for additional electric and gas combination oven sizes[1] and specifies reporting requirements for water consumption of combination ovens. Importantly, savings estimates from the recently updated ENERGY STAR CFS Equipment Calculator[2] show that v3.0 provides substantial additional per-unit savings for full-size electric convection, gas convection, and gas combination ovens in comparison to v2.2, as summarized in Table 1.[3] For example, the per-unit electricity savings for full-size electric convection ovens are about 25-fold higher and the per-unit gas savings for both gas convection are about 10-fold higher at v3.0.

[1]ENERGY STAR v3.0 includes half- and full-size gas combination ovens with a pan capacity ≥ 5 and ≤ 40, half- and full-size electric combination ovens with a pan capacity ≥ 3 and ≤ 40, and 2/3-size electric combination ovens with a pan capacity ≥ 3 and ≤ 5. ENERGY STAR v2.2 scope included half- and full-size gas combination ovens with a pan capacity ≥ 6 and half- and full-size electric combination ovens with a pan capacity ≥ 5 and ≤ 20.
[2]www.energystar.gov/partner-resources/energy-star-training-center/commercial-food-service
[3]For v.3.0, we used the default calculator inputs. For v2.2 results, we changed the inputs to reflect the cooking efficiency and idle energy rate requirements of v2.2. Table 1 includes only the commercial oven categories that are included within both v2.2 and v3.0 (e.g., v3.0 covers additional oven categories/sizes) and that have different efficiency requirements (e.g., electric half-size convection ovens and gas rack ovens have the same cooking efficiency and idle energy rate requirements in v2.2 and v3.0). We note that we corrected an error in the calculator where the per-unit gas savings for combination gas ovens incorrectly references the cell for gas convection ovens.

Table 1. Per-unit electricity and gas savings comparison between ENERGY STAR v2.2 and v3.0 for several commercial oven types.

Oven Type		v2.2 Per-Unit Savings (kWh or MMBtu)	v3.0 Per-Unit Savings (kWh or MMBtu)
Convection	Electric (Full-size)	41	1,090
	Gas	1.0	11.1
Combination	Electric	7,510	7,835
	Gas	30.4	34.1

We estimate that adopting v3.0 would save an additional 276 BBtu of gas and about 12 GWh of electricity annually for California after stock turnover (in 2040) versus v2.2, as shown in Table 2; these energy savings would result in about $5.5 million in additional annual bill savings. Further, we estimate that the cumulative additional savings at v3.0 levels from sales between 2027 and 2050 would be 4,970 BBtu of gas and 210 GWh of electricity, as shown in Table 2; these energy savings would result in over $100 million in additional cumulative utility bill savings for purchasers of commercial ovens. Appendix A contains a description of our methodology for these results.

Table 2: Annual gas, electricity, and bill savings in CA after stock turnover (in 2040) and cumulative savings through 2050 for commercial ovens at standard levels equivalent to ENERGY STAR v2.2 and v3.0.

	2040 Annual Savings			Cumulative Savings Through 2050		
Standard Level	**Gas (BBtu)**	**Electricity (GWh)**	**Bill Savings (million 2023$)**	**Gas (BBtu)**	**Electricity (GWh)**	**Bill Savings (million 2023$)**
ENERGY STAR v3.0	530	73.3	19.1	9,530	1,320	353
ENERGY STAR v2.2	254	61.5	13.6	4,560	1110	251
Difference	*276*	*11.8*	*5.5*	*4,970*	*210*	*102*

Furthermore, we do not believe that California adopting commercial oven efficiency standards consistent with ENERGY STAR v3.0 would cause significant market disruptions. EPA's 2023 ENERGY STAR unit shipment data[4] shows that over half of commercial oven sales met ENERGY STAR v3.0 requirements and there are approximately 170 electric combination ovens, 50 gas combination ovens, 30 electric

[4]www.energystar.gov/partner-resources/products_partner_resources/brand-owner/unit-shipment-data

convection ovens, and 20 gas convection ovens currently available that are certified by ENERGY STAR;[5] many of these certified commercial ovens even exceed minimum ENERGY STAR requirements. Colorado has also already adopted v3.0 in their appliance efficiency regulations.

We encourage CEC to adopt regulations that cover additional commercial oven types not in the scope of ENERGY STAR v3.0. The scope of ENERGY STAR v3.0 broadly covers gas and electric convection ovens, gas and electric combination ovens, and gas rack ovens. However, in the RFI, CEC discusses additional types of commercial ovens available on the market today including conventional, conveyor, slow cook-and-hold, deck, hearth, microwave, range, rapid cook, rotisserie, and reel-type ovens. We encourage CEC to further investigate these additional oven types and to adopt (at minimum) test-and-list requirements for all commercial oven types for which there is an existing industry test procedure.[6]

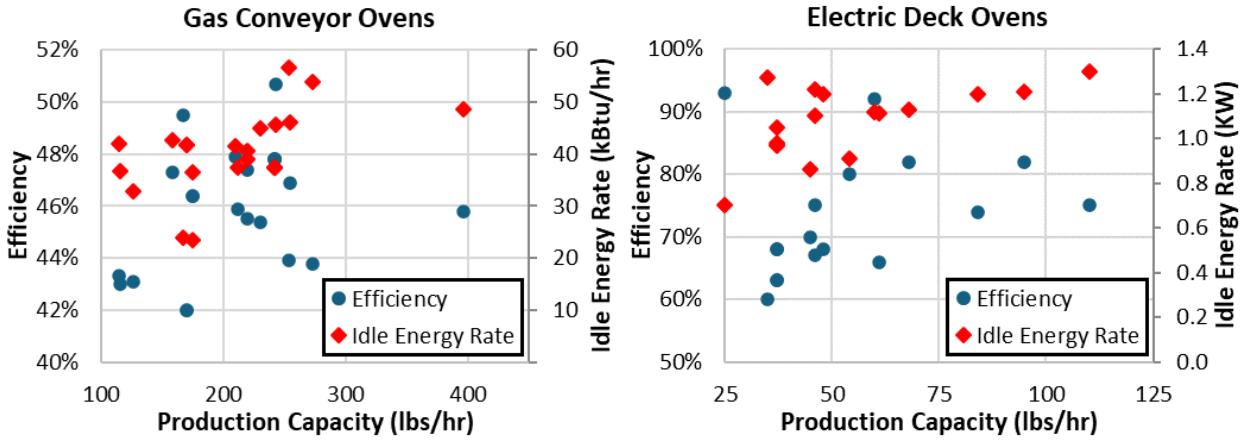

Figure 1: Efficiency and idle energy rate as a function of production capacity for gas conveyor ovens (left) and electric deck ovens (right) in the California Foodservice Instant Rebates program database.

Further, we encourage CEC to evaluate potential standards for gas conveyor ovens and electric deck ovens as there appears to be a broad range of efficient models available on the market. Figure 1 shows the efficiency and idle energy use rate as a function of production capacity for conveyor ovens (left) and deck ovens (right) that qualify for the California Foodservice Instant Rebates program.[7] While we are unaware of any data on the energy use of less efficient models available on the market, it is apparent that there are multiple models available across a broad range of capacities for both conveyor and deck ovens that exceed these CA utility rebate efficiency requirements. Thus, we encourage CEC to evaluate standard levels at or beyond these rebate efficiency requirements for conveyor ovens and deck ovens.

[5]Accessed October 21, 2024. data.energystar.gov/Active-Specifications/ENERGY-STAR-Certified-Commercial-Ovens/c8av-ccf7/about_data

[6]For example, the following commercial oven types have existing ASTM test procedures: conveyor ovens (F1817-17(2022)), slow cook-and-hold ovens (F3051-14(2019)), deck ovens (F1965-17), hearth ovens (F2521-09(2022)), microwave ovens (F1360-17(2023)), range ovens (F2521-09(2022)), rapid cook ovens (F2238-20), and rotisserie ovens (F1787-98(2020)).

[7]caenergywise.com/instant-rebates/. Accessed October 10, 2024. Qualifying gas conveyor oven models must have a baking energy efficiency of ≥ 42% and an idle energy rate ≤ 57 kBtu/hr. Qualifying electric deck ovens must have a tested heavy load cooking energy efficiency of ≥ 60% and an idle energy rate less than or equal to 1.3 kW.

Thank you for considering these comments.

Sincerely,

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Appliance Standards Awareness Project

Matt Malinowski
Director, Buildings Program
American Council for an Energy-Efficient Economy

Appendix A. Methodology and Assumptions for Savings Estimates

Our general methodology is based on estimates for per-unit savings and annual shipments. We first estimated national annual electricity and natural gas savings for commercial ovens at efficiency levels reflecting ENERGY STAR v2.2 and v3.0 based on estimated annual shipments in the year the standard takes effect (assumed to be 2027); per-unit energy savings; and average product lifetime (assumed to be 12 years for all categories). Our analysis inputs, summarized in Table A1, are based on data from ENERGY STAR: our estimates for per-unit savings are based on the recently updated ENERGY STAR CFS Equipment Calculator,[8] and our estimates for national shipments and the portion of sales already meeting v2.2 or v3.0 (53% for both) are based on ENERGY STAR's 2022 and 2023 unit shipment data, respectively.[9] Since our analysis is assuming the same portion of units would meet both v2.2 or v3.0, we may be overestimating the total savings if CEC were to adopt v2.2 (i.e., presumably some shipments meet v2.2 and not v3.0). We assumed that both annual shipments and the baseline efficiency in the base case remain constant over time. In reality, both shipments and base case efficiency tend to increase over time. Thus, we implicitly assumed that these two factors cancel each other out.

Table A1. Analysis inputs for commercial ovens.

Type		Per-Unit Savings - v2.2 (kWh or MMBtu)	Per-Unit Savings - v3.0 (kWh or MMBtu)	National Shipments (thousand)	California Shipments (thousand)
electric	Convection – half-size	2,259	2259	37	4.3
	Convection – full-size	41	1090		
	Combination	7510	7835		
gas	Convection	1.0	11.1	50	5.8
	Combination	30.4	34.1		
	Rack – single	22.9	22.9		
	Rack – double	19.3	19.3		

We used the equation below to calculate savings in each year of the analysis:

Annual savings = Number of installed units x Per-unit savings

where the number of installed units is:

Before full stock turnover: Annual shipments x (Number of years after compliance date + 0.5)

After full stock turnover: Annual shipments x Average product lifetime

[8]www.energystar.gov/partner-resources/energy-star-training-center/commercial-food-service
[9]www.energystar.gov/partner-resources/products_partner_resources/brand-owner/unit-shipment-data

In calculating the number of installed units meeting the new standard prior to full stock turnover, we accounted for products being purchased throughout the year. Thus, in any given year we counted only one-half year of savings from products purchased in that year.

We calculated California electricity and natural gas savings by allocating national product sales to California. We assumed that shipments scale with state population, resulting in 11.6% of national commercial oven shipments being allocated to California. We calculated bill savings using California electricity and natural gas prices for the commercial sector. We used price projections from the US Energy Information Administration's (EIA's) Annual Energy Outlook (AEO) 2023 to calculate electricity prices for each of the NERC regions for each year of the analysis period relative to 2023 prices.[10] We then applied these projections for the NERC regions to 2023 AEO California electricity prices.[11] For states like California that span more than one NERC region, we calculated weighted-average projected changes in electricity prices based on electricity sales. We used price projections from EIA's AEO 2023 to calculate natural gas prices for the Pacific Census region for each year of the analysis period relative to 2023 prices. We then applied these regional price projections to 2023 AEO California natural gas prices to project future California gas prices.[12]

[10] www.eia.gov/outlooks/aeo/.
[11] EIA-861 Annual Electric Power Industry Report. www.eia.gov/electricity/data/state/.
[12] www.eia.gov/dnav/ng/ng_pri_sum_a_EPG0_PRS_DMcf_a.htm.