

**DOCKETED**

<b>Docket Number:</b>	23-AAER-01
<b>Project Title:</b>	Commercial Food Service Equipment (i.e. Commercial Steam Cookers, Commercial Ovens, Commercial Dishwashers, and Commercial Fryer)
<b>TN #:</b>	260295
<b>Document Title:</b>	Earthjustice Comments on Title 20 Commercial Oven Efficiency Standards
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via electronic submission

November 26, 2024

California Energy Commission  
 Docket Unit  
 Docket No. 23-AAER-01  
 715 P Street  
 Sacramento, CA 95814

**RE: Earthjustice Comments on Efficiency Standards for Commercial Ovens, Docket 23-AAER-01**

Energy Commission:

Earthjustice appreciates the opportunity to submit the following comments on Title 20 efficiency standards for commercial ovens. Earthjustice recommends that the California Energy Commission (“CEC”) adopt more stringent efficiency standards than the ENERGY STAR Version 3.0 (“V3.0”) specifications for commercial gas ovens to move the market toward electrification. By adopting the proposed performance standards presented in Table 1 below, California can advance essential public health, air quality, and climate goals.

**Table 1. Proposed Performance Standards for Commercial Gas Ovens.**

Combination Ovens: 5-40 pan (“P”) capacity						
Operation	V3.0 Idle Rate (Btu/hr)	Proposed Idle Rate (Btu/hr)	V3.0 Cooking Energy Efficiency (%)	Proposed Cooking Energy Efficiency (%)	V3.0 Water Consumption Rate (gal/pan)	Proposed Water Consumption Rate (gal/pan)
Steam Mode	200P + 6,511	200P + 6,511	41	47	.5	.5
Convection Mode	140P + 3,800	140P + 3,800	57	62	.4	.4
Convection Ovens <sup>1</sup>						
Oven Size	V3.0 Idle Rate (Btu/hr)	Proposed Idle Rate (Btu/hr)	V3.0 Cooking Energy Efficiency (%)	Proposed Cooking Energy Efficiency (%)		
Full-Size	≤ 9,500	≤ 9,000	49	≥ 51		

<sup>1</sup> The Codes and Standards Enhancement Team (“CASE Team”) recommends ENERGY STAR Version 2.2 specifications for convection ovens, including an idle rate of 12,000 Btu/hr and a cooking energy efficiency of 46 percent.

Rack Ovens						
Oven Size	V3.0 Idle Rate (Btu/hr)	Proposed Idle Rate (Btu/hr)	V3.0 Cooking Energy Efficiency (%)	Proposed Cooking Energy Efficiency (%)		
Single	≤25,000	≤25,000	48	55		
Double	≤30,000	≤30,000	52	55		

The proposed performance standards will give California consumers the option to purchase a high-performing, efficient gas oven or choose an electric alternative. By incentivizing the electrification of commercial kitchen equipment, California can abate greenhouse gas emissions and hazardous air pollution, reducing related adverse health outcomes. The California Air Resources Board has recognized that its climate policies “must include transitioning away from fossil gas in residential and commercial buildings, and will primarily on advancing energy efficiency while replacing gas appliances with non-combustion alternatives.”<sup>2</sup> In alignment, the CEC has stated that “gas equipment efficiency investments have a growing likelihood over time of becoming stranded assets... causing the state to miss its goals.”<sup>3</sup> Accordingly, the CEC should design Title 20 efficiency standards to move the market toward electric options to better ensure California achieves its climate and public health objectives.

Detailed in the comments below, Earthjustice recommends that the CEC: 1) recognize the operational benefits of electric ovens over gas ovens; 2) acknowledge that strengthening performance standards beyond ENERGY STAR V3 specifications for commercial gas ovens does not incur incremental costs; 3) expand the scope of the proceeding to include additional types of ovens; and 4) use a gas rate forecast that accounts for increased gas rates from declining gas demand. With regard to standards for electric ovens, Earthjustice supports CEC adoption of standards set forth under ENERGY STAR V3.

**1. Electric ovens are more energy efficient, cheaper, safer, and have better temperature controls resulting in more evenly cooked foods.**

Electric ovens are superior to gas ovens in many ways. Electric ovens are far more energy efficient than gas ovens – the average energy efficiency of an ENERGY STAR certified electric oven is 79 percent compared to 55 percent for ENERGY STAR certified gas ovens.<sup>4</sup>

<sup>2</sup> CARB, *2022 Scoping Plan for Achieving Carbon Neutrality*, at 212 (Dec. 2022), <https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf>.

<sup>3</sup> CEC, *2021 Integrated Energy Policy Report Vol. 1*, at 22 (Feb. 2022), <https://efiling.energy.ca.gov/GetDocument.aspx?tn=241599>.

<sup>4</sup> ENERGY STAR, *ENERGY STAR Certified Commercial Ovens* (November 8, 2024), <https://data.energystar.gov/w/e8av-ccf7/im48-wy4k?cur=o0Hmhm-AbNo&from=dPCmZdfDEwy>. The average energy efficiency calculation used the energy efficiency data from convection mode, not steam mode, for combination ovens.

This difference in efficiency is inherent to the design of the heating elements because gas ovens vent out combustion byproducts via a flue, losing heat in the process.<sup>5</sup> The flue also makes gas ovens less reliable in maintaining a constant temperature. Alternatively, electric ovens have more precise temperature control and have a dryer heat, resulting in more evenly cooked and crispier foods.<sup>6</sup> The heat of a gas oven is considered wetter because methane combusts into CO<sub>2</sub> and water, adding moisture where it may not be desirable in the baking process.

Electric ovens are cheaper and easier to install and maintain than gas ovens. The upfront equipment cost of an electric oven is cheaper than a gas one. For all sizes of commercial combination and convection ovens, the CASE Team found that the equipment cost of an electric oven is significantly cheaper than a gas oven.<sup>7</sup> For combination ovens, electric models were thousands of dollars cheaper than gas models. For installation, electric ovens are more flexible in their placement, requiring only a 240 Volt electrical outlet for installation. Gas ovens can be more difficult to install, requiring proper ventilation and a gas line.<sup>8</sup> For maintenance, gas ovens are harder to clean because the combustion of methane causes burn residue in the interior of the oven cavity.<sup>9</sup>

Importantly, electric ovens are safer for workers and customers. Gas ovens combust methane to produce heat, creating harmful combustion byproducts and contributing to indoor air pollution. Combustion appliances like gas ovens expose workers and customers to carbon monoxide, particulate matter and NO<sub>x</sub>, causing adverse health outcomes.<sup>10</sup> The concentration of air pollutants can far exceed safe levels of exposure if there is improper or poor ventilation. In addition to air quality issues, gas ovens create a risk of gas leaks and explosions.

Despite these advantages, 90 percent of convection ovens in California are gas-fueled.<sup>11</sup> For combination ovens, 45 percent of smaller ovens (less than 15 pans) are gas, 65 percent of mid-size ovens (from 15 to 28 pans) are gas, and nearly all large ovens (above 28 pans) are gas.<sup>12</sup>

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<sup>5</sup> Chef's Deal Restaurant Equipment, *Electric vs. Gas Oven: Which One Should You Choose?* (December 7, 2023), <https://www.chefsdeal.com/blog/electric-vs-gas-oven>

<sup>6</sup> *Id.*

<sup>7</sup> California Statewide Investor-Owned Utilities, Commercial Ovens, Codes and Standards Enhancement (CASE) Initiative For PY 2024: Title 20 Standards Development, Docket 23-AAER-01, at 49-50 ("Title 20 Commercial Ovens Report") (November 21, 2024), <https://efiling.energy.ca.gov/GetDocument.aspx?tn=260264&DocumentContentId=96480>.

<sup>8</sup> UNOX, Commercial electric oven: why it's the best solution for your kitchen, [https://www.unox.com/au\\_au/blog/commercial-electric-oven-best-solution-kitchen/](https://www.unox.com/au_au/blog/commercial-electric-oven-best-solution-kitchen/).

<sup>9</sup> Chef's Deal Restaurant Equipment, *Electric vs. Gas Oven: Which One Should You Choose?* (December 7, 2023), <https://www.chefsdeal.com/blog/electric-vs-gas-oven>

<sup>10</sup> Nate Seltenrich, *Take Care in the Kitchen: Avoiding Cooking-Related Pollutants*, 122 Environ Health Perspect. 6 (2014), <https://pmc.ncbi.nlm.nih.gov/articles/PMC4050506/>.

<sup>11</sup> California Statewide Investor-Owned Utilities, Commercial Ovens, Codes and Standards Enhancement (CASE) Initiative For PY 2024: Title 20 Standards Development, Docket 23-AAER-01, at 10 ("Title 20 Commercial Ovens Report") (November 21, 2024), <https://efiling.energy.ca.gov/GetDocument.aspx?tn=260264&DocumentContentId=96480>.

<sup>12</sup> *Id.* at 53.

The continued dominance of gas-fueled commercial ovens subverts California’s climate and public health goals, while the electrification of commercial appliances offers both progress on these goals and the economic and operational advantages listed above.

**Adopting Performance Standards for Commercial Ovens That Are More Stringent Than the ENERGY STAR V3 Specification Will Not Incur Incremental Costs.**

Strengthening the performance standards from the ENERGY STAR V3 specifications to the proposed standards in Table 1 will not increase the equipment cost of commercial gas ovens for consumers. To assess incremental costs, Earthjustice collected price data on commercial gas ovens, presented in Table 3 and 4 in Annex A below. To calculate incremental cost, Earthjustice averaged the equipment cost of models compliant with ENERGY STAR V3 specifications and the proposed standards in Table 1, taking the difference between the two. The result of adopting the proposed performance standards is that there are cost savings created for convection and rack ovens and \$1,053 incremental cost, or a 3.8 percent increase, for combination ovens.

**Table 2. The incremental cost of adopting the proposed performance standards compared to the ENERGY STAR V3 specification.**

Combination Ovens			
	Number of Available Models	Average Equipment Cost (USD)	Incremental Cost (USD)
ENERGY STAR V3 compliant models	44	\$27,078	\$1,053
Proposed performance standard compliant models	19	\$28,131	
Convection Ovens			
	Number of Available Models	Average Equipment Cost (USD)	Incremental Cost
ENERGY STAR V3 compliant models	15	\$11,411	-\$873
Proposed performance standard compliant models	9	\$10,538	
Rack Ovens			
	Number of Available Models	Average Equipment Cost (USD)	Incremental Cost
ENERGY STAR V3 compliant models	10	\$41,800	-\$2,837
Proposed performance standard compliant models	6	\$38,963	

In addition to strengthening performance standards, the CEC should leverage the California Foodservice Instant Rebate Program to incentivize the deployment of zero-emission technologies. Currently, the program offers \$2,000 for gas rack ovens, \$1,200 for gas conveyor ovens, up to \$1,200 for gas combination ovens, and \$600 per cavity for gas convection ovens.<sup>13</sup>

<sup>13</sup> California Foodservice Instant Rebates, Qualifying Equipment (January 2024), [https://caenergywise.com/instant-rebates/Customer\\_Flyer-CA\\_FS\\_IR-WEB\\_v240130.pdf](https://caenergywise.com/instant-rebates/Customer_Flyer-CA_FS_IR-WEB_v240130.pdf).

This is a significant amount of funding for the procurement of combustion appliances that are incongruent with state climate and public health goals. Customers choosing electric models are offered the same rebate, or in some cases, less.<sup>14</sup> By adopting the proposed performance standards for commercial gas ovens, efficiency funding is properly focused on incentivizing electric models as few gas models would substantially exceed baseline efficiency requirements.

### **The CEC Should Expand the Scope of the Proceeding to Include Additional Types of Commercial Ovens.**

In addition to considering combination ovens, convection ovens, and rack ovens, the CEC should consider increasing the scope of the proceeding to include additional types of ovens that are not currently eligible for ENERGY STAR certification. In agreement with the Appliance Standards Awareness Project and American Council for an Energy Efficient Economy, Earthjustice recommends that the CEC should investigate performance standards for conventional ovens, conveyer ovens, pizza ovens, slow cook-and-hold ovens, range ovens, rapid cook or high-speed ovens, rotisserie ovens, and reel-type or rotating ovens.<sup>15</sup> Together, pizza/deck ovens, conveyor ovens, slow cook-and-hold ovens, and high-speed ovens are 14 percent of total commercial ovens sales.<sup>16</sup> If the CEC only considers three types of ovens for Title 20 standards, a significant portion of commercial oven market will be excluded, reducing the effectiveness of this proceeding.

### **The CEC Should Use the Recently Adopted Gradual Transformation Forecasting for Gas Prices in Cost-Effectiveness Analysis**

When evaluating the cost-effectiveness between gas and electric ovens, the CEC should use a gas pricing model that accounts for a decline in gas demand over time. In the *Title 20 Commercial Fryer Report*, the *Title 20 Commercial Steamer Report* and the *Title 20 Commercial Ovens Report*, the CASE Team used California Public Utilities Commission's *Utility Costs and Affordability of the Grid of the Future Report* to forecast gas rates which assumes annual growth in gas demand of 6.5 percent per year based on historic averages.<sup>17</sup> This assumption is both incompatible with California's climate goals and certainly inaccurate to what California's future gas consumption will be. As California's gas demand decreases, gas rates will increase as system costs are spread between fewer and fewer consumers. Instead, the CEC should use the Gradual Transformation forecast adopted in May 2024, which was designed with this gas

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<sup>14</sup> *Id.*

<sup>15</sup> ASAP, ACEEE, Docket No. 23-AAER-01, ASAP ACEEE Commercial Ovens RFI Comments at 3 (October 25, 2024).

<sup>16</sup> California Statewide Investor-Owned Utilities, Commercial Ovens, Codes and Standards Enhancement (CASE) Initiative For PY 2024: Title 20 Standards Development, Docket 23-AAER-01, at 30 ("Title 20 Commercial Ovens Report") (November 21, 2024),

<https://efiling.energy.ca.gov/GetDocument.aspx?tn=260264&DocumentContentId=96480>.

<sup>17</sup> California Public Utilities Commission, *Utility Costs and Affordability of the Grid of the Future Report* at 73 (May 2021), [https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/office-of-governmental-affairs-division/reports/2021/senate-bill-695-report-2021-and-en-banc-whitepaper\\_final\\_04302021.pdf](https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/office-of-governmental-affairs-division/reports/2021/senate-bill-695-report-2021-and-en-banc-whitepaper_final_04302021.pdf).

transition in mind and will produce a more accurate operational cost comparison between electric and gas ovens.<sup>18</sup>

Thank you for your consideration. Earthjustice looks forward to continued engagement with the CEC throughout its rulemaking process.

Sincerely,

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<sup>18</sup> CEC, 2023 Gradual Transformation Additional Achievable Fuel Substitution Scenario (May 8, 2024), <https://www.energy.ca.gov/filebrowser/download/6271?fid=6271>.

**ANNEX A.**

**Table 3. A list of ENERGY STAR certified gas oven models that meet the proposed performance standards.**

<b>Combination Ovens</b>							
	<b>Brand Name</b>	<b>Model Name</b>	<b>Model Number</b>	<b>Convection Mode Cooking Efficiency (%)</b>	<b>Steam Mode Cooking Efficiency (%)</b>	<b>Price (USD)</b>	<b>Citation</b>
1	Alto-Shaam - Prodigy Classic	CTC20-10G	CTC20-10G	64	55	36,446	Culinary Depot, Alto-Shaam 20-10G CLASSIC-NG 35.69" W Natural Gas Stainless Steel Prodigy Classic Combi Oven or Steamer, <a href="https://www.culinarydepotinc.com/alto-shaam-20-10g-classic-ng-35-69-w-natural-gas-stainless-steel-prodigy-classic-combi-oven-or-steamer-140-000-btu">https://www.culinarydepotinc.com/alto-shaam-20-10g-classic-ng-35-69-w-natural-gas-stainless-steel-prodigy-classic-combi-oven-or-steamer-140-000-btu</a> (last accessed November 13, 2024).
2	Alto-Shaam - Prodigy Classic	CTP20-20G	CTP20-20G	63	57	48,954	Culinary Depot, Alto-Shaam 20-20G CLASSIC-NG 43.75" W Natural Gas Floor Model Prodigy Classic Combi Oven or Steamer, <a href="https://www.culinarydepotinc.com/alto-shaam-20-20g-classic-ng-43-75-w-natural-gas-floor-model-prodigy-classic-combi-oven-or-steamer-242-000-btu">https://www.culinarydepotinc.com/alto-shaam-20-20g-classic-ng-43-75-w-natural-gas-floor-model-prodigy-classic-combi-oven-or-steamer-242-000-btu</a> (last accessed November 13, 2024).
3	Alto-Shaam - Prodigy Pro	CTP7-20G	CTP7-20G	65	52	25,564	Culinary Depot, Alto-Shaam 7-20G PRO-LP 43.75" W Liquid Propane Countertop Prodigy Pro Combi Oven or Steamer, <a href="https://www.culinarydepotinc.com/alto-shaam-7-20g-pro-lp-43-75-w-liquid-propane-countertop-prodigy-pro-combi-oven-or-steamer-98-000-btu">https://www.culinarydepotinc.com/alto-shaam-7-20g-pro-lp-43-75-w-liquid-propane-countertop-prodigy-pro-combi-oven-or-steamer-98-000-btu</a> (last accessed November 13, 2024).
4	Alto-Shaam - Prodigy Pro	CTP20-10G	CTP20-10G	64	55	32,086	Chef's Deal Restaurant Equipment, Alto-Shaam CTP20-10G Full-Size Roll-In Gas Combi-Oven, <a href="https://www.chefsdeal.com/alto-shaam-ctp20-10g-combitherm-ct-proformance-combi-oven-steamer.html">https://www.chefsdeal.com/alto-shaam-ctp20-10g-combitherm-ct-proformance-combi-oven-steamer.html</a> (last accessed November 13, 2024).
5	Alto-Shaam - Prodigy Pro	CTC20-20G	CTC20-20G	63	57	41,857	Chef's Deal Restaurant Equipment, Alto-Shaam 20-20G PRO Gas Combi Oven,



							<a href="https://www.chefsdeal.com/alto-shaam-20-20g-pro-gas-combi-oven.html">https://www.chefsdeal.com/alto-shaam-20-20g-pro-gas-combi-oven.html</a> (last accessed November 13, 2024).
6	Convotherm	C4eD 6.20 GB	C4eD 6.20 GB	62	51	21,326	KaTom Restaurant Supply, Convotherm C4 ED 6.20GB Full-Size Combi-Oven, <a href="https://www.katom.com/768-C4ED620GBLP.html">https://www.katom.com/768-C4ED620GBLP.html</a> (last accessed November 13, 2024).
7	Convotherm	C4eT 6.20 GB	C4eT 6.20 GB	62	51	23,839	KaTom Restaurant Supply, Convotherm C4ET6.20GBDD120/60/1 Full Size Combi Oven, <a href="https://www.katom.com/768-C4ET620GBDD120.html">https://www.katom.com/768-C4ET620GBDD120.html</a> (last accessed November 13, 2024).
8	Convotherm	C4eT 6.20 GB-N	C4eT 6.20 GB-N	62	51	22,918	Culinary Depot, Convotherm C4 ET 6.20GB-N 6 Pan Full Size Stainless Steel Natural Gas Convotherm Convotherm Combi Oven and Steamer, <a href="https://www.culinarydepotinc.com/convotherm-c4-et-6-20gb-stainless-steel-natural-gas-convotherm-combi-oven-steamer-68-200-btu">https://www.culinarydepotinc.com/convotherm-c4-et-6-20gb-stainless-steel-natural-gas-convotherm-combi-oven-steamer-68-200-btu</a> (last accessed November 13, 2024).
9	Convotherm	C4eD 6.20 GS-N	C4eD 6.20 GS	62	58	22,383	KaTom Restaurant Supply, Convotherm C4 ED 6.20GS Full-Size Combi-Oven, <a href="https://www.katom.com/768-C4ED620GSNG.html">https://www.katom.com/768-C4ED620GSNG.html</a> (last accessed November 13, 2024).
10	Convotherm	C4eT 6.20 GS-N	C4eT 6.20 GS	62	58	23,855	KaTom Restaurant Supply, Convotherm C4ET6.20GSDD120/60/1 Full Size Combi Oven, <a href="https://www.katom.com/768-C4ET620GSDD120.html">https://www.katom.com/768-C4ET620GSDD120.html</a> (last accessed November 13, 2024).
11	Rational AG	iCombiClassic 6-full gas	LM200CG	63	48	19,696	Chef Buyer, Rational ICC 6-FULL NG 208/240V 1 PH (LM200CG) (CC2GRR.0000273 - NG - 208/240V) iCombi Classic®, <a href="https://www.chefbuyer.com/p/rational-icc-6-full-ng-208-240v-1-ph-lm200cg.html">https://www.chefbuyer.com/p/rational-icc-6-full-ng-208-240v-1-ph-lm200cg.html</a> (last accessed by November 13, 2024).

12	Rational AG	iCombiPro 6-half gas	LM100BG	62	50	16,856	Restaurant Supply.com, Rational ICP 6-HALF NG 208/240V 1 PH (LM100BG) (CB1GRRA.0000231) ICombi Pro® 6-Half Size Combi Oven, <a href="https://www.restaurantsupply.com/rational-icp-6-half-ng-208-240v-1-ph-lm100bg-cb1grra-0000231-icombi-pro-6-half-size-combi-oven">https://www.restaurantsupply.com/rational-icp-6-half-ng-208-240v-1-ph-lm100bg-cb1grra-0000231-icombi-pro-6-half-size-combi-oven</a> (last accessed November 13, 2024).
13	Rational AG	iCombiPro 20-half gas	LM100FG	65	52	37,976	Chef's Deal Restaurant Equipment, RATIONAL ICP 20-HALF NG 120V 1 PH (LM100FG) Half Size Natural Gas Combi Oven, <a href="https://www.chefsdeal.com/rational-icp-20-half-ng-120v-1-ph-lm100fg-gas-combi-oven.html">https://www.chefsdeal.com/rational-icp-20-half-ng-120v-1-ph-lm100fg-gas-combi-oven.html</a> (last accessed November 13, 2024).
14	Rational AG	iCombiPro 10-half gas	LM100DG	64	55	23,048	Culinary Depot, RATIONAL ICP 10-HALF LP 208/240V 1 PH (LM100DG) Natural Gas Combi Oven or Steamer, <a href="https://www.culinarydepotinc.com/rational-icp-10-half-lp-208-240v-1-ph-lm100dg-natural-gas-combi-oven-or-steamer-208-volts-1-phase">https://www.culinarydepotinc.com/rational-icp-10-half-lp-208-240v-1-ph-lm100dg-natural-gas-combi-oven-or-steamer-208-volts-1-phase</a> (last accessed November 13, 2024).
15	Rational AG	iCombiPro 6-full gas	LM100CG	66	55	25,056	Restaurant Supply.com, Rational ICP 6-FULL NG 208/240V 1 PH (LM100CG) (CC1GRRA.0000238) ICombi Pro® 6-Full Size Combi Oven, <a href="https://www.restaurantsupply.com/rational-icp-6-full-ng-208-240v-1-ph-lm100cg-icombi-pro-6-pan-natural-gas-full-size-combi-oven-208-240v-106-500-btu">https://www.restaurantsupply.com/rational-icp-6-full-ng-208-240v-1-ph-lm100cg-icombi-pro-6-pan-natural-gas-full-size-combi-oven-208-240v-106-500-btu</a> (last accessed November 13, 2024).
16	Rational AG	iCombiPro 10-full gas	LM100EG	64	57	33,312	Restaurant Supply.com, Rational ICP 10-FULL NG 208/240V 1 PH (LM100EG) (CE1GRRA.0000240) ICombi Pro® 10-Full Size Combi Oven, <a href="https://www.restaurantsupply.com/rational-icp-10-full-ng-208-240v-1-ph-lm100eg-icombi-pro-10-pan-natural-gas-full-size-combi-oven-208-240v-152000-btu">https://www.restaurantsupply.com/rational-icp-10-full-ng-208-240v-1-ph-lm100eg-icombi-pro-10-pan-natural-gas-full-size-combi-oven-208-240v-152000-btu</a> (last accessed November 13, 2024).

17	Rational AG	iCombiPro 20-full gas	LM100GG	62	58	23,048	JES Restaurant Equipment, Rational ICP 10-HALF NG 120V 1 PH (LM100DG) - iCombi Pro 10 Pan Half-Size Combi Oven, <a href="https://www.jesrestaurantequipment.com/rational-b118206-27e.html">https://www.jesrestaurantequipment.com/rational-b118206-27e.html</a> (last accessed November 13, 2024).
18	UNOX S.p.A.	XA*A-1011- GX*S-***	XA*A-1011- GX*S-***	62	49		Discontinued or not publicly listed.
19	UNOX S.p.A.	XA*A-1011- NX*S-***	XA*A-1011- NX*S-***	62	49		Discontinued or not publicly listed.

Convection Ovens							
	Brand Name	Model Name	Model Number	Convection Mode Idle Energy Rate (Btu/hr)	Convection Mode Cooking Efficiency (%)	Price (USD)	Citation
1	American Range	MSD-1HE	MSD-1HE	8671	51	6247	Webstaurant Store, American Range MSD-1HE Majestic Single Deck Liquid Propane Convection Oven, <a href="https://www.webstaurantstore.com/single-deck-standard-depth-manual-controls-and-glass-doors/65AMSD1HELP.html">https://www.webstaurantstore.com/single-deck-standard-depth-manual-controls-and-glass-doors/65AMSD1HELP.html</a> (last accessed November 12, 2024).
2	American Range	M1-HE	M1-HE	8325	52	6229	Chef's Deal Restaurant Equipment, American Range M1-HE Gas Convection Oven, <a href="https://www.chefsdeal.com/american-range-m1-he-gas-convection-oven.html">https://www.chefsdeal.com/american-range-m1-he-gas-convection-oven.html</a> (last accessed November 12, 2024).
3	Blodgett	DFG-100-ES	DFG-100-ES	7620	54	16546	Culinary Depot, Blodgett DFG-100-ES BASE-LP Liquid Propane Single-Deck Convection Oven, <a href="https://www.culinarydepotinc.com/blodgett-dfg-100-es-base-lp-liquid-propane-single-deck-convection-oven-45-000-btu">https://www.culinarydepotinc.com/blodgett-dfg-100-es-base-lp-liquid-propane-single-deck-convection-oven-45-000-btu</a> (last accessed November 12, 2024).
4	Revent	ONE39	ONE39	3516	69	28890	Chef's Deal Restaurant Equipment, Revent ONE39-G Gas Convection Oven, <a href="https://www.chefsdeal.com/revent-one39-g-gas-">https://www.chefsdeal.com/revent-one39-g-gas-</a>

							convection-oven.html (last accessed November 12, 2024).
5	Royal Range	RCOS-1	RCOS-1	8866	54	6375	Chef Mart Restaurant Supply, Royal Range RCOS-1 Convection Oven, Gas, <a href="https://chefmart.net/products/royal-rcos-1">https://chefmart.net/products/royal-rcos-1</a> (last accessed November 12, 2024).
6	Southbend	BGS/13SC	BGS/13SC	6798	51	5225	Burkett Restaurant Equipment & Supplies, Southbend BGS/13SC Single Deck Gas Convection Oven, <a href="https://www.burkett.com/southbend-bgs-13sc-single-gas-convection-oven">https://www.burkett.com/southbend-bgs-13sc-single-gas-convection-oven</a> (last accessed November 12, 2024).
7	Southbend	KLGS/17SC	KLGS/17SC	8930	51	6250	Burkett Restaurant Equipment & Supplies, Southbend (Middleby) KLGS/17SC Convection Oven, Gas, <a href="https://www.burkett.com/southbend-middleby-klgs-17sc-convection-oven-gas-122170">https://www.burkett.com/southbend-middleby-klgs-17sc-convection-oven-gas-122170</a> (last accessed November 12, 2024).
8	Vulcan	SG4	SG4	8853	52	13369	Webstaurant Store, Vulcan SG4-NAT Natural Gas Single Deck Full Size Gas Convection Oven, <a href="https://www.webstaurantstore.com/vulcan-sg4-nat-natural-gas-single-deck-full-size-gas-convection-oven-with-solid-state-controls-60-000-btu/901SG4N.html">https://www.webstaurantstore.com/vulcan-sg4-nat-natural-gas-single-deck-full-size-gas-convection-oven-with-solid-state-controls-60-000-btu/901SG4N.html</a> (last accessed November 12, 2024).
9	Wolf	WC4GD	WC4GD	8317	54	5715	Culinary Depot, Wolf WC4GD-NG 40" W Stainless Steel Single Deck Natural Gas Convection Oven, <a href="https://www.culinarydepotinc.com/wolf-wc4gd-ng-40-w-stainless-steel-single-deck-natural-gas-convection-oven-50-000-btu">https://www.culinarydepotinc.com/wolf-wc4gd-ng-40-w-stainless-steel-single-deck-natural-gas-convection-oven-50-000-btu</a> (last accessed November 12, 2024).

Rack Ovens							
	Brand Name	Model Name	Model Number	Convection Mode Total Idle Energy Rate (Btu/hr)	Baking-Energy Efficiency (%)	Price (USD)	Citation

1	Baxter Mfg.	OV500G2EE	OV500G2EE	29,462	55	49876.2	Restaurant Supply.com, Baxter Manufacturing Baxter Manufacturing OV500G2EE Rotating Rack Oven Gas Curved Front, <a href="https://www.restaurantsupply.com/baxter-ov500g2ee-rotating-rack-oven-gas-curved-front">https://www.restaurantsupply.com/baxter-ov500g2ee-rotating-rack-oven-gas-curved-front</a> (last accessed November 12, 2024).
2	Baxter	CS500G2	CS500G2	25,002	56	37906.28	Chef's Deal Restaurant Equipment, Baxter CS500G2 Roll-In Gas Oven, <a href="https://www.chefsdeal.com/baxter-cs500g2-roll-in-gas-oven.html">https://www.chefsdeal.com/baxter-cs500g2-roll-in-gas-oven.html</a> (last accessed November 12, 2024).
3	Baxter Mfg.	OV520G2	OV520G2	23,214	59	52201.88	Restaurant Supply.com, Baxter Manufacturing OV520G2 Rotating Rack Oven Gas Curved Front, <a href="https://www.restaurantsupply.com/baxter-ov520g2-rotating-rack-oven-gas-curved-front">https://www.restaurantsupply.com/baxter-ov520g2-rotating-rack-oven-gas-curved-front</a> (last accessed November 12, 2024).
4	LBC Bakery	LRO-1G6	LRO-1G5, LRO-1G6	14,413	61	24427.58	Chef's Deal Restaurant Equipment, LBC Bakery Eq LRO-1G5 Roll-In Gas Rotating Rack Oven, <a href="https://www.chefsdeal.com/lbc-bakery-eq-lro-1g5-roll-in-gas-oven.html">https://www.chefsdeal.com/lbc-bakery-eq-lro-1g5-roll-in-gas-oven.html</a> (last accessed November 12, 2024).
5	LBC Bakery	LRO-2G6	LRO-2G5, LRO-2G6	17,369	71	30943.84	Chef's Deal Restaurant Equipment, LBC Bakery Eq LRO-2G5 Roll-In Gas Rotating Rack Oven, <a href="https://www.chefsdeal.com/lbc-bakery-eq-lro-2g5-roll-in-gas-oven.html">https://www.chefsdeal.com/lbc-bakery-eq-lro-2g5-roll-in-gas-oven.html</a> (last accessed November 12, 2024).
6	Revent	724	724	21,477	59	38,420	Restaurant Stock, Revent 724G Double Rack Gas Oven, <a href="https://restaurantstock.com/products/revent-724g-double-rack-gas-oven?gQT=2">https://restaurantstock.com/products/revent-724g-double-rack-gas-oven?gQT=2</a> (last accessed November 12, 2024).

**Table 4. A list of ENERGY STAR certified gas oven models that fail to meet the proposed performance standards.**

Combination Ovens							
1	Brand Name	Model Name	Model Number	Convection Mode Cooking Efficiency (%)	Steam Mode Cooking Efficiency (%)	Price (USD)	Citation
2	Alto-Shaam - Prodigy Pro	CTP6-10G	CTP6-10G	58	41	15,732	Chef's Deal Restaurant Equipment, Alto-Shaam CTP6-10G Full-Size Gas Combi-Oven, <a href="https://www.chefsdeal.com/alto-shaam-ctp6-10g-combitherm-ct-proformance-combi-oven-steamer.html">https://www.chefsdeal.com/alto-shaam-ctp6-10g-combitherm-ct-proformance-combi-oven-steamer.html</a> (last accessed November 13, 2024).
3	Alto-Shaam - Prodigy Pro	CTP10-10G	CTP10-10G	60	43	19,062	Chef's Deal Restaurant Equipment, Alto-Shaam 10-10G PRO Gas Combi Oven, 11 Full Size Pan Capacity, <a href="https://www.chefsdeal.com/alto-shaam-10-10g-pro-gas-combi-oven.html">https://www.chefsdeal.com/alto-shaam-10-10g-pro-gas-combi-oven.html</a> (last accessed November 13, 2024).
4	Convotherm	C4eT 10.20 GS-N	C4eT 10.20 GS-N	57	56	28,047	KaTom Restaurant Supply, Convotherm C4 ET 10.20GS Full-Size Combi-Oven, <a href="https://www.katom.com/768-C4ET1020GSNG.html">https://www.katom.com/768-C4ET1020GSNG.html</a> (last accessed November 13, 2024).
5	Electrolux Professional	COG61T30	COG61T30	58	43		Discontinued or not publicly listed.
6	Electrolux Professional	COG62T30	COG62T30	60	43		Discontinued or not publicly listed.
7	Electrolux Professional	COG11T30	COG11T30	63	45		Discontinued or not publicly listed.
8	Electrolux Professional	COG12T30	COG12T30	58	47		Discontinued or not publicly listed.
9	Rational AG	iCombiClassic 6-half gas	LM200BG	60	52	13,248	Restaurant Supply.com, Rational ICC 6-HALF NG 120V 1 PH (LM200BG) (CB2GRRA.0000267) ICombi Classic® 6-Half Size Combi Oven, <a href="https://www.restaurantsupply.com/rational-icc-6-half-ng-120v-1-ph-lm200bg-cb2grra-0000267-icombi-classic-6-half-size-combi-oven">https://www.restaurantsupply.com/rational-icc-6-half-ng-120v-1-ph-lm200bg-cb2grra-0000267-icombi-classic-6-half-size-combi-oven</a> (last accessed November 13, 2024).

10	UNOX S.p.A.	XAVL-2021-GP*S	XAVL-2021-GP*S-***	61	41	47,000	UNOX, Commercial trolley combi ovens CHEFTOP MIND.Maps™ BIG PLUS, <a href="https://www.unox.com/us_us/ovens/cheftop-mindmaps-big-plus-xavl-2021-gprs/">https://www.unox.com/us_us/ovens/cheftop-mindmaps-big-plus-xavl-2021-gprs/</a> (last accessed November 13, 2024).
11	UNOX S.p.A.	XA*A-0611-GX*S-***	XA*A-0611-GX*S-***	58	43		Discontinued or not publicly listed.
12	UNOX S.p.A.	XAVL-2021-NP*S	XAVL-2021-NP*S-***	60	43	46,300	UNOX, Commercial trolley combi ovens CHEFTOP MIND.Maps™ BIG PLUS, <a href="https://www.unox.com/us_us/ovens/cheftop-mindmaps-big-plus-xavl-2021-nprs/">https://www.unox.com/us_us/ovens/cheftop-mindmaps-big-plus-xavl-2021-nprs/</a> (last accessed November 13, 2024).
13	UNOX S.p.A.	XA*A-0611-NX*S-***	XA*A-0611-NX*S-***	57	44		Discontinued or not publicly listed.
14	UNOX S.p.A.	XEVL-2011-GP*S-***	XEVL-2011-GP*S-***	57	44		Discontinued or not publicly listed.
15	UNOX S.p.A.	XA*A-06FS-GX*S-***	XA*A-06FS-GX*S-***	58	46		Discontinued or not publicly listed.
16	UNOX S.p.A.	XA*A-06FS-NX*S-***	XA*A-06FS-NX*S-***	58	46		Discontinued or not publicly listed.
17	UNOX S.p.A.	XEVC-0711-GP*M-***	XEVC-0711-GP*M-***	58	46		Discontinued or not publicly listed.
18	UNOX S.p.A.	XEDA-0621-GX*S	XEDA-0621-GX*S-***	57	49		Discontinued or not publicly listed.
19	UNOX S.p.A.	XEDA-0611-GX*S	XEDA-0611-GX*S-***	58	47		Discontinued or not publicly listed.
20	UNOX S.p.A.	XEDA-1021-GX*S-***	XEDA-1021-GX*S-***	58	48		Discontinued or not publicly listed.
21	UNOX S.p.A.	XAVC-10FS-GP*M-***	XAVC-10FS-GP*M-***	59	49	19,914	Chef's Deal Restaurant Equipment, UNOX XAVC-10FS-GPRM Full Size Countertop Gas Combi Oven, <a href="https://www.chefsdeal.com/unox-xavc-10fs-gpr-gas-combi-oven.html">https://www.chefsdeal.com/unox-xavc-10fs-gpr-gas-combi-oven.html</a> (last accessed November 13, 2024).
22	UNOX S.p.A.	XAVC-06FS-GP*M-***	XAVC-06FS-GP*M-***	59	50	15,915	Chef's Deal Restaurant Equipment, UNOX XAVC-06FS-GPL ChefTop MIND.Maps™ Plus Full-Size Gas Combi Oven, <a href="https://www.chefsdeal.com/unox-xavc-06fs-gpl-gas-combi-oven.html">https://www.chefsdeal.com/unox-xavc-06fs-gpl-gas-combi-oven.html</a> (last accessed November 13, 2024).

23	UNOX S.p.A.	XA*A-10FS-GX*S-***	XA*A-10FS-GX*S-***	60	48		Discontinued or not publicly listed.
24	UNOX S.p.A.	XA*A-10FS-NX*S-***	XA*A-10FS-NX*S-***	60	48		Discontinued or not publicly listed.
25	UNOX S.p.A.	XAVC-1011-GP*M-***	XEVC-1011-GP*M-***	61	51	20,600	UNOX, Commercial countertop combi ovens CHEFTOP MIND.Maps™ COUNTERTOP PLUS Door opening, <a href="https://www.unox.com/us_us/ovens/cheftop-mindmaps-plus-xavc-1011-gprm/">https://www.unox.com/us_us/ovens/cheftop-mindmaps-plus-xavc-1011-gprm/</a> (last accessed November 13, 2024).
26	UNOX S.p.A.	XEDA-1011-GX*S	XEDA-1011-GX*S-***	61	52		Discontinued or not publicly listed.

Convection Ovens							
	Brand Name	Model Name	Model Number	Convection Mode Idle Energy Rate (Btu/hr)	Convection Mode Cooking Efficiency (%)	Price (USD)	Citation
1	Blodgett	Zephaire-200-G-ES	Zephaire-200-G-ES	9842	54	16120	Webstaurant Store, Blodgett ZEPHAIRE-200-G-ES Natural Gas Double Deck Full Size Bakery Depth Convection Oven, <a href="https://www.webstaurantstore.com/blodgett-zephaire-200-g-es-natural-gas-double-deck-full-size-bakery-depth-convection-oven-with-draft-diverter-100-000-btu/195ZEP2GES2N.html">https://www.webstaurantstore.com/blodgett-zephaire-200-g-es-natural-gas-double-deck-full-size-bakery-depth-convection-oven-with-draft-diverter-100-000-btu/195ZEP2GES2N.html</a> (last accessed November 12, 2024).
2	Blodgett	HV-100G	HV-100G	6435	49	26757	Webstaurant Store, Blodgett HV-100G-NAT Natural Gas Single Deck Full Size Hydrovection Oven, <a href="https://www.webstaurantstore.com/blodgett-hv-100g-nat-natural-gas-single-deck-full-size-hydrovection-oven-60-000-btu/195HV1SGN.html">https://www.webstaurantstore.com/blodgett-hv-100g-nat-natural-gas-single-deck-full-size-hydrovection-oven-60-000-btu/195HV1SGN.html</a> (last visited November 12, 2024).
3	Imperial	PCVG-1	PCVG-1		49	5693	KaTom Restaurant Supply, Imperial PCVG-1 Single Full Size Liquid Propane Gas Convection Oven, <a href="https://www.katom.com/406-ICV1LP.html">https://www.katom.com/406-ICV1LP.html</a> (last accessed November 12, 2024).



4	Imperial	PCVG-2	PCVG-2		49	11385	Restaurant Equippers Warehouse Stores, Imperial PCVG-2 Full Size Double Deck Natural Gas Convection Oven, <a href="https://www.equippers.com/imperial-icvg-2-full-size-double-deck-natural-gas-convection-oven">https://www.equippers.com/imperial-icvg-2-full-size-double-deck-natural-gas-convection-oven</a> (last accessed November 12, 2024).
5	IKON	IGCO	IGCO	8272	50	5084	Chef's Deal Restaurant Equipment, IKON IGCO Single Deck Full Size Gas Convection Oven, <a href="https://www.chefsdeal.com/ikon-igco-gas-convection-oven.html">https://www.chefsdeal.com/ikon-igco-gas-convection-oven.html</a> (last accessed November 12, 2024).
6	Southbend	GS/15SC	GS/15SC	8983	49	11294	Plant Based Pros, Southbend GS/15SC MarathonerGold Single Full Size Convection Oven, <a href="https://www.plantbasedpros.com/product/southbend-gs-15sc-marathonergold-single-full-size-convection-oven-90000-btu">https://www.plantbasedpros.com/product/southbend-gs-15sc-marathonergold-single-full-size-convection-oven-90000-btu</a> (last accessed November 12, 2024).

Rack Ovens							
	Brand Name	Model Name	Model Number	Convection Mode Total Idle Energy Rate (Btu/hr)	Baking-Energy Efficiency (%)	Price (USD)	Citation
1	Baxter Mfg.	OV500G1EE	OV500G1EE	22,081	48	40055	Restaurant Supply.com, Baxter Manufacturing OV500G1EE Rotating Rack Oven Gas Curved Front, <a href="https://www.restaurantsupply.com/baxter-ov500g1ee-rotating-rack-oven-gas-curved-front">https://www.restaurantsupply.com/baxter-ov500g1ee-rotating-rack-oven-gas-curved-front</a> (last accessed November 12, 2024).
2	Baxter Mfg.	OV520G1	OV520G1	19,649	49	44719	Chef's Deal Restaurant Equipment, Baxter OV520G1 Roll-In Gas Rotating Single Rack Oven, <a href="https://www.chefsdeal.com/baxter-ov520g1-roll-in-gas-oven.html">https://www.chefsdeal.com/baxter-ov520g1-roll-in-gas-oven.html</a> (last accessed November 12, 2024).
3	Revent	726 G CG U	726 G CG U	24,504	49	43740	Chef's Deal Restaurant Equipment, Revent 726U-G Roll-In Gas Rotating Rack Oven, <a href="https://www.chefsdeal.com/revent-726u-g-roll-in-gas-oven.html">https://www.chefsdeal.com/revent-726u-g-roll-in-gas-oven.html</a> (last accessed November 12, 2024).
4	Revent	ONE26	ONE26	20,028	53	55,710	Chef's Deal Restaurant Equipment, Revent ONE26-G Roll-In Gas Rotating Rack Oven,

							<a href="https://www.chefsdeal.com/revent-one26-g-roll-in-gas-oven.html">https://www.chefsdeal.com/revent-one26-g-roll-in-gas-oven.html</a> (last accessed November 12, 2024).
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