[ORAL ARGUMENT NOT SCHEDULED]

Nos. 22-1030, 23-1285, 23-1337

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

AMERICAN GAS ASSOCIATION, et al.,

Petitioners,

v.

UNITED STATES DEPARTMENT OF ENERGY, et al.,

Respondents.

On Petitions for Review of Final Rules of the U.S. Department of Energy

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INITIAL BRIEF FOR RESPONDENTS

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CERTIFICATE AS TO PARTIES, RULINGS, AND RELATED CASES

Pursuant to D.C. Circuit Rule 28(a)(1), the undersigned counsel certifies as follows:

A. Parties and Amici

Petitioners in these consolidated cases are the American Gas Association (22-1030, 23-1285, 23-1337), the American Public Gas Association (22-1030, 23-1285, 23-1337), the National Propane Gas Association (23-1285, 23-1337), Spire, Inc. (22-1030), Spire Alabama Inc. (22-1030), Spire Missouri Inc. (22-1030), and Thermo Products LLC (22-1030, 23-1337).

Respondents are the United States Department of Energy (22-1030, 23-1285, 23-1337), the Secretary of the Department of Energy (22-1030, 23-1285, 23-1337), and the Department of Energy's Office of Energy Efficiency and Renewal Energy (23-1285, 23-1337).

Intervenors supporting respondents are the City of New York (22-1030), Massachusetts (22-1030), the Consumer Federation of America (22-1030), the District of Columbia (22-1030), Illinois (22-1030), Maine (22-1030), Maryland (22-1030), Minnesota (22-1030), Nevada (22-1030), New Jersey (22-1030), New Mexico (22-1030), New York (22-1030),

Oregon (22-1030), Vermont (22-1030), Washington (22-1030), the Massachusetts Union of Public Housing Tenants (22-1030, 23-1285, 23-1337), the Natural Resources Defense Council, Inc. (22-1030, 23-1285, 23-1337), and the Sierra Club (22-1030, 23-1285, 23-1337).

Amicus curiae supporting petitioners in all three cases are the Chamber of Commerce of the United States of America, the National Multifamily Housing Council, the National Apartment Association, the National Association of Home Builders, the Manufactured Housing Institute, Tennessee, Alabama, Arkansas, Florida, Georgia, Indiana, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Nebraska, Oklahoma, South Carolina, Texas, Virginia, and West Virginia.

B. Rulings Under Review

Petitioners seek review of three Department of Energy final rules: (1) *Energy Conservation Program for Appliance Standards: Energy Conservation Standards for Residential Furnaces and Commercial Water Heaters*, 86 Fed. Reg. 73,947 (Dec. 29, 2021); (2) *Energy Conservation Program: Energy Conservation Standards for Commercial Water Heating Equipment*, 88 Fed. Reg. 69,686 (Oct. 6, 2023); (3)

Energy Conservation Program: Energy Conservation Standards for Consumer Furnaces, 88 Fed. Reg. 87,502 (Dec. 18, 2023).

C. Related Cases

These cases have not previously been before this or any other court. In *New York v. U.S. Department of Energy*, No. 21-602 (2d Cir. filed Mar. 16, 2021), a group of states challenged the 2021 withdrawal of proposed rules addressing the efficiency standards for consumer furnaces and commercial water heaters. That case is currently in abeyance pending resolution of the petitions for review here. Counsel for respondents are not aware of any other related cases.

/s/ Steven H. Hazel
Steven H. Hazel

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GLOSSARY

APA	Administrative Procedure Act
Btu	British thermal unit
Commercial Water Heaters Rule	*Energy Conservation Program: Energy Conservation Standards for Commercial Water Heating Equipment*, 88 Fed. Reg. 69,686 (Oct. 6, 2023)
Consumer Furnaces Rule	*Energy Conservation Program: Energy Conservation Standards for Consumer Furnaces*, 88 Fed. Reg. 87,502 (Dec. 18, 2023)
Department	Department of Energy
EPCA	Energy Policy and Conservation Act
HVAC	Heating, ventilation, and air-conditioning
Interpretive Rule	*Energy Conservation Program for Appliance Standards: Energy Conservation Standards for Residential Furnaces and Commercial Water Heaters*, 86 Fed. Reg. 73,947 (Dec. 29, 2021)

STATEMENT OF JURISDICTION

This Court has jurisdiction over these petitions for review under 42 U.S.C. §§ 6306(b) and 6316. The Department of Energy issued the challenged rules pursuant to its authority under 42 U.S.C. §§ 6295 and 6313. The Interpretive Rule, 86 Fed. Reg. 73,947, was published in the Federal Register on December 29, 2021, and petitioners filed a timely petition for review on February 25, 2022. The Commercial Water Heaters Rule, 88 Fed. Reg. 69,686, was published in the Federal Register on October 6, 2023, and petitioners filed a timely petition for review on October 13, 2023. The Consumer Furnaces Rule, 88 Fed. Reg. 87,502, was published in the Federal Register on December 18, 2023, and petitioners filed a timely petition on the same day.

STATEMENT OF THE ISSUES

The Energy Policy and Conservation Act (EPCA) establishes efficiency standards for certain appliances, including consumer furnaces and commercial water heaters, and authorizes the Department to periodically review and revise those standards as appropriate. Any amended standards must be economically justified and must achieve efficiency improvements without compromising "performance

characteristics" or product "features." 42 U.S.C. §§ 6295(o), 6313(a). These consolidated cases concern condensing technology, a design that significantly improves consumer furnace and commercial water heater efficiency but does not alter their performance. In adopting amended standards requiring that those appliances reach efficiency levels consistent with condensing technology, the Department applied a detailed economic model. The model projects that the amended standards will generate billions of dollars in net economic benefits each year. The questions presented are:

1. Whether the Department correctly recognized that condensing technology improves efficiency without compromising performance characteristics or product features.

2. Whether the Department reasonably concluded that the amended standards are economically justified.

PERTINENT STATUTES AND REGULATIONS

Pertinent statutes and regulations are reproduced in the addendum to this brief.

STATEMENT OF THE CASE

A. Statutory and Regulatory Background

The Energy Policy and Conservation Act, Pub. L. No. 94-163, 89 Stat. 871 (1975) (codified as amended at 42 U.S.C. §§ 6201-6422), was enacted to promote national "energy conservation," including by improving the energy efficiency of certain "major appliances" and "consumer products," 42 U.S.C. § 6201(4), (5). Congress initially established a voluntary, market-based program for achieving that goal, *see* § 325, 89 Stat. 923-26, but it soon amended EPCA to require mandatory energy conservation standards, *see* National Energy Conservation Policy Act, Pub. L. No. 95-619, tit. IV, pt. 2, § 422, 92 Stat. 3206, 3259-62 (1978). Congress has continued to amend EPCA over time to revise those standards and to advance the goal of energy conservation.

As amended, EPCA prescribes energy conservation standards for consumer furnaces and commercial water heaters, 42 U.S.C. §§ 6295(f), 6313(a), and it directs the Department to periodically review and revise those standards as appropriate, *id*. §§ 6295(m), 6313(a)(6). Any amended standard cannot "increase[] the maximum allowable

energy use[] . . . of a covered product," *id.* § 6295(o)(1), and must be "technologically feasible and economically justified," *id.* § 6295(o)(2)(A).[1] Thus, Congress intended that the Department would "steadily increas[e] the energy efficiency of covered products." *Natural Res. Def. Council v. Abraham*, 355 F.3d 179, 197 (2d Cir. 2004).

In verifying that an amended standard is economically justified, the Department analyzes "whether the benefits of the standard exceed its burdens." 42 U.S.C. §§ 6295(o)(2)(B)(i); *id.* 6313(a)(6)(B). To aid that assessment, Congress articulated six non-exhaustive factors for the Department to consider. *See id.* § 6295(o)(2)(B)(i)(I)-(VII). For instance, ECPA authorizes the agency to account for "any lessening of the utility or the performance of the covered products likely to result" from the amended standards. *Id.* § 6295(o)(2)(B)(i)(IV). The statute does not require the agency to give any factor any particular weight.

[1] Separate statutory provisions address the energy conservation standards for covered consumer products and commercial/industrial equipment. *See* 42 U.S.C. §§ 6295 (consumer products); 6313 (commercial/industrial equipment). Where there is no material difference in how EPCA treats those categories of appliances, this brief cites only the provision concerning consumer products.

As particularly relevant here, EPCA recognizes that more efficient designs sometimes involve higher initial costs and directs the Department to account for such costs in its economic analysis. In particular, one of the enumerated factors requires the agency to compare "the savings in operating costs" attributable to improved designs with "any increase in the price of, or in the initial charges for, or maintenance expenses of" the product. 42 U.S.C. § 6295(o)(2)(B)(i)(II).

Although EPCA establishes that any costs associated with more efficient designs will normally be weighed as part of the economic analysis, it rules out designs that compromise an appliance's basic functionality. The Department cannot promulgate amended standards if "the [agency] finds (and publishes such finding)" that "interested persons have established by a preponderance of the evidence" that the standards are "likely to result in the unavailability" of "performance characteristics (including reliability), features, sizes, capacities, and volumes that are substantially the same as those generally available in the United States." 42 U.S.C. § 6295(o)(4). EPCA therefore recognizes that determining whether a more efficient design impairs a product's

performance characteristics or features is a fact-intensive inquiry that implicates the Department's technical expertise.

Examples of product features the Department has previously identified as protected include oven-door windows and refrigerator icemakers. With respect to oven-door windows, the agency explained that windows improve an oven's functionality by allowing cooks to "gauge the progress of food undergoing baking, without the need to open the oven door." 86 Fed. Reg. at 73,953 (JA___). Likewise, refrigerator icemakers with "through the door service" "provide[] consumers with an additional benefit during [the refrigerator's] operation." 88 Fed. Reg. at 87,535 (JA___).

B. Technical Background

These consolidated cases involve the efficiency standards for gas-powered consumer furnaces and commercial water heaters. A consumer furnace is used to heat homes and smaller commercial buildings. *Cf.* 10 C.F.R. § 431.72 (separately regulating commercial furnaces, which boast a heating capacity of "225,000 [British thermal units (Btu)] per hour or more"). And a commercial water heater is used to heat water in larger commercial buildings and multi-family apartments. *Cf.* 10

C.F.R. § 430.2 (separately regulating consumer water heaters, which have lower heating input capacities than commercial water heaters). The Department has divided consumer furnaces and commercial water heaters into various sub-classes, the details of which are not at issue here. *See* 88 Fed. Reg. at 69,688 (JA___) (listing classes of commercial water heaters); 88 Fed. Reg. at 87,504 (JA___) (same for consumer furnaces).

In a gas-fired furnace or water heater, burning gas generates heat. A heat exchanger transfers that heat to air (in the case of furnaces) or water (in the case of water heaters). As part of the transfer, a substantial amount of energy is wasted. The wasted energy takes the form of hot gases that must be vented outside the building. *See* 88 Fed. Reg. at 87,535 (JA___); 88 Fed. Reg. at 69,709 (JA___).

Condensing technology makes this process more efficient by changing the heat exchanger's geometry or introducing a second heat exchanger. That improved or additional heat exchanger captures much of the heat that non-condensing furnaces and water heaters waste. The exhaust produced by a condensing unit is thus cooler than that produced by a non-condensing unit and involves condensed water vapor,

which gives condensing technology its name. *See* 86 Fed. Reg. at 73,949 & n.4, 73,966 (JA___).

This small design change yields large efficiency benefits. A non-condensing furnace or water heater wastes roughly 20% of the energy stored in a unit of gas. *See, e.g.*, 88 Fed. Reg. at 87,509 (JA___). For condensing units, by contrast, the amount of waste is no more than 10% and is often even less. *See id.* at 87,510, 17 (JA___). Over the 20-to-25-year expected life of the relevant appliances, *see id.* at 87,520 (JA___); 88 Fed. Reg. at 69,758 (JA___), condensing units thus conserve substantial amounts of energy and yield significant savings for the average consumer.

Because appliances with condensing designs work by capturing heat that would otherwise be wasted, they improve efficiency without sacrificing performance. When "interacting with a residential furnace or commercial water heater during operation of the appliance, a consumer discerns no unique utility resulting from the specific heat exchanger technology (non-condensing or condensing)" as "the heated air or water provided by the appliance is indistinguishable." 86 Fed. Reg. at 73,955 (JA___). There is, in other words, "no noticeable

difference to the consumer in access or output based upon the type of technology . . . used by the appliance." *Id.* (JA___). Indeed, most consumers are likely unaware whether the appliances in their homes and offices use condensing technology.

In addition to offering the same performance as non-condensing units, condensing designs also involve similar installation requirements. Every gas-powered furnace and water heater, whether condensing or not, produces exhaust that must be vented. *See* 88 Fed. Reg. at 87,535 (JA___); 88 Fed. Reg. at 69,709 (JA___). By virtue of their greater efficiency, condensing units create cooler exhaust that requires different types of venting, including the use of corrosion-resistant rather than heat-resistant pipes. This difference does not change where condensing units can be installed or how much space they occupy, only the amount of installation costs. *See* 86 Fed. Reg. at 73,955-60 (JA___). Relative to non-condensing units, condensing variants are generally less expensive to install in new construction and when replacing another condensing unit, but more expensive to install when replacing a non-condensing unit. *See* 88 Fed. Reg. at 87,559, 87,581-82 (JA___).

C. The Challenged Rules

The rules at issue here require that gas-fired consumer furnaces and commercial water heaters meet efficiency standards consistent with condensing technology. The amended standards apply to consumer furnaces imported or manufactured after December 18, 2028, *see* 88 Fed. Reg. at 87,503 (JA___), and to commercial water heaters imported or manufactured after October 6, 2026, *see* 88 Fed. Reg. at 69,686-87 (JA___).

1. The Interpretive Rule

As an initial matter, the Department explained that condensing designs do not compromise any "performance characteristic[]" or product "feature" provided by non-condensing appliances. 86 Fed. Reg. at 73,954 (JA___) (citing 42 U.S.C. § 6295(o)(4)). First, the agency recognized that non-condensing and condensing designs do not differ in what functions they perform, how well they perform those functions, and where they can do so. *See* 86 Fed. Reg. at 73,955-61 (JA___). Second, the Department observed that to the extent the venting requirements for condensing and non-condensing units translate to installation cost differences, "such installation costs are appropriately

considered" as part of the economic analysis required by EPCA. *Id*. at 73,967 (JA___). Finally, the agency noted that this approach accords with its "historical[] view[]" that a statutorily-protected "performance characteristic" must involve an appliance's "operation" or functionality. *Id*. at 73,953 (JA___). Although the Department briefly departed from this approach in a 2021 rulemaking, *see id*. at 73,958-59 (JA___) (citing *Energy Conservation Program for Appliance Standards: Energy Conservation Standards for Residential Furnaces and Commercial Water Heaters*, 86 Fed. Reg. 4776 (Jan. 15, 2021)), it promptly identified the departure as an error and "revert[ed] to [its] historical interpretation," 86 Fed. Reg. at 73,959 (JA___).

2. The Consumer Furnaces and Commercial Water Heaters Rules

Consistent with the Interpretive Rule and with its obligations under EPCA, the Department amended the efficiency standards for consumer furnaces and commercial water heaters. Before those amendments, the standards for consumer furnaces and commercial water heaters had last been updated in 2007 and 2015, respectively. *See* 88 Fed. Reg. at 87,509 (JA___), 88 Fed. Reg. at 69,695 (JA___). The prior standards required the relevant appliances to reach an efficiency

level of just 80%. *See* 88 Fed. Reg. at 87,509 (JA___); 88 Fed. Reg. at 69,693 (JA___). Under the updated standards at issue here, by contrast, covered appliances must achieve efficiency levels of at least 95%. *See* 88 Fed. Reg. at 87,503 (JA___); 88 Fed. Reg. at 69,687 (JA___).

a. The cost/benefit balancing required to assess whether the final rules are "economically justified" heavily favored the amended standards. 42 U.S.C. § 6295(o)(2)(A). With respect to the Consumer Furnaces Rule, the Department found that the annual benefits (including energy savings, consumer health benefits, consumer operating savings, and emission reductions) outweigh the burdens (loss for manufacturers and cost increases for some consumers) by between $2.5 billion to $3.5 billion, depending on the discount rate applied. 88 Fed. Reg. at 87,506-7 (JA___). Similarly, the Commercial Water Heaters Rule generates net economic benefits of between $289 million and $380 million each year, again depending on the discount rate. 88 Fed. Reg. at 69,691 (JA___). Over a 30-year period, the rules will also reduce energy use by over 5 quadrillion Btus (equivalent to the energy consumption of more than 50 million homes in a single year), *see* 88

Fed. Reg. at 87,504-07 (JA___); 88 Fed. Reg. at 69,688-92 (JA___), and avoid emissions of hundreds of millions of metric tons of carbon dioxide and large quantities of other pollutants, *see* 88 Fed. Reg. at 87,504-07 (JA___); 88 Fed. Reg. at 69,688-92 (JA___).

In performing this economic analysis, the Department recognized that some purchasers would select condensing units even in the absence of amended standards. To estimate the probability that a given purchaser would choose a condensing unit, the agency relied primarily on "historical shipment data" showing trends in sales of condensing furnaces and water heaters. 88 Fed. Reg. at 87,556 (JA___). The Department also accounted for additional factors that have been shown to influence purchase decisions, including the region in which an appliance will be installed (in the case of consumer furnaces, *see id*. at 87,574-75 (JA___)), and the type of commercial building (in the case of commercial water heaters, *see, e.g.*, 88 Fed Reg. at 69,731 (JA___)). Based on these real-world inputs, the model projects that while many consumers would select condensing appliances when they are cost-justified in the long run, a substantial number would not and would therefore benefit from the amended standards.

In response to comments urging that the model assume that all consumers would select the economically-optimal appliance in the absence of amended standards, the Department observed that this assumption would defy "current market reality." 88 Fed. Reg. at 87,580 (JA___). Instead of studying future energy prices, maintenance expenses, and the host of other variables relevant to an appliance's value over its 20-to-25-year expected life, many consumers prioritize initial costs. For example, landlords "make[] the choice[s] of what [appliance] to install" but are generally not "responsible for paying energy bills" and therefore tend to select units with lower initial costs but higher long-term expenses. *Id.* at 87,577 (JA___). Likewise, purchases often occur in "emergency replacement[]" situations—such as when an appliance breaks in mid-winter—when consumers are likely to place even more emphasis on initial costs. *Id.* at 87,560 (JA___). These and other market failures lead many consumers to choose non-condensing units even though condensing alternatives would be cost-justified in the long run. *See id.* at 87,576-80 (JA___).

b. As part of the economic analysis, the Department also considered the possibility that amended standards will prompt some

consumers to switch from gas-powered furnaces and water heaters to electric alternatives. Because gas and electric appliances have different cost profiles, this possibility can affect a standard's benefits and burdens. *See* 42 U.S.C., § 6295(o)(2)(B)(i). The Department therefore "routinely accounts for potential fuel switching." 88 Fed. Reg. at 87,590 (JA___). In the rulemakings at issue here, however, the Department's economic conclusions did not depend on fuel switching. As to commercial water heaters, the Department determined "that the amended standard[s] will not introduce additional economic incentives that would cause a noticeable increase in fuel switching" and it accordingly "did not explicitly include fuel or technology switching . . . beyond the continuation of historical trends." 88 Fed. Reg. at 69,771 (JA___). As to consumer furnaces, the agency modeled scenarios with no fuel switching and with the maximum foreseeable fuel switching, *see* 88 Fed. Reg. at 87,585-87 (JA___), and noted that it would "come to the same conclusions regarding economic justification" in either scenario, *id*. at 87,588 (JA___).

c. For both rules, the Department provided ample opportunity for public comment. Only the rulemaking process for the Consumer

Furnaces Rule is at issue here. Along with a more than 200-page notice of proposed rulemaking that detailed the Department's methodology, the agency also published a technical support document and three spreadsheets containing relevant data and calculations. *See Notice of Proposed Rulemaking: Energy Conservation Standards for Consumer Furnaces*, 87 Fed. Reg. 40,590, 40,612 (July 7, 2022).

When stakeholders noted that certain figures in one spreadsheet were not identical to corresponding figures in the proposed rule, the Department explained that the relevant spreadsheet includes a commercially available software program. *See Notification of Data Availability*, 87 Fed. Reg. 52,861, 52,862 & n.3 (Aug. 30, 2022). That program "incorporate[s] uncertainty and variability into the analysis" by "randomly sampl[ing] input values from probability distributions." *Id.* at 52,862. As the Department noted, the average benefits and costs do not vary significantly across model simulations and each simulation produces "similar results" that support the same "conclusions," "policy decision," and "associated rationale." *Id.* Out of an abundance of caution, the agency issued a "locked" spreadsheet with data that does not vary and extended the comment period by 30 days. *See id.* at

52,861. The public thus had a total of 90 days to comment on the Consumer Furnaces Rule.

D. The Petitions for Review

Petitioners in these consolidated cases are natural gas utilities, a manufacturer of certain heating appliances, and trade associations representing the natural gas and propane industries. Petitioners assert that the amended standards impair statutorily-protected performance characteristics and that the Department's economic model is unreasonable. As a remedy, petitioners request that all three rules be vacated.

SUMMARY OF ARGUMENT

I. EPCA establishes initial efficiency standards for certain appliances, including consumer furnaces and commercial water heaters, and directs the Department to periodically review and raise those standards as appropriate. Any amended standards must be economically justified and must accomplish efficiency improvements without compromising performance characteristics or product features.

The rules at issue here amend the efficiency standards for consumer furnaces and commercial water heaters, which were last

updated in 2007 and 2015, respectively. Under the new standards, consumer furnaces and commercial water heaters must reach efficiency levels consistent with condensing designs. By capturing heat that other designs waste, condensing designs can reduce the amount of wasted energy from about 20% to 5% or even less. Over the 20-to-25 year expected life of the relevant products, the amended standards will thus create substantial savings for the average consumer and generate billions of dollars in net economic benefits for the United States.

Petitioners do not claim that condensing and non-condensing designs differ in the functions they perform or in how well they perform them. Instead, petitioners argue that the particular manner in which non-condensing designs are installed constitutes a "performance characteristic" requiring that those designs be forever preserved, despite their limited efficiency. But petitioners' argument rests on a series of factual assertions that are both mistaken and plainly at odds with factual findings that were made by the Department in these proceedings and that petitioners do not challenge. Contrary to petitioners' suggestion, condensing technology does not alter where an appliance can be installed or how much space it requires, and it has

only a limited effect on installation costs. As EPCA instructs, the Department accounted for those installation costs in its economic analysis. *See* 42 U.S.C. § 6295(o)(2)(B)(i)(II).

II. In determining that the amended standards are economically justified, the Department applied a detailed economic model. As particularly relevant here, the model recognizes that some consumers would install condensing appliances even in the absence of amended standards. To estimate the prevalence of that behavior, the model uses real-world data showing how often consumers choose condensing units today. Based on that data, the model projects that while many consumers would select condensing appliances when they are cost-justified, a substantial number would not and would thus benefit from amended standards.

Rather than grapple with the available data, petitioners disregard it. They argue that the model should have assumed that all consumers would select the appliance that is economically optimal in the long run. But a typical consumer does not perfectly calculate the benefits and costs of a furnace or water heater over its 20-to-25-year expected life. Instead, market failures distort consumer decision-making. As this

Court has observed, for example, "appliances are often purchased by landlords, builders of new homes, and other 'third-party purchasers' who will not pay the fuel bills" and who thus "have an incentive" to choose "initially inexpensive but inefficient appliances with high life cycle costs." *Natural Res. Def. Council, Inc. v. Herrington*, 768 F.2d 1355, 1389 (D.C. Cir. 1985). The real-world data on which the Department's model relies reflects instances in which these market failures disrupt consumer decisions as well as instances in which consumers identify the economically "correct" appliance.

Petitioners' fallback arguments are similarly flawed. Although petitioners object to the Department's consideration of the possibility that the amended standards will lead some consumers to switch from gas to electric appliances, fuel switching can affect a standard's economic benefits and costs, and the agency has routinely accounted for it in past rulemakings. In any event, the Department determined that the amended standards would be economically justified without regard to fuel switching. Likewise, petitioners identify no proper basis for their claim that the 90-day window for public comments on the Consumer Furnaces Rule was inadequate.

III. If the Court were to conclude that remand is warranted, it should remand without vacatur. *See Allied-Signal, Inc. v. U.S. Nuclear Regulatory Comm'n*, 988 F.2d 146, 150 (D.C. Cir. 1993). Vacating the rules would inflict significant harms, including by depriving the public of the amended standards' economic, health, and climate benefits. By contrast, none of the errors alleged by petitioners are grave, and all could be readily addressed on remand. With respect to the economic model, petitioners' claim is that even though the model uses real-world data and includes every variable the data shows to be significant, the agency should further refine the model by controlling for certain additional variables. And with respect to the performance-characteristics provision, petitioners' argument primarily rests on factual assertions regarding condensing technology that the agency considered and rejected. Were the Court to conclude that the Department's factual findings or its analysis of those findings are unsupported, the proper course would not be to supersede the agency's technical judgment but to remand for the agency to revisit that judgment.

STANDARD OF REVIEW

The challenged rules may not be set aside unless they are "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 5 U.S.C. § 706(2)(A); *see* 42 U.S.C. § 6306(b)(2). This standard is "highly deferential" and "presumes agency action to be valid." *American Trucking Ass'ns v. Federal Motor Carrier Safety Admin.*, 724 F.3d 243, 245 (D.C. Cir. 2013) (quoting *American Wildlands v. Kempthorne*, 530 F.3d 991, 997 (D.C. Cir. 2008)). As particularly relevant here, the Department's conclusion that amended standards are economically justified is subject to substantial-evidence review, in the case of the Consumer Furnaces Rule, *see* 42 U.S.C. § 6306(b)(2), and clear-and-convincing evidence review, in the case of the Commercial Water Heaters Rule, *see id.* § 6313(a)(6)(A)(ii)(II). "Substantial evidence is 'such relevant evidence as a reasonable mind might accept as adequate to support a conclusion.'" *Duke Energy Corp. v. Federal Energy Regulatory Comm'n*, 892 F.3d 416, 420 (D.C. Cir. 2018). And "clear and convincing evidence" requires the factfinder "to have an 'abiding conviction' that her findings" are "'highly probable' to be true." *American Pub. Gas Ass'n v. U.S. Dep't of Energy (APGA I)*, 22

F.4th 1018, 1025 (D.C. Cir. 2022). "Even where clear and convincing evidence is required," "judicial review of agency action remains deferential." *Id*. at 1025-26.

ARGUMENT

I. The Amended Standards Improve Appliance Efficiency Without Compromising Performance Characteristics or Product Features

A. EPCA directs the Department to periodically consider whether to adopt amended efficiency standards for covered appliances, including consumer furnaces and commercial water heaters. *See* 42 U.S.C. §§ 6295(m)(1), 6313(a)(6)(C). Any amended standard cannot "increase[] the maximum allowable energy use[] . . . of a covered product," *id*. § 6295(o)(1), and must be "technologically feasible and economically justified" *id*. § 6295(o)(2)(A). Congress therefore contemplated that the agency would "steadily increas[e] the energy efficiency of covered products." *Natural Res. Def. Council, Inc. v. Abraham*, 355 F.3d 179, 197 (2d Cir. 2004).

When the Department amends efficiency standards, manufacturers must abandon outdated designs and embrace more efficient alternatives. As the agency has observed, amended standards

"save energy by removing the least-efficient technologies and designs from the market." 88 Fed. Reg. at 87,535 (JA___). For instance, a recent rule raising lightbulb efficiency standards will require manufacturers to eschew inefficient incandescent and halogen designs and prioritize improved alternatives such as LEDs. *See Energy Conservation Standards for General Service Lamps*, 87 Fed. Reg. 27,439, 27,452-53, 457 (May 9, 2022).

EPCA recognizes that more efficient designs sometimes involve higher initial costs and authorizes the Department to take those costs into account in its economic analysis. In particular, one enumerated economic factor requires the agency to compare "the savings in operating costs" attributable to a more efficient design with "any increase in the price of, or in the initial charges for, or maintenance expenses of" the product. 42 U.S.C. § 6295(o)(2)(B)(i)(II).

Although EPCA establishes that any costs associated with more efficient designs will normally be included in the economic analysis, it rules out design changes that impair a product's performance characteristics or features. Under the statute, the Department cannot adopt amended standards "if the [agency] finds (and publishes such

finding)" that "interested persons have established by a preponderance of the evidence" that the standards are "likely to result in the unavailability" of "performance characteristics (including reliability), features, sizes, capacities, and volumes that are substantially the same as those generally available in the United States." 42 U.S.C. § 6295(o)(4).

Thus, amended standards must accomplish efficiency improvements through designs that perform existing product functions more efficiently, rather than by compromising the product's basic functionality. By definition, a "performance" characteristic is one that affects a product's "operation." *Performance*, Oxford English Dictionary, https://doi.org/10.1093/OED/1163430397. The ordinary meaning of a product "feature" likewise involves a "distinctive or characteristic part" of how a product functions. *Feature*, Oxford English Dictionary, https://doi.org/10.1093/OED/1067298650. The Department has accordingly recognized that the performance-characteristics provision precludes amended standards that impair "what the consumer perceives as the function of the product." 86 Fed. Reg. at 73,948 (JA___).

Other aspects of the statutory text illustrate the same understanding. As an example of a performance characteristic, EPCA identifies a product's "reliability." 42 U.S.C. § 6295(o)(4). "Whether a consumer can depend on a product to provide its useful output when needed" is directly relevant to a product's functionality. 86 Fed. Reg. at 73,955 (JA___). And in addition to referring to performance characteristics and product features, the statute also prevents amended standards from eliminating product "sizes, capacities, and volumes." 42 U.S.C. § 6295(o)(4). Each of those attributes affects whether and how well a product can perform its designated function. *See* H.R. Rep. No. 100-11, at 22 (1987) (noting that the performance-characteristics provision "ensures that energy savings are not achieved through the loss of significant consumer features").

Consistent with these provisions, the Department has long understood that EPCA protects product attributes that "provide a consumer unique utility during the operation of the appliance." 86 Fed. Reg. at 73,955 (JA___). For example, the agency has indicated that it will not adopt efficiency standards that effectively preclude oven-door windows. Those windows improve an oven's functionality by allowing

cooks to "gauge the progress of food undergoing baking, without the need to open the oven door." *Id.* at 73,953 (JA___). The agency has reached a similar conclusion with respect to refrigerator icemakers because they "provide[] consumers with an additional benefit during [the refrigerator's] operation." 88 Fed. Reg. at 87,535 (JA___).

As these examples illustrate, determining whether a more efficient design would compromise a product's performance characteristics or features is a fact-intensive inquiry that implicates the Department's technical expertise. The agency's experts have decades of experience studying the efficiency, features, and performance of covered appliances, including consumer furnaces and commercial water heaters. *See, e.g.*, 86 Fed. Reg. at 73,948-49 (JA___). In recognition of that expertise, the performance characteristics and features provision applies only when the Department "finds (and publishes such finding)" that "interested persons" have "established by a preponderance of the evidence" that amended standards would eliminate a protected product attribute. 42 U.S.C. § 6295(o)(4). It is therefore a challenger's burden to demonstrate that the performance-characteristics provision is

implicated, and the agency's role to identify performance characteristics.

B. The Department properly determined that the amended standards at issue here improve consumer furnace and commercial water heater efficiency without sacrificing performance characteristics and features. In making that factual determination, the agency consulted its technical experts, studied the relevant appliances, and considered input from manufacturers, contractors, and other third parties. *See* 86 Fed. Reg. at 73,955-961 (JA___).

The amended standards require that gas-fired consumer furnaces and commercial water heaters reach efficiency levels consistent with condensing designs. In a non-condensing furnace or water heater, burning gas generates heat. A heat exchanger then transfers that heat to air (in the case of furnaces) or water (in the case of water heaters). As part of the transfer, a substantial amount of energy is wasted. The wasted energy takes the form of hot gases that must be vented outside. *See* 88 Fed. Reg. at 87,535 (JA___); 88 Fed. Reg. at 69,709 (JA___).

Condensing designs make this process more efficient by modifying the heat exchanger's geometry or introducing a second heat exchanger.

That additional or improved exchanger captures much of the heat that non-condensing designs waste. The resulting exhaust is therefore cooler than that produced by a non-condensing unit and involves condensed water vapor, which gives condensing technology its name. *See* 86 Fed. Reg. at 73,949 & n.4, 73,966 (JA___).

This small design change generates large efficiency benefits. A non-condensing furnace or water heater typically wastes about 20% of the energy stored in a unit of gas. *See* 88 Fed. Reg. at 87,509 (JA___). For condensing units, by contrast, the amount of waste can be as low as 2%, and under the amended standards at issue here must be 5% or less. *See id*. at 87,508, 510 (JA___). Over the 20-to-25 year expected life of the relevant appliances, *see id*. at 87,520 (JA___); 88 Fed. Reg. at 69,758 (JA___), condensing units therefore conserve substantial amounts of energy and provide the average consumer with significant savings.

With respect to consumer furnaces, for example, the amended standards will save consumers billions of dollars in operating costs. *See* 88 Fed. Reg. at 87,505 (JA___) (estimating between $9.3 and $24.8 billion in consumer operating cost savings, depending on the discount rate, over 30 years of shipments). Requiring that commercial water

heaters meet efficiency standards consistent with condensing technology generates similarly robust economic benefits. *See* 88 Fed. Reg. at 69,688-89 (JA___) (estimating between $1.28 and $2.76 billion in consumer operating cost savings, again depending on the discount rate, over 30 years of shipments).

As the Department has explained, condensing designs achieve these efficiency improvements without impairing functionality. *See* 86 Fed. Reg. at 73,954-67 (JA___). When "interacting with a residential furnace or commercial water heater during operation of the appliance, a consumer discerns no unique utility resulting from the specific heat exchanger technology (noncondensing or condensing)" as "the heated air or water provided by the appliance is indistinguishable." *Id.* at 73,955 (JA___). There is, in other words, "no noticeable difference to the consumer in access or output based upon the type of technology . . . used by the appliance." *Id.* (JA___). Indeed, most consumers are likely unaware whether the appliances in their homes and workplaces use condensing technology.

In addition to offering the same performance as non-condensing units, condensing designs also involve similar installation

requirements. Every gas-powered furnace and water heater, whether condensing or not, produces exhaust that must be vented. *See* 88 Fed. Reg. at 87,535 (JA___); 88 Fed. Reg. at 69,709 (JA___). By virtue of their greater efficiency, condensing units create cooler exhaust that requires different types of venting, including the use of corrosion-resistant rather than heat-resistant pipes.

The particular manner in which condensing units are installed does not change where they can be used or how much space they occupy, only the amount of installation costs. *See* 86 Fed. Reg. at 73,955-60 (JA___). In new construction, condensing units are generally less expensive to install than their non-condensing counterparts. *See* 88 Fed. Reg. at 87,581 (JA___). In replacement scenarios, condensing units are generally less expensive to install in buildings that already have a condensing unit, but more expensive to install in buildings previously equipped with a non-condensing unit. *See id*. at 87,582 (JA___). Over time, condensing units are expected to grow more prevalent even in the absence of amended standards. *See id*. at 87,601 (JA___). With each passing year, condensing units will thus be less expensive to install in an increasingly large share of buildings.

As EPCA requires, the Department accounted for the different installation costs associated with condensing and non-condensing designs in its economic analysis. The statute directs the agency to compare the operating cost savings created by a more efficient design with any increase in the product's price, maintenance costs, or "initial charges," including installation costs. 42 U.S.C. § 6295(o)(2)(B)(i)(II). Consistent with that provision, the Department estimated the installation costs for condensing and non-condensing units in a variety of specific installation scenarios. *See, e.g.*, 86 Fed. Reg. at 73,962 (JA___) (discussing cost differences attributable to "PVC combustion air venting," "concealing venting pipes," "accounting for commonly-vented water heaters," and "condensate removal," among other scenarios); *Technical Support Document: Energy Conservation Program for Consumer Products and Commercial and Industrial Equipment: Consumer Furnaces (Consumer Furnaces Technical Support Document)*, Appendix 8D (Sept. 2023), https://perma.cc/5WHP-GGAG (exhaustively detailing the agency's methodology for identifying and estimating these costs). The Department found that the additional installation costs attributable to condensing units are far outweighed by those units'

reduced operating expenses. *See* 88 Fed. Reg. at 87,563-68 (JA___); 88 Fed. Reg. at 69,739-51 (JA___).

C. Petitioners fail to refute the central premises underlying the Department's analysis of the performance-characteristics provision. Petitioners do not dispute that identifying performance characteristics and product features requires a fact-intensive comparison of condensing and non-condensing designs. Nor do petitioners take issue with the Department's determination that those designs do not differ in the heating functions they perform or in how well they perform those functions.

Instead, petitioners reiterate factual assertions that the Department considered and properly rejected during the relevant rulemakings. Petitioners argue, in particular, that condensing designs are "impossible" to install in some buildings, Br. 14, consume more of a building's interior space than non-condensing units, Br. 32, and often create "exorbitant" installation costs, Br. 64. Based on these assertions, petitioners depict (Br. 44-45) the particular manner in which non-condensing designs are installed as a performance characteristic

requiring that those designs be preserved, despite their limited efficiency.

1. Petitioners identify no proper basis for displacing the Department's factual determinations regarding the appliances it regulates. Those determinations are subject to substantial evidence review, *see* 42 U.S.C. § 6306(b)(2), and petitioners make no attempt to contest the determinations under that standard. Indeed, petitioners do not meaningfully engage either with the agency's factual findings or with the evidence underlying those findings.

Contrary to petitioners' suggestion, condensing units can function in the same places as non-condensing variants. The Department has found that "in all cases" where a non-condensing appliance could be installed, so could a condensing unit. 86 Fed. Reg. at 73,955 (JA___). For example, the Department cited a study showing that it is "always possible" to install a condensing appliance. *Id*. at 73,960 (JA___). It also credited a manufacturer's submission "that it is technologically feasible to replace noncondensing equipment [with condensing units] in every commercial setting." *Id*. at 73,961-2 (JA___). And it noted that Canada, which has required the use of condensing technology since

2009, did not encounter "significant implementation issues." 88 Fed. Reg. at 87,516, 87,641 (JA___).

There is likewise no meaningful difference in the space requirements for non-condensing and condensing units. After "survey[ing] the dimensions" of representative appliances, the Department determined that non-condensing designs "are not significantly different in overall footprint[] . . . from their condensing counterparts." 86 Fed. Reg. at 73,957 & n.13 (JA___); *see* 88 Fed. Reg. at 87,537 (JA___). And in response to the concern that adding condensing-compatible venting to a building that already has non-condensing venting might reduce usable interior space, the agency explained that various "commercially-available product[s]" allow condensing appliances to be "vented . . . through an existing vent." 86 Fed. Reg. at 73,960-62 (JA___); 88 Fed. Reg. at 87,564 (JA___) (noting that consumer and contractor surveys reflect that it is not necessary to place condensing furnaces in different locations than non-condensing ones).

It is similarly incorrect for petitioners to suggest (Br. 15, 65) that installing a condensing unit is materially more "disruptive" than

installing a non-condensing unit. Although petitioners claim (Br. 65) that condensing units normally require "lengthy renovations," the Department has found that both condensing and non-condensing units are typically installed in a single day. *See, e.g.*, *Consumer Furnaces Technical Support Document*, Appendix 8D, Tables 8D.2.4, 8D.2.5, 8D.2.11, 8D.2.12, 8D.2.13, 8D.2.15, 8D.2.17, 8D.2.18, 8D.2.22, 8D.2.23 (estimating the labor hours associated with various installation scenarios). With respect to consumer furnaces, for example, the agency observed that installation is normally "of limited duration" and "would not have a significant effect" on consumers or on the agency's conclusions. 88 Fed. Reg. at 87,565 (JA___). And in the commercial water heaters context, the Department likewise noted that purchasers "have many alternatives for minimizing or mitigating" the limited downtime associated with installation, 88 Fed. 69,754 (JA___), including business "contingency plans" and "insurance policies which include coverage of business loss due [to] equipment failures," *id.* at 69,650-51 (JA___).

Petitioners also significantly overstate the installation cost differences between condensing and non-condensing units. As

discussed, *see supra* pp. 31-32, condensing units are less expensive to install in new construction and when replacing other condensing units, a scenario that is becoming increasingly common. And even when condensing units replace non-condensing ones, the incremental installation costs are comparatively modest in most situations. *See, e.g.*, 88 Fed. Reg. at 87,559 (JA___) (estimating that the average "incremental installation cost is $490" for non-weatherized gas furnaces in replacement scenarios). Indeed, a study that the agency credited found that only "5 percent or fewer of condensing gas appliance installations were challenging." 86 Fed. Reg. at 73,960 (JA___).

Under these factual circumstances, the Department correctly concluded that the amended standards do not impair any performance characteristic or product feature. The particular manner in which condensing designs are installed does not alter what functions they perform, where they can be installed, or how much space they occupy. Instead, installation differences sometimes give rise to incremental costs that inform the economic analysis required by EPCA. *See* 42 U.S.C. § 6295(o)(2)(B)(i)(II).

2. Although petitioners primarily rely on the mistaken factual assertions discussed above, they also seem to suggest (*see, e.g.*, Br. 64, 69) that installation costs qualify as a protected performance characteristic or feature. That suggestion is unmoored from EPCA's text and inconsistent with its purposes. No ordinary person would describe the installation costs associated with a product as a "performance characteristic[]" or product "feature[]." 42 U.S.C. § 6295(o)(4). And despite expressly directing the Department to consider a product's costs—including its "price," "initial charges," and "maintenance expenses"—in the economic analysis, *id.* § 6295(o)(2)(B)(i)(II), Congress omitted any reference to costs in the performance-characteristics provision, *see id.* § 6295(o)(4). Accordingly, while such costs are not properly considered as performance characteristics or product features, they are addressed in detail in the Department's economic analysis. *Cf. infra* pp. 47-67 (discussing the agency's economic model).

The error in petitioners' argument is underscored by a provision on which they rely. *See* Br. 51 (citing 42 U.S.C. § 6295(q)). That provision authorizes the Department to divide consumer products into

sub-classes when some 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 [efficiency] standard." 42 U.S.C. § 6295(q)(1)(B). In determining whether this test is satisfied, the Department must "consider such factors as the utility to the consumer of" the performance-related feature, as well as "such other factors as the Secretary deems appropriate." *Id.* This language confirms that Congress regarded as distinct only those products with a unique "capacity or other performance-related feature," a term that makes the focus on a product's functionality—rather than its costs—particularly clear. To the extent petitioners construe the reference to "utility" as indicating that cost is a protected attribute, *see* Br. 51, the cited provision reflects that utility is relevant only insofar as it helps identify "capacity or other performance-related feature[s]."

In addition to disregarding these aspects of EPCA's text, petitioners' argument also undermines the statute's purpose of "improv[ing]" appliances' "energy efficiency." 42 U.S.C. § 6201(5). As the statutory text itself reflects, *see id.* § 6295(o)(2)(B)(i)(II), few designs improve efficiency without producing some increase in product price,

installation costs, or maintenance expenses. Treating cost differences as a performance characteristic or product feature would therefore "preserve inefficient technologies at the expense of EPCA's energy conservation goals and frustrate the purpose of EPCA." 86 Fed. Reg. at 73,956 (JA___). Congress did not create a detailed statutory scheme empowering the Department to amend efficiency standards only to preclude such amendments in the vast majority of circumstances.

The sweeping consequences of petitioners' theory are on full display here. Increasing the efficiency of gas-powered furnaces and water heaters beyond a certain point inevitably generates "condensate . . . that would require [venting] similar to what is required for condensing systems." 86 Fed. Reg. at 73,966 (JA___). Petitioners' approach thus threatens not only to pretermit the amended standards here, but also to forever preserve inefficient furnace and water heater designs. Nothing in EPCA's text, structure, or purpose justifies such an extraordinary result.

D. The rules at issue here therefore bear no resemblance to prior rules in which the Department identified performance characteristics or product features. For decades, the agency has understood the terms

"performance characteristics" and product "features" as referring to an appliance's functionality. 42 U.S.C. § 6295(o)(4). A 1998 rulemaking regarding ovens, for example, identified oven-door windows as a product feature, crediting comments that their removal "would adversely affect cooking utility and quality." *Energy Conservation Standards for Electric Cooking Products*, 63 Fed Reg. 48,038, 48,041 (Sept. 8, 1998). The same functional approach is reflected in numerous rulemakings over the intervening years, as well as in the three rules challenged here. *See* 86 Fed. Reg. at 73,948-49 (JA___) (collecting examples). Although the Department briefly departed from this traditional understanding in a January 2021 rule, *see* 86 Fed. Reg. 4776, it promptly explained that the departure was an error and "revert[ed] to [its] historical interpretation," 86 Fed. Reg. at 73,959 (JA___).

Petitioners fail to identify any prior rulemaking in which the Department has treated installation costs (or the manner of installation more generally) as a protected product attribute. Indeed, both condensing and non-condensing furnace and water heater designs have been on the market for many years, yet the agency has never promulgated standards separating those designs into distinct product

classes. Rather than engage with that history, petitioners discuss at length (Br. 56-64) various rulemakings concerning appliances other than furnaces and water heaters. As the Department has cautioned, "disparate products" often have "very different" functions, making "comparisons difficult and potentially misleading." 86 Fed. Reg. at 73,949 (JA___).

In nonetheless straining to compare the Consumer Furnaces and Commercial Water Heaters Rules to prior rulemakings involving different products, petitioners rely on the same factual errors refuted above. For instance, petitioners note that the Department placed "[v]entless dryers" in their own product class and suggest that the agency has thereby identified venting as a performance characteristic. Br. 49; *see Energy Conservation Standards for Residential Clothes Dryers and Room Air Conditioners*, 76 Fed. Reg. 22,454 (Apr. 21, 2011). But the agency has explained that if amended standards had removed ventless dryers from the market, a "substantial subset of consumers (*e.g.*, high-rise apartment dwellers) would [have been] deprived of the benefits . . . of having [a] clothes-drying appliance in their residence entirely." 86 Fed. Reg. at 73,957 (JA___). Here, however, condensing

units can be installed in the same places as non-condensing variants. *See supra* pp. 34-35. The amended standards therefore do not deprive any consumer of the covered appliances.

The challenged rules likewise stand in stark contrast to rulemakings in which the Department has distinguished between products based on their size. In addition to preserving product "features" and "performance characteristics," EPCA also requires the agency to avoid amended standards that eliminate product "sizes, capacities, and volumes." 42 U.S.C. § 6295(o)(4). The Department has accordingly created distinct product classes for front-loading washing machines, which are "designed to be installed in confined spaces," *Energy Conservation Standards for Residential Clothes Washers*, 84 Fed. Reg. 37,794, 37,797 (Aug. 2, 2019); certain types of commercial refrigerators that petitioners concede vary in size, *see* Br. 55 (citing *Energy Conservation Standards for Commercial Refrigeration Equipment*, 78 Fed. Reg. 55,890, 55,905 (Sept. 11, 2013)); and "standard size" packaged terminal air conditioners and "non-standard size" packaged terminal air conditioners, *see Packaged Terminal Air Conditioner and Packaged Terminal Heat Pump Energy Conservation*

Standards, 73 Fed. Reg. 58,772, 58,782 (Oct. 7, 2008). Unlike those appliances, non-condensing furnaces and water heaters "are not significantly different in overall footprint[] . . . from their condensing counterparts." 86 Fed. Reg. at 73,957 (JA___).

For similar reasons, petitioners' focus (Br. 53-55) on various product categories included in EPCA is misplaced. There is no indication that in delineating the categories of products the agency is authorized to regulate, Congress regarded itself as bound by the same criteria it established to govern the agency's division of those products into sub-classes. In any event, as petitioners' brief reflects (Br. 54-55), each of the categories they highlight involves differences in how large a product is or where it can be installed. No such distinctions are present here.

Other rulemakings cited by petitioners similarly fail to advance their argument. Petitioners emphasize (Br. 58-59) that the Department has established separate efficiency standards for condensing furnace fans and non-condensing furnace fans. A furnace fan circulates the heat created by a furnace throughout a building. *See Energy Conservation Standards for Residential Furnace Fans*, 79 Fed. Reg.

38,130, 38,142 (July 3, 2014). Because the presence of an additional or improved heat exchanger results in an increase in static pressure, furnace fans compatible with condensing furnaces generally require more powerful motors in order to move air through the system. The Department has accordingly identified the greater power associated with condensing furnace fans as a "performance characteristic[]" that warrants the creation of a separate product class. 42 U.S.C. § 6295(o)(4); *id.* 6295(q)(1). In this case, by contrast, condensing and non-condensing furnaces do not differ in their heating capacity or in any other performance characteristic. *See supra* pp. 34-37.

II. The Department's Economic Model Is Sound

In determining that the amended standards are economically justified, the Department used a detailed economic model. The model accounts for a "variety of inputs, such as product prices, product energy consumption, energy prices, maintenance and repair costs, product lifetime, and discount rates." 88 Fed. Reg. at 87,528 (JA___); *see* 88 Fed. Reg. at 69,774, 770 (JA___). Based on those inputs, the model projects that the Consumer Furnaces Rule will create net economic benefits of several billion dollars a year, 88 Fed. Reg. at 87,507 (JA___),

and that the Commercial Water Heaters Rule will generate net benefits of several hundred million dollars a year, 88 Fed. Reg. at 69,691 (JA___). The cost-benefit analysis thus weighs heavily in favor of the amended standards.

The economic model underlying these findings is reasonable and readily withstands review. Under EPCA, the agency's conclusion that amended standards are economically justified implicates substantial-evidence review, in the case of the Consumer Furnaces Rule, *see* 42 U.S.C. § 6306(b)(2), and clear-and-convincing evidence review, in the case of the Commercial Water Heaters Rule, *see id.* § 6313(a)(6)(A)(ii)(II). "Even where clear and convincing evidence is required," "judicial review of agency action remains deferential" and "the court asks itself only whether it was reasonable for the agency to determine it met the standard." *APGA I*, 22 F.4th 1018, 1025-26 (D.C. Cir. 2022). An "agency's judgment to use a particular model" will therefore be sustained so long as "the agency examines the relevant data and articulates a reasoned basis for its decision." *Natural Res. Def. Council, Inc. v. Herrington*, 768 F.2d 1355, 1385 (D.C. Cir. 1985).

Petitioners do not take issue with the vast majority of the data and decisions included in the model. Instead, petitioners challenge two particular aspects of the agency's analysis: its projections regarding how consumers would behave in the absence of amended standards, and its consideration of the possibility that those standards will prompt some consumers to switch from gas to electric appliances. Petitioners thus contest "predictive judgments" about the regulated market that "are entitled to particularly deferential review." *U.S. Telecom Ass'n v. FCC*, 825 F.3d 674, 707 (D.C. Cir. 2016) (quotation marks omitted). And as petitioners admit (Br. 99-100), the rules' benefits exceed their costs unless both of petitioners' challenges succeed. Neither has merit.

A. The Department Reasonably Projected Consumer Behavior in the Absence of Amended Standards

The Department's model relies on real-world data and generates estimates consistent with available benchmarks.

1. As part of the "economically justified" analysis, the Department assesses the savings an amended standard is expected to produce in the form of lower energy bills over the life of the appliance. 42 U.S.C. § 6295(o)(2)(B). To perform that assessment, the Department had to

project a "base case"—that is, what purchasers would do if the agency did not adopt amended standards and instead left current standards in place. The base case involves two analytical steps: (1) surveying the buildings that use an appliance, and (2) estimating the probability that the owners of those buildings would install condensing appliances in the absence of amended standards.

At both steps, the Department used real-world data. First, the agency looked to "the most comprehensive and statistically representative surveys of energy consumption in residential and commercial buildings available." 88 Fed. Reg. at 87,555 (JA___) (discussing the Commercial Building Energy Consumption Survey and the Residential Energy Consumption Survey). Those surveys describe the building stock in the United States and identify the energy use associated with representative buildings.

Second, the Department similarly relied on real-world data to estimate the probability that the owner of a given building will purchase a condensing appliance. The agency began by gathering shipment data showing what portion of purchasers select condensing appliances today. *See* 88 Fed. Reg. at 69,757 (JA___); 88 Fed. Reg. at

87,574 (JA___). It then estimated how demand will change in the future based on "derived historical trends," including a trend reflecting increased interest in condensing technology. 88 Fed. Reg. at 87,574, 87,556 (JA___); *see* 88 Fed. Reg. at 69,757-770 (JA___). Finally, it assigned appliances to buildings in accordance with estimated sales for each product class. For example, if in a given year 65% of new commercial water heaters will be condensing units, a building that needs a new commercial water heater in that year will generally be assigned a condensing unit 65% of the time.

By grounding the estimates in "historical shipment data," this approach reflects the relative weight that consumers have actually placed on initial costs as compared with operating costs. 88 Fed. Reg. at 87,556 (JA___). To the extent purchasers value the reduced operating costs associated with condensing models, shipment data incorporates that preference. And to the extent purchasers instead prioritize products with lower initial costs, shipment data likewise reflects that behavior.

Because the Department analyzed separate shipment data for each product class, the model accounts for differences in purchasing

patterns attributable to the type of building in which an appliance will be installed. The product classes at issue here correspond with different types of buildings. With respect to consumer furnaces, for example, the agency distinguishes between mobile home gas furnaces, which are "designed for use only in mobile homes," 10 C.F.R. § 430.2, and non-weatherized gas furnaces, which are typically used in other residences, *cf. id.* § 431.72 (separately defining "commercial" furnaces, which boast a heating capacity of "225,000 Btu per hour or more"). And as the name suggests, commercial water heaters "generally have higher input ratings than residential water heaters" and are normally found in large commercial buildings and multi-family apartments. 88 Fed. Reg. at 69,692 (JA___). Thus, the model takes into account that whether an appliance will be installed in a mobile home, building suitable for a consumer furnace, or large commercial building may influence the probability that the purchaser will select a condensing unit.

In addition to incorporating these variables, the Department further refined the model based on factors particular to the consumer furnaces and commercial water heaters markets. Historical data shows that condensing furnaces are more popular in northern states, and the

Consumer Furnaces Rule thus considers a purchaser's state when estimating the probability that they will choose a condensing furnace. *See* 88 Fed. Reg. at 87,574-75 (JA___). In contrast, climate does not have a significant effect on hot water needs or purchases, and the Commercial Water Heaters Rule therefore does not consider a purchaser's geographic location. The agency has found, however, that different classes of commercial water heaters are installed in different types of commercial buildings. For instance, larger commercial buildings, such as hospitals and hotels, are typically fitted with a particular class of commercial water heaters known as commercial gas storage water heaters. *See* 88 Fed. Reg. at 69,731 (JA___) (explaining that the agency identified installation practices using "industry sizing tools and methodologies"). In estimating the probability that a given building will be equipped with a condensing water heater, the model looks to shipment data for the specific class of water heaters typically installed in that type of commercial building.

The Department used real-world data not only to determine which variables to include in the model but also to decide when additional refinements would be unwarranted. For the consumer furnaces market,

the agency reviewed multiple data sets and identified "little to no correlation between furnace efficiency and household characteristics" other than those already incorporated in the model. 88 Fed. Reg. at 87,576 (JA___). For the commercial water heaters market, the Department similarly found no "data showing a correlation between [commercial water heater] efficiency" and other variables, such as "building hot water load." 88 Fed. Reg. at 69,758 (JA___). The agency accordingly concluded that adding further variables would not meaningfully improve the model.

2. Instead of grappling with real-world data, petitioners disregard it. Although the Department relied primarily on shipment data provided by appliance manufacturers, petitioners' brief does not materially engage with that data, identify any basis for discounting it, or put forward contrary data. Rather, petitioners urge that the Department should have assumed that when consumers decide whether to purchase condensing appliances, they are "perfectly rational." Br. 80. In other words, petitioners believe (*see* Br. 74) that consumers consider all variables included in the Department's own economic analysis—from

future energy prices to discount rates—and correctly identify the appliance that minimizes long-run costs.

But the Department's focus on a limited number of variables in projecting the base case reflects the limits that constrain consumer decision-making. To assess whether a more efficient appliance will produce net savings for a consumer over the appliance's life, the Department reviewed a number of offsetting present costs including "installation [cost] and sales tax" and "operating expense (including energy, maintenance, and repair expenditures)." 88 Fed. Reg. at 69,704 (JA___); 88 Fed. Reg. at 87,528 (JA___). The Department then had to "discount [those figures] over the lifetime of the equipment," 88 Fed. Reg. at 69,704 (JA___), which the agency estimated to be on average about 20-to-25 years. *See id.* at 69,758 (JA___); 88 Fed. Reg. at 87,552 (JA___). This life cycle "analysis require[d] a variety of inputs, such as product prices, product energy consumption, energy prices, maintenance and repair costs, product lifetime, and discount rates." 88 Fed. Reg. at 69,704 (JA___); 88 Fed. Reg. at 87,528 (JA___). All of these figures are—by their nature—forward looking, predictive, and therefore subject to uncertainty. "To account for uncertainty and variability in

specific inputs, such as equipment lifetime and discount rate, [the Department] use[d] a distribution of values, with probabilities attached to each value." 88 Fed. Reg. at 69,704 (JA___); *see* 88 Fed. Reg. at 87,528 (JA___).

As the Department has explained, this is not how consumers make purchase decisions in the real world. A typical consumer has neither the expertise nor the time to review information about discount rates, projected price trends, or the host of other variables included in the Department's own calculations. Instead, consumers generally rely on the appliances recommended by contractors, who typically prefer to install appliances that are in stock and with which they are familiar. *See* 88 Fed. Reg. at 87,584 (JA___). That is particularly true in emergency replacement situations, such as when an appliance breaks in mid-winter and a replacement must be obtained and installed quickly. *See id*. at 87,577 (JA___). Consumer decisions therefore do not normally involve an exhaustive review of all variables that may affect long-run costs.

There are many reasons to conclude that this imperfect decision-making environment leads consumers to purchase fewer condensing

appliances than would be economically justified. Studies show that consumers tend to undervalue energy efficiency and that "a significant subset" appear "to purchase appliances without taking into account their energy efficiency and operating costs at all." 88 Fed. Reg. at 87,577 (JA___). To take a familiar example, even though LED lightbulbs are generally cost-justified in the long run, many consumers have continued to purchase inefficient incandescent lightbulbs. *See* 87 Fed. Reg. at 27,452.

The market failures that generally affect energy-related decisions are particularly pernicious in the context of consumer furnaces and commercial water heaters. The Department has explained that landlords, contractors, and developers often "make[] the choice of what [appliance] to install" but do not benefit from the lower operating costs associated with condensing units (or suffer from the higher utility bills associated with non-condensing units). *See* 88 Fed. Reg. at 87,577 (JA___). This Court has likewise recognized that "appliances are often purchased by landlords, builders of new homes, and other 'third-party purchasers' who will not pay the fuel bills" and who therefore "have an

incentive" to buy "initially inexpensive but inefficient appliances with high life cycle costs." *Herrington*, 768 F.2d at 1389.

These market failures harm individuals and businesses alike. "[M]ore than a quarter of commercial buildings" in the Department's dataset "are occupied at least in part by a tenant," indicating that "the building owner is likely . . . not responsible for paying energy costs" and will thus undervalue condensing designs. 88 Fed. Reg. at 87,578 (JA___). In addition, many companies require a payback period of only one to two years—far shorter than the 20-to 25-year product lifetime the Department estimated—to invest in energy efficient projects. *See id*. at 87,579 (JA___). Under those circumstances, even if a more efficient appliance would produce significant savings over a 20-year period, a business may leave those savings on the table if the increased cost of purchasing the more-efficient appliance is not recovered within the first few years of operation. Likewise, tax rules can incentivize reduced capital expenditures, encouraging businesses to install appliances with lower initial costs but higher operating expenses. *See id*. at 87,578 (JA___).

EPCA itself recognizes that consumers do not invariably select appliances that are cost-justified in the long-term. As this Court has observed, the statute reflects Congress's "concern[] over the tendency of consumers to reject efficiency-improving appliances with long payback periods." *Herrington*, 768 F.2d at 1405. Indeed, "[n]umerous witnesses [before Congress] . . . testified that the average consumer looks for a payback from higher purchase prices within 3 years." *Id.* (quotation marks omitted). This propensity to focus on the short term is especially unfortunate here, where the benefits of condensing units extend over two decades or more. By authorizing the Department to amend efficiency standards, Congress acted in part to rectify this and other distortions in appliance markets. *See id.* (noting that "Congress viewed this consumer behavior as a kind of market failure").

3. The Department's model generates predictions consistent with the consumer decision-making process and with available benchmarks.

As particularly relevant here, the model reflects that many consumers will purchase cost-justified appliances regardless of the relevant standards. For consumer furnaces, the model projects that about 45% of consumers "are not impacted by the [amended efficiency

standards], as they already purchase higher-efficiency furnaces," and that another 19% "experience a net cost," as they "would not financially gain from a more-efficient furnace." 88 Fed. Reg. at 87,580 (JA___). For commercial water heaters, the model similarly predicts that about 44% of consumers would purchase condensing units even without the amended standards, and that an additional 21% correctly recognize that condensing water heaters are not cost-justified in their particular circumstances. *See* 88 Fed. Reg. at 69,792-94, 69,812 (JA___).[2]

At the same time, the model recognizes that a substantial number of consumers for whom condensing units are economically justified would not adopt them in the absence of amended standards. The Consumer Furnaces Rule projects that about 36% of consumers would select non-condensing designs when condensing designs are cost-justified. *See* 88 Fed. Reg. at 87,580 (JA___). And the Commercial Water Heaters Rule projects that the same portion of consumers—about

[2] The 44% figure provided in the text is derived from data on pages 69,792-94 of the Commercial Water Heaters Rule. Those pages present information regarding each class of commercial water heaters. To convert that class-specific information into a single statistic covering all commercial water heaters, the government calculated the average across product classes, as weighted by each class's market share.

36%—would opt for non-condensing appliances when they would be better off with condensing units in the long run. *See* 88 Fed. Reg. at 69,792-94, 69,812 (JA___).[3]

These estimates align with available data regarding the prevalence of market failures. According to national survey data, about 20% of buildings with a consumer furnace and 25% of buildings with a commercial water heater are rented, and landlords are subject to misaligned incentives as discussed above. *See* 88 Fed. Reg. at 87,577-78 (JA___); 88 Fed. Reg. at 69,758 (JA___). And of furnaces and water heaters purchased as replacements, almost all of them are installed by contractors with similar incentive problems. *See* 88 Fed. Reg. at 87,577 (JA___); *id.* at 87,545 & n.68 (JA___) (estimating that all but 1-2% of gas furnaces are installed by contractors). In addition, roughly 40% of HVAC replacements occur in emergency situations in which market failures are particularly acute. *See* Decision Analyst, *American Home Comfort Survey* 196 (2022). In combination, these data indicate that market failures infect well over half of the relevant consumer decisions.

[3] As described in the previous footnote, the government derived the figure provided in the text from information on pages 69,792-94 of the Commercial Water Heaters Rule.

Measured against that benchmark, the model's estimate that about a third of purchasers would not purchase a condensing product when it would be cost-justified to do so is eminently reasonable.

Petitioners provide no support for their assertion that the model's projections are "absurd." Br. 81. Without citing any data, petitioners maintain that the Department should have assumed that consumers "usually" act in a perfectly rational way. Br. 85. But as discussed, the Department's approach *does* estimate that more than half of consumers make the "correct" economic decision. To the extent petitioners think the estimate should be higher, how much higher? On what basis? *Cf. Zero Zone, Inc. v. U.S. Dep't of Energy*, 832 F.3d 654, 674 (7th Cir. 2016) ("Without evidence that contradicts [the Department]'s assumptions, we cannot conclude that [the Department]'s conclusions were 'so implausible that it could not be ascribed to a difference in view or the product of agency expertise.'") (citation omitted). As detailed above and in the rules, the Department gathered all the data it could to constrain its model and concluded—based on what it knew about consumer behavior from the scientific literature—that estimates grounded in historical shipment data would best approximate the consumer

behaviors that exist in the market. *See U.S. Telecom Ass'n*, 825 F.3d at 707 ("[A]n agency's predictive judgments about areas that are within the agency's field of discretion and expertise are entitled to particularly deferential review[]").

Petitioners' misunderstanding of the model is illustrated by their claim (Br. 95) that the Department assumed that consumers act "randomly" when deciding whether to purchase a condensing appliance but "rationally" when determining whether to switch from gas to electric appliances. Again, the model does not assume that purchase decisions are random; instead, it relies on historical data and projects that many consumers would make the choice that is cost-justified in the long run. And as detailed below, *see supra* pp. 70-71, the Department did not assume that consumers act "completely rationally" when deciding whether to switch from gas to electric furnaces, Br. 96. The purpose of the analysis to which petitioners refer was "not to model consumers' *actual* expected behavior," but to "estimate an outer bound" for the "maximum" amount of fuel switching that might occur as a result of amended standards. 88 Fed. Reg. at 87,587 (JA___). For that limited purpose, the agency adopted an "intentionally simplified"

analysis that did not incorporate the "market inefficiencies and consumer biases known to shape consumers' actual purchasing decisions." *Id.* (JA___).

The extent of petitioners' error is further highlighted by their reliance on *APGA I*, 22 F.4th at 1018. That case concerned a 2020 rule that used historical shipment data to model consumer behavior in the market for commercial packaged boilers. *See id.* at 1027. The Court remanded without vacatur, observing that the rule lacked a "cogent and reasoned" explanation for that aspect of its analysis.[4] *Id.* at 1028. Both the Consumer Furnaces Rule and Commercial Water Heaters Rule were published well after the *APGA I* decision, and both rules implement that decision's teachings. Unlike the rule challenged in *APGA I*, the rules at issue here address at length the model's use of historical shipment data, the relevant market failures, and the problems with assuming perfectly rational consumer behavior, *see* 88 Fed. Reg. at 87,576-85 (JA___); *id.* at 69,757-61 (JA___).

[4] In a subsequent decision, the Court vacated the commercial packaged boilers rule on grounds unrelated to the pending petitions for review. *See American Pub. Gas Ass'n v. U.S. Dep't of Energy*, 72 F.4th 1324, 1342 (D.C. Cir. 2023).

4. Although petitioners focus their remaining arguments on the Consumer Furnaces Rule, that Rule illustrates the reasonableness of the Department's economic model.

In applying the model, the Department reviewed robust information regarding the consumer furnaces market. That information included "proprietary Gas Furnace shipments data" provided by industry stakeholders, a survey of "recent purchasers of HVAC equipment regarding the perceived efficiency of their equipment" that incorporated "questions related to various household and demographic characteristics," a study of appliance choices and energy use by a sample of Illinois households, and certain "permit data" submitted to the agency, among other sources. 88 Fed. Reg. at 87,574 & n.175, 87,576 (JA___). Citations for each of these sources are available in the Consumer Furnaces Rule. *See id.* at 87,576-80 (JA___).

Based on this information, the Department refined its estimates to account for salient features of the consumer furnaces market. As discussed, the propensity to purchase condensing furnaces varies by region, and the agency accordingly generated separate probability estimates "for each State." 88 Fed. Reg. at 87,576 (JA___). In addition,

because survey results suggest that the owners of homes under 1,500 square feet are "five percent less likely to install higher efficiency units" than the average homeowner, while the owners of homes "above 2,500 sq. ft." are "five percent more likely to do so," the Department accounted for those trends. *Id*. at 87,576 (JA___).

Petitioners fail to identify data demonstrating a significant correlation between furnace purchase decisions and any variable that is not included in the model. Instead, petitioners note (Br. 85) that "the real-world market share of condensing furnaces is much higher in cold weather states" and assume that consumers must therefore perfectly account for all other variables. But the fact that climate—an especially obvious factor affecting the economic value of an efficient furnace—influences purchase decisions does not suggest that the same is true for less prominent factors. That is borne out in the data, which, as discussed, indicates that "household characteristics" other than climate (and to a limited extent square footage) do not substantially affect consumer choices. 88 Fed. Reg. at 87,576 (JA___).

The degree to which petitioners depart from the data before the agency is exemplified by their reliance (Br. 82-86) on a declaration

submitted after the rulemaking ended. As an initial matter, because petitioners failed to present the declaration (or its content) to the agency during the notice-and-comment period, it is not properly before this Court. *See CTS Corp. v. EPA*, 759 F.3d 52, 64 (D.C. Cir. 2014). "[W]hen [a petitioner] opposes a regulation on a ground that requires data for the ground to be convincing, they had better obtain and submit the data." *USA Grp. Loan Servs., Inc. v. Riley*, 82 F.3d 708, 713-14 (7th Cir. 1996). The petitioners here failed to do so.

In any event, the declaration only serves to underscore the reasonableness of the agency's approach. Petitioners emphasize, for example, that "80% of the time" the model "assigned new home builders a noncondensing furnace when a condensing furnace would have been cheaper to install." Br. 77-78 (citing Meyer Decl. ¶ 5). But this figure is misleading: the model predicts that only about a fifth of all furnace purchases will be for new buildings, and that of that subset of purchases, only about a quarter will involve a non-condensing furnace. *See* Dep't of Energy, *Consumer Furnaces Rule: Life Cycle Cost Spreadsheet* (Sept. 29, 2023). Thus, the scenario on which petitioners focus occurs in "only a few percent" of all the purchase decisions

included in the model. 88 Fed. Reg. at 87,584 (JA___); *see id.* (JA___) (noting that "excluding these individual outcomes" would not "substantially change" the economic analysis). Regardless, as the Department has explained, developers sometimes install non-condensing units in new buildings even when a condensing unit would have lower initial *and* operating costs. *See id.* at 87,582 (JA___). Because that scenario occurs in real-world shipment data, it also occurs in the model.

Petitioners similarly fail to advance their argument by noting that the model "assigned 60% of the replacement furnace installations for existing homes to the less economically rational option." Br. 84 (citing Meyer Decl. ¶ 7). Replacement scenarios involve particularly acute market failures, including the distorted incentives facing landlords, the problems associated with emergency replacements, and the bias towards "like-for-like replacement (*i.e.*, replacing the non-functioning equipment with a similar or identical product)." 88 Fed. Reg. at 87,577 (JA___). It is therefore unsurprising that in replacement scenarios a substantial portion of consumers do not select the furnace that is economically justified in the long run.

The gap between petitioners' position and market reality is further demonstrated by their claim that amended standards will cost consumers money. *See* Br. 99 (citing Meyer Decl. ¶¶ 8-9). This claim rests on the premise that in the absence of standards, all consumers would choose the furnace that the Department's life-cycle analysis identifies as optimal in the long term. But under EPCA, the relevant question is not whether amended standards would benefit consumers in an imaginary world where every consumer invariably selects the economically-optimal appliance. Instead, the question is whether amended standards produce economic benefits for the nation as a whole when compared with the real world, where market failures plague many consumer decisions. For the reasons given above, the answer to that question is a resounding yes.

B. The Department Reasonably Accounted for Fuel Switching

Petitioners also err in contending that EPCA prohibits the agency from considering the possibility that the amended standards will prompt some consumers to switch from gas to electric appliances.

1. Fuel switching is a basic element of the heating appliances market. The rules at issue here set efficiency standards for gas-fired

furnaces and water heaters. *See supra* p. 6. Separate rules have established efficiency standards for electric heat pumps and water heaters. *See*, *e.g.*, 10 C.F.R. § 430.32(c), (d) (addressing consumer heat pumps and water heaters); *id.* § 431.110(a), (c) (addressing commercial water heaters). "[A]t any time, a segment of consumers may choose replacement products that rely on a different fuel source than that of the [appliance] being replaced." 88 Fed. Reg. at 87,590 (JA___). For example, "in any given year" some consumers will "voluntarily switch their home heating system . . . to a heat pump from a gas furnace." *Id.* at 87,589 (JA___). Those choices are reflected in the appliance shipment data that forms an integral part of the economic analysis in any amended standards rulemaking.

EPCA accordingly authorizes the Department to consider fuel switching as part of its larger economic analysis. That analysis turns on "whether the benefits of [an amended standard] exceed its burdens." 42 U.S.C. § 6295(o)(2)(B)(i). As relevant here, when an amended standard leads a consumer to switch from a gas appliance to an electric one, that consumer's energy needs and expenses change. Fuel

switching can therefore alter the benefits and burdens that EPCA requires the Department to consider.

Consistent with EPCA, the Department "routinely accounts for potential fuel switching" when assessing whether an amended standard is economically justified. 88 Fed. Reg. at 87,590 (JA___). Indeed, the agency has long considered fuel switching in rulemakings amending the standards for furnaces and water heaters. *See, e.g.*, *Energy Conservation Standards for Residential Furnaces and Boilers*, 72 Fed. Reg. 65,136, 65,144 (Nov. 19, 2007); *Energy Conservation Standards for Residential Water Heaters, Direct Heating Equipment, and Pool Heaters*, 75 Fed. Reg. 20,112, 20,163-64 (Apr. 16, 2010). Various stakeholders accordingly urged the Department to account for fuel switching as part of the rulemakings at issue here. *See* 88 Fed. Reg. at 87,586 (JA___).

In nonetheless asserting that EPCA forbids the Department from considering fuel switching, petitioners misread the statute's non-exhaustive list of economic factors. Petitioners emphasize (Br. 93-94) that several factors refer to "the covered products" and insist that this language implicitly precludes any consideration of products other than

the gas-fired appliances covered by the challenged rules. But multiple factors independently authorize the Department's fuel switching analysis. First, the factor addressing "the total projected amount of energy[] . . . savings likely to result directly from the imposition of the standard" permits the agency to consider the economic effect of a decision to switch from gas to electric appliances. 42 U.S.C. § 6295(o)(2)(B)(i)(III). Second, the factor addressing "the economic impact of the [amended] standard" on "the consumers of the products subject to [the] standard" likewise allows the agency to account for any economic impact associated with a consumer's choice to stop using a gas furnace or water heater. *Id.* § 6295(o)(2)(B)(i)(I).

2. In any event, the Department's determinations that the amended standards are economically justified do not depend on fuel switching. As to commercial water heaters, the Department found, based on a review of the technical and economic characteristics of electric alternatives, "that the amended standard[s] will not introduce additional economic incentives that would cause a noticeable increase in fuel switching from gas-fired [commercial water heaters] . . . to their electric counterparts." 88 Fed. Reg. at 69,771 (JA___). The agency thus

"did not explicitly include fuel or technology switching" in the Commercial Water Heaters Rule "beyond the continuation of historical trends." *Id.* (JA___).

With respect to furnaces, the Department determined that the Consumer Furnaces Rule would be economically justified without regard to fuel switching. To "bookend the range of reasonably plausible switching results," the agency modeled a scenario with "no switching at all" as well as a "maximum-switching scenario" in which "every consumer for whom switching would be economically justified . . . would do so." 88 Fed. Reg. at 87,587 (JA___). In each scenario, the Rule produces economic benefits for the average consumer, *see id.* at 87,588 (JA___), and "the proposed standard level is economically justified," *id.* at 87,587 (JA___). The Department would therefore "come to the same conclusions regarding economic justification even if the impacts of the fuel switching analysis were not included." *Id.* at 87,588 (JA___).

3. Petitioners do not advance their argument by citing a statutory provision establishing a "rebuttable presumption" that a standard is economically justified if a consumer would break even within three years of installing a more efficient product. Br. 98 (quoting 42 U.S.C.

§ 6295(o)(2)(B)(iii)). Petitioners imply that because the amended standards here involve payback periods of longer than three years, the standards are not economically justified. But the provision that petitioners cite expressly prohibits the negative inference they urge this Court to draw. *See* 42 U.S.C. § 6295(o)(2)(B)(iii) (noting that the fact that the presumption "is not met shall not be taken into consideration" in determining "whether a standard is economically justified"). This case confirms the wisdom of that approach: both challenged rules involve payback periods longer than three years but far shorter than the multi-decade expected life of the relevant appliances. *See* 88 Fed. Reg. at 87,504 (JA___) (estimating a payback period of 3.2 years for mobile home gas furnaces and 7.6 years for other consumer furnaces); 88 Fed. Reg. at 69,688 (JA___) (estimating a payback period of between 5.8 and 9.4 years for commercial water heaters, depending on the product class).

C. The Department Provided Ample Opportunity for Public Comments on the Model

Petitioners fare no better in urging that the agency provided an insufficient window for public comments on the Consumer Furnaces Rule.

1. The Department fully complied with the notice and comment requirement. *See* 42 U.S.C. § 6306(a) (noting that EPCA incorporates this aspect of the Administrative Procedure Act). Consistent with that requirement, the Department published a more than 200-page notice of proposed rulemaking explaining the agency's expected methodology, analysis, and conclusions. *See* 87 Fed. Reg. 40,590. The Department also issued a technical support document further detailing its approach, along with three spreadsheets containing relevant data and calculations. *See id*. at 40,612 (describing the calculations included in each spreadsheet). Initially, the agency established a 60-day period for public comments.

After the Department published the notice of proposed rulemaking and supporting materials, stakeholders noted that certain figures in one of the spreadsheets were not identical to figures in the notice. In response, the Department explained that the relevant spreadsheet uses a commercially-available add-on to Microsoft Excel. *See* 87 Fed. Reg. at 52,861, 52,862 & n.3. That program "incorporate[s] uncertainty and variability into the analysis" by "randomly sampl[ing] input values from probability distributions." *Id*. at 52,862. Thus, every time the program

is activated, there are slight variations in the data it generates. As the Department noted, however, the program always produces "similar results" that support the same "conclusions," "policy decision," and "associated rationale." *Id.* Out of an abundance of caution, the Department issued a "locked" spreadsheet with data that does not vary and extended the comment period by 30 days. *See id.* at 52,861. The public thus had a total of 90 days to comment on the Consumer Furnaces Rule.

2. It is nonetheless petitioners' contention that the comment period was inappropriately truncated. They primarily urge (Br. 103) that the Department should have provided more than 30 days for the public to consider the revised spreadsheet. But at the outset, petitioners fail to explain why the revisions should be viewed as "critical factual material" for which any extension would be required. *Chamber of Commerce v. SEC*, 443 F.3d 890, 900 (D.C. Cir. 2006). As discussed, the notice of proposed rulemaking included an exhaustive description of the Department's methodology and results, *see* 87 Fed. Reg. at 40,612-97, and the initial version of the spreadsheet similarly documented the agency's "rationale" and "conclusions," 87 Fed. Reg. at 52,862.

Petitioners do not identify any way in which the slightly changed figures in the revised spreadsheet were critical to their comments. In any event, the Department in fact provided a 30-day extension to enable consideration of the revised spreadsheet, and petitioners cite no authority suggesting that such an extension would be inadequate.

Equally meritless is petitioners' argument that the Department erred in establishing an initial comment period of 60 days. Petitioners invoke (Br. 101) a Department regulation specifying that even though EPCA only requires a comment period of 60 days, *see* 42 U.S.C. § 6295(p)(2), the agency will generally provide 75 days for comments, *see* 10 C.F.R. pt. 430, subpt. C, app. A. Petitioners acknowledge, however, that the regulation "does not[] create any right or benefit, substantive or procedural, enforceable at law or in equity." *Id.* § 3(c). That is fatal to petitioners' argument. Even if it were otherwise, the agency may deviate from the cited regulation "with notice of the deviation and an explanation." *Id.* § 3(a). Here, the Department explained that it opted for a slightly shorter initial comment period because "[c]ompletion of this furnaces rulemaking is overdue under the relevant statutory deadline," and because the public had "previously

provided numerous rounds of input on [the underlying] methodologies." 87 Fed. Reg. at 40,607. Petitioners do not engage with those explanations or identify any reason for disregarding them. Regardless, when the 30-day extension is taken into account, the Department provided well over 75 days for public comments.

There is likewise no basis for petitioners' cursory suggestion (Br. 103) that the information in the revised spreadsheet remained inadequate. To the extent petitioners assert that the spreadsheet "failed to identify source data for certain inputs," *id.*, they do not explain how the allegedly missing data would have affected their comments, *see Chamber of Commerce*, 443 F.3d at 904, nor do they identify any basis for concluding that any changes to their comments would have altered the Department's ultimate decision to adopt the amended standards, *see* 5 U.S.C. § 706 ("[D]ue account shall be taken of the rule of prejudicial error."). And to the extent petitioners assert (Br. 103) that the spreadsheet "failed to document that the model's qualitative and quantitative methods were . . . sound," the only methodological errors petitioners allege are the consumer behavior and fuel switching concerns refuted above.

III. If the Court Were to Conclude that Remand Is Required, It Should Do So Without Vacatur

If the Court finds the challenged rules deficient, the appropriate remedy would be to remand without vacatur. "Although 'vacatur is the normal remedy' under the [Administrative Procedure Act]" in this Court,[5] the Court's precedents allow for "remand without vacating the agency's action in limited circumstances." *American Great Lakes Ports Ass'n v. Shultz*, 962 F.3d 510, 518 (D.C. Cir. 2020) (quoting *Allina Health Servs. v. Sebelius*, 746 F.3d 1102, 1110 (D.C. Cir. 2014)); *see* 42 U.S.C. § 6306(b)(2) (stating that EPCA permits courts to award the same relief as the APA). "To determine whether to remand without vacatur, this court considers" "the seriousness of the [action's]

[5] Contrary to that practice, a court's invalidation of a regulation in an APA action should not have the effect of a nationwide vacatur. There is no sound reason to conclude that Congress "meant to upset the bedrock practice of case-by-case judgments with respect to the parties in each case" by adopting the "unremarkable" "set aside" language in 5 U.S.C. § 706(2). *Arizona v. Biden*, 40 F.4th 375, 396 (6th Cir. 2022) (Sutton, C.J., concurring); *cf. Georgia v. President of the U.S.*, 46 F.4th 1283, 1303-08 (11th Cir. 2022) (listing reasons to be "both weary and wary of" nationwide relief). The extraordinary consequences of the claimed judicial authority strongly counsel against interpreting the APA's delegation so expansively. *Cf. West Virginia v. EPA*, 597 U.S. 697, 723 (2022) (reasoning that "[e]xtraordinary grants of . . . authority are rarely accomplished through 'modest words,' 'vague terms,' or 'subtle device[s]'" (third alteration in original)).

deficiencies" and "the likely "disruptive consequences of vacatur." *American Great Lakes*, 962 F.3d at 518-19 (alteration in original). Both considerations counsel against vacatur in these circumstances.

First, vacating the challenged rules would thwart Congress's efforts to conserve energy and improve appliance efficiency. In accordance with a congressionally-mandated review process, the Department reasonably concluded that the preexisting standards—which date back to 2007 for consumer furnaces and 2015 for commercial water heaters—are no longer sufficiently rigorous. Vacatur would frustrate the statute's manifest objective of "steadily increasing the energy efficiency of covered products," *Abraham*, 355 F.3d at 197, and would result in the continued application of outdated standards.

Vacatur would also cause significant harm to the public at large. The standards are expected to generate billions of dollars in net economic benefits each year and to reduce emissions by many millions of tons over a 30-year period, *see* 88 Fed. Reg. at 87,635 (JA___); 88 Fed. Reg. at 69,807 (JA___).[6] And the nature of the efficiency standards

[6] In calculating the amended standards' net economic benefits, the Department included the standards' "climate benefits." 88 Fed. Reg. at

Continued on next page.

ensures that the disruption caused by vacatur will be long-lived. Efficiency standards apply to furnaces and water heaters based on the date of manufacture with a statutorily prescribed three-to-five-year lag between a standard's publication and the date by which compliance is required. *See* 42 U.S.C. § 6295(m)(4)(A)(ii) (five-year lag for consumer products); *id.* § 6313(a)(6)(C)(iv) (three-year lag for relevant commercial equipment). If the rules are vacated, firms will be allowed to manufacture non-compliant appliances until three-to-five years after the Department reimplements the standards on remand. Those non-compliant appliances—which could be sold to consumers well past any compliance date—will be locked in and will not be replaced with compliant appliances if the Department ultimately reimplements the

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87,504 (JA___). Petitioners mistakenly suggest (Br. 97 n.9) that the agency "disclaimed reliance on those [climate] benefits as a basis for justifying the final rules." To the contrary, the rules make clear that climate benefits provide strong support for the adopted standards. The Commercial Water Heaters Rule observes that "consideration of [climate benefits] is important when determining the impact to the nation" and that "the rule is economically justified [even] without" those benefits. 88 Fed. Reg. at 69,786 (JA___). The Consumer Furnaces Rule similarly states "that the net benefits are substantial even in the absence of the climate benefits" and that the Department "would adopt the same standards in the absence of such benefits." 88 Fed. Reg. at 87,507 (JA___).

same standards on remand. Because non-compliant appliances would remain operational for an average of 20-to-25 years, vacatur would inflict long-lasting, irreparable harm on the public.

Second, the alleged shortcomings in the agency's analysis are not grave and could readily be addressed on remand. With respect to the performance-characteristics provision, the Department scrutinized the relevant appliances and found that the amended standards would not compromise their performance. *See supra* pp. 30-32. In contesting that finding, petitioners rely primarily on factual assertions that the agency considered and properly rejected. To the extent this Court nonetheless perceives the Department's analysis as deficient, the appropriate course would not be to supersede the agency's technical judgment, but to remand for the agency to revisit that judgment in light of the Court's order.

Any error in the agency's economic model similarly fails to support vacatur. There is no dispute that the Department conducted an extensive economic analysis, and petitioners do not take issue with the vast majority of the data or decisions underlying that analysis. Instead, petitioners argue that even though the part of the model they challenge

relies on real-world data and includes all variables the data show to be significant, it should be refined to control for certain additional variables. That argument does not identify the sort of "serious[]" defect needed to justify vacatur. *Allied-Signal, Inc. v. U.S. Nuclear Regulatory Comm'n*, 988 F.2d 146, 150 (D.C. Cir. 1993) (quotation marks omitted). The same is true of petitioners' other contentions: The rules explicitly state that the Department's consideration of fuel switching did not alter its economic conclusions, and no one could view petitioners' request for a slightly longer opportunity to comment on the Consumer Furnaces Rule as implicating a serious deficiency.

CONCLUSION

For the foregoing reasons, the petitions for review should be denied.

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

This brief complies with the type-volume limit of 18,000 words established by this Court's January 29, 2024 order because it contains 14,767 words, excluding the parts of the brief exempted by Federal Rule of Appellate Procedure 32(f). This brief also complies with the typeface and type-style requirements of Federal Rule of Appellate Procedure 32(a)(5)-(6) because it was prepared using Word for Microsoft 365 in Century Schoolbook 14-point font, a proportionally spaced typeface.

/s/ Steven H. Hazel
Steven H. Hazel

CERTIFICATE OF SERVICE

I hereby certify that on June 10, 2024, I electronically filed the foregoing brief with the Clerk of the Court for the United States Court of Appeals for the District of Columbia Circuit by using the appellate CM/ECF system. Service will be accomplished by the appellate CM/ECF system.

/s/ Steven H. Hazel
Steven H. Hazel

ADDENDUM

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42 U.S.C. § 6295

§ 6295. Energy conservation standards

(a) Purposes

The purposes of this section are to--

(1) provide Federal energy conservation standards applicable to covered products; and

(2) authorize the Secretary to prescribe amended or new energy conservation standards for each type (or class) of covered product.

. . . .

(o) Criteria for prescribing new or amended standards

(1) The Secretary may not prescribe any amended standard which increases the maximum allowable energy use, or, in the case of showerheads, faucets, water closets, or urinals, water use, or decreases the minimum required energy efficiency, of a covered product.

(2)(A) Any new or amended energy conservation standard prescribed by the Secretary under this section for any type (or class) of covered product shall be designed to achieve the maximum improvement in energy efficiency, or, in the case of showerheads, faucets, water closets, or urinals, water efficiency, which the Secretary determines is technologically feasible and economically justified.

(B)(i) In determining whether a standard is economically justified, the Secretary shall, after receiving views and comments furnished with respect to the proposed standard, determine whether the benefits of the standard exceed its burdens by, to the greatest extent practicable, considering--

(I) the economic impact of the standard on the manufacturers and on the consumers of the products subject to such standard;

(II) the savings in operating costs throughout the estimated average life of the covered product in the type (or class) compared to any increase in the price of, or in the initial charges for, or maintenance expenses of, the covered products which are likely to result from the imposition of the standard;

(III) the total projected amount of energy, or as applicable, water, savings likely to result directly from the imposition of the standard;

(IV) any lessening of the utility or the performance of the covered products likely to result from the imposition of the standard;

(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;

(VI) the need for national energy and water conservation; and

(VII) other factors the Secretary considers relevant.

(ii) For purposes of clause (i)(V), the Attorney General shall make a determination of the impact, if any, of any lessening of competition likely to result from such standard and shall transmit such determination, not later than 60 days after the publication of a proposed rule prescribing or amending an energy conservation standard, in writing to the Secretary, together with an analysis of the nature and extent of such impact. Any such determination and analysis shall be published by the Secretary in the Federal Register.

(iii) If the Secretary finds that the additional cost to the consumer of purchasing a product complying with an energy conservation standard level will be less than three times the value of the energy, and as applicable, water, savings during the first year that the consumer will receive as a result of the standard, as calculated under the applicable test procedure, there shall be a rebuttable presumption that such standard level is economically justified. A determination by the Secretary that such criterion is not met shall not be taken into consideration in

the Secretary's determination of whether a standard is economically justified.

(3) The Secretary may not prescribe an amended or new standard under this section for a type (or class) of covered product if--

(A) for products other than dishwashers, clothes washers, clothes dryers, and kitchen ranges and ovens, a test procedure has not been prescribed pursuant to section 6293 of this title with respect to that type (or class) of product; or

(B) the Secretary determines, by rule, that the establishment of such standard will not result in significant conservation of energy or, in the case of showerheads, faucets, water closets, or urinals, water, or that the establishment of such standard is not technologically feasible or economically justified.

For purposes of section 6297 of this title, a determination under subparagraph (B) with respect to any type (or class) of covered products shall have the same effect as would a standard prescribed for such type (or class).

(4) The Secretary may not prescribe an amended or new standard under this section if the Secretary finds (and publishes such finding) that interested persons have established by a preponderance of the evidence that the 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 United States at the time of the Secretary's finding. The failure of some types (or classes) to meet this criterion shall not affect the Secretary's determination of whether to prescribe a standard for other types (or classes).

(5) The Secretary may set more than 1 energy conservation standard for products that serve more than 1 major function by setting 1 energy conservation standard for each major function.

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42 U.S.C. § 6313

§ 6313. Standards

(a) Small, large, and very large commercial package air conditioning and heating equipment, packaged terminal air conditioners and heat pumps, warm-air furnaces, packaged boilers, storage water heaters, instantaneous water heaters, and unfired hot water storage tanks

. . . .

(6) Amended energy efficiency standards

(A) In general

(i) Analysis of potential energy savings

If ASHRAE/IES Standard 90.1 is amended with respect to the standard levels or design requirements applicable under that standard to any small commercial package air conditioning and heating equipment, large commercial package air conditioning and heating equipment, very large commercial package air conditioning and heating equipment, packaged terminal air conditioners, packaged terminal heat pumps, warm-air furnaces, packaged boilers, storage water heaters, instantaneous water heaters, or unfired hot water storage tanks, not later than 180 days after the amendment of the standard, the Secretary shall publish in the Federal Register for public comment an analysis of the energy savings potential of amended energy efficiency standards.

(ii) Amended uniform national standard for products

(I) In general

Except as provided in subclause (II), not later than 18 months after the date of publication of the amendment to the ASHRAE/IES Standard 90.1 for a product described in clause (i), the Secretary shall establish an amended uniform national standard for the product at the minimum level specified in the amended ASHRAE/IES Standard 90.1.

(II) More stringent standard

Subclause (I) shall not apply if the Secretary determines, by rule published in the Federal Register, and supported by clear and convincing evidence, that adoption of a uniform national standard more stringent than the amended ASHRAE/IES Standard 90.1 for the product would result in significant additional conservation of energy and is technologically feasible and economically justified.

(B) Rule

(i) In general

If the Secretary makes a determination described in subparagraph (A)(ii)(II) for a product described in subparagraph (A)(i), not later than 30 months after the date of publication of the amendment to the ASHRAE/IES Standard 90.1 for the product, the Secretary shall issue the rule establishing the amended standard.

(ii) Factors

In determining whether a standard is economically justified for the purposes of subparagraph (A)(ii)(II), the Secretary shall, after receiving views and comments furnished with respect to the proposed standard, determine whether the benefits of the standard exceed the burden of the proposed standard by, to the maximum extent practicable, considering--

(I) the economic impact of the standard on the manufacturers and on the consumers of the products subject to the standard;

(II) the savings in operating costs throughout the estimated average life of the product in the type (or class) compared to any increase in the price of, or in the initial charges for, or maintenance expenses of, the products that are likely to result from the imposition of the standard;

(III) the total projected quantity of energy savings likely to result directly from the imposition of the standard;

(IV) any lessening of the utility or the performance of the products likely to result from the imposition of the standard;

(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;

(VI) the need for national energy conservation; and

(VII) other factors the Secretary considers relevant.

(iii) Administration

(I) Energy use and efficiency

The Secretary may not prescribe any amended standard under this paragraph that increases the maximum allowable energy use, or decreases the minimum required energy efficiency, of a covered product.

(II) Unavailability

(aa) In general

The Secretary may not prescribe an amended standard under this subparagraph if the Secretary finds (and publishes the finding) that interested persons have established by a preponderance of the evidence that a standard is likely to result in the unavailability in the United States in any 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 United States at the time of the finding of the Secretary.

(bb) Other types or classes

The failure of some types (or classes) to meet the criterion established under this subclause shall not affect the determination of the Secretary on whether to prescribe a standard for the other types or classes.

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