Presentation to Office of Management & Budget: DOE Consumer Water Heater Efficiency Rule

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INTRODUCTION

- DOE's proposed rule eliminates non-condensing gas instantaneous water heaters (GIWH), which are a cost effective, reduced emissions and highly efficient option, while maintaining the option of less efficient, higher emission gas storage water heaters.
- DOE's proposed rule will not save energy, is not economically justified, and makes product characteristics and features unavailable.
- DOE's proposed rule impacts competition, U.S. manufacturing, and affordable housing.
- Modifying the rule to include separate standards for non-condensing and condensing GIWH would provide customers at all income levels an affordable, cost effective, higher efficiency solution.
    - Result would be an additional 0.61 quad in energy savings and an additional 31 million metric tons carbon emissions savings over the 30-year time period calculated in the rule.

DOE's Proposed Rule

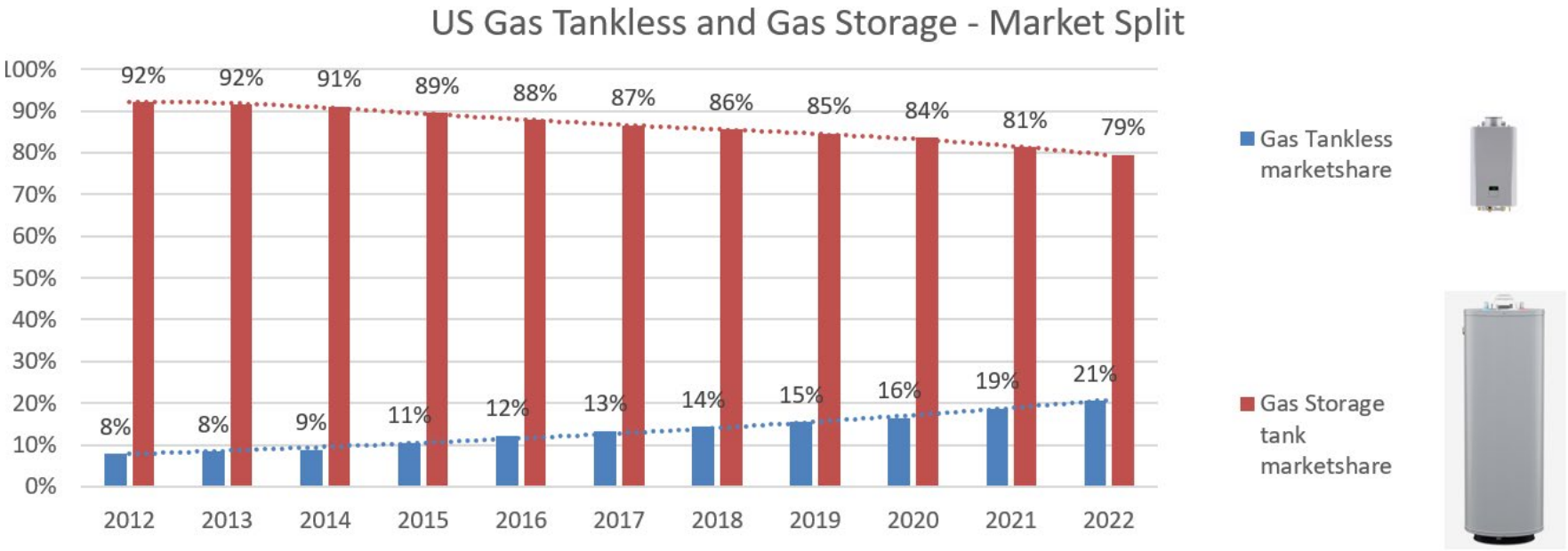
- DOE's existing standard sets the efficiency level for all GIWH at a level that allows both non-condensing and condensing GIWH (**0.81 UEF**).
- The proposed standard increases the efficiency level for all GIWH to a level that allows only condensing GIWH (**0.91 / 0.93 UEF**).
- The proposed new standard is **not technologically feasible** for non-condensing GIWH.
- As a result, **non-condensing GIWH will be eliminated**.

Background: Market Overview

- **Expanding market:** GIWH have been expanding U.S. market share, in large part by replacing storage water heaters.
  - Since their introduction in 2004, GIWH have grown to 10% of the water heater market and are projected to grow to 12% by 2027.

- **Reduces emissions:** Sales of non-condensing gas tankless water heaters alone saved 339 million MMBtus (0.34 quads) and 37.7 billion pounds (17 million metric tons) of carbon emissions between 2005 and 2022.

Figure 1: Gas Tankless and Gas Storage Market Share 2012-2022



Background: GIWH Technology

- **Condensing GIWH:**
  - slightly more efficient but more expensive than non-condensing GIWH
  - have different installation requirements, including the need for condensate management, i.e., drainage and / or a condensate pump, neutralizer
  - use different venting materials and designs from non-condensing technology

- **Non-condensing GIWH:**
  - cost less and are slightly less efficient
  - smaller in size and do not require condensate management
  - use different venting from condensing technology

- **Both condensing and non-condensing GIWH** are substantially more efficient than gas storage (tank) water heaters.

- Many existing buildings were constructed for non-condensing appliances and would require alterations to install condensing appliances.

Table 1: Change From 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	• Non-condensing • Condensing	• Non-condensing • Condensing
Gas Tankless Water Heater	0.81	0.91 / 0.93
Technology That Can Achieve	• Non-condensing • Condensing	• Condensing **only**

*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

Market Impact of Proposed Rule

- **Under existing rule, market-driven trend results in more efficient appliances, greater energy savings and reduced emissions**
  - Both condensing and non-condensing GIWH sales have increased over the past two decades
  - Non-condensing models represent more than 50% of the installed base of GIWH and are roughly 30% of current sales of GIWH

- **Under proposed rule, eliminating non-condensing GIWH will impede this market trend and result in lost energy savings**
  - The proposed rule ignores potential product substitution with a less efficient and less expensive gas storage water heater option still on the market.

Proposed Rule Will Not Result in Significant Energy Savings

- EPCA prohibits DOE from issuing a standard that does not result in **significant energy savings**. *See* Section 6295(o)(3).
- Under DOE's analysis, proposed rule has **minimal** energy savings.
  - It predicts only 0.40 quads of energy savings over the next 30 years.
- Rinnai's analysis shows proposed rule would lose energy savings.
  - If only 30% of sales that would otherwise be non-condensing GIWH sales instead are gas tank water heater sales, there is a **loss** in energy savings.
- By leaving non-condensing GIWH on the market for next 30 years, existing rule could achieve an extra 0.61 quad of energy savings.

Proposed Rule Is Not Economically Justified

- EPCA prohibits DOE from issuing a standard that is **not economically justified**. *See* Sections 6295(o)(2), (o)(3).
- LCC savings for GIWH standard are **minimal: $135 for 20 years**.
- LCC analysis is flawed and relies on inaccurate information, making it probable that the actual LCC is **negative**.
  - **Rinnai submitted data** showing product cost and installed cost do not reflect market prices (e.g., venting costs high; condensate costs low).
  - Joint Commenters' sensitivity analysis shows even minor changes (e.g., 6% increase in cost) would flip the result to negative.
  - Concerns with random assignment modeling, older data, among others.

Proposed Rule Makes Non-Condensing Features Unavailable

- Section 6295(o)(4) states that DOE cannot amend a standard if likely to result in unavailability of performance characteristics or features.
  - Features that make products compatible with the existing infrastructure of a building and able to be used as a “like-for-like” replacement provide utility to consumer.
- DOE reading of this provision is unduly narrow.
  - In other rulemakings, DOE has considered size constraints, installation limits, and venting as distinct features.

Impacts of Proposed Rule

- DOE failed to adequately consider economic impact on **U.S. manufacturing**.
  - Rinnai is the only domestic manufacturer of GIWHs. It will lose a key product offering, millions in sales, and may have to close its new manufacturing facility. That facility has 122 employees, and Rinnai has 450 additional employees supporting non-condensing GIWH.
- DOE's proposed standard will **lessen competition** in a highly-concentrated market.
  - The proposed rule will shift more water heater market share to two out of the three large players, who supported the proposed rule. Rinnai is a much smaller competitor making inroads in this market.
- DOE's proposed standard will **impact housing affordability**.
  - For lower- and middle-income consumers, the upfront costs of more expensive water heaters will be burdensome. This will disproportionately impact low-income and affordable housing.
- Proposed rule **raises legal concerns**.
  - In combination with other appliance rulemakings, this implicates the major questions doctrine.

DOE Should Issue a Separate Standard For Non-Condensing GIWH

- There is a statutory solution: DOE has authority to issue separate standards for condensing and non-condensing GIWH.
  - Section 6295(q) says DOE "shall specify" a "higher or lower standard" for any group of products with "a capacity or other performance-related feature" that justifies a "higher or lower standard" from other products in the class or type.
- Allows increases in efficiency without making product features or characteristics unavailable to consumers.

Questions?

Thank You

For Your Time

Appendix

Additional Tables and Figures

Figure 2: Water Heater Marketshare 2012-2022

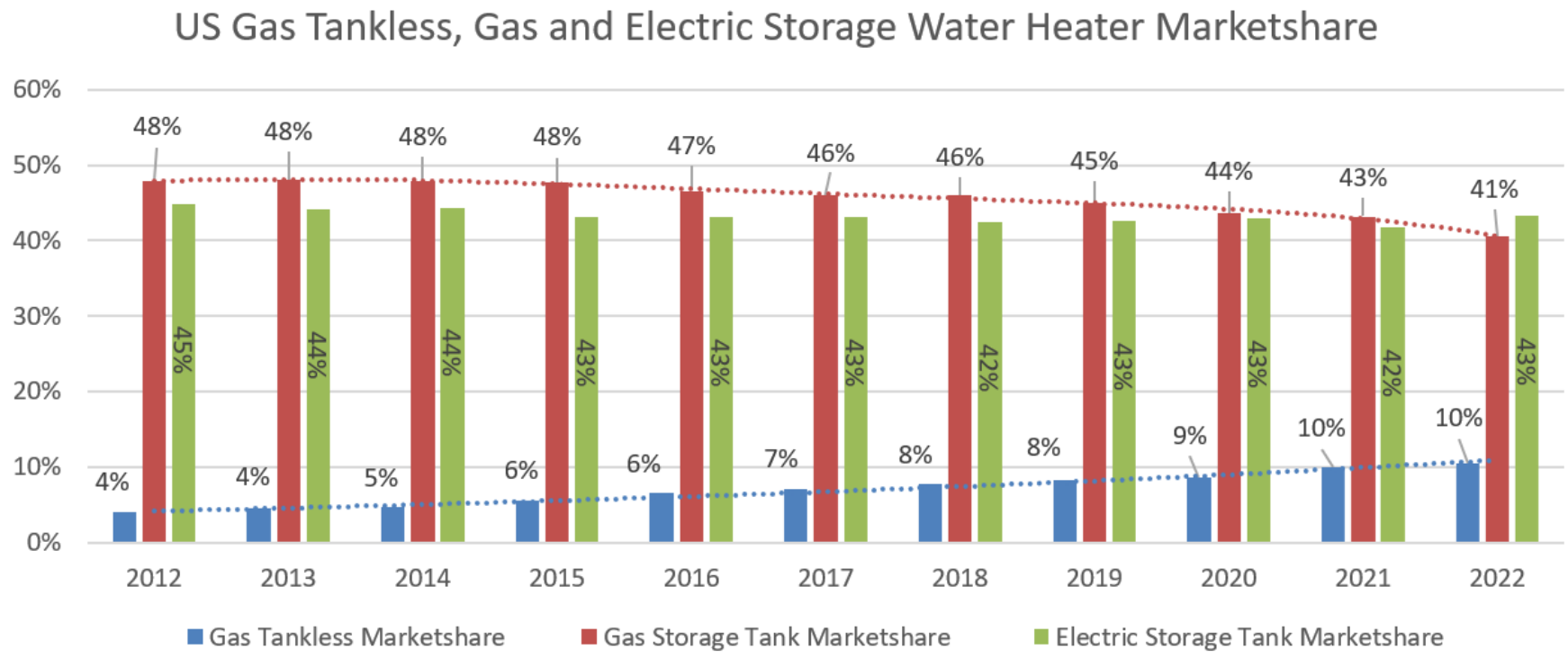


Table 2: Average Efficiencies and Prices for Gas Water Heater Products

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

*Average retail price difference between condensing and non-condensing tankless water heater is ~$450

Table 3: Impact of Allocation of Non-Condensing GIWH Sales to Tank Water Heaters or Condensing GIWH, 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

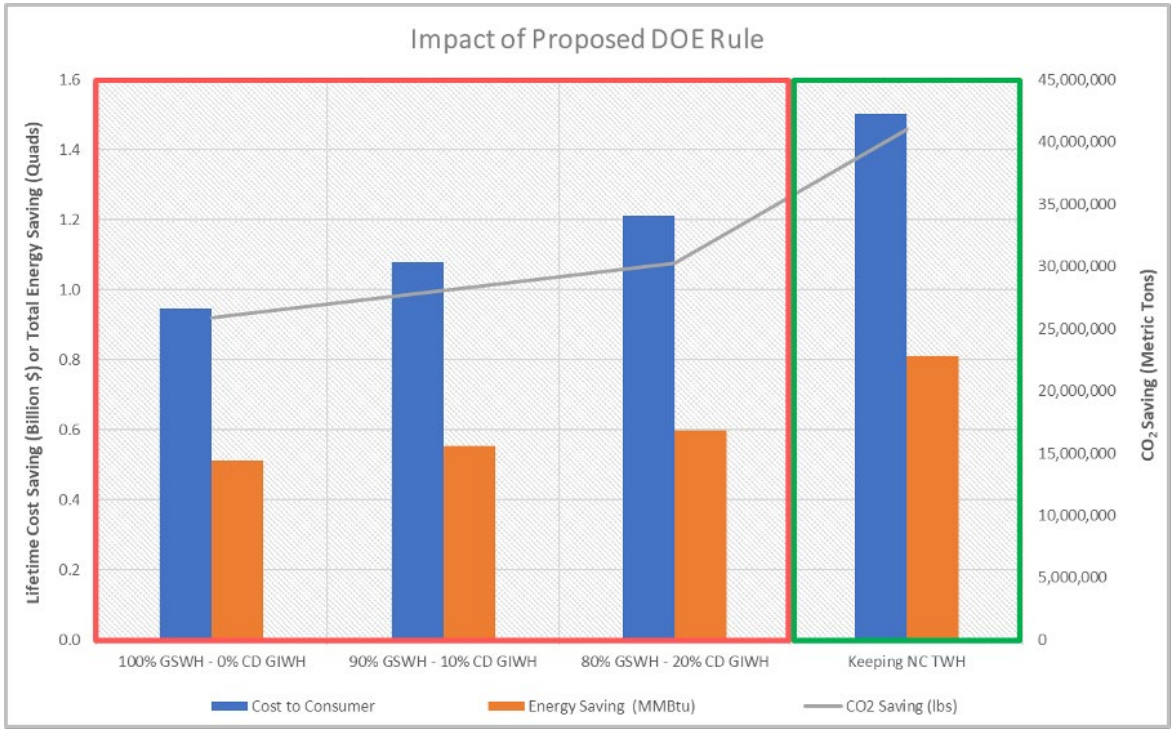


Table 4: Impact of Allocation of Non-Condensing GIWH Sales to Tank Water Heaters or Condensing GIWH, 2005 - 2059

	% 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