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December 21, 2022

Ms. Tanja Crk
U.S. Environmental Protection Agency (EPA)
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Submitted via email to CFS@energystar.gov

Subject: ENERGY STAR Version 1.0 Commercial Electric Cooktops Draft 1 Specification

Dear Ms. Crk,

Illinois Tool Works-Food Equipment Group (ITW) includes Vulcan, Wolf, Hobart and other trusted commercial cooking equipment brands domestically and abroad. We are proud partners with ENERGY STAR for several commercial cooking products, including, but not limited to, Convection Ovens, Fryers, and Griddles. ITW appreciates the opportunity to comment on the subject ENERGY STAR draft specification.

Background

In February 2021, the U.S. Environmental Protection Agency (EPA) issued a Discussion Guide regarding development of a new ENERGY STAR specification for Commercial Electric Cooktops (ref. 1).

On March 17th, 2021, ITW participated in the EPA Webinar (ref. 2), and additionally on a phone call with EPA and EPA's contractor, ICF, on March 26th, 2021. ITW submitted concerns with the discussion guide for the new specification to EPA on April 22, 2021 (att. A).

On November 10th, 2022, EPA issued Draft 1 Specification with supporting Cover Memo, Data Package, and Webinar Comment Matrix (refs. 3-6). On November 30th, 2022, ITW participated in the EPA Webinar (ref. 7).

Discussion

Following the above and additional correspondence between EPA and other stakeholders, ITW maintains several substantial concerns with the proposed ENERGY STAR specification for Commercial Electric Cooktops:

- Scope
- Transparency
- Validity of Data
- Value to Customers

Scope

Most commercial cooktops are integrated into ranges. Ranges usually include an oven, but can also be integrated with cabinets, heated holding, or refrigerated bases. Ranges are built, tested, and sold as complete devices, and frequently include more than one cooktop such as open top burners, griddles, and hot tops. Ranges are also freestanding, with primarily one gas or electrical hookup and no further installation or component assembly required (e.g. drop-in).

As expressed in Attachment A, ITW recommends that EPA distinguish between “range” and “non-range” cooktop applications. This is necessary to prevent confusion about whether a cooktop integrated into a range can be ENERGY STAR certified if the equipment to which it is permanently attached does not qualify. If it cannot be certified, then most potential cooktops would never apply under this specification.

Alternatively, if a top can be certified separately from the base, this could force the market to re-create all ranges as separately serialized devices. This approach might be useful in a few applications and custom jobs, but it would present an undue burden on most commercial range customers, along with the manufacturers, certifiers, and inspectors. ITW is not opposed to a more segmented approach to commercial range specification, particularly if there is a strong customer and energy efficiency benefit to doing so, but the benefit should outweigh the burden.

Furthermore, the countertop version of a range is traditionally termed “hot plate”, not “range”. The National Association of Food Equipment Manufacturers (NAFEM) estimates for total Hot Plate market size (global) for 2021 is $8.7 million (ref. 8). This compares to all Ranges at $224 million. While this represents revenue and not device (or hob) count, it is indicative of the overall market size.

Transparency

It appears that the subject Commercial Electric Cooktops Draft 1 Specification has been developed largely to promote induction technology. The majority, if not all, data and supporting documentation has originated from one stakeholder: the consulting firm Frontier Energy, Inc.

Frontier Energy, Inc. operates the Food Service Technology Center (FSTC) and has tested induction cooktops as part of a program with Southern California Edison (SCE). Frontier Energy, Inc. also maintains an Induction Technology Center (ITC), and actively promotes the technology through cooking demonstrations, lending programs, and educational sessions.

While there are certain merits and benefits of induction technology in commercial applications, it is not clear that any consideration has been given to *any other* commercial cooking technology, gas or electric, in the development of this new ENERGY STAR category. Also, while induction technology has been targeted for cooktop applications, it is not apparent that the end use, installation, cost, and feature set (and drawbacks) make it functionally equivalent to traditional cooktops, gas or electric. Functional equivalency is one of the Guiding Principles of the ENERGY STAR program (ref. 9).

FSTC advocates extensively for consideration of induction as a superior cooktop, but existing and future applications are more representative of a luxury hot plate, which could be a strong addition to a commercial kitchen lineup, but not a replacement for traditional burners or electric hobs. NAFEM industry estimates further reflect this point. The Induction Range (*NAFEM classification)* market size estimate for 2021 ($14.6 million, ref. 8) continues to rise but proportionately (approximately 7% by revenue) to the Range market, further indicating that the technology is more of a complement to, rather than a replacement for, existing cooktop solutions.

Induction cooktop technology incurs several limitations, including use of specific steel cookware, prohibiting contact with aluminum foil, prohibiting use of the top for storage, requiring low ambient temperatures (e.g. 120°F), requiring grease filters, emitting EMF, and necessitating pan detection and thermal cutoff systems for the most basic safety of each hob. This amounts to tremendous cost and maintenance, *per hob*, if truly intended for commercial application. Induction setups also introduce the risk of glass breakage, and likewise require additional and amended safety qualifications thru UL 197 and the FCC beyond typical commercial range cooktops, gas or electric.

Regarding the Reference 5 Data Package, induction is the only cooktop data included. Furthermore, half of the data is for 120V products. ITW has requested transparency on the units that were tested, but has still not received that data. ITW has previously explained to EPA and ICF that most electric installations are field wired for 208V or higher. ITW has also explained that most customers choose electric because they lack gas infrastructure, not for efficiency reasons. Electrification of commercial gas kitchens requires substantial infrastructure investment to carry the necessary amperage increase.

Lastly, EPA and ICF have commented that the specification development process has been “technology neutral” (discussed in ref. 7 Webinar). This is consistent with the ENERGY STAR Guiding Principle #4, “…specifications will generally take a technology neutral approach to helping consumers.” (ref. 9). However, given the reliance on data from a stakeholder with a vested interest in one particular technology, and another reason shared directly with EPA, ITW has concerns that a technology neutral approach is being achieved.

Validity of Data

The proposed ENERGY STAR Commercial Electric Cooktops Draft 1 Specification references ASTM F1521 (ref. 10) for baseline efficiency tests. The standard was ballot-approved in October 2022. The primary test is a water “Boil Test” and consists of raising 20lbs of water from 70°F-200°F.

In the February 2021 letter (ref. 1), EPA states “Testing centers such as Frontier Energy’s Food Service Technology Center test cooktops with method ASTM F1521.” However, upon review of cited publications and the Reference 5 Data Package submitted by FSTC, ITW has learned that

FSTC has routinely *not* tested to ASTM F1521. Further, the impact of these deviations can have a big effect on reported performance of both induction and non-induction cooktops.

In Reference 1, EPA cites the undated FSTC Induction Cooktop Analysis (ref. 11) as a primary comparison between induction and non-induction cooktops. ITW located a report on the FSTC website that appears to match this reference. In it, the report cites "Natural gas, resistive electric, and electric induction exhibited ranges of efficiencies between 25 and 40%, 65% and 75%, and 80% to 85%, respectively." However, no details of this previous testing, or any further reference, is provided. Later, the same report concludes "The focus is often placed on the appliance, but the cookware paired with the equipment might also prove to have a significant impact."

Based on recent testing that ITW performed as closely as possible to the latest approved ASTM F1521, ITW completely agrees that cookware has a significant impact on efficiency results.

ASTM F1521 requires a cooking vessel with very specific features that, based on attempts to source, may be difficult to obtain and impossible to recreate at different test facilities. The standard requires a 13" diameter pot, 20 qt, stainless steel or aluminum, and total weight with lid of 6.80 lb (tolerances omitted for clarity). However, 2 new pots sourced from the local The Restaurant Store fail to meet all these conditions. Further, the steel pot options tend to include multiple layers of steel and aluminum (e.g. "3-ply" clad, or more), which adds weight but can improve efficiency. The images shown in the Reference 11 report appear to show a multi-ply steel pot, which helps with efficiency. Yet, it is not clear if the reported non-induction data was also collected using the same exact vessel or setup, particularly since no test units are mentioned and the data is not acknowledged as being collected during the induction study.

ITW referenced the importance of pot material and size in our Attachment A letter, where we noted that the size of cookware relative to the burner can significantly impact efficiency, based on an EPRI report. ITW also notes that another stakeholder noted the importance of the type of steel used on induction during the Reference 7 Webinar. Per the Draft Reference 3 specification, EPA simply proposes a steel pot to the sizes specified in ASTM F1521.

Regarding internal ITW tests, ITW conducted as many tests as practicable on one (non-induction) test unit, trying to replicate the latest approved ASTM F1521 Boil Test requirements, along with introducing variables that may have been used to evaluate different technologies to this point. In short, among possible variables, including 5 different types of cookware, ITW was able to achieve production capacities ranging from 31-48 lb/h and efficiencies ranging from 61%-91% *on the same 2.0 kW hob*. ITW concludes, then, that the cookware and any deviations from the ASTM F1521 standard *are critical* to establishing any baseline efficiency comparison.

ITW also expresses significant concerns with the validity of the Reference 5 Data Package, submitted by FSTC/SCE in October just prior to the Draft 1 Specification, and prior to ballot-approval of the latest ASTM F1521. ITW has noted several discrepancies in the data, including Water Production Capacity (lb/h) not aligning with measured Power Consumption (kWh), Measured Power (kW) for half of the test units falling outside the +/- 5% allowance in the ASTM F1521 standard, starting Cook Temperature of 75°F falling outside the ASTM requirement, and misrepresentation of averages as "test runs".

This lack of transparency, combining of datasets, failure to follow requirements set out in the standard, and misrepresentation of data are all issues that should be evaluated carefully before EPA relies on them to establish a specification. While FSTC collects data to promote

awareness and education of food service opportunities, they are not a certified third-party lab, and they are not subject to accepted international principles for laboratory competence and certification testing including Repeatability, Impartiality, and Objectivity (refs. 13, 14).

ITW raised concerns in the Reference 7 Webinar about the sudden timeline and how we would not be able to collect data from a third-party lab using the latest approved procedure before the December 22nd, 2022 comment deadline. EPA/ICF acknowledged that challenge but dismissed the need for third-party data since, to summarize, stakeholders can all be trusted to submit mostly relevant and credible information. This position is also explained in the EPA letter that "Data used for purposes of setting specification levels do not need to be third-party certified." (ref. 4) This position is not consistent with ENERGY STAR's general requirements that "brand owners are required to have products tested for ENERGY STAR in a laboratory that is accredited to ISO/IEC 17025 for the relevant test procedures, and has gained recognition from EPA. EPA has an exception for first-party laboratories to conduct testing if they are enrolled in an EPA-recognized CB's supervised or witnessed manufacturers' testing laboratory (SMTL/WMTL) program, which includes demonstrating compliance with ISO 17025 as described in Appendix A of the Conditions and Criteria for Recognition of Certification Bodies for the ENERGY STAR Program." (EPA ENERGY STAR website FAQ)

The lack of rigid, repeatable, objective, and market-comprehensive data would suggest that a defined and independent test program is warranted to affirm energy efficiency value and to assess whether there are products/technologies that may deliver that value better than others.

Finally, ITW continues to request the data on which products were tested for the Energy Cost and Payback calculations in the Reference 5 Data Package. EPA cites one cost for an induction cooktop of $1000, and a payback after .4 years. EPA also cites one data point for estimated product lifetime of an induction cooktop at 9 years. ITW questions these data sources and calculations and submits updated evaluations in Attachment B.

Value to Customers

Central to the FSTC argument for induction is that there is customer "perception" or "misconceptions" that need to be overcome to broaden implementation (refs. 11, 15). ITW disagrees. As noted earlier, the biggest challenge to converting from commercial gas cooking equipment to commercial electric cooking equipment is infrastructure. Beyond infrastructure, there are significant challenges with durability/product life in typical commercial kitchens, efficient integration into ranges, and total cost.

EPA cites an example in Reference 1 where a single electric hotplate was replaced with an induction hot plate in a "small restaurant". No details were provided regarding voltage or amp draw, but if this were a 120V application then the swap out would be easy. Meanwhile, FSTC cites an example of a case study at a restaurant called Versailles Cuban in Los Angeles, CA (ref. 16) where induction was not chosen even after remodeling. With 24 gas burners, along with other gas ovens and fryers, the entire kitchen was remodeled and replaced with gas equipment to achieve efficiency and cost savings. None of the gas burner applications were replaced with induction, nor any electric equipment. Instead, gas stock pot ranges were recommended along with energy-efficient finned bottom pots, which FSTC cited as having 32% energy savings.

The Versailles Case Study also cited 30 total stock pots and 70 total frying pans at the restaurant. This is instructive for estimating the additional costs that would be needed if a

cookware-specific technology such as induction is ever used. The costs associated with stainless steel cookware can be more than double that of basic aluminum, and these costs need to be included in the payback evaluation for any ENERGY STAR specification that requires specific cookware or accessory to function. As noted in various discussions with EPA and ASTM, ITW's experience is that aluminum is the predominant pot and pan material found in commercial kitchens.

Regarding durability, EPA has repeatedly requested stakeholder feedback and data on induction durability, yet none has been shared. ITW submits that our standard electric hob (non-induction) is an industry-proven design and that we experience less than a 1% field replacement rate for any reason during a 1-year timeframe. ITW strongly recommends that any conclusions regarding Energy Cost and Payback must assume that reliability and maintenance, not to mention intended usage, are equivalent, or otherwise figured into the calculations.

Regarding Energy Cost and Payback calculations in Reference 5, EPA appears to be using efficiency values that are not representative of their actual data. More clarity is needed to validate the conclusions.

Assuming that induction hot plates are functionally equivalent to non-induction hot plates, ITW includes an updated Energy Cost and Payback Summary in Attachment B. Based on this comparison, the proposed ENERGY STAR devices would be expected to take an average of 33 years to payback the initial investment, based on energy cost *alone*. This does not include the added investment required for steel cookware, nor the unknown risk of lifetime durability compared to the Baseline models. ITW also notes that this comparison aims to address similar power levels – higher power units will generally incur higher costs, may differ in efficiency (higher or lower), and require greater infrastructure investment to carry the larger overall amperage load, depending on how many hobs are installed.

Given the unlikely payback and other drawbacks noted earlier, it is clear that induction is, and will likely remain, a sophisticated complement to the simple, reliable, efficient, and versatile hot plates already in the market. Features continue to be added to the standalone induction hobs to further enhance their appeal, but, at the same time, further differentiate them from all-purpose cooktop hobs, both commercial and residential.

Integration into ranges should also not be overlooked. There is a longstanding, but often overlooked, design efficiency by incorporating cooktops directly over an oven. Historically, this would mean effective utilization of a common heat source. In more recent times, this is reflected in efficient utilization of space: the centralization of hoods (both commercial and residential), grease traps, and fire suppression systems. In a true commercial environment, this infrastructure cost is significant and is measured by the foot. Certain electric technologies, regardless of heat transfer method, can claim to be ventless or hoodless but this does not eliminate their potential use in preparing high volumes of greasy and odorous food products.

Other Recommendations

1. As noted in Attachment A, Induction Cooktops already have their own ASTM Standard F2834-10A (ref. 18), and it includes a minimum Boil Efficiency of 85%, conducted per ASTM F1521. It is not apparent why a separate ENERGY STAR specification that includes induction cooktop technology, and a proposed efficiency less than 85%, is needed in addition to this standard.

2. One ENERGY STAR Guiding Principle (ref. 9) is based on labeling to effectively differentiate similar products for customers. The term “induction” is sufficiently differentiated and marketed to end users, and introducing an ENERGY STAR label would only serve to confuse the market.
3. ITW continues to disagree with 120V units being classified as Commercial Cooktops. EPA has suggested 1kW minimum as eligibility criteria for this standard. These values are not in line with any other commercial cooktop power levels, and the expected production capacity would not be adequate in a commercial environment.

ITW recognizes the benefits of induction cooking technology, but the process of promoting this single technology has resulted in a lack of recognition of market realities, customer needs, and objective data. No other ENERGY STAR category for commercial cooking product uses induction technology. No other ENERGY STAR exists for ranges or cooktops. Conduction, convection, and radiation, both gas and electric, are all widely accepted and proven means of cooking and yet no attention has been given to understanding and promoting the most efficient products in these categories.

ITW opposes the ENERGY STAR specification in the proposed draft form. However, should the EPA proceed with the draft specification for Commercial Electric Cooking, ITW strongly recommends that EPA create sub-categories to differentiate between cooking technology: conduction and induction.

Conclusion

ITW once again appreciates the opportunity to participate in the stakeholder process to establish commercial food equipment ENERGY STAR specifications. As an annual recipient of the ENERGY STAR Partner of the Year Sustained Excellence Award for more than a decade, we have welcomed the opportunities to participate in these proceedings over the years and will continue to offer our support and expertise wherever possible.

Respectfully Submitted,

H. Joshua Jackson
Engineer Lead
ITW Food Equipment Group

References:

1. ENERGY STAR Commercial Electric Cooktop Version 1.0 Discussion Guide dated February 2021
2. ENERGY STAR Commercial Electric Cooktop Version 1.0 Webinar dated March 17th, 2021
3. ENERGY STAR Commercial Electric Cooktops Version 1.0 Draft 1 Specification dated November 10th, 2022
4. ENERGY STAR Commercial Electric Cooktops Version 1.0 Draft 1 Cover Memo dated November 10th, 2022
5. ENERGY STAR Commercial Electric Cooktops Data Package dated November 10th, 2022
6. ENERGY STAR Commercial Electric Cooktops Discussion Guide and Webinar Comment Matrix dated November 10th, 2022
7. ENERGY STAR Commercial Electric Cooktops Version 1.0 Draft 1 Webinar dated November 30th, 2022
8. NAFEM 2022 Size and Shape of the Industry Data dated July 28th, 2022
9. ENERGY STAR Product Program Strategic Vision and Guiding Principles
10. ASTM F1521, Standard Test Methods for Range Tops
11. Induction Cooktop Analysis, undated, from FSTC website
12. Conduction Cooktop Analysis Report, report #501350103-R0, dated January 2020, from FSTC website
13. ISO/IEC 17025:2017, International Standard, General Requirements for the Competence of Testing and Calibration Laboratories
14. ISO/IEC 17065:2012, International Standard, Conformity Assessment – Requirements for Bodies Certifying Products, Processes, and Services
15. “How Frontier Energy’s New Induction Technology Center Puts the Power in Operator’s Hands”, FERMAG Article March 3rd 2022, Alyx Arnett
16. Cookline Replacement Study, Versailles Cuban, undated, from FSTC website
17. “If Induction Cooktops Are So Great, Why Does Hardly Anyone Use Them?”, NY Times June 25th, 2019, Tyler Wells Lynch
18. ASTM F2834-10A, Standard Specification for Induction Cooktops, Counter Top, Drop-In Mounted, or Floor Standing

Attachments:

A. ITW Comments to EPA dated April 22, 2021, emailed to cfs@energystar.gov
B. Energy Cost and Payback Summary

Attachment A

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ITW Food Equipment Group

April 22, 2021

Tanja Crk
U.S. Environmental Protection Agency (EPA)
Submitted via email: CFS@energystar.gov

Subject: ENERGY STAR Commercial Electric Cooktops Version 1.0

ITW-Food Equipment Group, LLC representing the brands of Vulcan, Wolf and Hobart (hereinafter "ITW FEG") are located in Baltimore, Maryland; Charlotte, North Carolina; and Troy, Ohio. ITW FEG has been a premier name in the foodservice industry for more than 70 years, recognized as providing a diverse selection of best-in-class, top quality, and energy efficient commercial cooking equipment. Over the years, we have proactively worked to implement environmentally sustainable options that promote responsible resource usage, energy savings and overall good stewardship practices while meeting the needs of the diverse commercial cooking equipment market.

The U.S. Environmental Protection Agency (hereinafter "EPA") issued an Energy Star Commercial Electric Cooktops Version 1.0 Discussion Guide in February 2021 and held a subsequent webinar on March 17th, 2021. After attending the webinar on March 17th and ASTM sub-committee meeting on April 14th concerning potential revisions to the F1521 Range Tops standard, ITW FEG has comments about the process.

1. **EPA asks is further classification needed for the cooktop category, such as table or countertop, floor standing, and drop-in?**

ITW FEG suggests that EPA should classify cooktops as either tabletop/countertop or drop-in. Floor standing would generally be considered as a range. A commercial range typically features two major elements: the cooktop surface (gas burner, griddle top, induction cooktop, etc.), through which direct heat is applied, and the bottom, standing portion – usually an oven. A commercial range typically comes in sizes ranging from 24" up to 72" with the ability to contain multiple configurations of cooktops and ovens. Because of the number of uses and configurations on a range, ranges are not included in any Energy Star category. For that reason, we feel that any use of the phrase "Range Tops" in the development of this specification should be replaced with "Cooktops" to avoid any confusion. In addition, we recommend the scope of the proposed new specification exclude ranges and cooktops that are integral to ranges.

2. **EPA seeks comments or concerns regarding use of the ASTM F1521 test method.**

ITW FEG suggests that EPA consider recommending that ASTM should either: (1) create a separate test method dedicated to induction cooktops; or (2) create sub-categories

within the ASTM F1521 test method that would cover gas, traditional electric coil technology, and induction.

ITW FEG agrees that induction technology has significant energy efficiency potential under the proper circumstances but revising the current ASTM F1521 test method in a way that is beneficial to promoting the efficiency of induction cooking is unwarranted. There is already a Standard Specification for Induction Cooktops, ASTM F2834 - 10A (2017). It makes sense that there should be a Standard Test Method for the Performance of Induction Cooktops that is a stand-alone document like there exists for most other product categories. ASTM F1521 should not be revised to include induction specific testing to the detriment of other cooktops. Doing so would overburden manufacturers and laboratories with unnecessary and additional testing for products that do not need additional or revised test methods to quantify their efficiency. We also provide further comments about sub-categories below.

3. **EPA seeks input on lifecycle/life expectancy on typical commercial induction cooktops and similar information related to maintenance/repair on significant components.**

ITW FEG concurs with EPA's decision to seek input on lifecycle/life expectancy for induction cooktops. There has been little spoken during the webinar and subsequent ASTM meetings about the life expectancy of induction cooktops, not to mention the quality/durability and repair/replacement costs. Durability of induction cooktops, particularly the glass/ceramic top has always been an issue. Commercial kitchens are notoriously abusive environments where the potential for the glass/ceramic top to break is substantial, leaving the cooktop out of service until it can be repaired or replaced. Repair and/or replacement costs for induction cooktops are higher than other cooktops as well. This level of transparency would benefit all stakeholders by allowing an opportunity for them to understand the aspects related with owning/maintaining an induction cooktop as it relates to conventional cooktops.

4. **Request stakeholder input to determine the need for cooktop sub-categories.**

ITW FEG recognizes that some equipment may not be covered under the existing scope, but we urge the EPA to explore creating sub-categories for commercial cooktops similar to how sub-categories and different criteria have been created for commercial ovens. For example, griddles are technically considered a cooktop, yet they have different sub-categories and criteria, as should other forms of cooktops. Induction cooktops are drastically different from gas cooktops and traditional electric coil technology cooktops and should not be held to the same criteria.

In addition, the fact that induction cooktops require the use of specific cookware to function properly is further evidence that they should be evaluated differently. The size of the pots used for induction cookware are also a factor in determining efficiency. Citation 8 in the Energy Star commercial electric cooktops Version 1.0 discussion guide, Induction Cooking Technology Design and Assessment from the Electric Power Research Institute, documents the performance test results and provides real data to quantify the efficiency and energy savings potential of induction cooktops, electric resistance coil cooktops, and gas cooktops. Induction has its benefits, but mainly with *small* cookware. Electric resistance coils are more efficient with larger cookware, which logically is why larger

cookware is more prevalent in commercial cooking settings. We propose separate categories for electric, gas, and induction cooktops. Griddles could be a sub-category within electric or gas cooktops

CONCLUSION

ITW FEG once again appreciates the opportunity to provide our stakeholder commentary to help the EPA Energy Star program enhance its regulatory processes. As an annual recipient of the Energy Star Partner of the Year for Sustained Excellence Award for more than a decade, we have welcomed the opportunities to participate in these proceedings and will continue to offer our support and expertise wherever possible.

Respectfully submitted,

Robert Dunn
Agency Engineer/Quality Engineer
ITW Food Equipment Group

Attachment B - Energy Cost and Payback

Baseline Market

Mfr	Model	List	Net/Map	Voltage	Power/hob (kW)	Hobs/Unit
A	A1	$6,702	$3,686	208	2	2
B	B1	$1,521	$760	208	1.5	2
C	C1	$3,854	$1,927	208	2.6	2
D	D1	$2,868	$1,577	208	1.5	2
E	E1	$2,680	$1,474	208	1.95	2
Average			**$1,885**			

ENERGY STAR Market

Mfr	Model	List	Net/Map	Voltage	Power/hob (kW)	Hobs/Unit
F	F1	$7,030	$3,866	208	2.5	2
B	B2	$7,050	$3,525	208	2.9	2
Average			**$3,696**			

Prices are from Autoquotes 12-13-22

Baseline - Typical

ENERGY STAR - Potential

Assumptions

2420	kWh/yr

Estimated annual energy needed per hob, based on EPA Data Package

Boil Efficiency:

0.78	Baseline Models
0.85	ENERGY STAR Models

Efficiencies estimated based on most representative datasets from EPA, online, and collected by ITW

$0.1078	$/kWh

Energy cost from EPA Data Package

	Per Hob		Total Energy
	Efficiency	**Annual Energy Usage (kWh/yr)**	**Annual Energy Cost**	**Cost (2 Hobs)**
Baseline	0.78	3103	$334.46	$668.91
ENERGY STAR	0.85	2847	$306.91	$613.83

$55.09 Annual Savings with ENERGY STAR

Baseline to ENERGY STAR Comparison

	Avg. Price Difference	**Payback Time (yrs)**
Between Ref. Mfrs/Models:	$1,811	**33**
Between Mfr "B" Models:	*$2,765*	**50**