



September 26, 2023

U.S. Department of Energy
Attn: Julie Hegarty
100 Independence Avenue SW
Washington, DC 20585

Re: Comments of Rinnai America Corporation on Energy Conservation Program: Energy Conservation Standards for Consumer Water Heaters, EERE-2017-BT-STD-0019/RIN 1904-AD91

Dear Ms. Hegarty:

Rinnai America Corporation (“Rinnai”) respectfully submits the following comments to the Department of Energy (the “Department”) on its proposed modifications to minimum energy efficiency standards for consumer water heaters, rulemaking Energy Conservation Program: Energy Conservation Standards for Consumer Water Heaters, EERE-2017-BT-STD-0019/RIN 1904-AD91.

INTRODUCTION

Rinnai is the U. S. based subsidiary of Rinnai Corporation, Nagoya, Japan, and is part of the over 100-year-old Rinnai Group. Rinnai is the leading gas tankless (“instantaneous”) water heater provider in North America. It sells both non-condensing and condensing gas tankless water heaters, which provide greater efficiency, have longer life span, and use less space than traditional storage gas water heaters. Rinnai sells roughly 60% of all non-condensing tankless water heaters and 20% of condensing tankless water heaters in the United States.

Rinnai has its headquarters in Peachtree City, GA and in 2022, it opened the first gas tankless water heater manufacturing facility in the United States, a 360,000 square foot manufacturing facility in Griffin, Georgia. Rinnai’s new facility employs advanced automation, precision assembly processes, and is ISO 9001 and/or ISO 14001 certified. The only product that Rinnai manufactures at this new plant is a product that the Department is proposing to ban under this new rule – non-condensing gas tankless water heaters. Rinnai’s new facility alone currently employs 122 people, including 78 jobs held by female workers and 102 jobs held by minority workers. Further, Rinnai has 450 employees in sales, service, customer care, and supply chain, among other areas, many of which work to support the sales, installation, and servicing of non-condensing tankless water heaters.

Rinnai supports efforts to increase energy efficiency and reduce energy use. Rinnai has a goal of becoming carbon neutral by the year 2050. The company’s brand promise is to “Create a Healthier Way of Living.” The Rinnai Innovation Manifesto (RIM 2050) is focused on ensuring we achieve our sustainability goals including 2030 “low-carbon targets” and decarbonization by 2050. Rinnai believes that all of its products move the United States in that direction. All of Rinnai’s residential gas tankless water heaters are 0.81 UEF level or higher – representing a substantial improvement in energy savings and emissions reductions over traditional gas storage

water heaters. Rinnai is also a proud corporate sponsor of The Midwest Food Bank, Folds of Honor, and Bloom Closet, a local non-profit supporting the needs of foster children.

Tankless gas water heaters have been expanding in the U.S. market, in large part by replacing storage water heaters, helping improve efficiency, and reduce greenhouse gas emissions. This includes both non-condensing and condensing models of gas tankless water heaters. Since their inception in 2004, gas tankless water heaters have grown to 10% of the water heater market in the U.S. and are projected to grow to 12% by 2027. For sales of non-condensing gas tankless water heaters alone, from 2005 to 2022, this has already saved 339 million MMBtus (0.34 quads) and 37.7 billion pounds (17 million metric tons) of carbon emissions.

The Department has proposed a rule that would eliminate non-condensing gas tankless water heaters. The proposed rule exceeds the Department's authority, is arbitrary and capricious, and will adversely impact Rinnai's business, undermining tens of millions of dollars in capital investment and threatening the livelihoods of hundreds of American workers. If the proposed rule were to go into effect, it would eliminate one of Rinnai's two residential tankless water heater product offerings and significantly impact Rinnai's tankless water heater sales. Rinnai anticipates that most of the proscribed non-condensing tankless water heater sales will shift to less-efficient gas tank water heaters, rather than condensing tankless water heaters, and thus would result in a substantial loss of efficiency and energy savings for consumers. Moreover, the proposed rule limits the affordable, efficient options available to consumers, will halt or impede a market-driven shift toward more efficient water heaters, and will result in a net reduction in energy savings and an increase in carbon emissions. The proposed rule also runs afoul of statutory provisions in the Energy Policy & Conservation Act, most notably the unavailability provision.

The Department's own analysis predicts that the proposed standard for gas tankless water heaters will generate minimal consumer benefits in terms of life cycle cost (LCC) savings and national energy savings, while imposing substantial costs. To be clear, Rinnai presents information that shows the Department's approximations of life cycle costs and energy savings are flawed and inaccurate – and that the LCC is likely to be *negative* for this proposed standard. But even taking the Department's analysis at face value, the proposed elimination of non-condensing tankless water heaters provides only *de minimis* efficiency gains and cost savings for the remaining condensing tankless water heaters. In the case of net present value of consumer benefits over 30 years, the Department's analysis confirms that almost all of the benefit from its proposed suite of standards is from other (electric) product standards, and that at a 7% discount rate, only 1.4% of the total claimed benefits are from the gas tankless water heater proposed standard. *See* NOPR at 49150, Table V.26. The Department's analysis likewise shows that there are *de minimis* national energy savings over 30 years for gas tankless water heaters. And the Department's analysis further shows that the proposed standard for gas tankless water heaters is forecast to produce 0.4 quads of energy savings, out of a total of 26.6 quads of energy savings, or only 1.5% of total savings across all water heater technologies. *See* NOPR at 49148, Table V.24.

Rinnai shows in the comments below that even these minimal savings are inflated – among other issues, in the case of LCC savings, by underestimating installed costs of condensing tankless water heaters, particularly in the water heater replacement market (which constitutes approximately 70% of all sales), and in the case of energy savings, by failing to take into account loss of efficiency from product substitution from non-condensing gas tankless water heaters to gas storage water heaters.

Under the current efficiency standard, gas tankless water heaters, have been expanding in the U.S. market, in large part by replacing gas storage water heaters, helping improve efficiency and reduce greenhouse gas emissions. Tankless gas water heaters, since their inception in 2004, have grown to 10% of the water heater market in the U.S. and are projected to grow to 12% by 2027. For the non-condensing gas tankless water heaters alone, from 2005 to 2022, this has already saved 339 million MMBtus (0.34 quads) and 37.7 billion pounds (17 million metric tons) of carbon emissions. The Department’s proposed rule threatens to halt this market-driven trend toward more efficient products.

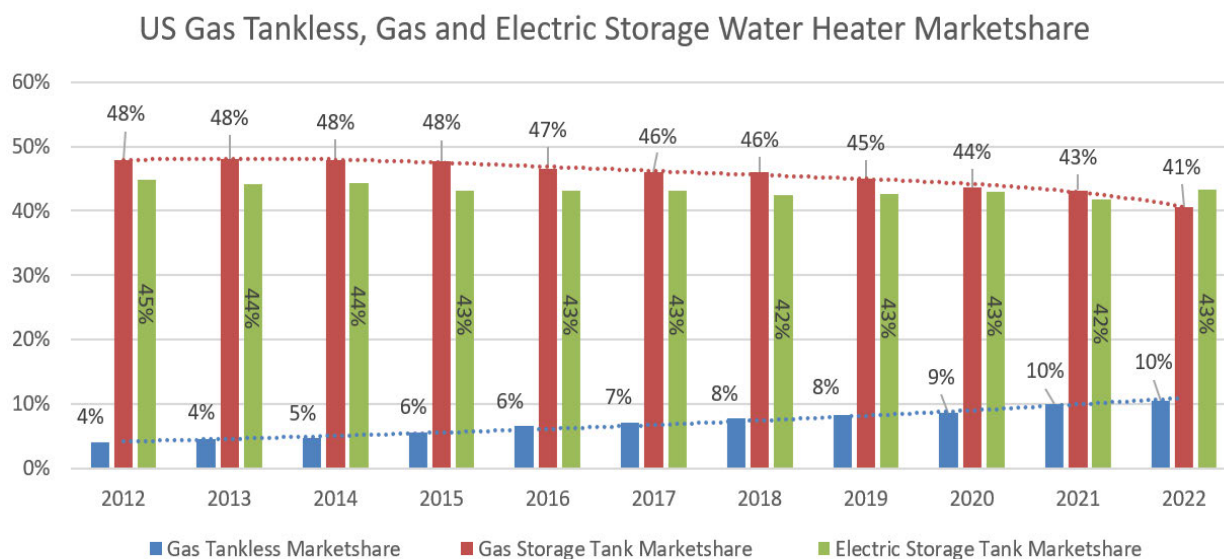
Accordingly, Rinnai respectfully requests that the Department correct deficiencies in its preliminary Technical Support Document, and either modify its proposal to set separate efficiency standards for non-condensing and condensing gas tankless (instantaneous) water heaters or withdraw its proposed standard for gas instantaneous water heaters and retain the existing minimum efficiency standard.

BACKGROUND

Historically, the consumer water heater market in the United States has been dominated by storage water heaters in which water is heated in a tank. Such gas storage water heaters are the least expensive on the market, but they are also the least efficient. As a result, over the past two decades, “instantaneous” or “tankless” water heaters have experienced a growth in market share driven by their improved performance and superior efficiency (resulting in lower utility costs), despite their generally higher price tag.¹ Figure 1 below shows the market share of gas tankless, gas storage, and electric storage water heaters relative to the total water heating market over the past decade. As can be seen, gas tankless water heating market share has demonstrated significant growth, increasing from 4% in 2012 to 10% market share in 2022, while gas storage water heater market share declined from 48% to 41% over the same period.

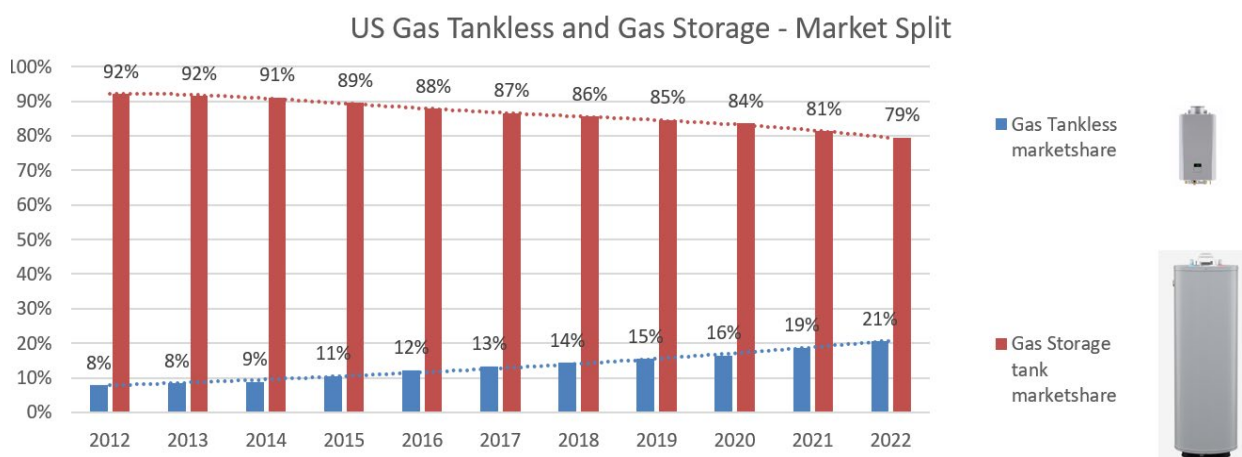
¹ These are generally referred to throughout as gas tank water heaters (or gas storage water heaters) and gas tankless water heaters (or gas instantaneous water heaters), although the terms are used interchangeably. These are sometimes abbreviated as GSWH and GIWH.

Figure 1: Gas tankless, gas storage and electric water heating market share 2012 – 2022:



This can be more clearly seen by looking at the market split between gas tankless and gas storage water heaters. As seen in Figure 2 below, there has been a decline in the gas storage water heating market, dropping from 92% to 79% between 2012 and 2022, while gas tankless water heaters increased from 8% to 21% market share over the same time frame.

Figure 2: Gas tankless and gas storage water heating market share 2012-2022:



Furthermore, under the Department’s existing energy efficiency standards, the gas tankless water heater market is expected to grow and reach 12% in 2027 across the entire water heating market, confirming its benefits and the preference by many consumers.

Tankless water heaters can be either gas or electric powered, and gas tankless water heaters can be either “condensing” or “non-condensing.” Five key differences between the condensing and non-condensing gas tankless technologies are cost, efficiency, venting, condensate, and installation space requirements. Generally speaking, condensing tankless water heaters are more efficient but more expensive; they also use different venting materials and designs and require the addition of condensate drainage or a condensate pump and neutralizer to manage the condensate produced by the accompanying combustion and heat recovery process. Non-condensing tankless water heaters, on the other hand, cost less and are slightly less efficient; they use different venting and do not require a condensate drain or a condensate pump or a neutralizer.

These differences between condensing and non-condensing tankless water heaters result in different installation requirements that may not be compatible with existing buildings without substantial modifications, may therefore not be suitable for emergency replacements, and may not be appropriate for certain locations. Notably, the majority of existing buildings were constructed with non-condensing technology in mind; Energy Information Agency data shows that “more than half of all commercial buildings were constructed before condensing commercial water heaters were introduced to the market.” Energy Conservation Program for Appliance Standards: Energy Conservation Standards for Residential Furnaces and Commercial Water Heaters: Proposed Rule, 84 Fed. Reg. 33,011 (July 11, 2019). In addition, non-condensing tankless water heaters are still dramatically more efficient than storage water heaters while being only modestly more expensive. There are also regional differences in adoption of non-condensing gas tankless water heaters, which are more prevalent in the Southeast, reflecting suitability for different locations and structures. And non-condensing models are often selected by consumers because they are more affordable than condensing models while providing many of the same practical benefits.

The two types of gas tankless water heaters thus have different features, installation capabilities and suitability, and pricing, and serve different construction markets and needs. The non-condensing gas tankless water heaters are an important market option compared to storage water heaters because they offer installation flexibility, preserve space in homes, and provide energy and associated cost savings. And for many consumers who urgently need to replace their water heater, the non-condensing tankless is a cost-effective alternative with relative ease of installation, whereas the condensing tankless may be cost prohibitive and may not be compatible with the existing infrastructure. In short, non-condensing tankless water heaters are preferred by many builders, installers, and distributors, and are a better alternative to gas storage water heaters for many consumers, especially in the replacement market for existing buildings where there is often a need for urgency.

There are roughly 72 Rinnai models of gas tankless water heaters currently on the market.² Of those, only 32 models meet the 0.91 or higher UEF in the Department’s proposed rule and all of those are condensing technology. Thus, the rule, were it to go into effect,

² Model data is drawn from AHRI information.

potentially eliminates more than half of the Rinnai gas tankless water heater models on the market today.

Because of the market dynamics in the water heating category and the rapid growth rates for gas tankless water heaters in the U.S., Rinnai made strategic investments and built a new manufacturing facility in Griffin, GA, specifically for non-condensing gas tankless water heaters. These investments allow Rinnai to offer highly efficient and more affordable gas tankless water heaters to the consumer as a choice for replacing less efficient storage water heaters.

The different average efficiency levels and product price range for storage, non-condensing gas tankless, and condensing gas tankless water heaters are as follows:

Table 1: (average efficiencies and product prices for types of gas water heaters)³

Product Class	UEF Level	Average Retail Price
Gas storage water heaters (non-condensing)	0.54-0.63	\$580
Gas-fired tankless hot water heaters (non-condensing)	0.81	\$1056
Gas-fired tankless hot water heaters (condensing)	0.91-0.93	\$1509

The Department's existing minimum efficiency standards treat many types of electric, gas, storage, and tankless water heaters differently. For gas water heaters alone, there are 16 different efficiency levels within the categories. But the Department's rules do not differentiate between non-condensing and condensing tankless water heaters, despite their technological differences and the impact that has on consumer preferences, pricing, suitability for certain buildings and in certain locations and installation capabilities.⁴ The existing federal minimum efficiency standards set the baseline efficiency level (or UEF) for *all* gas tankless water heaters at 0.81 UEF, effectively at the efficiency level of *non-condensing* tankless water heaters.

The Department's proposed minimum efficiency standards continue to treat electric, gas, storage and tankless water heaters differently. For example, under the Department's proposed rules, gas storage water heaters would continue to have a much lower minimum efficiency level than gas tankless water heaters, and while the baseline efficiency level for gas storage water heaters may increase slightly, it is not a substantial change. The Department's proposed rule, however, sharply increases the baseline efficiency level for *all* gas tankless water heaters to 0.91 / 0.93 UEF, effectively setting the UEF at the level of *condensing* tankless water heaters. This proposed new standard is only achievable by condensing gas tankless water heaters, and it will

³ Pricing data is taken from www.homedepot.com; average efficiency levels are based on EERE-2017-BT-STD-0019.

⁴ Code of Federal Regulations, Title 10, Chapter II, Subchapter D, Part 430, Subpart C.

make all non-condensing gas tankless water heaters obsolete the date the rule goes into effect, excluding them from the market. The change in the UEF standards is illustrated in Table 2.

Table 2: Change from the Department’s existing standard to proposed standard

Product Class	Current Baseline Efficiency Level	Proposed Baseline Efficiency Level
Gas Tank Water Heater*	0.54 - 0.63	0.59 - 0.68
Technology That Can Achieve	<ul style="list-style-type: none"> • Non-condensing • Condensing 	<ul style="list-style-type: none"> • Non-condensing • Condensing
Gas Tankless Water Heater	0.81	0.91 / 0.93
Technology That Can Achieve	<ul style="list-style-type: none"> • Non-condensing • Condensing 	<ul style="list-style-type: none"> • Condensing <u>only</u>

*For gas-fired storage water heater efficiency band leverages 28-, 38-, and 48-gallon storage capacity for respective draw pattern

**The minimal increase in efficiency level for Storage Gas Water Heaters keeps non-condensing as a viable option for Storage Gas Water Heaters

Accordingly, the Department’s proposed rule would effectively ban non-condensing gas tankless water heaters while allowing less efficient gas storage water heaters **or** more efficient but also more expensive condensing gas tankless water heaters that might not be compatible with or suitable for existing structures. Most consumers would be forced to turn to less efficient gas storage water heaters as a result of these installation and cost hurdles, which the Department did not fully consider in its analysis.

Further, as explained in Rinnai’s August 28, 2023 Letter to the Department of Justice (“Rinnai DOJ Letter”), EERE-2017-BT-STD-0019-0612 (Attachment A), this ban would create a number of detrimental effects on competition by limiting consumer choice, raising prices on more efficient products, eliminating consumers’ option to make like-for-like product replacements, and putting Rinnai at an unjustified disadvantage as a much smaller competitor in the concentrated water heater market. Rinnai has made inroads into the storage water heater market over the past decade, gradually increasing the percentage of gas tankless water heaters by replacing gas storage water heaters with its more efficient products. This market-driven trend has resulted in significant energy savings and significant cost savings to consumers over the past two decades – a trend that is put at risk by the Department’s proposed rule.

COMMENTS

EPCA mandates that the Department incrementally increase the minimum efficiency standards for covered products to maximize the efficiency levels that are technically feasible and

economically justified. *See generally* 42 U.S.C. Section 6295(o)(2)-(3). It bears noting, however, that these are *minimum* efficiency levels, meant to be achievable by the “covered products” in the various types and classes of appliances. While EPCA’s goal is to gradually increase minimum efficiency levels in order to promote energy conservation, its clear emphasis is on practicality and the preservation of consumer and builder choice of appliance options and availability.

Thus, while the Department is not permitted to “backslide” by lowering previously existing standards for specific appliances, Section 6295(o)(1), it also cannot regulate in a way that makes appliances having certain performance characteristics or features unavailable, Section 6295(o)(4). There is a large installed base of appliances in existing buildings that are compatible with the design and infrastructure of those homes, apartments, and condominiums – and Congress mandated that the Department preserve the ability of consumers and builders to choose which appliances to use in their homes and buildings. A similar principle can be seen in related provisions, as in Section 6297(f)(3), which precludes the Department from granting a waiver from exemption to any state or local government regulation that effectively makes any type or class of appliance unavailable.

Section 6295(o) lays out criteria for the Department to issue new or amended regulations. Section 6295(o)(2) explains the affirmative burden the Department must carry to show that any amended rule is technically feasible and economically justified. Section 6295(o)(2)(B) provides criteria for determining whether a standard is economically justified, which include the impact on manufacturers, the life-cycle cost savings from the proposed standard, the energy savings from the proposed standard, any lessening of utility to the consumer of the product, and any lessening of competition, among other things.

Section 6295(o)(3) and Section 6295(o)(4), however, limit what the Department can do. Section 6295(o)(3) prohibits the Department from issuing regulations that do not result in significant conservation of energy. Section 6295(o)(4) makes clear that the Department does not have the authority to amend a standard if the effect is to regulate a product with performance characteristics or features out of existence.

While Section 6295(o) lays out the criteria for issuing new or amended standards, and when the Department is precluded from doing so, Sections 6295(q) directs that the Department “shall specify” a “higher or lower standard” for certain groups of products within a class or type that have certain capacities or performance-related features and would justify a different standard, taking into account their utility to consumers.

When these provisions are read in context, it is clear that the Department cannot issue an amended standard for gas tankless water heaters that eliminates non-condensing gas tankless water heaters by raising the minimum efficiency level to that of the condensing gas tankless water heaters, the product having the highest efficiency level in the class. The proposed rule for gas tankless water heaters does not adequately account for technical feasibility, economic justification, or energy savings. And the proposed rule makes unavailable performance

characteristics and features that are valuable to consumers. The Department therefore should reconsider its proposal and utilize Section 6295(q) to issue a “higher or lower” standard for non-condensing and condensing gas tankless water heaters —the only viable alternative is to withdraw the proposed rule.

I. THE DEPARTMENT MAY NOT MAKE NON-CONDENSING TANKLESS WATER HEATERS UNAVAILABLE PURSUANT TO SECTION 6295(o)(4).

One of the express limits on the Department’s authority to issue new or amended standards for covered products is the prohibition on making unavailable performance characteristics, features, sizes, capacities and volumes that are currently available on the market. Section 6295(o)(4). In other words, through EPCA, Congress intended to preserve consumer and builder choice among existing product options – recognizing that many buildings are designed and built to accommodate certain types of appliances and that limits what can easily be used in replacement scenarios.

Specifically, the Department cannot amend a standard if a preponderance of the evidence shows that that standard is likely to result in

the unavailability in the United States in any covered product type (or class) of performance characteristics (including reliability), features, sizes, capacities, and volumes that are substantially the same as those generally available in the [U.S. at the time].

Id. (emphasis added) (the “unavailability provision”). The Department, however, reads this provision to say that it cannot amend a standard if the new standard is likely to result in

[the unavailability of] those features that provide a consumer unique utility during the operation of the appliance in performance of its major function(s).

86 FR 247, at 73955 (emphasis added). As can readily be seen, the Department’s reading represents a radically narrowed interpretation of the statutory terms and is not supported by the provision’s plain language.

On its face, the unavailability provision is not limited to standards that would make a product type or class unavailable – indeed, it says that “in” a product type or class, products with certain performance characteristics, features, *etc.* cannot be made unavailable. Congress could easily have said that a standard could not make a product type or class (such as instantaneous water heaters) unavailable, if that was what it intended. Instead, however, Congress used broad language to describe what amended regulations cannot permissibly do – make unavailable “performance characteristics (including reliability), features, sizes, capacities, and volumes” that were “generally available” at the time.

There is no basis categorically to exclude different technologies from the scope of this provision, particularly where those different technologies have different installation capabilities

(size, shape, location, drainage and venting requirements), different suitability for certain buildings or regions, and different costs. As commenters have noted, characteristics or features that make products compatible with the existing utility infrastructure of a building provide utility to the consumer and are not merely an “installation cost” that is “incidental to the appliance’s purpose.” See Oct. 12, 2021 Joint Comments of Spire Inc., *et al.* (Dkt. No. EERE–2018–BT–STD–0018) at 11. Indeed, as noted above, the purpose of the unavailability provision is to ensure that the Department could not change the performance characteristics of product options available to consumers, impacting in particular consumers’ ability to replace existing appliances with like products that do not require building modifications or infrastructure additions. See H.R. Rep. No. 100-11 at 22-23 (1987) (EPCA’s unavailability provision was designed to ensure that standards do not deprive purchasers of “product choices and characteristics, features, sizes, *etc.*” and that energy savings are achieved “without sacrificing the utility or convenience of appliances to consumers”); see also 73 FR 58772 (Oct. 7, 2008) (recognizing separate equipment classes for standard size PTACs and non-standard size PTACs because of different installation hurdles and costs); 10 C.F.R. § 430.32(h)(3) (recognizing separate product classes for residential clothes dryers based on installation space constraints and differences in electric power supply). In short, characteristics or features that are important to consumers in selecting, installing, and being able to use an appliance are within the plain language of the unavailability provision.

Certainly, there is no basis in this broad statutory language to limit its scope to what consumers perceive during operation. There is no reference in the unavailability provision to “consumer utility.” Consumer utility is referenced in the provision on whether an amendment is economically justified. 42 U.S.C. 6295(o)(2). And it is referenced in the “special rule” subsection that requires the Department to issue higher or lower standards for groups of products within a type or class in certain circumstances. 42 U.S.C. 6295(q). There is no basis to read Section 6295(q) as a redundant “companion” provision to Section 6295(o)(4), as the Department suggests. Section 6295(o)(4) limits the Department’s ability to issue new or amended standards that would make products with certain performance characteristics or other features unavailable. Section 6295(q) requires that the Department evaluate groups of products within its established product classes as to whether a different efficiency standard is justified. The provisions do not use the same language –the word “feature” appears in both provisions, but it is one out of a longer list in (o)(4). And (q) uses “utility to the consumer” as a factor in determining whether a separate standard is justified, while (o)(4) does not reference utility. The Department cannot do an end-run around the limits on its authority under (o)(4) by relying on a narrow reading of a term in (q) that does not appear in (o)(4).

Regardless, even under the Department’s unduly narrow reading, non-condensing gas tankless water heaters still provide utility because the consumer’s “operation of or interaction with the appliance” necessarily depends on whether the appliance can be installed at all. The Department’s argument that installation costs, even where significant building modifications are required, should be considered only under the “economically justified” analysis and not under the unavailability provision is incorrect. The unavailability provision was designed to ensure that even economically justified standards achieve energy savings “without sacrificing the utility or convenience of appliances to consumers.” H.R. Rep. 100-11 at 22-23 (1987). And

installations costs and capabilities are undoubtedly part of consumer utility and convenience. The relevant question thus is whether non-condensing gas tankless water heaters have “performance characteristics” or “features” that are generally available and that are important to consumers, and they plainly do. Accordingly, the Department may not enact a rule that makes them unavailable.

II. THE DEPARTMENT SHOULD SPECIFY A DIFFERENT STANDARD FOR NON-CONDENSING AND CONDENSING GAS TANKLESS WATER HEATERS PURSUANT TO SECTION 6295(q).

There is a simple solution here for the Department’s desire to increase efficiency standards while still preserving product availability: have a separate standard for non-condensing and condensing gas tankless water heaters. There are two ways to do this. One would be to simply create new product classes for non-condensing and condensing gas tankless water heaters. A second way is to specify a separate standard for a group of products within the existing gas tankless water heater category; in this regard, because the existing standard is 0.80 / 0.81 UEF for gas tankless water heaters, a separate *higher* standard could be created for condensing gas tankless water heaters of 0.91 / 0.93 UEF (or alternatively, issue an amended standard of 0.91 / 0.93 UEF but then have a separate *lower* standard for non-condensing gas tankless water heaters of 0.81 UEF).

Both of these solutions are well established in prior Department regulations and actions. There are 16 different classes for gas water heaters alone, with multiple UEF standards for products serving the same function. For example, gas tank water heaters have different UEF requirements depending on size / storage capacity and draw pattern, and the Department’s proposed new rule for tankless water heaters specifies different levels for different draw patterns. And historically the Department has done this as well; it has previously provided for separate standards for products with different installation and space requirements, including certain dryers, air conditioners, furnaces, and heat pumps. These prior Department decisions reflect EPCA’s requirement to promulgate energy efficiency standards that are responsive to building limitations. In the case of ventless driers, for example, the Department recognized consumer costs associated with venting requirements as a basis for separate product classes, and for space-constrained air conditioners and heat pumps, the Department recognized that physical limitations in building locations (including footprint and head space limits) impacted installation requirements. *See* 73 FR 58772, 58782 (Oct. 7, 2008) (recognizing separate equipment classes for standard size PTACs and non-standard size PTACs because of different installation hurdles and costs associated with common building limitations); 10 C.F.R. § 430.32(h)(3) (recognizing separate product classes for residential clothes dryers based on installation space constraints and differences in electric power supply). The Department used these building-associated installation limitations as a basis for defining separate product classes for these appliances, and it should do the same here.

Section 6295(p) states that the Department must consider as part of its procedures for issuing new or amended rules whether “a higher or lower standard” should apply to groups of products within a type or class. And Section 6295(q) says the Department “shall specify” a “higher or lower standard” for any group of products within a type or class that “have the same function or intended use” where the products “have a capacity or other performance-related feature which other products within such type (or class) do not have *and* such feature justifies a higher or lower standard from that which applies (or will apply) to other products within such type (or class).” *Id.* (emphasis added). Section 6295(q) then goes on to state in a sub-section that, “In making a determination . . . *whether a performance-related feature* justifies the establishment of a higher or lower standard, the Secretary shall consider such factors as *the utility to the consumer of such a feature . . .*” *Id.* (emphasis added).

In its proposed rule, the Department found that “non-condensing technology does not constitute a performance-related ‘feature’ that provides a distinct utility to consumers as prescribed by EPCA at 42 U.S.C. 6295(q)(1).”⁵ This finding exceeds the Department’s authority under that provision and is arbitrary and capricious for two reasons.

First, the Department errs by limiting its analysis to “non-condensing technology,” ignoring important features associated with non-condensing technology such as ease of installation and reduced likelihood of building modifications that could be required for condensate piping, pump, neutralizer, etc. The Department bases its interpretation on reading “performance-related feature” as limited to features that provide consumer utility (which it then also defines very narrowly). But Section 6295(q) makes clear that “consumer utility” is distinct from whether a product or group of products has “capacity or other performance-related feature[s].” Only after determining whether there are capacities or “performance-related features” does the Department consider the “utility to the consumer” in deciding whether a separate standard is justified. Thus, the utility to the consumer is not the measure of whether a characteristic is a “performance-related feature,”⁶ although it is an important consideration in determining whether there should be a higher or lower standard for a group of products within an existing class.

Thus, the Department should first determine whether there are capacities or other performance-related features that make a group of products distinct from other products in the

⁵ The Department relies in part for this interpretation on its Final Interpretive Rule, 86 Fed. Reg. 73947 (2021), which addressed gas-fired furnaces and is the subject of a pending legal challenge in the D.C. Circuit. While focused on a different product class, that interpretation has similar flaws and also lacks statutory support; moreover, the Department acted arbitrarily and capriciously in reversing its prior final rule, which did not represent a departure from a long-standing interpretation.

⁶ The Department uses “consumer utility” to limit “performance-related feature” not only for purposes of considering a special standard under (q) but also for purposes of interpreting the unavailability provision in 6295(o)(4), which has broader language and does not reference consumer utility.

same class. That is undoubtedly the case here, where non-condensing gas tankless water heaters have distinct features from condensing gas tankless water heaters, including the ability to avoid difficulties in installation where condensate management is technically difficult or economically impractical. The only “feature” that the Department recognized in its analysis, however, was the fact that non-condensing water heater products use “non-condensing technology.”⁷ It refused to consider installation and related requirements associated with the technology that could also provide utility. Merriam-Webster defines “feature” as a “prominent part or characteristic,” and it defines “capacity” as “the facility or power to produce, perform, or deploy.” Thus, by limiting its analysis to operation of “non-condensing technology,” the Department failed to consider all capacities or other performance-related features of non-condensing technology (e.g., installation requirements and suitability, lack of condensate). Put differently, the issue is that the Department failed to consider the full range of performance-related features that provide utility to the consumer.

Properly considered, the non-condensing product has multiple capacities and other relevant performance-related features that should form the basis for the Department’s analysis under a plain reading of 6295(q)(1). Chief among those is that non-condensing gas tankless water heaters can be used to replace gas storage water heaters with relative ease of installation and limited building modification, offering consumers a readily available more-efficient option. These products also allow non-condensing gas tankless water heaters that have reached the end of their useful life to be replaced without any building modification. This is a particularly important feature because there are many existing buildings (e.g., large apartment buildings) that cannot accommodate a change from non-condensing water heaters to condensing water heaters, in part because the latter requires different venting and/or drainage – and thus non-condensing technology is able to be installed (and thus perform) where condensing technology would not be.⁸ Similarly, there are regional preferences for the type of technology based in part on various installation and operational considerations. In other words, a full analysis of non-condensing technology requires considering what that technology enables, and Rinnai’s market experience has shown that non-condensing tankless water heaters offer the “feature” of operation without

⁷ The Department only considers features that a “layperson” would notice in their interaction with the product. Section 6295(q) requires that the Department specify a different standard for products “*hav[ing] the same function or intended use*” when there are different capacities or performance-related features – so the fact that two products both provide hot water (i.e., have the same function) does not mean that they do not have distinct capacities or performance-related features. This undermines the Department’s insistence that utility must be evaluated during the performance of the appliance’s major function – in the context of (q), the products already have the same function, and that should not be the focus of the inquiry.

⁸ Requiring consumers to change venting systems, drills holes in walls, expand or relocate appliance spaces, or thread vents and condensate lines through existing structures are not just “installation cost adders” with solely economic implications, as the Department treats them. In prior cases, the Department has avoided these sorts of building alterations by defining separate product classes, such as “space constrained air conditioners” and “space constrained heat pumps.”

the need for installing condensate management, a “feature” that is lost when the only tankless technology available is “condensing.”⁹

Second, the Department reads “utility” too narrowly, far afield of the common-sense understanding of the term and without support from the statute or any statutory interpretation principles. The capacities and performance-related features discussed above have utility to consumers that justify a different standard for non-condensing gas tankless water heaters as compared to condensing gas tankless water heaters. But the Department limited its obligation to consider the “utility” of the non-condensing tankless water heater’s features to whether non-condensing technology influences the consumer’s “operation of or interaction with the appliance.” There is no statutory support for such a limited definition. As explained above, EPCA recognizes that consumers need access to a wide variety of appliances to support their energy needs, and the focus in Section 6295(q) is on utility *to the consumer*. This shows that, if anything, “utility” should be read broadly to encompass performance features that provide practical benefits to consumers beyond their “interaction with” the appliance — such as whether an appliance can perform at all in millions of American homes. In short, “utility” in context is not ambiguous and the Department is not owed any deference for its anomalous and unsupported interpretation.

The Merriam-Webster dictionary defines utility as (1) “fitness for some purpose or worth to some end” or (2) “something useful or designed for use.” Under either definition, the more forgiving installation requirements of the non-condensing product and its ability to be installed in certain building configurations and locations (e.g., exterior walls, basements, and other restricted areas) for which condensing products are not always workable (or affordable), provides “utility” to the consumer. Consumers (and builders) don’t need the space for certain materials, don’t need to pay for them, and don’t face installation hurdles that otherwise exist with gas tank water heaters and condensing tankless water heaters. This utility is particularly apparent for consumers in the replacement market who may not have time for burdensome modifications required by condensing gas tankless water heaters, which is often the case but has not been considered by the Department in its analysis of consumer choice and product substitution. And indeed, the Department has previously recognized the utility of similar features in other appliances. *See, e.g.,* Energy Conservation Program: Energy Conservation Standards for Residential Furnaces and Residential Central Air Conditioners and Heat Pumps, 76 FR 37408, 37446 (June 27, 2011) (recognizing separate classes of “space constrained” air conditioning units from standard air conditioners because their ability to accommodate space constraints qualified as a performance-related feature); 10 C.F.R. § 430.32(h)(3) (recognizing separate product classes for residential clothes dryers based on installation space constraints and differences in electric power supply); Energy Conservation Program for Consumer Products: Energy Conservation Standards for Water Heaters, 66 FR 4474 at 4478 (Jan. 17, 2001) (recognizing separate product class for tabletop water heaters based on their ability to accommodate the product’s “strict size limitations”). Here,

⁹ The subsequent need for consumers is to either absorb the costs of adding a condensate management system where doing so is technically feasible or substituting to other products where not, such as lower-efficiency gas storage water heaters.

the Department suggests that installation considerations and even whether a product is able to be installed in a certain building at all, on exterior walls, or only with substantial building modifications cannot be considered as part of the utility to the consumer. There is no statutory basis for such a cramped reading of utility – and indeed, the Department apparently found the need to address the Rheem and Bradford White comments on the importance of access/installation requirements in making its finding that storage and tankless water heaters should be in different categories, *see* NOPR at 49,078.¹⁰

Moreover, even under the Department’s cramped definition of utility, the installation and space requirements of non-condensing tankless water heaters provide utility to consumers distinct from that provided by condensing tankless water heaters. The consumer’s “operation of or interaction with the appliance” necessarily depends on whether the appliance can be installed at all. Thus, for consumers who cannot install condensing tankless heaters (because of practical space or other constraints) but can install non-condensing tankless heaters, non-condensing heaters’ more forgiving space and installation requirements allow consumers to receive the benefits of tankless heaters — benefits that the Department has recognized. *See* 88 FR 49058 at 49078 (justifying different product classes for tank and instantaneous heaters on the basis that “instantaneous water heaters provide a continuous supply of hot water, up to the maximum flow rate”). Put differently, but for these different installation requirements, many consumers simply could not receive benefits of a recognized class of appliances.

Thus, pursuant to Sections 6295(q), the Department is required to issue a higher or lower standard for non-condensing and condensing gas tankless water heaters, which could be the existing 0.81 UEF for non-condensing and the proposed 0.91 / 0.93 UEF for condensing, because the products have distinct capacities and performance-related features that provide consumer utility and therefore justify a separate standard.

III. THE PROPOSED RULE FOR GAS TANKLESS WATER HEATERS WILL NOT RESULT IN “SIGNIFICANT CONSERVATION OF ENERGY” AND THEREFORE IS NOT PERMISSIBLE UNDER SECTION 6295(o)(3).

Under the Department’s own analysis, its proposed rule for gas tankless water heaters will have minimal energy savings. These estimated energy savings – which in any event are overstated and uncertain – do not qualify as “significant conservation of energy” under Section 6295(o)(3), and thus the Department cannot permissibly issue this rule.

¹⁰ Rinnai disagrees with the Department’s claim that “cost” cannot be considered as part of the utility to the consumer or builder. Nothing in the statutory text or structure makes consideration of cost exclusively a concern under the provision relating to economic justification, 6295(o)(3) – and certainly for lower- to middle-income consumers, having more efficient products that they can afford is a useful feature, i.e., the “consumer utility” is linked to minimizing consumer cost. But this issue need not be resolved because there are other bases for finding that non-condensing gas tankless water heaters provide utility to consumers beyond cost.

For national energy savings over 30 years of shipments, there are relatively small energy savings from the proposed rule for gas tankless water heaters. The Department's analysis shows that the proposed standard for tankless water heaters is forecast to produce 0.4 quads of energy savings over 30 years, or only 1.5% of the 26.6 quad total savings across all water heater technologies covered by the Department's proposed rules. *See* NOPR at 49148, Table V.24 (below).

TABLE V.24—CUMULATIVE NATIONAL ENERGY SAVINGS FOR CONSUMER WATER HEATERS; 30 YEARS OF SHIPMENTS [2030–2059]							
Energy savings	Product class	Trial standard level					
		1	2	3	4	5	6
		quads					
Primary energy	GSWH	0.4	1.8	1.8	1.8	1.8	7.5
	OSWH	0.001	0.001	0.001	0.001	0.001	0.001
	Small ESWH (20 gal $\leq V_{\text{eff}} \leq 35$ gal and FHR < 51 gal)	0.00	0.00	1.5	1.5	1.5	1.5
	ESWH (20 gal $\leq V_{\text{eff}} \leq 55$ gal), excluding Small ESWH.	0.00	24.3	28.5	33.3	34.3	34.3
	ESWH (55 gal $< V_{\text{eff}} \leq 120$ gal)	0.001	0.001	0.001	0.005	0.01	0.01
	GIWH	0.3	0.4	0.4	0.7	0.8	0.8
	Total	0.7	26.6	32.4	37.4	38.5	44.1

Similarly, in the case of net present value of consumer benefits over 30 years, the Department's analysis confirms that almost all of the benefit is from other (electric) product standards, and that at a 7% discount rate, only 1.4% of the total claimed benefits are from the gas tankless water heater proposed standard. *See* NOPR at 49150, Table V.26 (below).

TABLE V.26—CUMULATIVE NET PRESENT VALUE OF CONSUMER BENEFITS FOR CONSUMER WATER HEATERS; 30 YEARS OF SHIPMENTS [2030–2059]							
Discount rate	Product class	Trial standard level					
		1	2	3	4	5	6
		billion 2022\$					
3 percent	GSWH	1.6	7.1	7.1	7.1	7.1	10.6
	OSWH	0.01	0.02	0.02	0.02	0.02	0.02
	Small ESWH (20 gal $\leq V_{\text{eff}} \leq 35$ gal and FHR < 51 gal)	0.0	0.0	4.2	4.2	4.2	4.2
	ESWH (20 gal $\leq V_{\text{eff}} \leq 55$ gal), excluding Small ESWH.	0.0	152	177	213	214	214
	ESWH (55 gal $< V_{\text{eff}} \leq 120$ gal)	0.005	0.005	0.005	0.03	0.1	0.1
	GIWH	1.3	2.6	2.6	3.9	4.8	4.8
	Total	3.0	161	191	228	230	234
7 percent	GSWH	0.4	2.0	2.0	2.0	2.0	(1.6)
	OSWH	0.004	0.01	0.01	0.01	0.01	0.01
	Small ESWH (20 gal $\leq V_{\text{eff}} \leq 35$ gal and FHR < 51 gal)	0.0	0.0	0.6	0.6	0.6	0.6
	ESWH (20 gal $\leq V_{\text{eff}} \leq 55$ gal), excluding Small ESWH.	0.0	53.0	61.3	74.6	74.2	74.2
	ESWH (55 gal $< V_{\text{eff}} \leq 120$ gal)	0.002	0.002	0.002	0.01	0.02	0.02
	GIWH	0.4	0.8	0.8	1.2	1.4	1.4
	Total	0.8	55.8	64.6	78.3	78.1	74.6

Note: totals may not equal sums due to rounding.

These amounts are small enough that they do not qualify as a “significant conservation of energy” under the statute, particularly when the adverse impact on manufacturers, loss of consumer options, and other costs are taken into account. For purposes of comparison, the Department is predicting that its proposed rule will result in 0.4 quads of energy savings over 30 years, from 2030 – 2059. But in the past two decades (2005-2022), *non-condensing gas tankless water heaters* alone – excluding condensing gas tankless water heaters – have contributed 0.34 quad of energy savings.

Moreover, the Department’s analysis *overstates* the energy savings from its proposed rule because, among other things, it fails to account for the possibility that foregone sales of non-condensing gas tankless water heaters will instead change to sales of non-condensing gas storage water heaters. Rinnai estimates that under the Department’s proposed rule for gas tankless water heaters, 80% or more of Rinnai’s current non-condensing tankless sales will switch to sales of tank gas water heaters, while 20% or less will switch to condensing tankless. This is based on the product costs, installation-related capabilities and considerations, and building or climate suitability for each type of product. Gas storage water heaters are non-condensing, and do not require separate condensate management, and so have installation considerations relatively closer to those of non-condensing tankless gas water heaters. Storage water heaters are also closer in cost to (and less expensive than) non-condensing tankless water heaters. Condensing tankless water heaters, by comparison, cost more and require additional infrastructure (condensate management) that is more expensive, may require building modification, or may not be workable at all. Therefore, the elimination of an affordable, efficient product with relative ease of installation will force consumers to choose between a lower cost, lower efficiency option with ease of installation versus a higher-cost, higher-efficiency option that may have installation challenges or require building modification. Historic purchasing patterns in the marketplace show that many consumers needing an urgent replacement will choose a lower-cost option with ease of installation. Given rational consumer decision making, particularly in emergent replacement situations, consumers will likely replace storage water heaters with storage water heaters, and may also replace non-condensing instantaneous water heaters with storage water heaters.

The Department’s analysis ignores this possibility – that there may be a market shift back toward gas storage water heaters – and instead simply assumes that there will be no switching between non-condensing tankless and non-condensing storage water heaters. This assumption ignores the impact with condensing tankless of the switching costs and the installation considerations, including that a substantial percentage of buildings may not be easily converted to condensing technology – particularly for the replacement market, which represents almost 70% of all sales of water heaters. While the Department acknowledges that almost all storage water heaters are non-condensing and that switching to condensing technology would have “significant installation costs,” NOPR at 49119, it ignores that switching to *non-condensing tankless* does not have the same challenges. The Department thus fails to consider the risk of shifting to sub-optimal product alternatives, reflected in the market shift over the past two decades from gas storage water heaters to non-condensing tankless water heaters. As discussed in Section V below, the Department fails to provide the data underlying its “Consumer Choice

Model” which in any event appears to ignore this possibility and thus fails to do a proper consumer choice analysis. As a result, the Department’s energy savings calculations do not account for product choices that address the water heater replacement market and substitution of non-condensing gas tankless water heaters for gas storage water heaters.

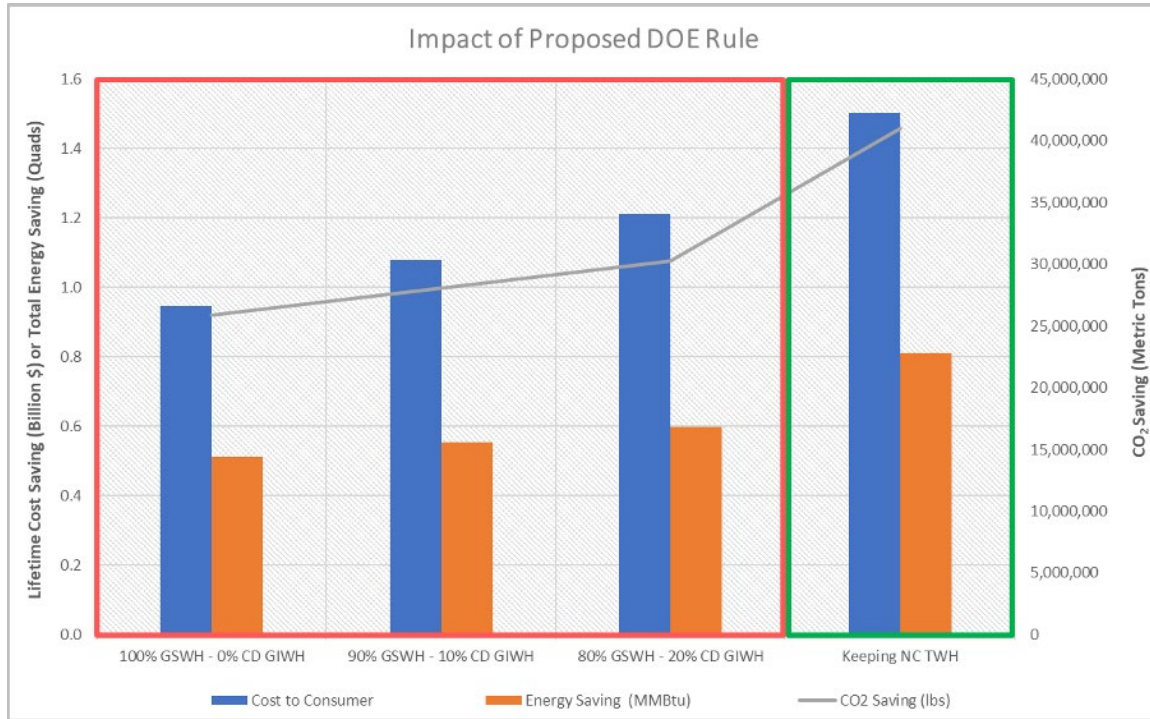
If 80% of what would be sales of non-condensing tankless gas water heaters instead are tank gas water heaters, there will be significant losses in energy savings, emissions reductions, and life-cycle cost savings from 2030 – 2049 (i.e., over the first 20 years that the proposed rule would be in effect). This can be seen in Table 3 below and also graphically in Figure 3. The higher the percentage of sales that use gas tank water heaters with the elimination of a non-condensing tankless option, the more energy savings decrease and emissions increase. But even if only about **31% of sales** of non-condensing tankless gas water heaters were to switch to tank gas water heaters under the proposed rule, there would still be a **net loss of 0.4% in energy savings** and of 0.04% in emissions reductions.

Table 3: Impact of Shift to Storage Water Heaters Upon LCC, Energy Savings, and Emissions Savings, 2005 – 2049

	% Allocation of NC TWH to Storage WH or CD TWH					
	100% Tank - 0% CD TWH		90% Tank - 10% CD TWH		80% Tank - 20% CD TWH	
	Total Saving Losses	% Loss	Total Saving Losses	% Loss	Total Saving Losses	% Loss
Lost Cost Saving (\$)	\$554,066,897	37%	\$422,213,207	28%	\$290,359,517	19%
Lost Energy Saving (Quads)	0.30	37%	0.26	32%	0.21	26%
Lost CO2 Saving (Metric Tons)	15,129,917	37%	12,939,286	32%	10,748,656	26%
Compared to EL-02 Storage Water Heaters, non-condensing TWH have saved the consumer between 2005 to 2022:						
Cost Savings (\$):	\$628,186,634					
Energy Savings (Quad):	0.34					
CO ₂ Savings (Metric Tons)):	17,153,906					
If not eliminated, compared to EL-02 Storage Water Heaters, non-condensing TWH will contribute to additional savings between 2030 to 2049:						
Cost Savings (\$):	\$554,066,897					
Energy Savings (Quad):	0.30					
CO ₂ Savings (Metric Tons)):	15,129,917					
Baseline: Non-condensing TWH Continue to Remain in Market - Total Savings 2005-2049						
Cost Savings (\$):	\$1,501,225,945					
Energy Savings (Quad):	0.81					
CO ₂ Savings (Metric Tons)):	40,994,010					
Key Takeaways						
Keeping non-condensing TWHs will continue to provide savings to the consumer						
Even going from 100% tank to 80% tank/20% condensing TWH has marginal impact on energy and CO ₂ savings						
Keeping non-condensing TWHs can provide 19%-37% in cost savings to the consumer						
Keeping non-condensing TWHs can provide 26%-37% in energy savings to the consumer						
Keeping non-condensing TWHs can provide 26%-37% in CO ₂ reduction						

*Estimated volumes leveraging modified version of 2023
Energy use and cost data leveraging Federal Register EERE-2017-BT-STD-0019 and Technical Support Document (TSD) EERE-2017-BT-STD-0019-0058*

Figure 3: Comparison of Impact on LCC Savings, Energy Savings, and Emissions Savings for Existing Efficiencies and Proposed Tankless Gas Water Heaters, 2005 – 2049.



Thus, if any meaningful percentage of foregone non-condensing gas tankless water heater sales instead are gas storage water heaters, there will be significant losses in energy savings, emissions reductions, and lifetime cost savings. The higher the percentage of sales that use gas storage water heaters with the elimination of a non-condensing tankless option, the more energy savings decrease and emissions increase.

Extending this analysis to the 30-year time frame used by the Department has the same results, simply with larger numbers, as can be seen in Table 4 below.

Table 4: Impact of Shift to Storage Water Heaters Upon LCC, Energy Savings, and Emissions Savings Until 2059

	% Allocation of NC TWH to Storage WH or CD TWH					
	100% Tank - 0% CD TWH		90% Tank - 10% CD TWH		80% Tank - 20% CD TWH	
	Total Saving Losses	% Loss	Total Saving Losses	% Loss	Total Saving Losses	% Loss
Lost Cost Saving (\$)	\$1,132,942,759	54%	\$863,331,483	42%	\$593,720,207	29%
Lost Energy Saving (Quads)	0.92	82%	0.80	71%	0.68	61%
Lost CO2 Saving (Metric Tons)	30,937,293	54%	26,457,944	47%	21,978,595	39%
Compared to EL-02 Storage Water Heaters, non-condensing TWH have saved the consumer between 2005 to 2022:						
Cost Savings (\$):	\$628,186,634					
Energy Savings (Quad):	0.34					
CO ₂ Savings (Metric Tons)):	17,153,906					
If not eliminated, compared to EL-02 Storage Water Heaters, non-condensing TWH will contribute to additional savings between 2030 to 2059:						
Cost Savings (\$):	\$1,132,942,759					
Energy Savings (Quad):	0.61					
CO ₂ Savings (Metric Tons)):	30,937,293					
Baseline: Non-condensing TWH Continue to Remain in Market - Total Savings 2005-2059						
Cost Savings (\$):	\$2,080,101,807					
Energy Savings (Quad):	1.12					
CO ₂ Savings (Metric Tons)):	56,801,385					

According to Rinnai’s calculation, under the assumption that non-condensing tankless water heaters would remain available (i.e., the current efficiency standards), there would be an additional 0.61 quads of energy savings over 30 years based on more consumers switching from gas tank to non-condensing gas tankless water heaters— *i.e.*, the predicted savings would increase from the Department’s predicted energy savings of 0.4 quads under its proposed standard to up to 1.01 quads of energy savings under the current rule.

The key conclusion from all this is that the Department’s purported energy savings from its proposed rule, even if they were accurate and reliable, do not show a significant conservation of energy. And there is a substantial likelihood that the Department’s claimed energy savings are not only overstated, but in fact represent a **decrease** from the energy savings that would occur in the absence of the proposed standard. At the least, there is significant uncertainty as to whether the proposed rule will result in **any energy savings**.

In short, the Department’s proposed rule does not “result in significant conservation of energy” and in fact will “thwart the intent of the revised standards by inducing substitution to less efficient products” and increasing emissions. Under Section 6295(o)(3), the Secretary accordingly “may not prescribe an amended or new standard” for gas tankless water heaters.

IV. THE DEPARTMENT HAS NOT SHOWN THAT ITS PROPOSED RULE IS “ECONOMICALLY JUSTIFIED” UNDER SECTION 6295(o)(2)(B).

A. The benefits of the proposed rule are minimal, and in light of the flawed data and the uncertainty in the analysis, are in fact non-existent.

The Department fails to examine the benefits of its proposed standard for gas tankless

water heaters separately, when more than 95% of the purported benefit from the Department’s suite of proposed rules comes from the electric tank water heater standards. Each proposed standard should stand or fall on its own merits, in light of the benefits it will bring and the costs it imposes. The Department is responsible for evaluating LCC savings for all efficiency levels (ELs) considered by the NOPR and all draw patterns since these represent distinct minimum efficiency standards for those product types. For example, EL 2 for gas storage water heaters has multiple minimum proposed efficiency levels based on storage volume and draw pattern. These are distinct proposed standards, and the Department is obligated under EPCA to evaluate the economic justification for each product independently. *See* Section 6295(o)(2)(B) (requiring the Department to consider the “economic impact of the standard on the manufacturers and on the consumers of the products subject to such standard” and requiring the Department to consider the LCC savings of the “covered product in the type (or class)”).

In particular, the LCC savings for the “gas instantaneous water heater” (GIWH), analyzed as a product class when moving from EL-0 to EL-2, is minimal at only \$162 for the entire 20-year lifespan of the product. NOPR at 49139, Table V.11. And this value is overstated. It underestimates the cost differential between non-condensing and condensing models of gas tankless water heaters. As explained further below, it excludes almost all installation costs related to and required for condensate management (drain, pump, neutralizer and associated recurring and maintenance costs) for condensing tankless water heaters installations. And it overstates the cost of energy, among other things. On the other hand, as discussed above, the energy savings and the present value consumer benefits for GIWH are minimal. *See* NOPR at 49150. Overall, the benefits of imposing this increased efficiency standard on GIWH are very small, even under the Department’s own calculations, and do not offset the adverse manufacturing impacts, job impacts, and shifts to less efficient technology that may thwart the intent of the rule.

Moreover, the Department’s analysis is based on rough estimates that overstate the benefit and understate the costs of the proposed rule. When uncertainty is taken into account in a sensitivity analysis, it is apparent that these purported benefits are not reliable and are effectively zero. The density distribution on its LCC analysis shows a heavily skewed distribution, which can be attributed to high impact outliers, yet the Department uses a mean value to assess the feasibility of its proposed standard, which further moves the LCC results away from its central tendency. To reach a well-reasoned conclusion, the Department would need to demonstrate sensitivity analysis and results using different averaging techniques and data populations and explain how such differences would impact its proposal, particularly because of the small difference in LCC costs and the narrow saving / net cost distribution (*see, e.g.*, Figures 8.5.20, 8.5.22, and 8.5.40 in EERE-2017-BT-STD-0019-0058).¹¹ In fact, with only minor corrections to the underlying data and assumptions, the benefits of the proposed rule become negative. Other

¹¹ Technical Support Document (TSD) EERE-2017-BT-STD-0019-0058 “Publication of determination.”, U.S. Department of Energy, “Energy Conservation Program: Energy Conservation Standards for Commercial Refrigeration Equipment,” 80 FR 44892 (Jul. 28, 2015).

commenters have conducted an analysis on the sensitivities of the LCC savings outcome.¹² That analysis shows that a mere 6% underestimation of installed cost for condensing tankless water heaters would drive the average LCC savings for gas tankless water heaters under the proposed rule to *negative savings*. It further shows that:

- A 3% underestimation of installed cost would produce negative savings for 50% of consumers.
- If maintenance costs for condensing water heaters were underestimated by 25%, the average LCC savings would be negative savings.
- If installed costs were underestimated by 2% and maintenance costs were simultaneously underestimated by 5%, 50% of consumers would experience net cost.
- If installed costs were underestimated by 2% and maintenance costs underestimated by 15%, the average LCC savings would be negative.

In short, the high potential for uncertainty of the average benefits used by the Department in its analysis shows that its proposed standard for gas tankless water heaters is economically unjustified.

B. The proposed rule is not economically justified under the factors listed in Section 6295(o)(2)(B).

1. The Department failed to properly consider the economic impact on manufacturers such as Rinnai (Section 6295(o)(2)(B)(i)(I))

The Department's review of manufacturer impacts did not take into account the Rinnai business case and the direct impact upon Rinnai from the loss of its sole product line produced in its Griffin facility, non-condensing tankless water heaters. This impact is at the heart of Rinnai's letter to the U.S. Department of Justice submitted under this rulemaking. The Department stated in the NOPR that its responsibilities for analyzing impacts of its proposal included considering "the impact of standards on domestic manufacturer employment and manufacturing capacity, as well as the potential for standards to result in plant closures and loss of capital investment." NOPR at 49072. Yet the Department did no analysis of the proposal's potential impact on Rinnai, the leading manufacturer of gas tankless water heaters.

¹² See Comments of American Gas Association, National Propane Gas Association, American Public Gas Association, and Spire ("Joint Commenters"), "Notice of Proposed Rulemaking and Request for Comment: Energy Conservation Program: Energy Conservation Standards for Consumer Water Heaters," EERE-2017-BT-STD-0019/RIN 1904-AD91, September 26, 2023.

The Department's proposed rule will have significant impacts on Rinnai. Manufacturing at Rinnai's new Griffin, GA facility is tooled and optimized for production of non-condensing tankless water heaters, which would be banned by the proposed rules. Figure 4 shows a photo of the new, \$70 million Griffin facility.

Figure 4: Rinnai's New Manufacturing Facility in Griffin, GA.



The Department's proposed rules for tankless water heaters would make the Griffin, GA facility largely obsolete. That in turn would result in eliminating 122 current jobs, including 78 jobs held by female workers and 102 jobs held by minority workers, which contribute primary value-added income to the local economy and its tax base.

Rinnai estimates that loss of the Griffin plant production and sales would mean a loss of gross profit of between \$30 million and \$36 million annually and a write-off of \$2 million in capital expenditure (CAPEX) that could not be repurposed. Condensing water heaters are not manufactured using the same technology, and it would require substantial re-investment to be able to convert the facility to a different product. Rinnai estimates that repurposing its Griffin facility to the condensing tankless water heater market would require more than \$15 million, which may be prohibitive given current production capacity in Japan – i.e., unless demand for condensing tankless in the U.S. market exceeds Japan's manufacturing capacity, re-purposing the U.S. facility would not be warranted.

The Department presents no analysis of these impacts. And the Department never contacted Rinnai as part of this rulemaking with respect to manufacturing impacts or otherwise, despite Rinnai's position as the leading seller of gas tankless water heaters. In this respect, the NOPR and more specifically the 2022 Notification of Availability of Preliminary Technical Support Document (pTSD) are incomplete and must be redone.

2. The Department has not accurately estimated the LCC savings (Section 6295(o)(2)(B)(i)(II))

When errors in the Department's engineering and life cycle cost calculations are corrected, the costs of the proposed rule for gas tankless water heaters will outweigh the benefits. Rinnai is confident in this prediction given the wide differences in the Department's cost analysis and Rinnai's cost data (as well as the uncertainties described above). Notably, the Department's analysis lacks grounding in actual product and installation-related cost data.

i. Incorrect data on product costs.

Based on published prices for non-condensing and condensing gas tankless water heaters, *see* Table 1 above, the Department underestimated the product cost differential to the consumer between condensing and non-condensing gas tankless water heaters by more than 40%. The Department appears to estimate the cost differential at about \$310, while Rinnai has estimated the cost differential based on public information as roughly \$450.¹³ This has a significant impact on the LCC analysis and is a key input variable in determining economic feasibility of the proposed rulemaking.

ii. Incorrect data on installation costs.

Venting Considerations - The Department's cost estimate for venting shows approximately a 211% difference between non-condensing and condensing tankless models, while market data shows closer to a 30% difference. In other words, the Department's estimated venting costs of \$499 for non-condensing GIWH and \$263 for condensing GIWH grossly overstate the cost differential, if any even exists based on installation scenarios.

The Department errs in using 4" stainless steel venting for non-condensing tankless water heaters in its analysis, when most non-condensing models use venting at 3" diameter, and 4" venting appears to be priced 25% higher than 3" venting. In addition, more than 75% of non-condensing models do not use stainless steel venting at all, and instead use concentric and aluminum venting. Rinnai, which sells approximately 50% of all non-condensing gas tankless water heaters in the market, uses aluminum 3" venting. The Department's numbers are thus too high for most of the installed models and represent less than 25% of the models in the market. In addition to the material selection, the LCC analysis uses 20 feet of venting and associated fittings, and this number needs to be subjected to additional sensitivity analysis, including the variation in installed vent lengths, materials used, concentric versus single wall vents, and product installation location. As an example, tankless water heaters are installed typically on an outside wall, which would require far less than 20 feet of venting, and for outdoor installations, there would be no venting required. The Department's cost for venting for non-condensing

¹³ The Department's product costs are based not on actual prices in the market, but on its "tear-down" methodology of pricing products. *See below* Section V.D.

tankless water heaters, which was a significant part of the Department’s LCC analysis, is thus overstated. As indicated in the sensitivity analysis discussion above (Section IV.A.), inaccuracies in installation costs of this magnitude are likely to turn the LCC savings negative.

Condensate-related costs – The Department also excludes from its analysis almost all costs of condensate management (drain, pump, neutralizer, and associated recurring and maintenance costs) needed for condensing gas tankless water heaters. To be clear, condensate management is not optional, but required, although the particular components needed in any installation will vary. In the replacement market in particular, however, which is 75% of all sales, buildings may not have been structured for condensate management and thus may require more expensive modifications. The cost for condensate management may include a neutralizer (mostly used and may be required), condensate removal pump (if needed), condensate heat tape, and piping and drainage availability (required), which may require alterations to buildings. The associated installation costs and applicable recurring costs (neutralizer replacement, condensate pump failures or replacement) should be an integral part of the Department’s analysis, and failing to include these costs substantially understates the installed costs of condensing gas tankless water heaters.

The Department allots just \$5 for installation costs associated with condensate management. This number is not accurate and significantly underestimates such costs, which is evident even in the Department’s own analysis. As can be seen in the table below, “Condensate Drainage” for condensing GIWH is listed at \$5.¹⁴

Product Class	<i>Eff. Level</i>	Basic Installation (2022\$)	Venting Costs (2022\$)	Other Costs (2022\$)	Condensate Drainage (2022\$)	Installation Costs (2022\$)
GIWH - Non-Condensing	0	\$417	\$499	\$152	\$0	\$1,068
GIWH - Condensing	1	\$417	\$236	\$162	\$5	\$821
GIWH - Condensing	2	\$417	\$236	\$162	\$5	\$821
GIWH - Condensing	3	\$417	\$236	\$162	\$5	\$821
GIWH - Condensing	4	\$417	\$236	\$162	\$5	\$821

And yet, the Department’s LCC analysis acknowledges other costs associated with condensate management that were then excluded from the installed cost used to calculate the LCC savings. The table below shows some of these condensate-related cost figures:¹⁵

¹⁴ See Consumer Water Heater Life-Cycle Cost (LCC) and Payback Period Main Analysis (NOPR) (July 21, 2023) (Doc. No. EERE-2017-BT-STD-0019-0060).

¹⁵ See Consumer Water Heater Life-Cycle Cost (LCC) and Payback Period Main Analysis (NOPR) (July 21, 2023) (Doc. No. EERE-2017-BT-STD-0019-0060).

	Crew	Crew Hrs	Unit	Material (in 2023\$)	Material (in 2022\$)
Condensate Removal					
PEX, flexible, no couplings or hangers 3/4" x 100'		0.000	LF	\$0.88	\$0.84
Condensate removal pump system					
Pump with 1 Gal. ABS tank, 115V, 1/50th HP, 200 GPH	1 Stpi	0.667	ea	\$233.00	\$223.30
Refrigerant Piping Component Specialties, Condensate drip/drain pan,	1 Stpi	0.333	ea	\$107.00	\$102.55
Condensate drip/drain pan	1 Stpi	0.333	ea	\$66.17	\$63.42
Piping Insulatin Protective Jacketing, PVC, 20 Mil thick, 1-1/2" ID	Q-14	0.059	LF	\$3.47	\$3.33
Condensate Heat Tape	Q-14	0.059	LF	\$6.24	\$5.98
Condensate Neutralizer					
Condensate Neutralizer		0.500	ea	\$71.21	\$68.25

The omission of condensate-related installation costs from the LCC savings calculation shows that the LCC savings of the proposed standard are overstated if not non-existent.

iii. Incorrect data on operating costs.

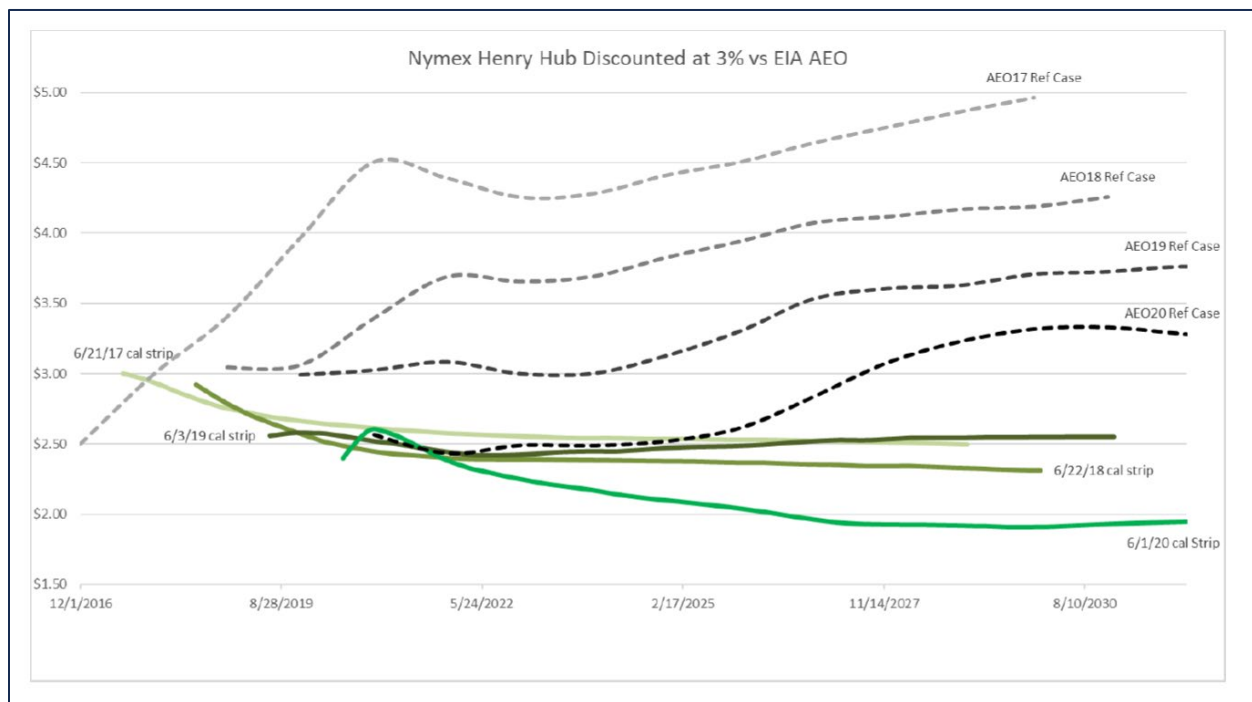
Hot water usage - The Department relies in the NOPR on water usage data from the Residential Energy Consumption Survey (RECS) (discussed more below in Section V.) Hot water usage drives consumer operating costs and energy use, so inaccurate or unreliable data can create bias in the overall LCC savings calculations. Where, as here, LCC savings are already extremely small, such bias can easily lead to inaccurate results – and correction of any bias could show negative LCC savings on average. While the Department’s opaque modeling methods make it difficult for stakeholders to quantify these effects, the Department should reconstruct its analysis using more transparent and reliable data.

Rather than using RECS data to determine water usage, the Department should use test procedure-defined hot water usage rates for comparisons of ELs. The water heating industry and the Department have worked hard to refine energy descriptors for residential water heaters to better reflect reasonable average hot water usage and developed the UEF rating metric as a result. Use of the UEF is to maintain consistency in comparing energy efficiency of products. The hot water usage patterns within the UEF procedures (very small, low, medium, and high draws) already provide data on average water use and therefore should be used for comparing ELs through the consumer energy savings and LCC savings calculations. Doing so would provide clearer consistency in comparison of residential water heater technologies generally and for EL comparison for proposed efficiency thresholds. Doing so would also bring the Department’s analysis procedures for minimum efficiency standards into better consistency with other federal rating programs such as the Federal Trade Commission’s (FTC) Energy Guide labeling program.

Energy Prices - The Department’s spreadsheet analysis of energy and cost savings relies heavily upon distributional data inputs to the Monte Carlo analysis of life cycle cost and paybacks. The Department uses single time series average and marginal consumer energy price forecasts for consumer electricity and gaseous fuels to support the pTSD analysis. But

historically, consumer energy price forecasts from the U. S. Energy Information Administration (EIA) have been notoriously unreliable from forecasting year to forecasting year, with diminishing accuracy and reliability in out years of the forecast period. Shown below is a record of EIA Henry Hub wholesale natural gas prices as compared to predicted retail natural gas prices from successive editions of the “Annual Energy Outlook, Reference Cases” from 2017 through 2020.¹⁶

Figure 5: Comparison of Successive Annual Energy Outlook Natural Gas Prices: 2017-2020.



As shown, successive forecasts of retail natural gas prices as reported in the Annual Energy Outlook (AEO), represented by the dotted lines in the graph, show overprediction when compared to relatively stable wholesale gas price forecasts. The Department relies on energy prices from the AEO 2021 edition. It can be expected that once again, the prices forecasted overpredict future prices.¹⁷ For analysis of gas-fired consumer water heaters, these trend

¹⁶ Spire, Inc., “Comments of Spire, Inc. in Response to the Request for Information Entitled ‘Energy Conservation Program: Energy Conservation Standards for Air-Cooled Commercial Package Air Conditioning and Heating Equipment and Commercial Warm Air Furnaces; Request for information,’” 85 FR 27941 (May 12, 2020), submitted July 1, 2020.

¹⁷ Additionally, the Department looks to the “Energy Price Trends,” which shows systematic increases in natural gas prices in the future, including a 36% increase between 2020 to 2050 and an annual increase of 0.37% per year in the years following 2050. At the same time,

predictions historically have overstated the LCC savings and paybacks for higher efficiency minimum efficiency standards for gas appliances.

The Department would be better served by using energy prices employed in the FTC Energy Guide labels for two reasons:

- The uncertainty of applying forecasted prices for technology comparisons in the energy efficiency standards process is dubious based upon the systematic errors discussed above. As recommended for energy use, technology comparisons across product classes and within proposed ELs should be conducted on a consistent basis and not incur distortions from biased information, in this case energy prices.
- FTC's use of AEO energy prices is audited annually and approved as published in the Federal Register prior to use for the EnergyGuide program. The Department exercises no similar discipline in its use of AEO forecasted prices, and while both FTC and the Department use the same EIA source information for the current year, the Department ignores the import of the historical data showing consistent overestimation of gas prices.

3. The Department has not accurately estimated the energy savings (Section 6295(o)(2)(B)(i)(III))

As discussed above, the Department fails to account for the possibility of product switching, primarily that in the absence of a non-condensing gas tankless water heater option, consumers with gas storage water heaters now may remain with storage water heaters and consumers with non-condensing gas tankless water heaters may replace them with storage water heaters. More broadly, the assumption that all sales of tankless water heaters will remain with tankless water heaters in the absence of a non-condensing option is unjustified. At a macro level, this plainly impacts the Department's predicted energy savings – minimal as they are.

4. The Department fails to properly consider any lessening of the utility or the performance of the covered product (Section 6295(o)(2)(B)(i)(IV)).

That there will not be products suitable for customer needs, especially in the emergency replacement market, is a lessening of the utility or performance of the covered products. Rinnai discusses the Department's failure to account for lessening utility and performance under its discussion of the unavailability provision above (Section I). Moreover, it bears noting that if, as Rinnai predicts, there will be a shift to gas tank water heaters (and the tankless gas water heater market grows more slowly than it otherwise would) as a result of the proposed rule, there will be other ancillary adverse impacts on consumer savings and the environment. Gas storage water heaters have to be replaced more often, having an average life span of 14.5 years as compared to

the trends reported for electricity show prices changing between a decline of 6% and a rise of 6% between 2020 and 2050 and declines of between 0.46% and 0.85% annually in the years following 2050.

20 years for tankless gas water heaters. They are also larger and heavier. This results in 1.5 gas storage water heaters being replaced for every single gas tankless water heater, generating a greater number of large appliances ending up in landfills or otherwise having to be dealt with. And as gas storage water heaters have a larger product footprint, they take away living space from houses and apartments that could be utilized by the occupants.

5. The Department should acknowledge the lessening of competition that will result from its proposed rule in the water heater market overall (Section 6295(o)(2)(B)(i)(V))

As explained above and in Rinnai's Letter to the Department of Justice (Attachment A), the proposed standard for gas tankless water heaters is likely to unjustly disadvantage a smaller competitor, increase market concentration, and have an adverse impact on consumer options – in short, its impact will be to lessen competition.¹⁸

The impact of the proposed rules on the highly concentrated water heater market raises anticompetitive concerns. Three large players dominate the market, and Rinnai is a much smaller competitor offering more efficient, higher technology products that have gradually been making inroads into the gas tank water heater market. As mentioned previously, tankless water heaters were only 8% of the gas water heater market in 2012, and by 2022 they were 21% of gas water heater market shipments. Rinnai does not offer gas tank water heaters in the residential market; it only offers tankless water heaters. And as to tankless water heaters, it only manufactures the non-condensing tankless in the U.S. Rinnai must import its condensing tankless water heaters, putting it at a pricing disadvantage for that product in the U.S. market. While Rinnai is the current leader in production and sales of gas tankless water heaters in the United States, the elimination of non-condensing tankless water heaters from the market will impact Rinnai's market share and competitive position. The overall impact of the proposed rule will be to shift more market share to two of the large players in an already concentrated market, and to eliminate a product option that will hamper a smaller competitor's ability to compete; this is anti-competitive and to the detriment of consumers.

More particularly, Rinnai's competitive position with respect to product offerings and pricing would be threatened by the elimination of non-condensing tankless water heaters from the market. As discussed above, Rinnai assesses the incremental product costs to consumers to be roughly \$450 and also the incremental installed costs to consumers to be substantial for condensing gas tankless water heaters as compared to non-condensing, making it highly likely that a substantial percentage of consumers facing an urgent replacement and lacking the alternative of a

¹⁸ The Department stated that it was not relying on purported benefits for the social cost of carbon or other monetized health benefits. Those purported benefits are inaccurate and unreliable for the same reasons discussed here, namely that the proposed rule in fact is likely to increase carbon emissions.

non-condensing tankless rationally will choose a tank gas water heater rather than condensing tankless products.

Rinnai's U.S. production of non-condensing tankless water heaters has contributed and would continue to contribute to a market transition from gas tank water heaters to higher efficiency tankless gas water heating with consequently lower emissions. This economically justified substitution effect is a market dynamic that is in effect today but that would be sacrificed by the proposed rule's elimination of non-condensing tankless water heaters. Since the current non-condensing products contribute efficiencies of 80% and above, these products are an important increased-efficiency option for consumers in the water heater replacement market, resulting in energy savings, reduced emissions, lower life-cycle costs, reduced footprint of water heating equipment, and extended life span of the product. The effect of the proposed rule will be to raise the price of tankless technology for water heaters, making them less accessible and affordable to consumers – putting them out of reach of some consumers where the building will not easily accommodate condensing technology. The Department's proposed rule will disrupt and stall the market-based transition to greater efficiency and lower emissions, and thus thwarts the purpose of the rule and lessens competition.

6. The Department does not adequately evaluate the impact of removal of non-condensing gas tankless water heaters in its Consumer Subgroup analysis.

The intermediate efficiency and intermediate cost of non-condensing tankless water heaters provide consumers with limited financial means an opportunity to install increased-efficiency water heating appliances without having to pay the premium prices and installation costs of condensing tankless water heaters. In the replacement market, the availability of non-condensing tankless water heaters offers consumers already owning a non-condensing tankless unit the opportunity to minimize replacement costs by providing a “drop in” replacement unit. And it offers consumers with non-condensing tank water heaters the opportunity to obtain increased efficiency with modest additional up-front costs. This opportunity and cost savings would well meet the needs of low-income households. Also, the availability of non-condensing gas tankless water heaters would allow rebate programs offered by government jurisdictions and utilities to expand the “reach” of these programs to more low-income households to make significant efficiency gains and greater leverage for sharing of installed costs for low-income households. The Department does not take any of these potential benefits to low- to middle-income consumers into consideration.

V. ADDITIONAL ANALYSIS DEFECTS

A. The Department failed to provide the data for its consumer choice model.

The Department claims that it uses a consumer choice model to evaluate the impact of the proposed standards on consumer water heater shipments and to cover product switching and repair versus replacement decisions that may be incentivized. However, neither the NOPR nor pTSD provide any record of this modeling effort or description of the model's formation or

operation. When asked about the missing modeling coverage at the September 13, 2023 webinar, Lawrence Berkeley National Laboratory staff explained that the model was covered in Chapter 9 of the pTSD, not in Appendix 8J as reported in the pTSD. In fact, Chapter 9 shows no record of the consumer choice model and its integration into the water heater shipments model. Accordingly, the NOPR is missing a key piece of its rationale, depriving commenters of the ability to evaluate the Department's reasoning.

Although commenters cannot fully evaluate the Department's consumer choice modeling analysis, the Department appears to have failed to take into account substitution effects in the replacement market, especially as applies to non-condensing tankless water heaters. The Department purports to consider three scenarios:

- Replacement of water heaters with same category of consumer water heaters that meet a particular standard level,
- Replacement with water heaters using different fuel or different category product (switching from a gas tank water unit to a condensing gas instantaneous unit, gas tank unit to an electric tank unit, electric tank unit to a gas tank unit), or
- Repair of the existing product, thereby delaying the replacement. [pTSD at ES26]

Importantly, in considering the replacement options under the second bullet point, the Department does not appear to consider the likely replacement scenarios in the market for non-condensing tankless water heater products as they have been sold in the U. S.: **replacement of a gas tank or of a non-condensing gas tankless water heater with a gas tank water heater (a non-condensing tankless product having been made unavailable)**. Consumer options under the condition of unavailability of the non-condensing tankless product need to be modeled to account accurately for water heater shipments. This is an additional deficiency of the pTSD, making unreliable the claimed impacts upon shipments of competing residential water heating products, consumer savings, and emissions. Here and elsewhere, gaps and deficiencies in the pTSD strongly suggest that the Department has not completed the analysis needed to demonstrate "economic justification" as required by EPCA.

B. The Department erroneously persists in using randomized assignment of trial cases in its Monte Carlo simulation of LCC savings.

In its simulation of 10,000 consumer trial cases to evaluate LCC savings and energy savings, the Department assigns base case efficiencies on existing residential water heaters randomly, and against those randomly assigned efficiencies, it then calculates the benefits of EL improvements in efficiency over those assigned base case efficiencies. The Department's justification for random assignment, across numerous similar rulemaking analyses, is to account for "market failure" effects that interfere with rational economic selection of base case appliances by efficiency, as well as various "agency" effects such as decision making by landlords on

appliances irrespective of a renter's economic best interest in terms of energy efficiency and operating costs. Several problems emerge from this approach.

Despite numerous efforts of the Department to defend this approach based on literature on market failure (the current NOPR discussion from the Department devotes five Federal Register pages and over 4,900 words to the topic), it has not addressed a central criticism of the approach: the failure of the Department to justify a relationship (either correlation or causation) of random assignment to the alleged market failures of concern. This criticism has been raised repeatedly in rulemaking comments by stakeholders and suggested as a deficiency in the National Academy of Science, Engineering and Medicine (NASEM) peer review of the Department's appliance efficiency rulemaking process.¹⁹ The NASEM report recommended alternative ways the Department ought to approach market failure considerations. Stakeholders have pointed out that the Department has many other means of addressing market failure in raising consumer energy efficiency for covered products and concluded that the minimum efficiency standards program is not a means of doing so.²⁰ Public information, appliance rebates, installation subsidies, and other approaches are available for federal action to address these concerns, and funding available under the Inflation Reduction Act.²¹ Overall, it is the opinion of Rinnai that the Department's continued use of random assignment within its Monte Carlo consumer simulations to address market failure in improving consumer energy efficiency is unjustified.

In addition, the Department's use of random assignment of its 10,000 trial cases to base cases has the effect of assuming that consumers do not make rational economic decisions prior to energy efficiency rulemaking. Thus, even in cases where an efficient product is the lowest cost option, the Department's assignment method does not assume a consumer will make that investment in the base case; and on the other hand, highly favorable economic outcomes are over-represented in the rule outcome group. The result is that the benefit of the average LCC outcome is substantially overstated. And this disfunction stems from a lack of recognition of actual purchasing behavior.

More specifically, this represents a logical flaw: random assignment for a given consumer is devoid of rational decision making, but purchase decisions of that consumer going forward are then assumed to be rational based upon maximizing LCC savings and installed cost payback. To address this discontinuity,²² other stakeholders have suggested that the Department might link rational decision making based on economics to a definition of the base case efficiency. The Monte Carlo method and tool used by the Department, the Microsoft ExcelTM add-in Crystal Ball, has

¹⁹ NASEM, "Review of Methods Used by the U. S. Department of Energy in Setting Appliance and Equipment Standards (2021), ISBN 978-0-309-68545-0/DOI 10.17226/25992.

²⁰ ONE Gas, "Comments on the U. S. Department of Energy, 'Notification of Availability of Preliminary Technical Support Document [pTSD] and Request for Comment [EERE-2017-BT-STD-0019] RIN 1904-AD91,'" May 16, 2022.

²¹ "Inflation Reduction Act," Pub. L.117-169, August 16, 2022.

²² ONE Gas, *supra* note 18.

functionality to implement such correlations in consumer simulations. Alternatively, the Department could simply and directly model base case efficiencies based on a rational consumer decision making foundation.

The problem facing the Department on its use of random assignment has taken on a heightened level of scrutiny with the remand of the Department's final standards for commercial packaged boilers from the Court of Appeals for the District of Columbia.²³

C. The Department's use of RECS data for determining energy use is unreliable.

Residential Energy Consumption Statistics (RECS) data is not complete or reliable. The Department's widespread use of and reliance on RECS data is a simplification that is especially ill suited for comparing the long-term impacts of ELs. There are other measures of energy use available. Rinnai recommends that the Department use test procedure hot water draw consumption and other available data sources to compare the impacts of proposed standards and technologies, which would provide a more reliable and consistent basis of comparison.

Moreover, the Department does not use the most recent RECS data in the NOPR. Instead, it relies upon data from the 2015 RECS to establish samples and calculate data,²⁴ which it claims is the most recent such survey currently available. According to the Energy Information Administration, the final set of data for the 2020 RECS was released on June 15, 2023, almost six weeks prior to publication of the NOPR on July 28, 2023.²⁵ Rather than use the most recent and reliable data available, the Department chose to use outdated, inapplicable data for most of its calculations. Rather than rely on older data, the Department should recalculate and reexamine its conclusions based on the best available, most current data.

D. The Department's tear-down analysis approach for developing product cost is inaccurate and unreliable.

As pointed out in numerous rulemaking proceedings over the past 20 years and in the NASEM peer review report, the Department's teardown analysis and cost reconstructions for existing products and newer high efficiency designs is flawed and produces systematically underestimated costs. As a rule of thumb, industry calculates this underestimation as between 30% and 50%. Underestimation of product cost leads to overstating of LCC savings in virtually all cases. Accordingly, the use of RECS data ultimately means that the Department's LCC savings are overstated, particularly in the case of gas tankless water heaters, as discussed above. The Department could, quite simply, look to market pricing to determine product cost.

²³ *Am. Pub. Gas Ass'n v. United States Dep't of Energy*, 72 F.4th 1324, 1336-40 (D.C. Cir. 2023).

²⁴ *See, e.g.*, NOPR at 49107.

²⁵ Residential Energy Consumption Survey (RECS) - Energy Information Administration (eia.gov) (last accessed Sept. 11, 2023). *See also* DOE Public Meeting, Sept. 13, 2023 at 2:09 PM-2:16 PM.

Alternatively, to improve its methods for estimating costs and pricing of current and future products, the Department could use “ground truthing” of its estimates of costs throughout the engineering, manufacturing, and shipments analysis stages of TSD development. This would assist both the Department and stakeholders in evaluating whether tear-down costs are in line with market pricing.

This issue has been compounded in the case of Rinnai since the Department never organized an interview on its products, manufacturing, and markets to help improve the accuracy of its tear-down cost estimates. That information would have been made available to the Department in an interview supporting the shipments analysis. As it has turned out, the Department’s analysis treats the gas tankless water heater as a monolithic product type and forecasts shipments irrespective of essential underlying changes in product cost differences between Rinnai’s non-condensing and condensing products.

E. The Department errs in providing a single LCC analysis for multiple efficiency standards.²⁶

The Department has proposed new minimum efficiency standards for eight separate categories of gas tank water heaters and twelve separate categories of gas instantaneous water heaters. 88 FR49058 at 49176-77. However, the Department has provided only one life-cycle cost analysis for gas tank water heaters and only one for gas instantaneous water heaters. As a result, the Department provides only one set of analytical results for the eight new standards for gas tank water heaters and one set of analytical results for the twelve new standards for gas instantaneous water heaters. *See* 88 FR 49058 at 49137 Tables V.1 and V.2 and 49139 Tables V.9 and V.11 (life-cycle cost and payback results for gas storage water heaters and gas instantaneous water heaters, respectively); 88 FR 59058 at 49149-51 (cumulative energy savings and net present value of consumer savings).²⁷ At most, these results show that the net effect for *each group of efficiency standards* is positive, but they do not show that any individual standard has a positive LCC. It could be that both standards are economically justified or that one is justified and the other is not. Having failed to address these questions, the Department has failed to justify any of its proposed standards for gas tankless water heaters.

F. The Department improperly abbreviated the rulemaking comment period.

²⁶ From: American Gas Association, American Public Gas Association, National Propane Gas Association, Spire, “Notice of Proposed Rulemaking and Request for Comment: *Energy Conservation Program: Energy Conservation Standards for Consumer Water Heaters*, EERE-2017-BT-STD-0019, RIN 1904-AD91, 88 FR 49058 (July 28, 2023).

²⁷ It should be noted that the Department’s analysis of emissions reductions and claimed climate and health benefits does not even provide results specific to the groups of standards for gas tank water heaters or gas instantaneous water heaters: instead, it provides a single set of results for the claimed combined impact of all of the Department’s proposed standards. 88 FR 49058 at 49151-56

The Department has rushed to finish this rulemaking and, in the process, has missed opportunities for prudent standards development. The following are specific examples of this:

- The Department is conducting this rulemaking with support from a “preliminary” technical support document published in 2022 and appears to have made no concerted effort to produce a final TSD and to fill in gaps in its analysis discussed previously in these comments.
- Rinnai requested an extension of time for comments on the NOPR, (Comment ID EERE-2017-BT-STD-0019-0610) but the Department has not responded to that request. As Rinnai stated in its letter, interested parties have not had sufficient time to analyze and respond to the hundreds of pages of information in the NOPR and pTSD. The Department’s rules state that 75 days at minimum will be provided for review of a NOPR, and there is no basis here to depart from that minimum time period, particularly where the proposed standards were not provided in prior analysis.
- The Department conducted its webinar on the NOPR on September 13, 2023, only 13 calendar days before comments to the NOPR were due, depriving stakeholders of an opportunity to respond to substantive comments provided on the webinar.

Other recent rulemakings have provided more time for public comment, and it is unclear why the Department decided to compress the schedule in this instance. Rinnai views these shortcuts in the rulemaking calendar as unjustified.

VI. THE DEPARTMENT IS EXCEEDING ITS STATUTORY AUTHORITY

The Department is acting ultra vires and beyond the authority delegated to it in the EPCA by using regulations to control the appliance manufacturing market, promoting some appliances, and eliminating others. As the unavailability provision and legislative discussions make clear, the purpose and intent of EPCA was to gradually and incrementally increase efficiency standards to promote energy conservation – but not to change the selection of appliances generally available to builders and consumers in the market. Through this rulemaking and other rulemakings on various appliances (e.g., furnaces, cooking appliances), the Department is wholesale re-making the appliance industry and the energy industry in the U.S. This is a major change that has not been expressly authorized by Congress and thus is not within the Department’s authority – to the contrary, EPCA’s provisions show that Congress did not intend to affect the types of appliances generally available in the U.S.

CONCLUSION


The proposed rule as it applies to residential tankless water heaters would put the U.S. on a path to eliminate the energy and carbon emission savings Rinnai has demonstrably achieved. It would remove a low cost, highly efficient option for consumers and could instead encourage

them to adopt a lower cost, less efficient option. It would negatively impact manufacturing and U.S. jobs. All this would achieve only 0.4 quad in energy savings, even under the Department's own analysis, when Rinnai predicts that the continued availability of non-condensing gas tankless water heaters would result in an additional 0.61 quad and a potential combined 1.01 quad in energy savings over the same 30-year time period, potentially increasing the current energy saving estimate in the rule of 26.6 quad to 27.21 quad. In other words, the proposed rule decreases energy savings over the upcoming decades, while removing a valuable option for consumers and builders.

Rinnai accordingly requests that the Department either modify its proposed rule to set separate efficiency standards for non-condensing and condensing gas tankless water heaters or withdraw its proposed rule and retain the current efficiency standards for gas tankless water heaters at 0.80 / 0.81 UEF. Additionally, Rinnai requests that the Department implement additions to the 2022 preliminary TSD underpinning the Department's proposals and address deficiencies including but not limited to accounting for product substitution effects in the water heater replacement market.

Rinnai appreciates your consideration of these comments.

Sincerely,

A handwritten signature in blue ink, appearing to read "Perry McGuire", with a stylized flourish underneath.

Perry McGuire
Vice President and General Counsel
Rinnai America Corporation

Attachment A



August 28, 2023

U. S. Department of Justice
Antitrust Division
950 Pennsylvania Avenue, NW
Washington, DC 20530

Re: Comments of Rinnai America Corporation on “Notice of Proposed Rulemaking and Announcement of Public Meeting,” U. S. Department of Energy, “Energy Conservation Program: Energy Conservation Standard for Consumer Water Heaters,” EERE-2017-BT-STD-0019 (RIN 1904-AD9), Federal Register Vol. 88, No. 144, Friday, July 28, 2023, pp. 49058-49177.

Sir/Madam:

Rinnai America Corporation (Rinnai) respectfully submits the following comments to the Department of Justice for the U. S. Department of Energy’s proposed modifications to minimum energy efficiency standards for consumer water heaters.

Rinnai America Corporation is the U. S. based subsidiary of Rinnai Corporation, Nagoya, Japan, and is part of the over 100-year-old Rinnai Group. Rinnai is the #1 tankless (instantaneous) gas water heater provider in North America. Rinnai has its headquarters in Peachtree City, GA and recently opened the first gas tankless water heater manufacturing facility in the United States, a 300,000 square foot manufacturing facility in Griffin, GA. Rinnai’s new facility employs advanced automation, precision assembly processes, and is ISO 9001 and/or ISO 14001 certified. Rinnai America is committed to its brand promise – “Creating a healthier way of living.” The Rinnai Innovation Manifesto (RIM 2050) is focused on ensuring “we achieve our sustainability goals including 2030 ‘low-carbon targets’ and decarbonization by 2050”. Rinnai’s comments herein on the Department of Energy’s proposed energy conservation standards for consumer water heaters (Docket No. EERE–2017–BT–STD–0019) align with supporting RIM 2050 and the goal of net-zero economy-wide greenhouse gas emissions.

The Department of Justice (DOJ) is required to determine the effects on competition for new or amended energy conservation standards for “covered products” under the Energy Policy and Conservation Act (EPCA). EPCA Section 6295(o)(2)(B)(i)(V) requires the Department of Energy (DOE) to consider among other effects:

(V) the impact of any lessening of competition, as determined in writing by the Attorney General, that is likely to result from the imposition of the standard . . .

The DOJ thus has the responsibility of making this determination in writing for the DOE. The DOJ has elaborated on the standard it applies:

In conducting its analysis, the Antitrust Division examines whether a proposed standard may lessen competition, for example, by substantially limiting consumer choice, by placing certain manufacturers at an unjustified competitive disadvantage, or by inducing avoidable inefficiencies in production or distribution of particular products. A lessening of competition could result in higher prices to manufacturers and consumers, and perhaps thwart the intent of the revised standards by inducing substitution to less efficient products.¹

DOJ has also stated that it will consider “whether a proposed standard may lessen competition . . . by . . . increasing industry concentration.”²

Rinnai in this letter is providing comments and information for consideration by DOJ in making the required determination as to the effects on competition.

COMMENTS

There are two types of tankless gas water heaters: non-condensing and condensing. The non-condensing cost less and are less efficient; the condensing cost more and are more efficient. Both are far more efficient than tank (or storage) gas water heaters, and both cost more. Despite the higher price tag, tankless gas water heaters have been making inroads into the gas storage water heater market – resulting in greater efficiency and reduced emissions. The non-condensing type of tankless gas water heater has some advantages in this competition: its price is close to that of storage water heaters, it uses less space, it lasts longer, it is often easy to install, and it delivers unlimited hot water.

The DOE’s **existing** minimum efficiency standard for tankless gas water heaters allows for both non-condensing and condensing gas water heaters; it is set in effect at the level of non-condensing efficiency. The DOE’s **proposed** minimum efficiency standard for tankless gas water heaters shifts the efficiency level sharply upward, to the level of condensing efficiency. The DOE uses only a single product category for non-condensing and condensing tankless gas water heaters. Thus, this new proposed standard effectively eliminates non-condensing tankless water heaters, which provide a less costly and more efficient solution for the consumer, because it is not technologically feasible.

The DOE’s proposed rule would lessen competition in the market for water heater products – the rule will reduce consumer choice, raise prices for efficient appliances, and reduce overall efficiency across the water heater market, thereby increasing emissions. The rule will have two related impacts: First, Rinnai itself will be hampered in its ability to compete in the market for gas

¹ “Publication of determination.”, U.S. Department of Energy, “Energy Conservation Program: Energy Conservation Standards for Commercial Refrigeration Equipment,” 80 Fed. Reg. 44892 (Jul. 28, 2015).

² “Publication of determination.”, U.S. Department of Energy, “Energy Conservation Program: Energy Conservation Standards for Residential Dehumidifiers,” 81 Fed. Reg. 55155 (Aug. 18, 2016)

water heaters and will have to expend a considerable amount of dollars to repurpose its brand-new manufacturing facility – the only one in the U.S. for gas non-condensing tankless water heaters. That new facility makes only non-condensing tankless gas water heaters – the type the proposed rule precludes. Second, the exclusion of non-condensing tankless water heaters from the market will result in increasing market concentration among the few large participants as the bulk of Rinnai’s customers for non-condensing tankless water heaters will shift to storage water heaters as the less expensive option. The water heater market is dominated by three large players, and this shift will benefit two of those players at the expense of Rinnai, a much smaller competitor that has been making inroads into the market by providing consumers with additional choices.

Background:

Historically, the consumer water heater market in the United States has been dominated by storage water heaters in which water is heated in a tank. Such gas storage water heaters are the least expensive on the market, but they are also the least efficient. As a result, in recent years “instantaneous” or “tankless” water heaters have experienced a growth in market share, driven by their improved performance and superior efficiency (resulting in lower utility costs), despite their generally higher price tag.

Figure 1 below shows the market share of gas tankless, gas storage and electric storage water heaters relative to the total water heating market over the past decade. As can be seen, gas tankless water heating market share has demonstrated significant growth, increasing from 4% in 2012 to 10% market share in 2022, storage water heater market share remained flat over the same period. With its higher efficiency, declining Year-Over-Year (YOY) Total Cost of Ownership, high quality, and superior performance, gas tankless water heaters are gaining attraction in the market and becoming the preferred choice of the consumer.

Figure 1 (Gas tankless, gas storage and electric water heating market share 2012 – 2022):

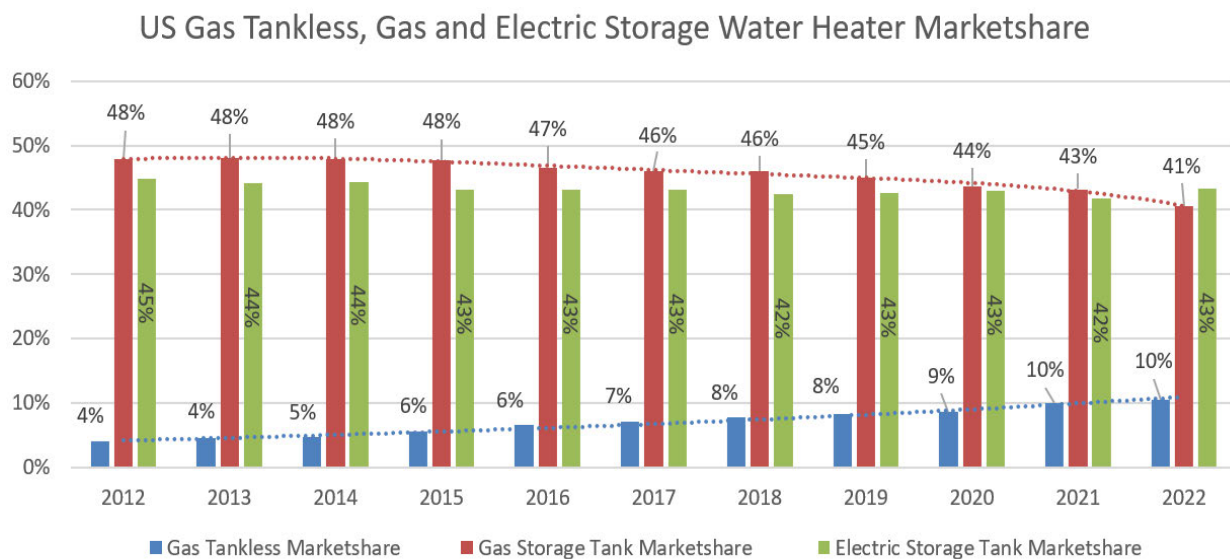
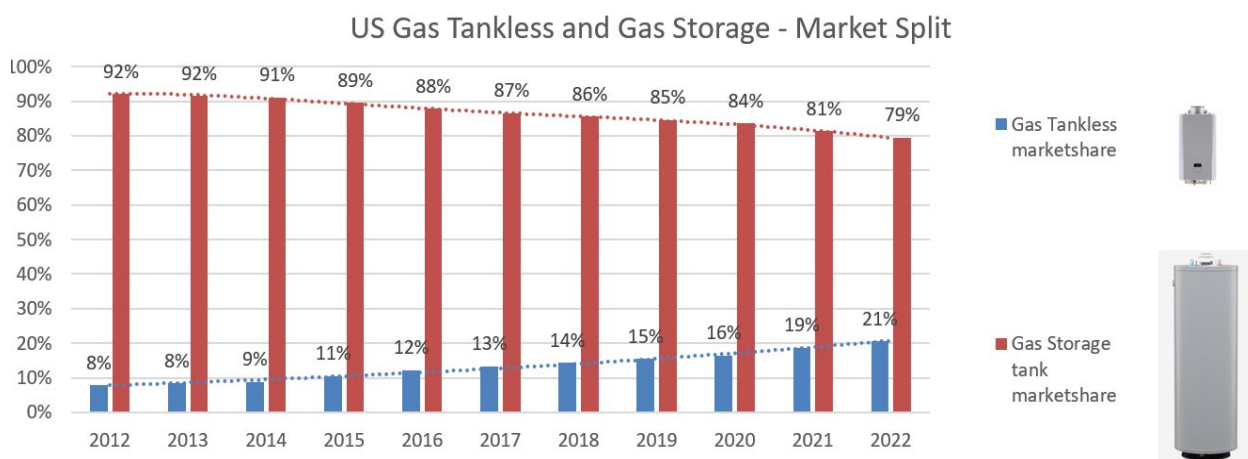


Figure 2 below further shows the market split between gas tankless and gas storage water heaters. It reflects a substantial decline in the gas storage water heating market, dropping from 92% to 79% between 2012 and 2022. Gas tankless water heaters, on the other hand, gained significant market share and increased from 8% to 21%, mainly by replacing less efficient gas storage water heaters.

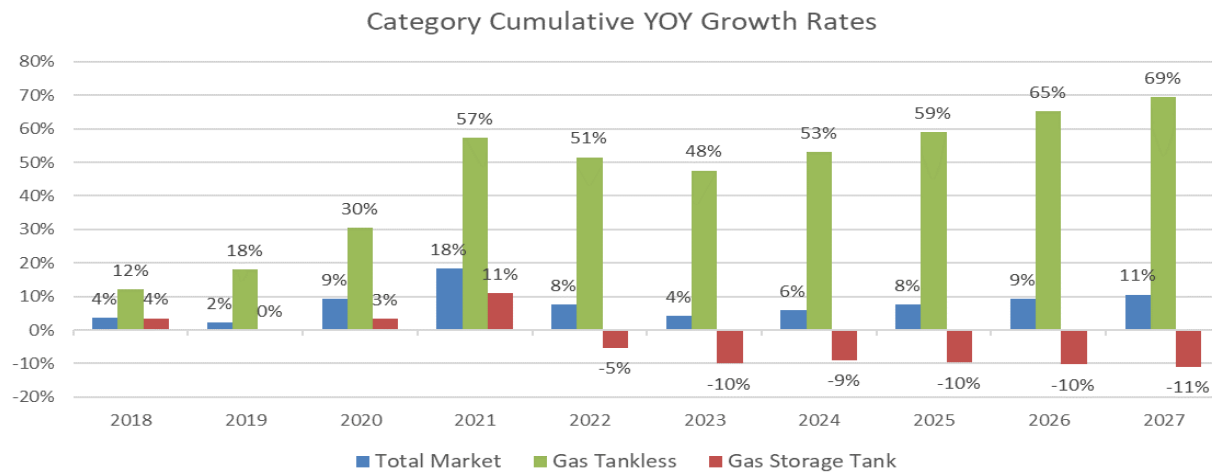
Figure 2: (Gas tankless and gas storage water heating market share 2012-2022):³



Furthermore, under the DOE's existing energy efficiency standards, the gas tankless water heater market is expected to grow and to reach 12% in 2027 across the entire water heating market, confirming its benefits and the preference by many consumers. As shown in Figure 3 below, Rinnai's market predictions are that gas tankless water heaters will continue to experience year-over-year growth rates in market share, while gas storage water heaters will see negative growth—even while the overall market is projected to have positive growth.

³ 2023 BRG Report.

Figure 3: (Predicted cumulative growth rates through 2027 under existing rules):⁴



As for tankless water heaters in particular, they can be either gas or electric powered, and gas tankless water heaters can be either “condensing” or “non-condensing.” Four key differences between the condensing and non-condensing gas tankless technologies are cost, efficiency, venting, and condensate requirements. Generally, condensing tankless water heaters are more efficient but more expensive; they also require additional condensate drainage or a condensate pump to manage the condensate produced, which results in different installation requirements that are often more expensive. Non-condensing tankless water heaters, on the other hand, cost less and do not require a condensate drain or a condensate pump. While less efficient than condensing tankless water heaters, non-condensing tankless water heaters are still dramatically more efficient than storage water heaters while being only modestly more expensive, and thus they are preferred by many builders, installers and distributors and are the product of choice for consumers in the replacement market. In short, non-condensing tankless water heaters are a better alternative to storage gas water heaters for many consumers.

The two types of gas tankless water heaters thus have different features, installation requirements, and pricing, and serve different construction markets and needs. The non-condensing tankless gas water heaters are a great option compared to storage water heaters given the space saving they bring to homes while adding to the energy savings, given their higher efficiency compared to storage water heaters. And for many consumers facing urgent replacement, the non-condensing tankless is a cost-effective alternative with relative ease of installation, whereas the condensing tankless may be cost prohibitive and may not be compatible with the existing infrastructure. Given the market dynamics in the water heating category and the rapid growth rates for gas tankless water heaters in the U.S., Rinnai made strategic investments and built a new manufacturing facility in Griffin, GA, specifically for non-condensing tankless gas water heaters. This allows Rinnai to offer highly efficient and more affordable tankless water heaters to the consumer as a choice for replacing less efficient storage water heaters.

⁴ 2023 BRG Report.

The different average efficiency levels and price range for storage, non-condensing tankless, and condensing tankless gas water heaters are as follows:

Table 1 (average efficiencies and product prices for types of gas water heaters):⁵

Product Class	Efficiency Level	Average Retail Price
Gas storage water heaters (non-condensing)	54% - 63%	\$580
Gas-fired tankless hot water heaters (non-condensing)	81%	\$1056
Gas-fired tankless hot water heaters (condensing)	91%-93%	\$1509

DOE's existing minimum efficiency standards treat many types of electric, gas, storage, and tankless water heaters differently. But DOE's rules do not differentiate between non-condensing and condensing tankless water heaters, despite their technological differences and the impact that has on sales, pricing, and market installation.⁶ The existing federal minimum efficiency standards set the baseline efficiency level (or UEF) for *all* gas tankless water heaters at 81%, effectively at the level of *non-condensing* tankless water heaters.

DOE's proposed minimum efficiency standards continue to treat electric, gas, storage, and tankless water heaters differently. For example, under DOE's proposed rules, storage gas water heaters would still have a much lower minimum efficiency level than tankless gas water heaters, and while the baseline efficiency level for storage gas water heaters increases slightly, it is not a substantial change. The DOE's proposed rule, however, sharply increases the baseline efficiency level for *all* gas tankless water heaters to 91% /93%, effectively setting the UEF at the level of *condensing* tankless water heaters. This proposed new standard for tankless gas water heaters is only achievable by condensing tankless gas water heaters, and it will make all non-condensing tankless gas water heaters obsolete immediately, excluding them from the market. The change in the UEF standards is illustrated in Table 2.

⁵ Pricing data is taken from homedepot.com; average efficiency levels are based on EERE-2017-BT-STD-0019.

⁶ Code of Federal Regulations, Title 10, Chapter 2, Subchapter D, Part 430, Subpart C

Table 2 (change from DOE existing standard to DOE proposed standard):

Product Class	Current Baseline Efficiency Level	Proposed Baseline Efficiency Level
Storage Gas Water Heater*	54%-63%	59%-68%
Technology That Can Achieve	Non-Condensing Condensing	Non-Condensing Condensing
Tankless (Instantaneous) Gas Water Heater	81%	91%-93%
Technology That Can Achieve	Non-Condensing Condensing	Condensing

*For gas-fired storage water heater efficiency band leverages 28, 38, and 48 gallon storage capacity for respective draw pattern

Accordingly, DOE's proposed rule would effectively ban non-condensing tankless gas water heaters while allowing less efficient storage gas water heaters **or** more efficient but also more expensive condensing tankless gas water heaters.

This effective ban creates a number of detrimental effects on competition by limiting consumer choice, raising prices on more efficient products, eliminating consumers' option to make like-for-like product replacements, and putting Rinnai at an unjustified disadvantage as a much smaller competitor in the concentrated water heater market. The proposed standards DOE is pursuing were recommended by two of the largest manufacturers of water heaters, Rheem and Bradford White, in an Oct. 21, 2022 Letter to DOE, at 2.⁷ The consumer water heater market is already concentrated, with just three firms (Rheem, Bradford White, and A.O. Smith) having a dominant market share. Rinnai, while a growing competitor, has a market share of less than 5% of the consumer water heater market (by shipments), and only offers tankless gas water heaters, not storage gas water heaters. Rinnai has made inroads into the storage water heater market over the past decade, gradually increasing the percentage of tankless gas water heaters by replacing gas storage water heaters with its more efficient products. Most hot water heater replacements and new construction installations prefer to use non-condensing tankless water heaters due to relatively lower cost and smaller footprint. For consumers *replacing* gas water heaters in particular, under the DOE's proposed rule, they will be forced to choose between low-cost storage water heaters and expensive condensing tankless gas water heaters – and most consumers choose the low-cost option. As a result, by eliminating non-condensing tankless gas water heaters from the market,

⁷ EERE-2017-BT-STD-0019_0049, American Council for an Energy-Efficient Economy Appliance Standards Awareness Project. Bradford White Corporation, Consumer Federation of America, Natural Resources Defense Council, Northwest Energy Efficiency Alliance, Rheem Manufacturing.

DOE's proposed rule will hamper Rinnai's ability to compete and is most likely to shift the market toward storage gas water heaters, to the benefit of dominant companies such as Bradford White and Rheem.

The proposed rule may also thwart the purpose of DOE's amendments by leading to the increased use of less efficient storage gas water heaters, and therefore greater emissions overall.

Specific Impacts of the Proposed Rule:

The following describes more specifically impacts from DOE's proposed minimum efficiency standards.

1. A clear consequence of eliminating non-condensing tankless gas water heaters is the loss of a band of products providing significantly increased efficiency over storage gas water heaters at only a modestly increased price – i.e., the DOE's proposed rules have a storage gas water heater baseline efficiency of 59% to 68% (with current efficiency 54% to 63%), while the current tankless gas water heater baseline efficiency is 81%. That 81% option will disappear with DOE's proposed baseline efficiency for all tankless gas water heaters of 91%-93%, which only allows for condensing tankless gas water heaters, a higher priced option. This will limit the available product (and installation) options and consumer choice.

Rinnai's non-condensing tankless gas water heaters – the only tankless gas water heaters manufactured in the U.S. – in fact generally exceed the current baseline efficiency standard of 81% for tankless gas water heaters with a UEF rating of 0.82 on most models. This presents efficiency performance well above competing storage gas water heater minimum efficiencies under either the current or proposed rules.

2. The loss of the intermediate efficiency and pricing, along with relative ease of installation, presented by non-condensing tankless gas water heaters would impose a substantial economic impact on consumers considering installing available tankless water heaters. Rinnai's estimate of incremental retail price of condensing gas water heaters is between \$450 to \$600 per unit higher than for non-condensing water heaters.⁸ Consumers incur additional installation costs for condensate management which is not required for non-condensing tankless water heaters.⁹

⁸ EERE-2017-BT-STD-0019_0049, American Council for an Energy-Efficient Economy Appliance Standards Awareness Project. Bradford White Corporation, Consumer Federation of America, Natural Resources Defense Council, Northwest Energy Efficiency Alliance, Rheem Manufacturing.

⁹ For purposes of comparison, there is data available for furnaces that are condensing versus non-condensing. See "Comments of American Gas Association: Energy Conservation Program: Conservation Standards for Residential Energy Furnaces and Residential Central Air Conditioners and Heat Pumps," Attachment A, EERE-2011-BT-STD-0011/RIN 1904-AC06, October 12, 2011. Cost adder data, collected across American Gas Association U. S. member utilities, covers cost adders for residential non-

DOE's Technical Support Document severely underestimates the installed cost differential between non-condensing and condensing residential water heaters given that the product price of a condensing tankless water heater is about \$450 (Table 1) higher than non-condensing tankless water heaters.¹⁰ The elimination of the non-condensing option will further increase the price gap between a gas (condensing) tankless and a gas storage water heater. Rinnai will address the accuracy of installed costs more directly in its comments to DOE, but as relevant to DOJ's determination, the importance is that the cost disparity is an essential and demonstrated motivation for homeowners to choose lower efficiency storage gas water heaters instead of condensing tankless gas water heaters, particularly in the replacement market. DOE's proposed rule removes the more moderately priced, non-condensing tankless gas water heaters from the market, forcing a choice between the low-price storage water heater and the high price condensing tankless model, which may not be physically compatible with all spaces. The obvious result will be that most consumers in the replacement market will switch, not to condensing tankless water heaters, but rather to less-efficient gas storage water heaters.

3. In short, the impact of DOE's proposed rule on the water heater market will be to induce a shift toward storage gas water heaters, reducing the expected growth of tankless gas water heaters. For the reasons explained above, Rinnai projects that if the DOE proposed rule goes into effect, a significant proportion (80%-100%) of sales of non-condensing tankless gas water heaters will shift to sales of storage gas water heaters. While condensing tankless water heaters will continue to be used in some situations, they are not likely to replace most sales of non-condensing tankless water heaters given their significantly higher cost and installation considerations.

Rinnai has examined water heater shipment data from a variety of sources to evaluate the impact of the shift in sales of non-condensing tankless gas water heaters to storage gas water heaters. This is shown in Table 3 and Figure 4 below for scenarios in which 100%, 90% or 80% of the current non-condensing tankless sales shift to storage gas water heaters (with the remainder 0%, 10%, or 20% shifting to condensing tankless water heaters). As can be seen in Table 3, a complete shift represents a loss of the 37% savings in environmental impact in the form of energy use and carbon dioxide emissions as well as consumer life-cycle costs as compared to a scenario where non-condensing tankless gas water heaters remain on the market. For cases where only 90% and 80% substitution of storage gas water heaters occurs, there are still substantial lost energy

weatherized condensing central furnace and excludes costs specifically applicable to furnace systems, which includes relining existing chimneys and venting modification to accommodate common venting commonly required for furnace replacements code requirements for proper vent sizing. Other condensing appliance installation cost adders covering condensate collection and removal, condensate freeze protection, and structural modification to accommodate venting are common to both furnaces and water heaters where condensing appliances serve as replacements or substitutes to non-condensing appliances and total to between \$900 and \$1,200 per installation.

¹⁰ EERE-2017-BT-STD-0019_0049, American Council for an Energy-Efficient Economy Appliance Standards Awareness Project. Bradford White Corporation, Consumer Federation of America, Natural Resources Defense Council, Northwest Energy Efficiency Alliance, Rheem Manufacturing

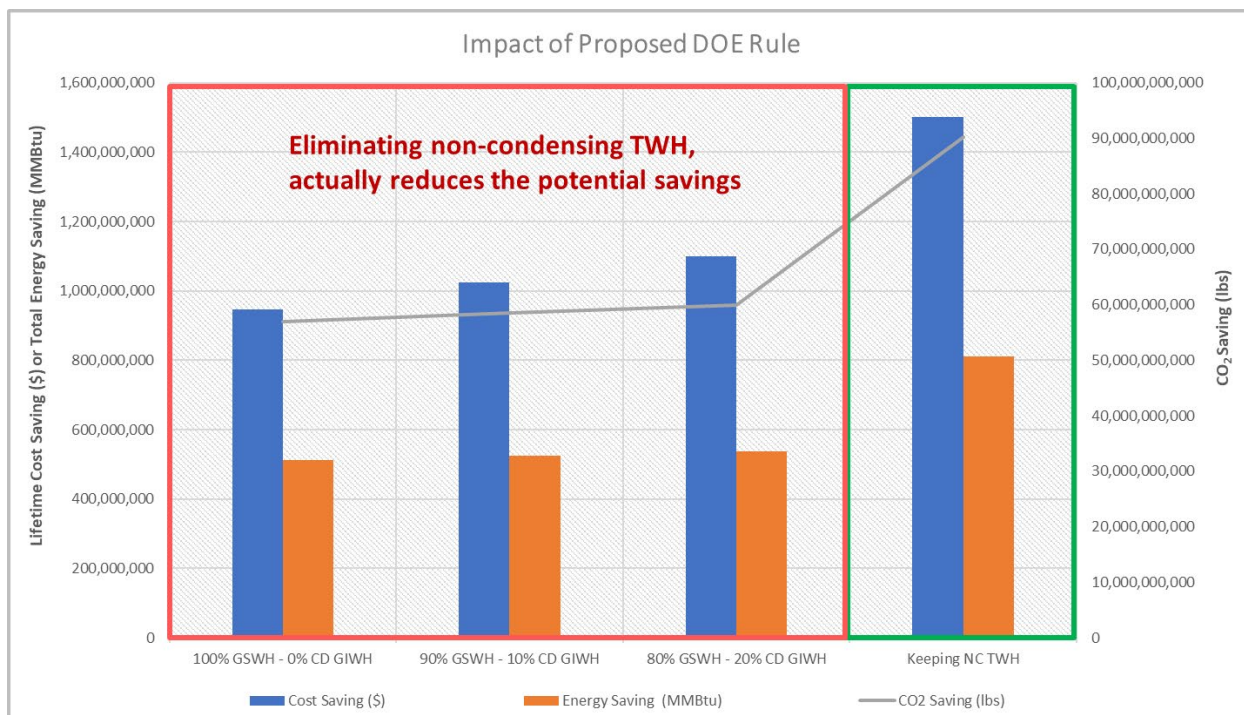
savings, carbon dioxide emissions reductions, and financial savings. Rinnai presents these alternative scenarios as a conservative measure of potential impacts.

Table 3 (impact of shift to storage / tank water heaters on lifetime cost savings, energy savings, and emissions savings from 2005 - 2050):

	% Allocation of NC TWH to Storage WH or CD TWH					
	100% Tank - 0% CD TWH		90% Tank - 10% CD TWH		80% Tank - 20% CD TWH	
	Total Saving Losses	% Loss	Total Saving Losses	% Loss	Total Saving Losses	% Loss
Lost Cost Saving (\$) By Eliminating NC TWH	\$554,066,897	37%	\$477,619,897	32%	\$401,172,897	27%
Lost Energy Saving By Eliminating NC TWH (MMBtu)	299,196,043	37%	286,220,964	35%	273,245,885	34%
Lost CO ₂ Saving By Eliminating NC TWH (lbs)	33,325,808,040	37%	31,833,211,788	35%	30,340,615,536	34%
Compared to EL-02 Storage Water Heaters, non-condensing TWH have saved the consumer between 2005 to 2030:						
Lifetime Cost Savings (\$):	\$947,159,048					
Energy Savings (MMBtu):	511,465,748					
CO ₂ Savings (lbs):	56,969,367,458					
If not eliminated, non-condensing TWH will contribute to additional savings between 2030 to 2050:						
Lifetime Cost Savings (\$):	\$554,066,897					
Energy Savings (MMBtu):	299,196,043					
CO ₂ Savings (lbs):	33,325,808,040					
Baseline: Non-condensing TWH Continue to Remain in Market - Total Savings 2005-2050						
Lifetime Cost Savings (\$):	\$1,501,225,945					
Energy Savings (MMBtu):	810,661,792					
CO ₂ Savings (lbs):	90,295,175,498					
Key Takeaways						
Keeping non-condensing TWHs provides the best savings to the consumer						
Even going from 100% tank to 80% tank/20% condensing TWH has minimal impact on energy and CO ₂ savings						
Keeping non-condensing TWHs can provide 27%-37% in cost savings to the consumer						
Keeping non-condensing TWHs can provide 34%-37% in energy savings to the consumer						
Keeping non-condensing TWHs can provide 34%-37% in CO ₂ reduction						

*Estimated volumes leveraging modified version of 2023 BRG report
Energy use and cost data leveraging Federal Register EERE-2017-BT-STD-0019 and Technical Support Document (TSD) EERE-2017-BT-STD-0019-0058*

Figure 4 (comparison of impact on lifetime cost savings, energy savings, and emissions of existing and proposed DOE standards):



As Table 3 and Figure 4 show, eliminating non-condensing tankless gas water heaters will result in lost energy use savings, emissions reductions, and cost savings over the next decades. Thus, DOE’s proposed rule will “thwart the intent of the revised standards by inducing substitution to less efficient products” and increasing emissions.¹¹ Moreover, this will result in the suppression of competition from tankless gas water heaters in general and increase market concentration while denying consumers valuable product options.

4. The impact of the proposed rules on the concentrated water heater market raises anticompetitive concerns. As noted above, three large players dominate the market, and Rinnai is a much smaller competitor offering more efficient, higher technology products that have gradually been making inroads into the gas storage water heater market. As can be seen in Figure 2 above, in 2012, tankless water heaters were only 8% of the gas water heater market, and in 2022 they were 21%. Rinnai does not offer gas storage water heaters in the residential market; it only offers tankless water heaters. And as to tankless water heaters, it only manufactures the non-condensing tankless in the U.S. As explained more below, Rinnai must import its condensing tankless water

¹¹ Technical Support Document (TSD) EERE-2017-BT-STD-0019-0058 “Publication of determination.”, U.S. Department of Energy, “Energy Conservation Program: Energy Conservation Standards for Commercial Refrigeration Equipment,” 80 Fed. Reg. 44892 (Jul. 28, 2015).

heaters, putting it at a pricing disadvantage for that product in the U.S. market. While Rinnai is the current leader in production and sales of gas tankless water heaters in the United States, the elimination of non-condensing tankless water heaters from the market will impact Rinnai's market share and competitive position dramatically. The overall impact of the proposed rule will be to shift more market share to two of the large players in an already concentrated market, and to eliminate a product option that will hamper a smaller competitor's ability to compete; this is anti-competitive and to the detriment of consumers.

More particularly, Rinnai's competitive position with respect to product offerings and pricing would be threatened by the elimination of non-condensing tankless water heaters from the market. If the market moves to condensing tankless gas water heaters only, Rinnai America must import condensing tankless water heaters and therefore would be at a competitive disadvantage with a potentially higher cost position. This ultimately lessens and harms competition in the market. Additionally, since Rinnai does not manufacture storage water heaters, it cannot offer consumers a storage product alternative and would have to compete in the residential water heater market solely on sales of its higher-cost condensing water heater products. As discussed above, Rinnai assesses the incremental installed costs to consumers for condensing over non-condensing to be significant (increased product costs of about \$450 (Table 1), and additional costs incurred for condensate management), making it highly likely that replacement consumers rationally will forgo Rinnai's condensing tankless products in favor of storage water heaters.

Rinnai's U. S. production of non-condensing tankless water heaters has contributed and would continue to contribute to a market transition from gas storage water heaters to higher efficiency tankless gas water heating with consequently lower emissions. This economically justified substitution effect is a market dynamic that is in effect today but that would be sacrificed by the elimination of non-condensing tankless water heaters. Since the current non-condensing products contribute efficiencies of 80% and above, these products are an important increased-efficiency option for consumers in the water heater replacement market, resulting in energy savings, reduced emissions, lower life-cycle costs, reduced footprint of water heating equipment, and extended life span of the product. DOE's proposed rules eliminating non-condensing tankless water heaters as a consumer option will disrupt and stall this market-based transition to greater efficiency and lower emissions.

5. In addition to the substantial risk of increasing market concentration and reducing competition, DOE's proposed rule will have specific impacts on Rinnai. Manufacturing at the new Griffin, GA facility is tooled and optimized for production of non-condensing tankless water heaters, which would be banned by the proposed rules. Figure 5 shows a photo of the new, \$70 million Griffin facility.

Figure 5 (Rinnai's new manufacturing facility in Griffin, GA):



The net effect if the DOE's proposed rules for tankless water heaters go forward would be to make the Griffin, GA facility largely obsolete. That would result in eliminating 122 current jobs, including 78 jobs held by female workers and 102 jobs held by minority workers.

Rinnai estimates that loss of the Griffin plant production and sales would mean a loss of gross profit of between \$30 million and \$36 million annually and a write-off of \$2 million in capital expenditure (CAPEX) that could not be repurposed. Condensing water heaters are not manufactured using the same technology, and it would require substantial re-investment to be able to convert the facility to a different product. Rinnai estimates that CAPEX for repurposing Griffin to the condensing tankless water heater market would require between \$3 million and \$9 million, which may be prohibitive given current production capacity in Japan – i.e., unless demand for condensing tankless in the U.S. market exceeds Japan's manufacturing capacity, re-purposing the U.S. facility would not be warranted. And as explained above, Rinnai thinks it is highly unlikely that eliminating non-condensing tankless will result in a shift to condensing tankless; instead, it predicts that over 80% of non-condensing tankless water heaters will be replaced with gas storage water heaters.

6. DOE's analysis does not refute these points on the likely competitive effects of the proposed rule. DOE ignores the likely substitution effect of non-condensing tankless for storage water heaters, particularly in the residential water heater replacement market. DOE did not adequately gather market information or assess the impacts on manufacturers. Notably, while DOE appears to have communicated with two of the large players in the water heater market – who stand to benefit from the elimination of non-condensing tankless as a product substitute – it did not contact Rinnai or seek Rinnai's input on the impacts of the proposed rule. Similarly,

manufacturer meetings convened by DOE did not involve Rinnai.¹² As a result, much of the information presented in this comment letter was never sought or considered by DOE.

Moreover, it appears that DOE *should have* analyzed some of these effects under its “Process Improvement Rule,” 10 CFR Part 430, Appendix A to Subpart C, which calls on the DOE to analyze:

(i) *Impacts on manufacturers.* The analysis of private manufacturer impacts will include: Estimated impacts on cash flow; assessment of impacts on manufacturers of specific categories of products/equipment and small manufacturers; assessment of impacts on manufacturers of multiple product-specific Federal regulatory requirements, including efficiency standards for other products and regulations of other agencies; and impacts on manufacturing capacity, plant closures, and loss of capital investment.¹³

To Rinnai’s knowledge, the DOE has yet to conduct an analysis of the “impact on manufacturers” that includes Rinnai’s product offerings, manufacturing capacity, or potential plant closure and loss of capital investment, and it has not accounted for its proposed rules’ likely market impacts and effects on consumer choice discussed earlier. A responsive analysis would assist the DOJ in making a determination as well as provide a fulsome explanation of the proposed rules’ impact on manufacturing.

¹² The DOE Technical Support Document reports conducting manufacturer interviews for developing its analysis of technological feasibility and economic justification, Federal Register/Vol. 88, No. 144/Friday, July 28, 2023/Proposed Rules page 49086 / 49088 as examples. But records indicate that it never contacted Rinnai, and Rinnai is not aware of any communications from the DOE relating to the proposed rule.

¹³ 10 CFR Part 430, Appendix A to Subpart C.

Conclusions:

The DOJ in prior determinations has laid out specific considerations to evaluate the anticompetitive effect of DOE proposed rules. *See supra* at 1-2. Respectfully, it is Rinnai's position that the proposed rule at issue here meets each of those criteria and will plainly have anticompetitive effects. DOE's proposed rule eliminating non-condensing tankless gas water heaters (while not substantially increasing the required efficiency for storage gas water heaters) will unreasonably restrict consumer access to an efficient, cost-effective option for tankless water heater products; will disproportionately impact middle-income households and small businesses who cannot afford the more expensive condensing tankless option; and will create an uneven playing field in the market, favoring large players who provide storage gas water heaters that are less expensive but also far less efficient, likely resulting in increased market concentration. Thus, the proposed rule:

- “Substantially [limits] consumer choice” by removing a product from the residential market that provides a higher efficiency option for replacing storage gas water heaters. This cuts off the market trend of consumers substituting cost-effective, more efficient non-condensing tankless gas water heaters for storage gas water heaters, instead removing that product option, and forcing consumers in the replacement market to choose between higher-priced condensing tankless water heaters or lower cost storage gas water heaters. The impacts would be especially dramatic for existing users of non-condensing tankless water heaters. To date approximately four million non-condensing tankless water heaters have been installed. For these units, the DOE's proposed rule would eliminate a drop-in replacement, resulting in lower efficiency options being introduced and higher costs to the consumer.
- Imposes an “unjustified competitive disadvantage” on Rinnai by eliminating the only product it manufactures in the U.S., substantially devaluing (if not rendering obsolete) its investment in a new manufacturing facility, and virtually eliminating potential customers in the replacement market.
- Constitutes a “lessening of competition” by inducing a shift toward storage gas water heaters that favors the large players in the market and may result in increasing market concentration, at the expense of a smaller competitor with a cost-effective, high-efficiency product manufactured in the U.S.
- “Thwart[s] the intent of the revised standards by inducing substitution to less efficient products” by forcing consumers replacing gas water heaters to choose between lower-cost, lower-efficiency storage water heaters or significantly higher cost, more efficient condensing tankless gas water heaters – and market data shows that in a replacement scenario, consumers choose the less expensive option. A shift to storage gas water heaters will lead to decreased efficiency.

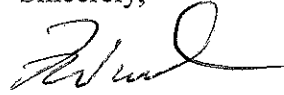
Accordingly, Rinnai requests that the DOJ determine that the proposed rule will likely have anti-competitive effects and therefore recommend that DOE revise its proposed rule so as not to eliminate non-condensing tankless gas water heaters from the market. This could be accomplished by DOE in one of two ways: either by setting separate efficiency standards for non-condensing tankless and condensing tankless water heaters, or by setting a standard for all tankless water heaters that is technologically feasible for non-condensing tankless water heaters.

Alternatively, Rinnai suggests that, at the least, DOJ does not have sufficient information, data, and analysis to allow it to conclude that there is no anticompetitive effect here. DOJ therefore should recommend that DOE gather additional information and data and undertake a market analysis to evaluate the evidence and claims presented by Rinnai herein before issuing a final rule. DOJ previously has published recommendations for how to conduct a competitive market analysis, as illustrated in its December 2020 Organization for Economic Co-operation and Development (OECD) paper, “Using Market Studies to Tackle Emerging Competition Issues,”¹⁴ which could serve as a template for DOE’s investigation. DOJ thus should determine that there is insufficient evidence on the manufacturing impacts, effects on market concentration, and consumer impacts, and recommend that DOE pause issuing a final rule and instead implement a similar process of using workshops and market studies to gather information and to investigate these factors. That information should then be subject to comment and consideration, including review by DOJ. This process would inform both DOE and DOJ regarding the advisability of the minimum efficiency standards in the proposed rule that exclude non-condensing tankless gas water heaters from the market.

¹⁴ Mancini, J. “USING MARKET STUDIES TO TACKLE EMERGING COMPETITION ISSUES – Contribution from the United States, Session IV, Global Forum on Competition, Directorate for Financial and Enterprise Affairs Competition, Committee, JT03469048, November 26, 2020.

Rinnai greatly appreciates the opportunity to present these comments to DOJ.

Sincerely,

A handwritten signature in black ink, appearing to read 'Frank Windsor', with a stylized, flowing script.

Frank Windsor
President, Rinnai Corporation