

DOE's Proposed Commercial Water Heater Standards

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DOE's Proposed Commercial Boiler Standards

- There have been serious systemic problems with DOE's regulatory analysis in standards rulemaking for gas products.
- DOE has routinely proceeded without adequate evidence to support statutorily-required determinations that standards are economically justified and without cogent response to substantial adverse information and argument.
- In the last 60 days a number of these problems have been confirmed by the D.C. Circuit's decision in *APGA v. DOE* and by a National Academies of Science report reviewing DOE's analytical methods.
 - [20-1068-1930930.pdf \(uscourts.gov\)](#)
 - <http://nap.edu/25992>
- DOE's proposal should be reexamined in light of these developments.

Our Principal Concerns

- We are concerned that DOE intends to propose new “condensing level” standards (*i.e.*, AFUE >90%) for commercial water heaters.
 - DOE previously proposed such standards in 2016 and has expressed an intent to do so again.
 - Such standards are unjustified and would be problematic for several reasons.
- We are concerned that DOE will not provide sufficient information to facilitate adequate comment on its proposal.
 - Standards are required to be economically justified on the basis of substantial evidence (and – in this case – clear and convincing evidence).
 - DOE’s economic justification for similar standards has been extremely complex, inadequately explained, and based on undisclosed information.

Condensing products are appropriate for some installations but not for others

- Condensing products have captured a significant and ever-expanding share of the commercial water heater market.
- Condensing products make sense in many cases.
 - In new construction, condensing products often have *lower initial costs* than less efficient products.
 - In other cases they impose higher initial costs but provide significant net savings over time.
- However, condensing products are not suitable for all installations.
 - In some cases the additional initial cost of condensing products would never be recovered in operating cost savings.
 - In many cases, existing commercial water heaters could not be replaced with condensing products without substantial (and sometimes impractical) building modifications.

The problems in replacement scenarios

- Most existing buildings were architecturally designed to accommodate atmospherically-vented gas products.
- Condensing products are not compatible with such buildings.
- If standards limit the market to condensing products, existing atmospherically vented products could not be replaced without the need to modify existing buildings to accommodate products for which they were not designed.
- There are many cases in which required modification would be impractical or would have undesirable impacts on occupied space or building exteriors.
- Many consumers would be left without replacement products suitable to their needs.

The Result

- Standards limiting the market to condensing products are designed to promote “fuel switching” rather than cost-effective efficiency improvements.
 - That’s why electrification advocates support such standards.
 - That’s why we oppose them.
- There is no ambiguity involved:
 - DOE recognizes that condensing standards would impose burdens that would cause many purchasers to replace gas products with electric alternatives; and
 - Has sought to justify condensing standards on the theory that “fuel switching” is a desirable outcome.

Condensing standards would be problematic for several reasons

- Condensing standards are precluded by specific statutory provisions designed to ensure that standards do not leave purchasers without products suitable to their needs.
- There is no evidence that there are any market failures warranting regulatory intervention.
- There is no evidence that new standards would be economically beneficial for consumers.
- Standards designed to promote fuel switching are inconsistent with the basic statutory scheme.

Condensing standards are inconsistent with EPCA's “unavailability” provisions

- EPCA precludes standards that would result in the unavailability “in any covered product type (or class) of performance characteristics (including reliability), features, sizes, capacities, and volumes” that are currently available to consumers. 40 C.F.R. §§ 6295(o)(4); 6313(a)(6)(B)(iii)(II)(aa).
- These “Unavailability Provisions” were designed to ensure that even economically justifiable standards achieve energy savings “without sacrificing the utility or convenience of appliances to consumers.” H.R. Rep. No. 100-11 at 22-23 (1987).
- Among other things, these provisions were specifically intended to preserve the availability of products that “fit in standard building spaces” in existing buildings. H.R. Rep. No. 100-11 at 22-23 (1987).

There is no evidence that market failures warrant regulatory intervention

- More efficient commercial water heaters are capturing an increasing share of the market.
- The economics of investments in such products is highly variable, resulting in significant net benefits in some cases and significant net costs in others.
- Investments in commercial water heaters involve substantial financial investments on the part of sophisticated purchasers.
- Such purchasers routinely consider the economics of investments in higher-efficiency products.
- There is no evidence that the investments such purchasers decline would, on average, produce net economic benefits.

DOE's failure to consider baseline purchasing behavior is a serious error

- The National Academies of Science report criticized DOE's failure to identify market failures justifying new standards and recommended that “[F]or some commercial goods in particular, there should be a presumption that market actors behave rationally unless DOE can provide evidence or argument to the contrary.” <http://nap.edu/25992> (at 3, 21-22, Recommendation 4-13).
- DOE's failure to provide evidence of relevant market failures was also criticized by the D.C. Circuit in *APGA v. DOE*. [20-1068-1930930.pdf \(uscourts.gov\)](https://www.uscourts.gov/20-1068-1930930.pdf) (Slip Op. at 13-15).

This failure invalidates DOE's analysis of economic impacts on consumers

- DOE's economic analysis considers the range of economic outcomes resulting from efficiency investments, but “assigns” economic outcomes to the base case or standards case randomly, as though purchasers *never* consider the economics of potential efficiency investments *regardless of the economic stakes involved*.
- This approach grossly overstates the potential for standards to produce economically beneficial outcomes while understating their potential to impose net cost outcomes.
- It also generates purported regulatory benefits in cases in which the basic premise that higher initial costs might deter beneficial efficiency investments does not even apply.

DOE's “fuel switching” analysis compounds the problem

- DOE recognizes that the incompatibility of condensing products with existing buildings would cause consumers to switch to electric alternatives.
- Having assumed that decisions to invest in more efficient gas products are *never* influenced by economics, DOE assumes that decisions to switch to electric alternatives *always* are, and uses a “fuel switching” analysis to:
 - Selectively exclude bad efficiency investments from its analysis; and
 - Replace them with “beneficial” economic outcomes attributed to assumed investments in electric alternatives.
- Rather than showing that *required efficiency improvements* would be justified by the energy savings those improvements would provide, this analysis seeks to show that *standards requiring economically unjustified efficiency improvements* would have economically justifiable consequences.

This regulatory approach is inconsistent with the basic statutory scheme

- The statutory purpose of EPCA's appliance and equipment efficiency program is to conserve energy through *improvements in the efficiency of the regulated products*, not to promote electrification. 42 U.S.C. § 6201.
- Standards must be economically justified based on the costs and benefits of efficiency improvements *in the products subject to the standards*.
 - EPCA requires that *standards* be economically justified. 42 U.S.C. § 6313(a)(6)(B)(ii).
 - By energy savings resulting “directly” from the standard. 42 U.S.C. § 6313(a)(6)(B)(ii)(III).
 - DOE must consider the economic impact of the standard on manufacturers and consumers “of the products subject to such standard.” 42 U.S.C. § 6313(a)(6)(B)(ii)(I).
 - DOE must compare the increase in the initial cost of more efficient products subject to the standards with the operating cost savings those more efficient products would provide over the life of those products. 42 U.S.C. § 6313(a)(6)(B)(ii)(II).

Transparency Issues –Individual Lifecycle Cost Outcomes

- The average lifecycle cost outcome (on which DOE primarily relies) is heavily influenced by a small percentage of relatively extreme individual LCC outcomes: the kinds of economic outcomes that are most likely to influence baseline purchasing behavior.
- However, DOE provides limited information on the range and distribution of individual LCC outcomes, particularly at the outcome-determinative ends of the range of economic outcomes.
- To provide a sufficient understanding of its analysis to facilitate comment, **DOE must disclose the magnitude and distribution of the most economically beneficial and highest net-cost individual LCC outcomes in both its base case and rule outcome cases.**

Illustration of the problem (from the analysis at issue in *APGA v. DOE*)

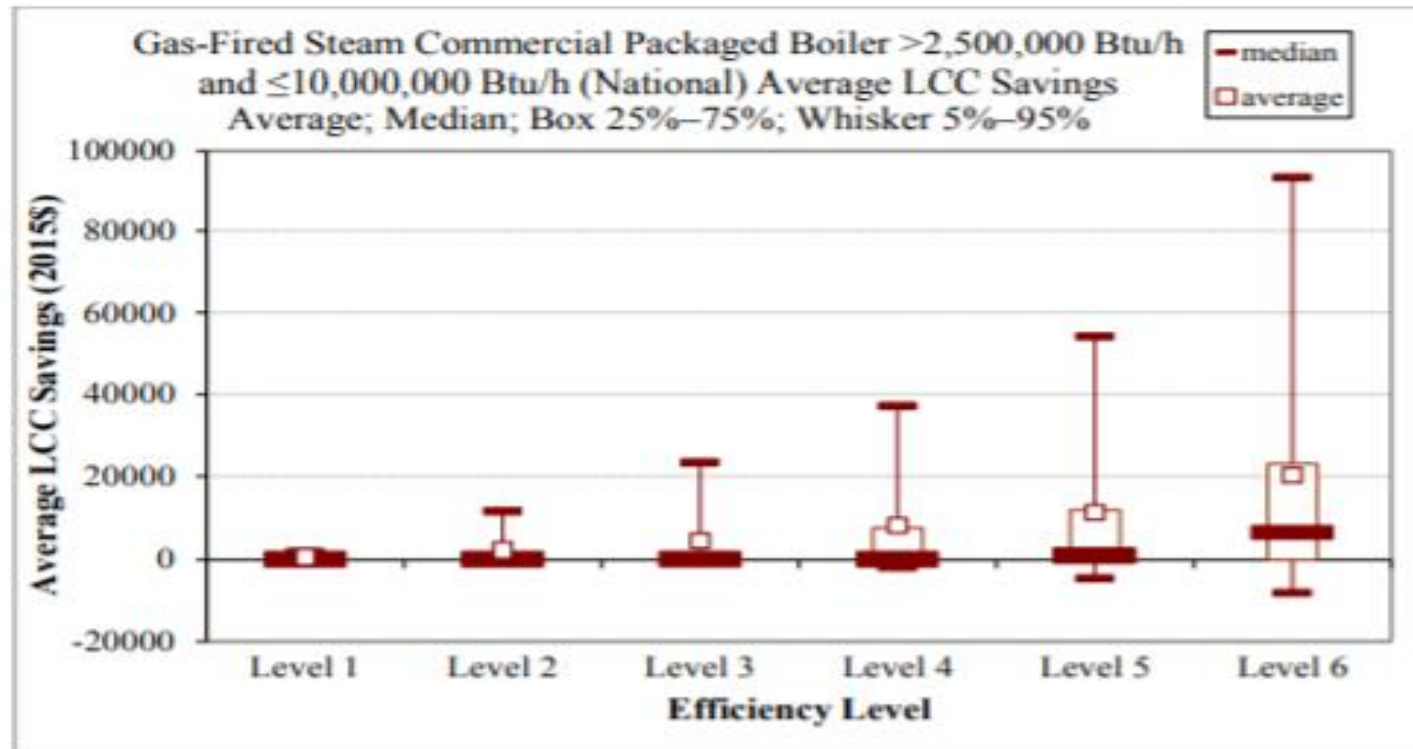


Figure 8.4.6 Distribution of LCC Savings for Gas-Fired Steam Commercial Packaged Boilers >2,500,000 Btu/h and ≤10,000,000 Btu/h

Accounting for windfall “benefits” *where no efficiency investment is required*

- DOE must provide sufficient information to confirm that its analysis does not claim regulatory benefits from installations in which standards compliant products have *lower initial costs* than less efficient alternatives (as commonly occurs in installations in new construction).
 - In such cases, the basic premise of efficiency regulation (that higher initial costs might deter efficiency investments that would provide net economic benefits over time) does not even apply.
 - Yet DOE’s “random assignment” methodology fails to assign such outcomes to the base case for analysis.
 - As a result, over 55% of the purported regulatory benefits claimed to justify DOE’s 2016 proposed residential furnace standards were generated by such outcomes.

Accounting for high net-benefit outcomes requiring at least some initial investment

- To permit an adequate understanding of the nature and impact of its assumptions with regard to baseline purchasing behavior, DOE must adequately disclose:
 - The magnitude and distribution of the highest net benefit LCC outcomes in both the base case and rule outcome cases; and
 - The justification for that distribution of outcomes.
- At a minimum, DOE must disclose:
 - The magnitude and distribution of the 5% of individual LCC outcomes with the highest net LCC benefits; and
 - The magnitude and distribution of individual LCC outcomes for which the simple payback period would not exceed one year.

Accounting for high net-cost efficiency improvements

- To permit an adequate understanding of the nature and impact of its assumptions with regard to baseline purchasing behavior, DOE must adequately disclose:
 - The magnitude and distribution of the highest individual *net cost LCC outcomes* in both the base case and rule outcome cases; and
 - The justification for that distribution of outcomes.
- At a minimum, DOE must disclose the magnitude and distribution of the 5% of individual LCC outcomes with the highest net LCC costs.

High net-cost efficiency improvements (cont'd)

- High net-cost outcomes appear to be significantly underrepresented in DOE's analysis.
- DOE must provide sufficient information to enable commenters to assess the extent to which DOE has:
 - Underestimated the frequency or magnitude of high net-cost efficiency investments;
 - Improperly assigned such investments to the base case for analysis (as occurs through random assignment); or
 - Selectively excluded such outcomes from its analysis (through use of a “fuel switching” analysis or otherwise).

Specific Transparency Issues – Marginal Prices for Natural Gas

- What are the prices used to calculate the utility bill savings efficiency improvements would provide?
- Spire determined the average marginal residential and commercial prices customers pay in Missouri, but DOE:
 - Ignored that information; and
 - Did not disclose its own numbers in a way that permits comparison.
- DOE must clearly disclose the range and average of the prices its analysis used to calculate utility bill savings in each state.

Specific Transparency Issues – Installed Costs for Commercial Water Heaters

- What do purchasers pay (purchase price and installation) for baseline and standards-compliant commercial water heaters?
- Interested parties have access to actual price data, but DOE does not disclose its own numbers in a way that facilitates comparison.
- DOE must clearly disclose the range and average of the purchase prices and installation costs its analysis used in each state.

Conclusions

- Any proposal to impose new standards for commercial water heaters should be reconsidered in light of defects in DOE's regulatory analysis identified in *APGA v. DOE* and the National Academies of Science review of DOE's analytical methods.
- Condensing level standards for gas products are inherently problematic and are not economically unjustified.
- At a minimum, any proposed standards must provide sufficient information to facilitate meaningful comment on core issues on which the results of DOE's economic analysis depend.