

States Can Lead the Way to Improved Appliance Energy Efficiency Standards

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Executive Summary

Improving appliance energy efficiency standards will benefit consumers, manufacturers, and the environment. Consumers will save money on their electric bills and likely enjoy updated appliances at a lower cost as a result of improved standards. Manufacturers stand to gain from increased sales and lowered production costs. The environment will benefit from reduced natural resource consumption and lowered greenhouse gas emissions. Unfortunately, these benefits are not currently realized due to numerous delays at both the political and federal agency levels. These delays will result in at least \$28 billion in unrealized energy savings by 2030.¹

Traditionally a strongly bipartisan issue, support for energy efficiency has been eroded by anti-regulation sentiments. Without strong political support or adequate resources, the Department of Energy (DOE) has struggled to promulgate adequate efficiency standards. Regulatory efforts at the federal level have come up short, resulting in weak and delayed standards, or often no standards at all. In the absence of a dramatic shift in political will at the federal level, the most effective way to bring about improved efficiency standards and realize their attendant benefits will be to establish a system that retains a strong federal standard while allowing states to set an alternative, more stringent standard.

Such a system could be implemented simply by amending DOE's existing regulations. First, DOE should clearly explain the existing waiver process and its requirements so that states can successfully apply for a waiver granting them permission to adopt an improved appliance efficiency standard. Second, DOE should alter its regulations to allow states to adopt another state's approved standard, thereby making improved standards available nationwide. Finally, DOE should ensure that there is only one standard in addition to the federal

baseline for an appliance at any time. This will alleviate the concern regarding a patchwork of standards sprouting up across the country.

This paper draws heavily on the arguments and discussions contained in Alexandra B. Klass, *State Standards for Nationwide Products Revisited: Federalism, Green Building Codes, and Appliance Efficiency Standards*, 34 HARV. ENVTL. L. REV. 335 (2010).

Introduction

The heated rhetoric surrounding the potential cost of government regulations, particularly those designed to meet environmental protection goals, often obscures the even greater costs associated with failing to regulate. Just such a failure is at work in the case of energy efficiency standards for appliances, including refrigerators, air conditioners, washing machines, and a host of other household and commercial appliances. A 2007 Government Accountability Office (GAO) report highlighted the fact that DOE had missed the statutory deadline for all 34 products with congressionally mandated efficiency standards.² While DOE eventually set the required standards for 11 of the 34 products, the other 23 remained backlogged.³ This backlog was partially alleviated by the Energy Independence and Security Act of 2007 (EISA), which established some of the standards DOE had yet to address.⁴ EISA, however, also increased the number of standards DOE is responsible for and has resulted in yet more missed deadlines.⁵

The failure of the political process has led to stagnant appliance energy efficiency regulations, foregoing significant savings for both consumers and manufacturers. The GAO report noted that delays in setting new standards would cost at least \$28 billion by 2030.⁶ DOE subsequently reported that it had implemented the recommendations included in the GAO's 2007 report, including increasing the staff and resources devoted to efficiency standards, which led to the promulgation of 21 of the previously delayed standards.⁷ Beyond simply adopting the GAO's recommendations, DOE independently determined that efficiency standards save consumers and businesses \$15 billion a year and will save almost twice that amount annually by 2025.⁸ Further delays could be avoided, and increased savings for consumers and manufacturers achieved, by adopting a system that allows states to spearhead the improvement of energy efficiency standards for appliances while retaining federal standards as a floor.

States are currently prevented from setting standards for appliances for which DOE has already established standards. There is a waiver provision in DOE's regulations, however, that should allow a state to implement its own more stringent standard if it can demonstrate a need for increased efficiency.⁹ Despite the clear need presented by some states, DOE has never granted a single waiver.¹⁰ The failure to grant waivers is even more troubling because Congress has directly endorsed using DOE's waiver provision to establish regional standards in areas of the country that might benefit from heightened efficiency in certain appliances.¹¹ In order to pave the way for states to spearhead an increase in appliance efficiency nationwide, DOE should clarify and reformulate its regulations so that states may successfully apply for waivers to set their own standards. DOE should also amend its regulations to allow a state to adopt the efficiency standard of another state. Allowing states to lead the effort to increase the energy efficiency of household and commercial appliances in this way will have direct and immediate benefits for all stakeholders:

Consumers

- *Lowered energy bills.* Increased appliance efficiency reduces energy consumption and lowers energy bills. Even the outdated standards currently in place have saved consumers an average of \$2,000 per household since they were put in place, an amount that will only increase as efficiency does.¹²
- *Updated appliances with new features.* As manufacturers update their product lines to increase efficiency, they generally add new features and functions. Experts have determined that requiring a redesign to achieve energy efficiency often provides an "extra impetus" for manufacturers to further update their offerings based on new technologies and changing market demands.¹³
- *Lowered purchase prices.* Appliance purchase prices often decrease when efficiency standards are tightened. When refrigerator standards were last improved in 1993, consumers actually paid 14 percent less for the updated models than they would have paid for the previous ones.¹⁴
- *Quickly realized savings.* Even when improved efficiency standards do not result in lower purchase prices, they pay for themselves, on average, within the first 3.3 years of an appliance's useful life.¹⁵

Manufacturers

- *Reduced production costs.* For example, when General Electric Co. revisited its product designs in 2010 to comply with updated efficiency standards, it determined that it could save up to 30 percent by updating its manufacturing processes as well.¹⁶
- *Increased sales and higher profit margins.* A survey of 15 manufacturer financial reports revealed the new standards had no negative economic effects and actually resulted in net gains for several of the manufacturers.¹⁷
- *Increased employment.* Several domestic manufacturers, including General Electric Co. and Whirlpool, increased employment when updating their products to meet new efficiency standards, and the American Council for an Energy-Efficient Economy, in conjunction with the Appliance Standards Awareness Project, estimates that the savings from increased energy efficiency created over 300,000 jobs in 2010.¹⁸

Environment

- *Decreased energy and natural resource consumption.* Current energy efficiency standards have reduced energy consumption by 5 percent and pollution from power plants by 2 percent.¹⁹
- *Dramatically decreased greenhouse gas emissions.* Approximately 40 percent of the United States' carbon dioxide emissions are directly attributable to buildings and 70 percent of those emissions are from appliances. In sum, appliances account for roughly 28 percent of the United States' carbon dioxide emissions.²⁰

The economic and environmental benefits that will result from increasing appliance energy efficiency standards would be quickly realized. Secretary of Energy Steven Chu went so far as to describe such standards as not just “low-hanging fruit” but “fruit lying on the ground.”²¹ Unfortunately, the once solidly bipartisan support for increased energy efficiency and reduced energy consumption has fractured into unnecessarily contentious and highly politicized talking points about big government and consumer choice. This obscures the eminent achievability of appliance energy efficiency goals and the very real benefits both consumers and manufacturers will receive as those goals are realized.

Energy efficiency has historically been supported by successful bipartisan legislation. The law that led to the recently improved light bulb efficiency

standards, for instance, passed Congress with bipartisan support and was signed by President Bush in 2007.²² Since then, however, many Republicans have come to oppose appliance efficiency standards as part of a more general opposition to any government standards. For instance, Rep. Fred Upton (R - MI), one of the co-authors of this law, has now become one of its strongest opponents.²³ His reversal illustrates energy efficiency's emergence as a hot-button, deeply partisan issue. The subsequent challenge to the light bulb standards featured strong Republican resistance to any federal involvement in standard-setting despite the general consensus in favor of such standards just a few years earlier. Lawmakers that had previously supported the law argued that requiring a certain level of efficiency was akin to telling American consumers which light bulbs they could purchase.²⁴ Notably, however, the primary light bulb trade group has supported the increased standards and has invested in research and development as well as new factories and employees.²⁵

This politicization of energy efficiency, despite the support of the industry itself and empirical evidence demonstrating the economic benefits, does not bode well for the improvement of appliance energy efficiency standards through new federal legislation. Moreover, the combination of a contentious political climate and an overwhelming workload has meant that DOE has been hamstrung in its attempts to improve existing federal efficiency standards. The agency has also failed to set standards for a full two-thirds of the products over which it has authority. While DOE can and should do more to meet its statutory obligations, the states can – and should – press forward with their own, stronger, standards. Allowing states to spearhead energy efficiency improvements in this way will sidestep the political morass surrounding direct legislative solutions while still achieving all of the benefits consumers, manufacturers, and the environment stand to reap as a result of increased appliance efficiency standards.

Such a scenario, however, is currently impossible under the appliance efficiency standard regime established by Congress and implemented by DOE,

which prevents states from supplementing nationwide, federal standards set by DOE with their own standards. A state-led system could be established, however, with only minimal changes to the current regulatory system. In order to put states at the forefront and achieve meaningful efficiency gains, DOE should initially provide a clear explanation of the waiver process so that states can apply correctly and know their request will be considered. The next step would be to adjust Congress's regional standards approach to allow any state to adopt the improved standard, not just neighboring states. Finally, DOE should alter its regulations to allow for only one enhanced state standard per appliance to ensure that states are using only the most stringent state standard or the federal baseline standard.

With these changes, the federal standard would function as a floor below which no appliance may sink while the states would be free to propose their own more stringent standards. If a state wished to implement an improved standard for a particular class of appliances, its proposed standard would need to be more stringent than the strictest state standard then in effect. When approved, the new standard would then supersede the previous state standard. This method of succession would prevent a proliferation of individual state standards and encourage continued improvement by ensuring that states could only adopt one of two standards: the default federal standard or the most stringent state standard approved to date.

This paper will (1) outline the system currently in place for setting appliance energy efficiency standards, (2) explore the benefits of improving those standards, and (3) demonstrate that were DOE to allow states to be at the forefront of the improvement efforts then those improvements and their associated benefits would be realized without adversely impacting consumers or the regulated community.

Current System

Under current regulations and policies, DOE is responsible for setting efficiency standards every five years for a range of appliances, notably refrigerators, air conditioners, and commercial HVAC systems.²⁶ In fact, DOE has set efficiency standards for only about a third of the products over which it has congressionally delegated authority, and none of these standards has been issued on time.²⁷ DOE has explained that the delays are a result of overly ambitious statutorily mandated schedules, while those outside the agency attribute the delays to DOE's inadequate allocation of resources and overly lengthy review processes.²⁸ DOE's rulemaking process can be "contentious and long," and processes meant to take three years have taken as many as ten.²⁹

In 2005, as a result of these continued failures, Congress ordered DOE to report to it on a regular basis regarding its progress in setting standards for appliances.³⁰ A group of 14 states and various organizations also attempted to force DOE to update efficiency standards by suing the agency for its failure to meet deadlines. The suit resulted in a 2007 consent decree that required DOE to promulgate final rules regarding 22 efficiency standards.³¹ In 2009, President Obama sent a memorandum to the Secretary of Energy requiring DOE to take "all necessary steps" to comply with the consent decree.³²

DOE's continued failures place an inordinate burden on states, many of which would like to see improved appliance energy efficiency standards. These states are eager to establish their own standards for a variety of reasons, including soaring energy demands from booming populations and regional climate variation. Massachusetts, for instance, would have much to gain by improving heating efficiency standards, as would California with regard to standards for air conditioners. They have been unable to do so, however, even though the law contains a waiver provision that nominally allows states to apply for a waiver to implement their own appliance efficiency standards.³³ The waiver

provision requires (1) “unusual and compelling State or local energy or water interests” that are “substantially different in nature or magnitude than those prevailing in the United States generally” and (2) that the “costs, benefits, burdens, and reliability of energy or water savings resulting from the State regulation make such regulations preferable or necessary.”³⁴ As a result of this high bar and DOE’s even narrower application, no waivers have been granted to date and the waiver provision is generally understood as impossible to satisfy.³⁵

Many Benefits of Improved Standards

Establishing more stringent appliance energy efficiency standards will result in substantial benefits. Consumers stand to save significant amounts of money as a result of more appropriately stringent, and more frequently updated, appliance energy efficiency standards for a variety of reasons. More efficient appliances allow consumers to spend less on their energy bills and require manufacturers to update their appliances more frequently. Such updates often result in other improvements to the appliances as well as increased competition among manufacturers, which should drive further improvements. Furthermore, updating appliances to comply with stricter efficiency standards, and doing so more frequently, will likely lead to refinements in the manufacturing process, which will, in turn, lower the price consumers pay for their updated appliances. A recent report from the American Council for an Energy-Efficient Economy highlighted the effect of improved standards and determined that the savings that result from increasing appliance efficiency exceed the costs of achieving those gains by more than four times.³⁶

Incentivizing or requiring manufacturers to update their product lines by heightening efficiency standards will result in cost savings for manufacturers as well. These savings are realized despite dire predictions by manufacturers regarding the potential economic effect of improved standards. When DOE promulgated the 1992 central air conditioner standard, manufacturers warned

that it would result in huge price increases, but air conditioner prices actually declined shortly after the standard went into effect.³⁷ A 2002 Lawrence Berkeley National Laboratory study surveyed six DOE efficiency standard rulemakings and found that they overestimated the price impacts by 20 to 310 percent.³⁸ Similarly, a survey of 15 manufacturers' financial reports filed from 1987-1993, six years during which many new standards took effect, revealed that the new standards had no negative economic effects and actually resulted in net gains for several of the manufacturers.³⁹

The inability or unwillingness on the part of manufacturers to account for innovation and increased market pressure is perhaps the largest factor contributing to the inaccuracy of DOE and manufacturers' estimates, like those above, of the financial impact of heightened efficiency. This trend is beginning to reverse within DOE however, and Secretary Chu will publish a study showing that increasing efficiency standards spurs innovation and does not result in a price increase.⁴⁰ Chu's research indicates that strengthened standards "actually drive[] the engineers to make a better product."⁴¹ His findings are corroborated by a history of increased efficiency standards that resulted in innovative products. Automobile manufacturers, for instance, claimed that the heightened emissions standards required by the Clean Air Act were unachievable but nevertheless responded with the catalytic converter. Similarly, the most efficient washing machines on the market in 2008 operated at levels that were thought to be unachievable when the 2007 standards were announced in 2001.⁴² In fact, the most efficient models from some of the largest manufacturers were three times as efficient as those manufacturers' models that just met the minimum standard.⁴³ Furthermore, a 1997 Lawrence Berkeley National Laboratory study revealed that when manufacturers turn back to the drawing board to increase the efficiency of their appliances, they also update other aspects of their products, which often results in lowered prices and increased manufacturing efficiency.⁴⁴

These patterns have been repeatedly demonstrated by experience. Engineers at refrigerator manufacturers observed that manufacturers “typically combine improvements in energy efficiency with cost reductions, quality improvement, and new features” and that “each manufacturer’s facility and tooling are typically revised at certain intervals to attain these other objectives due to improvements in technology and/or new marketplace demands.”⁴⁵ Improved efficiency standards create just such an opportunity to innovate, and due to market pressures created by the innovations of their competitors, will, in effect, require innovation in order to remain competitive. These innovations and market pressures amount to cost savings for manufacturers, from increased sales for more efficient and better featured products, and from increasing the efficiency of the manufacturing process itself.

Cost savings for manufacturers are passed on to the consumer. In fact, despite insistence from some efficiency standard critics that consumers will have to pay more for increased efficiency, increases in appliance energy efficiency standards are actually accompanied by decreases in retail prices.⁴⁶ As noted, the average refrigerator retail price decreased 14 percent after DOE promulgated the 1993 efficiency standard.⁴⁷ The same will likely be true once again: requiring product updates will increase both competition and efficiency, which will reduce costs for manufacturers as well as consumers.⁴⁸ Consumers stand to benefit even when improvements in appliance efficiency result in increased upfront costs. The energy savings that result from increases in efficiency are reflected in a reduction in electricity bills that will offset incremental costs, on average, within the first 3.3 years of the appliance’s life.⁴⁹ The savings achieved over the remainder of the product’s life go directly into the consumer’s pocket.

Changes in product design and manufacturing as a result of the redesigning opportunity provided by improved efficiency standards often result in increased investment by manufacturers. In fact, some manufacturers have already begun

to increase their work force in order to comply with the standards DOE has promulgated in recent years.⁵⁰ It is quite likely that this trend will continue and that manufacturers will hire more designers and engineers to increase the efficiency and desirability of their offerings. In addition to new hires, new products often require capital investments for retooling existing assembly lines or increasing manufacturing capacity.

The environmental benefits that will flow from increased appliance energy efficiency are significant. Approximately 40 percent of U.S. carbon dioxide emissions are directly attributable to buildings and 70 percent of those emissions are from appliances.⁵¹ Appliances, therefore, account for roughly 28 percent of the United States' carbon dioxide emissions and any increase in their efficiency would have a substantial impact on overall greenhouse gas emissions in the United States. In addition to substantially reducing greenhouse gas emissions, improved energy efficiency standards will directly result in meaningful decreases in resource consumption. Increased efficiency leads to reduced energy consumption, which requires less energy to be generated, meaning that less coal, oil, and natural gas will be burned, reducing emissions. Increasing efficiency standards also results in significantly reduced water consumption, both because of a reduction in electricity generation and a reduction in the water consumed by the appliances themselves, particularly washing machines. The current drought covering more than half of the nation further emphasized the importance of water conservation. Because these environmental benefits can be achieved while simultaneously reducing costs for both manufacturers and consumers there is a very good chance that they will be realized.

Some commentators have suggested that energy efficiency improvements will not result in significant energy savings because of the so-called “rebound” or “take-back” effect.⁵² The “rebound effect” is the idea that energy efficiency improvements lower the price of energy in consumer products and services, and consumers may respond to this cost savings by consuming more of those same

products or services (the direct rebound effect) or more of other products and services (the indirect rebound effect).⁵³ A direct rebound effect would occur, for example, if a homeowner installs a new, more efficient air conditioning system that costs less to operate and then uses it more than her old one. An indirect rebound effect occurs if that homeowner takes the money that she saves on air conditioning and spends it on some other energy-consuming activity, such as a new type of home appliance or more frequent air travel. To the extent a rebound effect occurs, a one-to-one relationship between efficiency improvements and energy savings does not hold. Instead, the amount of energy savings that would otherwise be expected to occur as a result of increased efficiency is reduced by the size of the rebound effect.

Therefore, the important question regards the actual size of the rebound effect.⁵⁴ The direct rebound effect has been more thoroughly studied than the indirect rebound effect and the available empirical evidence suggests that the size of the effect is relatively small.⁵⁵ In the transportation sector, where the direct rebound effect has been most studied, the effect is likely to lie between 10 percent and 30 percent.⁵⁶ In other words, 70 to 90 percent of the energy savings that a more efficient car would be expected to incur is actually saved (and not negated in the form of higher consumption). When more efficient household heating is installed, about 80 percent of the energy savings remain intact.⁵⁷ As for the indirect rebound effect, there is little empirical support for it because there are few published studies and those that exist have been seen as flawed.⁵⁸

Even though there may be some rebound effect associated with improved appliance energy efficiency standards, it is highly unlikely that this rebound would exceed the reductions in energy consumption realized by increasing those standards.⁵⁹ Homeowners may use their more efficient cooling systems somewhat more often, but the net outcome would still be a reduction in energy consumption. Indeed, evidence associated with previous improvements in

appliance efficiency shows significant reductions in energy consumption. For instance, energy consumption in the United States during 2010 was about 3.6 percent lower than it would have been absent appliance efficiency standards that took effect between 1987 and 2010.⁶⁰ This figure, which was derived by estimating the energy savings from more efficient devices, annual appliance sales, and the baseline market share of compliant products, is largely independent from the reduction in energy use that may have occurred as a result of the ongoing recession.⁶¹ Such a reduction would not have occurred were there a strong rebound effect as a result of increased appliance energy efficiency.

Finally, even to the extent that there is a rebound effect and “saving energy does not actually save energy,” its use as an argument against energy efficiency improvements ignores other consumer benefits. Consumers would at least be able to use the energy “not saved” to achieve some other benefit (cleaner clothes, colder refrigerators, warmer houses, etc.) and have more choice over how they spend their energy dollars, helping to generate economic activity.

Recommendation: Let the States Lead

The best way to increase appliance energy efficiency and realize the attendant benefits will be to adopt a system that allows states to lead in improving efficiency standards while retaining the federal standard as a backstop. Allowing states to spearhead improvements in appliance energy efficiency standards will not only overcome the current political gridlock in Congress, but will benefit consumers, manufacturers, and the environment. Such a system would allow a state, or groups of states, to set standards more restrictive than the current federal standard but still adoptable by all states. A state-led program would allow the new state standards to function as a ratchet and likely improve the default federal standard, to the benefit of all. As states adopt the more efficient standard, manufacturers would be strongly incentivized to meet that

standard, which would in turn eliminate manufacturers' insistence that more stringent standards are not feasible.

Several states, including those with large markets like California and New York, are already prepared to move forward with improved efficiency standards despite delays at the federal level.⁶² Any action occurring as a result of a state-led program would send a strong market signal indicating that several large state economies desire more efficient appliances and that there is thus money to be made by increasing efficiency. It would also allow other states to follow suit and adopt the improved standard, which could then lead DOE to improve federal standards.

California's authority to establish its own automobile emissions standards provides a relatively close analogue. California's history of leadership on energy and the environment, particularly automobile emissions standards, earned it a de facto exemption from federal automobile emissions standards legislation. While California must still apply for a waiver from EPA, Congress made it clear that EPA is to afford California great deference in setting its own emissions standards.⁶³ Thus, California is statutorily allowed to apply for a waiver granting it the ability to set mobile emissions standards that are more stringent than those established by the U.S. Environmental Protection Agency (EPA) and other states may choose to adopt the more stringent California standards to take advantage of California's leadership in this area. Unlike the appliance waiver provision, California's auto emissions waiver requests are routinely granted. The most significant difference is that California applies to the EPA with the explicit support of Congress, while under the current appliance waiver provision, states apply to DOE with no such support. However, if Congress were to make it clear that states ought to be afforded similar deference when applying for an energy efficiency standard waiver from DOE, then a state-led appliance efficiency program would likely have the same success.

Congress has already expressed an interest in establishing a similar waiver system for appliances and has expressly authorized DOE to set regional energy efficiency standards.⁶⁴ Unfortunately, this authorization has led to little action. While DOE has acknowledged the potential for regional standards and coalitions of states with similar interests, e.g. northern states applying together for a waiver granting them the ability to set stricter standards on furnaces or southern states doing the same for air conditioners, no waivers have been granted or programs established.

How It Would Work

The best way to implement a system that will allow states to lead is to base it on modern principles of federalism, so that the federal government remains directly involved but no longer bears sole responsibility for setting appliance energy efficiency standards. In this way, the federal standard would remain in place and DOE would still have to update its standards at the statutorily required intervals and promulgate standards for those appliances that remain unregulated.⁶⁵ The largest contemplated change, allowing states to set their own standards, is not actually an addition at all because it is already included in DOE's authorizing statute and regulations.⁶⁶ The change that needs to occur is simply one of policy: rather than stopping at recognizing that states or groups of states might have legitimate reason for requesting waivers to set their own efficiency standards for appliances, DOE needs to encourage state waiver applications, act on them, and, as appropriate, grant them.

Industry may complain that such an approach will result in a 50-state patchwork of efficiency standards. This potential shortcoming may be neatly sidestepped by allowing only two standards to exist at any one time: the default federal standard and the strictest state standard for that particular appliance approved by DOE. Any state or coalition thereof wishing to request a waiver to implement its own standards would have to propose a standard stricter than the

strictest state standard approved to date and obtain approval from DOE before putting it into effect. This progression will serve as an excellent mechanism to steadily ratchet up appliance energy efficiency standards while keeping the overall system simple.

Moreover, although such a system would allow for two standards, it may in fact ultimately lead to a single improved standard. California's automobile emissions standards have effectively acted as a ratchet on their federal counterparts, and they became one and the same starting with model year 2012 automobiles.⁶⁷ Just as the automobile emission waiver allowed California to initially work around EPA's reluctance to improve standards to meet California's particular need to address smog in the Los Angeles basin and Central Valley, the proposed appliance efficiency system will allow states to improve appliance efficiency standards even when DOE fails to act and could ultimately result in improved federal standards as well.

The implementation of this system is also relatively straightforward. As mentioned previously, the basic elements are already in place: both Congress and DOE have acknowledged the need for regional appliance energy efficiency standards, and DOE has a waiver process through which states may apply to implement their own improved standards. The key ingredient, approval of waiver applications, has so far been missing, partly due to the agency's exceedingly narrow interpretation of the current waiver provision.⁶⁸ It would be theoretically possible to establish this system in one fell swoop through legislation, but in light of the current gridlock in Congress, achieving the same result through incremental changes in regulation may be more cost effective, quicker, and not nearly as contentious.

Given the political reality, the first step to successful implementation should be a clear explanation of the waiver process and its requirements by DOE, such that states can successfully apply for a waiver. The second step toward

implementation would be for DOE to amend its regulations to allow states to adopt another state's heightened standard obtained through the DOE waiver process, without the need to go through the waiver process itself. This would serve to make the improved standard available as a nationwide standard and greatly incentivize adoption by manufacturers and other states because they would be secure in the knowledge that the approved standard was not applicable only to one state or region, but rather to the entire country. The last step in the transition to a more workable and advantageous system is for DOE to revise its regulations so that there may only be one standard in addition to the federal baseline for a given appliance at any one time. This alteration alleviates the concern regarding a patchwork of standards sprouting up across the country and will help assure manufacturers that their products will be saleable nationwide.

Conclusion

Energy efficiency policy is not about telling consumers what they can and cannot do or purchase, but about realigning manufacturers' incentive structures to provide economic and environmental benefits. Allowing states to spearhead improvements in appliance energy efficiency standards is a win-win reform. With an effective state-led approach to setting standards, consumers and manufacturers will see a reduction in costs as a result of decreased energy consumption and increased manufacturing and energy efficiency.

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Endnotes

¹ U.S. GOV'T ACCOUNTABILITY OFFICE, ENERGY EFFICIENCY: LONG-STANDING PROBLEMS WITH DOE'S PROGRAM FOR SETTING EFFICIENCY STANDARDS CONTINUE TO RESULT IN FORGONE ENERGY SAVINGS 11 (2007), <http://www.gao.gov/new.items/d0742.pdf> [hereinafter GAO REPORT].

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⁵ *Id.* at 16.

⁶ GAO REPORT at 11.

⁷ *See supra* note 4.

⁸ DOE, Energy Efficiency & Renewable Energy, Building Technologies Program, Appliance & Equipment Standards. http://www1.eere.energy.gov/buildings/appliance_standards/ (last visited June 25, 2012). "As of 2010, consumers and businesses have saved \$15 billion per year, and this annual amount is expected to nearly double by 2025."

⁹ National Appliance Energy Conservation Act of 1987, § 5, 101 Stat. at 107–17 (codified at 42 U.S.C. § 6295).

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²¹ See U.S. DEP'T OF ENERGY, *Obama Administration Launches New Energy Efficiency Efforts* (June 29, 2009), <http://www.energy.gov/news2009/7550.htm>.

²² Energy Independence and Security Act of 2007, Pub. L. No. 110-140, 21 Stat. 1492, 1493-1801 (2007), <http://www.gpo.gov/fdsys/pkg/PLAW-110publ140/content-detail.html>.

²³ See Sarah Leitner, *Upton Flip-Flops on the Light Bulb Ban*, WASHINGTON EXAMINER, June 30, 2011, <http://washingtonexaminer.com/blogs/beltway-confidential/2011/06/upton-flip-flops-light-bulb-ban>.

²⁴ Pete Kasperowicz, *Lightbulb Bill Likely Headed for Defeat in House*, THE HILL, July 11, 2011, <http://thehill.com/blogs/floor-action/house/170791-lightbulb-bill-likely-headed-for-defeat-in-house>.

²⁵ Bartholomew Sullivan, *Effort by Rep. Marsha Blackburn to Preserve Incandescent Light Bulbs Falls Short*, THE COMMERCIAL APPEAL, July 12, 2011, <http://www.commercialappeal.com/news/2011/jul/12/effort-rep-marsha-blackburn-tp-preserve-incandesce/?print=1>.

²⁶ Energy Policy and Conservation Act (EPCA), 42 U.S.C. § 6313(a) (2007). EPCA established energy efficiency standards for commercial heating, air conditioning, and water heater equipment.

²⁷ GAO REPORT, *supra* note 1, at 5. As of 2007, DOE had missed all 34 statutory deadlines for setting energy efficiency standards, and while DOE ultimately issued late efficiency standards for 11 of those products, it has yet to issue standards for the other 23 products.

²⁸ *Id.* at 14-15.

²⁹ Nadel, *supra* note 13, at 182.

³⁰ Pub. L. No. 109-58, § 141, 119 Stat. 594, 648 (2005) (codified at 42 U.S.C. § 15834 (2006)); Pub. L. No. 110-140, § 305, 121 Stat. 1492, 1553 (2007) (codified at 42 U.S.C. § 6295(m) (Supp. I. 2007)).

³¹ Consent Decree at 2–4, *New York v. Bodman*, No. 05-7807 (S.D.N.Y. Nov. 1, 2007), 2007 LEXIS 80980, available at http://www.fypower.org/pdf/DOE_Appliances_Decree.pdf.

³² Memorandum on Appliance Efficiency Standards, Executive Office of the President, 74 Fed. Reg. 6537 (Feb. 9, 2009).

³³ National Appliance Energy Conservation Act of 1987, *supra* note 11.

³⁴ 42 U.S.C. § 6297(d)(1)(B), (d)(1)(C)(i).

³⁵ See American Clean Energy and Security Act of 2009: Hearing on H.R. 2454 Before the Subcomm. on Energy and the Env't of the H. Comm. on Energy and Commerce, *supra* note 5. California, for instance, applied for a waiver that would allow it to set water efficiency standards for residential clothes washers in an effort to alleviate its growing water shortage only to have its application denied by DOE. DOE interpreted California's submission as narrowly as possible and even ignored much of the factual evidence the state submitted. The U.S. Court of Appeals for the Ninth Circuit determined that DOE's denial was arbitrary and capricious and ordered DOE to revisit its decision. See *Cal. Energy Comm'n v. Dept. of Energy*, 585 F.3d 1143 (9th Cir. 2009) and 71 Fed. Reg. 78,157 (Dec. 26, 2006).

³⁶ EFFICIENCY BOOM, *supra* note 15, at 20.

³⁷ See APPLIANCE STANDARDS AWARENESS PROJECT, STAYING COOL: HOW ENERGY-EFFICIENT AIR CONDITIONERS CAN PREVENT BLACKOUTS, CUT POLLUTION AND SAVE MONEY 15 n.8 (2000) ("The last time a standard was set for residential central air conditioners in the 1980s,

manufacturers predicted prices would increase by \$780 and the government predicted prices would increase by \$360. When the standard became effective in 1992, prices did not increase at all.”).

³⁸ Larry Dale, Camille Antinori, Michael McNeil, James E. McMahon & K. Sydney Fujita, *Retrospective Evaluation of Appliance Price Trends*, 37 ENERGY POLICY 597-605 (2009).

³⁹ Memorandum from Terry Chan & Carrie Webber, Lawrence Berkeley National Laboratory (Oct. 11, 1995).

⁴⁰ Paul Voosen, *For Energy Efficiency, Chu's Law is on the Way*, GREENWIRE, June 14, 2012, <http://www.eenews.net/public/Greenwire/2012/06/14/1>.

⁴¹ *Id.*

⁴² 2008 Standard Clothes Washer Energy Data, Federal Trade Commission (2008), http://www.ftc.gov/bcp/online/edcams/eande/appliances/data/2008/clwasher/standard_effic.pdf.

⁴³ *Id.*

⁴⁴ McInerney & Anderson, *supra* note 17, at 17.

⁴⁵ *Id.*

⁴⁶ Nadel, *supra* note 13, at 182.

⁴⁷ *See id.* at 172–73 (citing studies).

⁴⁸ Paolo Bertoldi, *The Market Transformation for Domestic Appliances Resulting from the European Union Policies*, EUROPEAN COMMISSION (2001), <http://www.resourcesaver.com/file/toolmanager/O105UF979.pdf>. For instance, when reporting on the efficacy of European Union energy efficiency standards, the European Commission noted that “[m]anufacturer profitability ... increased to levels of up to 8 percent in 1999” while the “average sales-weighted price of cold appliances declined by 2.9 percent in real terms from 1994 to 1998 even though both the average adjusted volume and the average efficiency increased.” The report went on to state “both consumers and the environment have benefited from a substantial increase in cold appliance efficiency without any adverse impacts on manufacturing.”

⁴⁹ EFFICIENCY BOOM, *supra* note 15, at 20.

⁵⁰ APPLIANCE EFFICIENCY STANDARDS: MONEY MAKER, *supra* note 16, at 14.

⁵¹ *See* OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY, *supra* note 20, at 1–21 (citing to data from 2006). Refrigerators, basic electronics, motors, swimming pool heaters, and hot tub heaters are included in the “other appliances” category.

⁵² *See e.g.*, John Tierney, *When Energy Efficiency Sullies the Environment*, N.Y. TIMES, March 7, 2011.

⁵³ Horace Herring & Robin Roy, *Technological Innovation, Energy Efficient Design and the Rebound Effect*, TECHNOVATION 27, no. 4, pp. 194-203, at 195 (2007). *See also* J.D. Khazzoom, *Energy Saving Resulting from the Adoption of More Efficient Appliances*, 8 ENERGY JOURNAL 85-89 (1987).

⁵⁴ The take back effect is most commonly expressed as a percentage. To say that there is a take-back or rebound effect of 10 percent “means that 10 percent of the energy efficiency improvement initiated by the technological improvement is offset by increased consumption.” *See* Peter H.G. Berkhaut, Jos C. Muskens, & Jan W. Velthuisen, *Defining the Rebound Effect*, 28 ENERGY POLICY 425-32 (2000).

⁵⁵ Steve Sorrell, John Dimitropoulos & Matt Sommerville, *Empirical Estimates of the Direct Rebound Effect: A Review*, 37 ENERGY POLICY 1356–1371 (2009).

⁵⁶ *Id.*

⁵⁷ STEVE SORRELL, *THE REBOUND EFFECT: AN ASSESSMENT OF THE EVIDENCE FOR ECONOMY-WIDE ENERGY SAVINGS FROM IMPROVED ENERGY EFFICIENCY*, UK ENERGY RESEARCH CENTRE (2007),

<http://www.ukerc.ac.uk/Downloads/PDF/07/0710ReboundEffect/0710ReboundEffectReport.pdf>.

⁵⁸ *Id.*

⁵⁹ In fact, an Energy Information Agency study concluded that the United States' marked decline in oil imports and general oil consumption were due partly to "changes in efficiency and consumer behavior." *U.S. Oil Import Dependence: Declining No Matter How You Measure It*, ENERGY INFORMATION AGENCY (2011),

<http://www.eia.gov/oog/info/twip/twiparch/110525/twipprint.html>.

⁶⁰ APPLIANCE EFFICIENCY STANDARDS: MONEY MAKER, *supra* note 16, at 5.

⁶¹ *Id.* These estimates also took into account DOE's rulemakings, as well as information from ENERGY STAR, appliance manufacturers, the U.S. Census Bureau, and utility energy efficiency reports.

⁶² Multi-State Appliance Standards Collaborative, <http://appliancestandards.org/states>, (last visited Jan. 30, 2012). Connecticut, Massachusetts, New York, Oregon, Rhode Island, and Washington have adopted appliance standards "the same as or similar" to California's for selected appliances not already subject to federal standards.

⁶³ *See* Clean Air Act § 209(b), 42 U.S.C. § 7543, and Environmental Protection Agency, California State Motor Vehicle Pollution Control Standards; Notice of Decision Granting a Waiver of Clean Air Act Preemption for California's 2009 and Subsequent Model Year Greenhouse Gas Emission Standards for New Motor Vehicles, 74 Fed. Reg. 32,744 (July 8, 2009).

⁶⁴ Pub. L. No. 110-140, §§ 541-548, 121 Stat. 1492, 1667-74 (2007) (codified at 42 U.S.C. §§ 17151-17158 (Supp. I 2007)).

⁶⁵ 42 U.S.C. § 6295 (2010).

⁶⁶ 10 C.F.R. § 430.40-49 (2009).

⁶⁷ Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Final Rule, 75 Fed. Reg. 25324 (May 7, 2010). This rule garnered broad industry support as evidenced by the commitment letters available on EPA's website. EPA, Office of Air Quality and Transportation, Presidential Announcements and Stakeholder Commitment Letters, <http://www.epa.gov/otaq/climate/letters.htm> (last visited Jan. 30, 2012).

⁶⁸ *See supra* note 35 (discussing California's waiver application).