Submitted via regulations.gov and
ResFurnaces2014STD0031@ee.doe.gov

August 29, 2022

Ms. Julia Hegarty
U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy
Building Technologies Office, EE-5B
1000 Independence Avenue SW
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Re: Topics to Address at Sept. 6, 2022 Public Meeting/Webinar re Energy *Energy Conservation Program: Energy Conservation Standards for Consumer Furnaces*, EERE-2014-BT-STD-0031, RIN 1904-AD20, 87 Fed. Reg. 40590 (July 7, 2022)

Dear Ms. Hegarty:

This letter follows up on the August 11, 2022 letter from the American Gas Association (The American Gas Association ("AGA"), American Public Gas Association ("APGA"), National Propane Gas Association ("NPGA"), Spire Inc., Spire Missouri Inc., Spire Alabama Inc., and Atmos Energy Corporation ("Atmos Energy") (collectively, "Joint Requesters") requesting, among other things, that the Department of Energy ("DOE") hold a workshop on its Life Cycle Cost ("LCC") model. We thank DOE for scheduling a webinar on the LCC model for September 6, 2022. We write to reiterate topics that will be critical for the DOE to address during the webinar.

The August 11, 2022 letter (attached) identified fundamental defects in the LCC model and other problems with the model that prevent stakeholders from meaningfully commenting in this proceeding. We appreciate that DOE made a revised version of its LCC spreadsheet supporting the model available on August 24, 2022, and we are working diligently to analyze it in the limited time that DOE has afforded. As indicated in an analysis of the DOE LCC model previously submitted to DOE, "the DOE LCC analysis spreadsheet model methodology uses complex algorithms that include interactive impacts among many input parameters."[1] In studying these methodological choices, input parameters, model logic, and functionality, several critical issues and severe flaws have been identified and persist, some of which were indicated in the August 11, 2022 letter. A preliminary analysis of the revised LCC spreadsheet released on August 24, 2022 shows that the model continues to possess several critical issues and flaws. To provide stakeholders

[1] *See* Leslie, Neil, Technical Analysis of DOE Notice of Proposed Rulemaking on Residential Furnace Minimum Efficiencies, GTI Project Nos. 21693 and 21754 at page 6 (July 7, 2015, V2 Revision July 10, 2015) *available at* https://www.gti.energy/wp-content/uploads/2018/11/21693-Furnace-NOPR-Analysis-FinalReport_2015-07-15.pdf

a meaningful opportunity to comment on the underlying proposed rule, the Joint Requesters ask that the DOE allocate substantial time during the webinar to allow stakeholders with experience and expertise utilizing the DOE LCC model developed for this and other rulemakings to share with DOE during the webinar their experiences using the model and spreadsheets as published. We ask that DOE be sure to address and take questions on the following topics regarding the LCC model:

- **Unrepresentative market shares:** The number of trial cases developed underlying the national averages in the model does not reflect the market share of fuel gas customers by state or census division. For example, for the entire Pacific census region, the model attributed only 719 out of 7,237 trials to natural gas retrofits, or 9.9% of the market, while the 2020 residential energy consumption survey determined that market to be 16% of all households. The inconsistent number of trial cases to actual market shares significantly impacts the model's outcome. In some cases, the model produces no trial cases for natural gas customers in certain states; therefore, natural gas customers in those states are not represented in the results. The model also produces no trial cases for propane customers in certain states; therefore, propane customers in those states are not represented in the final results.

- **Mistakes:** The Joint Requesters have identified numerous errors in the as-presented model. To provide one example, the Heat Pump Energy Use calculations in the excel model include the following equation "HHL / COP + Blower Energy." On the tab "Energy Use (Prod Switch) within cell K20" where this formula is used, the Blower Energy is not accounted for. Meanwhile, the Blower Energy is accounted for in Cell K14, which calculates energy use for electric furnaces. This is just one of many such errors that the Joint Requesters would like DOE to address.

- **Outliers:** The outcome of a single trial case can make the difference between a standard purportedly providing net LCC benefits and a standard imposing net LCC costs in a particular state. In the as-released LCC model that DOE provided for public comment on June 13, 2022, the Joint Requesters noted the outcome of a single trial case, out of 548 trial cases, in California made the difference between a standard purportedly providing net LCC benefits and a standard imposing net LCC costs in that state. In the revised LCC spreadsheet that DOE released on August 24, 2022, the random assignment analysis has produced a different set of trial cases for California, which have now resulted in a negative LCC savings for that state, and negative LCC savings for the majority of trial cases (customers) in that state.

- **Random Assignment:** Analysis previously submitted to DOE reveals that "the Base Case furnace assignment algorithm used by DOE ignores economic decision making by the consumer. Instead, the Base Case AFUE, which is the efficiency of the furnace that is chosen by an individual consumer without the influence of DOE's rule, is assigned randomly in the DOE NOPR LCC model. DOE's baseline furnaces in the 10,000 Crystal Ball trial case homes are intended to be representative of the RECS survey furnace distribution across various locations and categories throughout the country .... Random

assignment of the baseline furnace does not achieve this key objective. The economics of a particular efficiency level selection compared to other levels (e.g., 80% AFUE vs. 92% AFUE [or 95% AFUE]) are not considered in DOE's baseline furnace decision making methodology. DOE's methodology assumes that consumers do not consider economics at all when choosing a furnace. This technical flaw results in overstated LCC savings in the proposed rule."[2]

- **Fuel switching:** Unlike the random decisions in the Base Case AFUE assignment, "decisions on whether a consumer will choose a fuel switching option are based on consumer economics in the baseline DOE LCC model"[3] [emphasis added]. The methodological and logical inconsistency, in which consumers utilize economic decision-making with respect to fuel switching algorithm but not in the selection of base case furnace efficiencies, has substantial impacts on the outcomes of the economic analysis of trial standard levels.

- **Regional/state level subgroup analysis:** The DOE LCC subgroup analysis presented for comment in the TSD identifies impacts reported only on a national basis, or for states designated in a North region (as defined in the TSD). However, a regional and state analysis of consumers and subgroups of consumers has identified troubling and inconsistent results that suggest substantial impacts to consumers not readily apparent in national averages. For example, an analysis of the proposed standard level within California indicates that 55 percent of rule-affected trials result in negative LCC impacts with an average cost of $145.61. Within those trial groups, low-income customers are disproportionately affected, with an average LCC cost of $389.55, more than double the state average and well below the national average published in the TSD. Furthermore, some states appear to have no representation in terms of subgroups of fuel gas customers, suggesting the modeling scenarios do not capture critical subgroups that will be affected by this rulemaking.

- **Equipment lifetime assumptions:** The default DOE LCC model calculates the cost of different efficiency NWGF over the lifetime of the furnace discounted back to present. Analysis indicates that the LCC outputs may be highly sensitive to assumptions on equipment lifetime.

- **Residential Energy Consumption Survey** data is utilized in ways that lead to input parameters and results that are inconsistent with real-world representations of fuel gas market shares, building design, and appliance operation.

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[2] *See* Leslie, Neil, Technical Analysis of DOE Notice of Proposed Rulemaking on Residential Furnace Minimum Efficiencies, GTI Project Nos. 21693 and 21754 at page viii (July 7, 2015, V2 Revision July 10, 2015) *available at* https://www.gti.energy/wp-content/uploads/2018/11/21693-Furnace-NOPR-Analysis-FinalReport_2015-07-15.pdf.

[3] *Id*. at page 18 (emphasis added).

- Other critical input parameters include baseline furnace design, higher efficiency furnace design, weather data, energy prices, furnace prices, installation costs, maintenance costs, discount rates, local and regional factors, and others.

We are gratified DOE has scheduled this webinar and for its assurance that it wants stakeholders to understand the model. Addressing these issues during the webinar will be critical to enabling Joint Requesters to do so. Without doing addressing these issues, we will be foreclosed from a meaningful opportunity to comment on a critical aspect of the proposed rule. Furthermore, providing this information is consistent with DOE's Process Rule, which pledges DOE will "use qualitative and quantitative analytical methods that are fully documented for the public and that produce results that can be explained and reproduced, so that the analytical underpinnings for policy decisions on standards are as sound and well-accepted as possible." 10 C.F.R. part 430, App. A, § 1(f).

Thank you. We look forward to the webinar. In the meantime, if you have any questions regarding this submission, please do not hesitate to contact the undersigned.

Respectfully submitted,

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ATTACHMENT

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August 11, 2022

Ms. Julia Hegarty
U.S. Department of Energy
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Washington, DC 20585-0121

Re: Request for Workshop and Related Extension of the Comment Period
***Energy Conservation Program: Energy Conservation Standards for Consumer Furnaces*, EERE-2014-BT-STD-0031, RIN 1904-AD20, 87 Fed. Reg. 40590 (July 7, 2022)**

Dear Ms. Hegarty:

The American Gas Association ("AGA"), American Public Gas Association ("APGA"), National Propane Gas Association ("NPGA"), Spire Inc., Spire Missouri Inc., Spire Alabama Inc., and Atmos Energy Corporation ("Atmos Energy") (collectively, "Joint Requesters") respectfully reiterate their request at the August 3, 2022, public meeting webinar that the Office of Energy Efficiency and Renewable Energy ("EERE"), Department of Energy ("DOE") hold a workshop on its Life Cycle Cost ("LCC") model. As discussed at the webinar and herein, there are numerous, fundamental defects in the model. A workshop—and additional time thereafter to submit comments in light of the results of the workshop—are needed to resolve these issues. At the webinar, DOE pledged that it would take this under consideration and wants to make sure that everyone feels comfortable in relation to an LCC analysis. The Joint Requesters believe that a workshop is needed to achieve this critical objective.

AGA, founded in 1918, represents more than 200 local energy companies that deliver clean natural gas throughout the United States. There are more than 77 million residential, commercial, and industrial natural gas customers in the U.S., of which 95 percent—more than 73 million customers—receive their gas from AGA members. AGA is an advocate for natural gas utility companies and their customers and provides a broad range of programs and services for member natural gas pipelines, marketers, gatherers, international natural gas companies, and industry associates. Today, natural gas meets more than one-third of the United States' energy needs.[1]

APGA is the trade association for more than 730 communities across the U.S. that own and operate their retail natural gas distribution entities. They include not-for-profit gas distribution systems owned by municipalities and other local government entities, all locally accountable to the citizens

[1] For more information, please visit www.aga.org.

they serve. Public gas systems focus on providing safe, reliable, and affordable energy to their customers and support their communities by delivering fuel to be used for cooking, clothes drying, and space and water heating, as well as for various commercial and industrial applications.[2]

NPGA is the national trade association of the propane industry with a membership of about 2,500 companies, and 36 state and regional associations representing members in all 50 states. NPGA's membership includes retail marketers of propane gas who deliver the fuel to the consumer, propane producers, transporters and wholesalers, and manufacturers and distributors of equipment, containers, and appliances. Propane, or liquefied petroleum gas, is used in millions of installations nationwide for home and commercial heating and cooking as well as various other agricultural, industrial, and transportation sectors.[3] The variety of appliances powered by propane include the furnaces subject to the agency's proposal.

Spire Inc., Spire Missouri Inc., and Spire Alabama Inc. (collectively "Spire") are in the natural gas utility business. Spire Inc. owns and operates natural gas utilities that distribute natural gas to over 1.7 million residential, commercial, and institutional customers across Missouri, Alabama, and Mississippi, and Spire Missouri Inc. and Spire Alabama Inc. are the largest natural gas utilities serving residential, commercial, and institutional customers in Missouri and Alabama, respectively.

Headquartered in Dallas, Texas, Atmos Energy is one of the nation's largest natural-gas-only distributors, serving more than three million natural gas distribution customers in over 1,400 communities in eight states, from the Blue Ridge Mountains in the East to the Rocky Mountains in the West.

Joint Requesters provide the energy needed to fuel gas-fired heating equipment, thus making them critical stakeholders.

DOE's LCC model is central to its standards proposal—and thus is central to stakeholders' ability to comment on the proposal. At the August 3 webinar, new information was discussed regarding severe flaws in the model. It was further stressed that these should be able to be resolved through a workshop in which DOE and stakeholders can work together to come to a common understanding for an appropriate model.

Participants are unable to meaningfully comment in this proceeding since they cannot make the model work, and the model produces absurd results. When participants run the model using the most current version of the required Excel add-on, Oracle Crystal Ball (11.1.3.0.000), to regenerate results, the model produces summary table results inconsistent with the DOE Technical Support Document ("TSD"). Beyond that, for example, the random assignment analysis underlying DOE's national averages in the model do not reflect the market share of fuel gas customers by state or census division. For the entire Pacific census region, the model attributed only 730 out of 7,196 trials to natural gas retrofits or 10.1% of the market while the 2020 residential energy consumption survey determined that market to be 16% of all households. The model has gaps in coverage where some states only represent one fuel and may underweight or overweight the size of the user base

[2] For more information, please visit www.apga.org.
[3] For more information, please visit www.npga.org.

compared to other states. In some cases, the model produces no trial cases for natural gas customers in certain states, and therefore natural gas customers in those states are not represented in the final results. The model also produces no trial cases for propane customers in certain states, and therefore propane customers in those states are not represented in the final results. The outcome of even one trial case can be significant. For example, the outcome of a single trial case, out of 548 trial cases, in California makes the difference between a standard purportedly providing net LCC benefits and a standard imposing net LCC costs in that state. This is just a sampling of the severe flaws in the model.

Joint Requesters also stressed at the webinar the need for an adequate period of time to enable stakeholders to analyze the results of the workshop and prepare comments.

We are gratified that after hearing these problems and the requests for a workshop, DOE pledged at the webinar that it would take this under consideration and wants to make sure that everyone feels comfortable in relation to an LCC analysis. Joint Requesters believe that the only way to achieve this crucial objective is a workshop in which a common understanding can be reached. Joint Requesters urge that no less than 45 days from receipt of the results of a workshop be provided for submission of comments. Otherwise, they are effectively denied an opportunity to comment in this proceeding.

DOE again recently stated its adherence to transparency in rulemaking when it reformulated its so-called Process Rule. 10 C.F.R. part 430, App. A. In section 1(f), DOE pledges "to use qualitative and quantitative analytical methods that are fully documented for the public and that produce results that can be explained and reproduced, so that the analytical underpinnings for policy decisions on standards are as sound and well-accepted as possible." In this instance, DOE might achieve that objective with the requested workshop. Without the workshop, however, stakeholders and the public would be kept in the dark about the agency's analytical methods—thus flying in the face of the objective.

Joint Requesters thank you for the review and consideration of their request. If you have any questions regarding this submission, please do not hesitate to contact the undersigned. We look forward to the establishment of a workshop as soon as possible.

Respectfully submitted,

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Cc: Mr. Matthew Ring (U.S. DOE, Office of the General Counsel)