



Energy Conservation Program: Energy Conservation Standards for Walk-In Coolers and Freezers

Antony Dnes

Affiliated Scholar, Mercatus Center at George Mason University

Department of Energy

Comment Period closes November 12, 2013

INTRODUCTION

The Regulatory Studies Program of the Mercatus Center at George Mason University is dedicated to advancing knowledge about the effects of regulation on society. As part of its mission, the program conducts careful and independent analyses that employ contemporary economic scholarship to assess rulemaking proposals and their effects on the economic opportunities and the social well-being available to all members of American society.

This comment addresses, from an economic point of view, the efficiency and efficacy of the proposed rulemaking requiring increased energy efficiency of walk-in coolers and freezers. Specifically, it examines how the proposed rule may be improved by more closely examining the societal goals the rule intends to achieve and whether this proposed regulation will successfully achieve those goals. In many instances, regulations can be substantially improved by choosing more effective regulatory options or more carefully assessing the actual societal problem.

SUMMARY OF THE PROPOSED RULEMAKING

The Department of Energy (DOE) wishes to implement additional energy conservation standards for walk-in coolers and freezers. Its proposals go beyond the current standards developed from the 1975 Energy Policy and Conservation Act, which requires the DOE to consider from time to time whether more stringent standards would be technically feasible and economically justified. The DOE claims its new proposals meet both requirements, but its economic analysis is poor because of significant omissions.

The proposals are not transparently described in the Regulatory Impact Analysis (RIA) or elsewhere. The DOE refers to tabulated data covering refrigeration systems, panels, nondisplay doors, and display doors,

For more information, contact:

Robin Bowen, (703) 993-8582, rbowen@mercatus.gmu.edu

Mercatus Center at George Mason University

3351 Fairfax Drive, 4th Floor, Arlington, VA 22201

all rated at different heat outputs and energy inputs.¹ Broadly, the proposals are based on the selection of one trial standard level from among five, based on an assessment of technical feasibility, economic impact, employment effects, and reduced carbon emissions.

This notice of proposed rulemaking (NPRM) focuses on the details of the selected conservation standard, rather than a step-by-step account of how it was chosen. With 15 separate product standards embedded in the chosen conservation standard, it is not possible to give a meaningful overall figure for the tightening of standards, some of which are cited as formulae. Energy savings, financial impacts on manufacturers, cost changes facing consumers, and reduced NO_x and other assorted emissions are all assessed at the national level. Reduced emissions of CO₂ are valued in terms of the international ('global'²) Social Cost of Carbon (SCC), measuring the greenhouse impact of the chosen standard. The global SCC is approximately four to 14 times the national figure and thus imparts a bias in favor of tighter standards from the DOE's analysis.

The key to understanding the NPRM is in the assumed technical changes to be adopted by manufacturers in meeting the proposed standards. Clearly, the proposal is more restrictive in terms of energy efficiency than other conservation standards, except for the one that was rejected as unduly burdensome to small businesses. To put this into perspective, the DOE estimates that the present value of the cost impact of its proposal on consumers of walk-in coolers and freezers over a nine-year period will be \$1.98 billion (2012 dollars, using a seven percent discount rate). It further estimates the total energy savings, compared with doing nothing more now, over the period from 2017 to 2046 to be 5.39 quadrillion British thermal units.³ Consumers will, in general, value non-energy product characteristics, such as ease of use, aesthetic properties, noise levels, and the practical storage features attached to coolers and freezers, and tend to trade off certain characteristics for others—which is why we do not all end up buying the same product. Indeed, the DOE admits as much in its rejection of one highly energy-efficient standard because of its disproportionate cost impact on small businesses, but does not develop this idea by widening its approach further, as it should.

The proposal is to be commended for including the possibility for a manufacturer to demonstrate it already has technology that will yield results equivalent to one that would follow from the proposed standards. Unfortunately, the route for validating alternative approaches amounts to meeting a rebuttable presumption that a manufacturer's technology is not energy efficient, which shifts the costs of showing the presence of "good" technology onto the manufacturers. The DOE has effectively framed private-sector decision making as inefficient, even though there is a good argument in favor of the view that manufacturers would respond to consumer demand for cost-effective, energy-saving coolers and freezers. Over time manufacturers will bear the cost of demonstrating that their technology is indeed efficient, and the very process of doing so will create a perception that regulatory intervention really is necessary because private-sector decisions are obviously not trusted to be optimal.⁴

THE COSTS AND BENEFITS OF THE PROPOSAL

As required by Executive Order 12866, the DOE assessed the regulatory proposal as an economically significant regulatory action. The DOE has estimated the costs and benefits of its proposed standards using

1. Table I-1, Energy Efficiency Program for Certain Commercial and Industrial Equipment, 10 C.F.R. 431, RIN 1904-AB86.

2. RIN1904-AB86, FR 78, at 55787 and 55843.

3. See Ted Geyer and W. Kip Viscusi, "Overriding Consumer Preferences with Energy Regulations," *Journal of Regulatory Economics* 43 (2013): 248-64 for a recent article criticizing such one-dimensional engineering economics. The arguments go back a long way: see Antony W. Dnes, "Uranium Resource Economics," *Resources Policy* 6 (1980): 266-268.

4. The "framing effect" has been identified in studies in behavioral economics showing that how one presents information and choices can have real effects on what people do. See Christopher Koopman and Nita Ghei, "Behavioral Economics, Consumer Choice and Regulatory Agencies" (Economic Perspectives, Mercatus Center at George Mason University, Arlington, VA, August 2013) for a general summary of the relationship between modern behavioral economics and regulatory intervention. In general, this relationship often involves the misinterpretation of the welfare significance of apparently irrational behavior.

two different interest rates and several SCC calculations. With a three percent discount rate and an average of several SCC calculations, the DOE claims there will be an annual increase in equipment costs for consumers of \$399 million per year, reduced operating costs of \$1,606 billion, \$499 million in saved CO₂ emissions, and \$31 million in saved NO_x emissions. This estimation gives a total of \$1,737 billion per year⁵ in net benefits over the 2017 to 2046 period. The DOE recognizes that many of its underlying figures are highly dependent on assumptions it has made but suggests that the SCC figures in particular can still be applied usefully.

The DOE has carried out very crude calculations of costs and benefits. It counts increased total costs from the proposed standard levels as changed costs for consumers plus the change in manufacturers' net present value of cash flow, correctly recognizing that increased expenditures by consumers accrue as revenues for sellers. Unfortunately, this approach completely ignores the value of lost sales, to consumers and sellers, as consumers tend to respond to increased costs by buying fewer units. The omission results in a bias favoring finding a positive net benefit from the proposals. The use of global SCC estimates also imparts a bias toward finding a positive net benefit, as noted already. Benefits are seen primarily in terms of cost savings, including external costs such as those attached to CO₂ emissions.

THE UNDERLYING ANALYSIS

The underlying analysis informing the proposal suffers from six major problems. These are: the focus on energy analysis; the use of global SCC estimates; a failure to identify a systemic problem in need of remedy; the use of an irrational criterion in comparing costs and benefits; the use of soft interview data likely to elicit inaccurate responses; and the framing of industry decisions as tending toward suboptimality. The use of global SCC estimates is the most significant of these problems, although all of them are substantial. Two issues, energy analysis and framing, have already been discussed above and are discussed more briefly here with a focus on some additional points.

1. The Use of Energy Analysis

The economic analysis in the proposed rulemaking is an exercise in engineering economics that is driven by energy analysis. The approach has been used in some studies without converting energy effects into values and completing a financial calculation.⁶ In the DOE's calculations, monetization does occur, but that makes little or no difference: the essential character of the exercise is adding up energy gains.⁷ In the economy, different products and services carry different values, reflecting the intensity of preferences shown by consumers and resulting from ever-changing patterns of purchases. The kaleidoscopic activity going on in the marketplace arises partly as consumers substitute products in place of others. Energy analysis totally ignores substitution possibilities and changing relative values. It is completely incapable of examining a consumer's possible substitution of, say, a less noise-polluting unit, for one with less energy use attached to it. Therefore, it gives a misleading picture of economic activity making use of energy and other inputs in providing end results for people.

2. National and Global Carbon Impacts

The most questionable element in the DOE's proposed rulemaking is the use of global SCC estimates in the valuation of benefits. It is very unusual to carry out an analysis of economic policy from anything other than a national perspective.⁸ Furthermore, agencies are instructed by the OMB to "focus

5. Ibid at 55787.

6. See Dnes, "Uranium Resource Economics," 1980.

7. Energy has a monetary value implied by the calorific values of forms of energy, but that could be normalized to one.

8. This point may also be made in relation to other recent regulatory proposals, in particular those concerning CAFE standards (Corporate Average Fuel Efficiency) standards put forward by NHTSA and the EPA (see Gayer and Viscusi, "Overriding Consumer Preferences," 2013)

on benefits and costs that accrue to citizens and residents of the United States” in their analysis, but the DOE fails to do so.⁹

Although the United States never ratified the Kyoto Agreement signed by Vice President Gore, it remains influential, and the United States has steadily been meeting Kyoto targets. The weight given to global CO₂ emissions in the DOE’s proposals requires American businesses to bear the cost of providing a benefit to residents of the rest of the world. Although CO₂ reduction may have some benefits for Americans, the nature of the DOE’s calculations compares costs in the United States with benefits accruing abroad. The overseas benefits are weighted the same as if they accrued in the United States. In pursuing a policy where some gain and others lose but overall there is a national gain, one can argue that since the decision was made by representative government it is permissible to allow costs to remain where they fall. Such an argument is much harder to sustain when the beneficiaries are overseas residents.

A more appropriate approach would rely on the much smaller national SCC estimates. At the three percent discount rate, the rule fails a benefit-cost test once operating cost savings (see more below) and benefits to foreigners are excluded. If only operating cost savings are excluded, the rule passes a benefit-cost test using the 2013 estimate of the SCC but fails it using the 2010 estimate of the SCC.¹⁰

The current use of global estimates, therefore, biases the DOE’s findings in favor of the proposed standards.

3. A Systemic Problem?

Does the DOE truly identify a systemic problem in relation to purchases of walk-in coolers and freezers? We think probably not. Based on figures such as those in the net benefit calculation reviewed above, an obvious question is whether the market may already provide an optimal level of energy savings, at least from an American consumer’s perspective. Apparently, there are net financial savings to be had from paying up front for better energy-saving equipment, and the DOE notes that the technology is already available to achieve its planned level of savings.¹¹ Therefore, we might expect equipment buyers to show a demand for the equipment that provides such savings, and claims that they are irrationally ignoring the benefits are suspect—particularly when, as in this case, the consumers are mainly business users of refrigeration. If consumers do not buy the more energy-saving equipment, it could simply reflect their preferences for other product attributes.

It is worth paying some attention to regulators’ claims of irrational citizen behavior. As Gayer and Viscusi point out in relation to other similar regulatory proposals, claims that observed patterns of supply and demand are suboptimal typically rely on further claims that consumers undervalue some element that is highly prized by the regulator.¹² In the case of walk-in coolers and freezers, the DOE would like to increase the weight given

where benefits depend heavily on overseas environmental impacts. Even traditional demonstrations of the benefits of free trade rely on showing benefits for both nations but from the point of view of each. The Office of Management and Budget has recommended for some time that, where regulatory programs have impacts outside of the United States, both impacts within and without the United States should be reported separately. Office of Management and Budget, Circular A-4, “Regulatory Analysis” (September 17, 2003).

9. See Office of Management and Budget, Circular A-4, “Regulatory Analysis” (September 17, 2003). “Your analysis should focus on benefits and costs that accrue to citizens and residents of the United States. Where you choose to evaluate a regulation that is likely to have effects beyond the borders of the United States, these effects should be reported separately.”

10. The 2010 interagency working group report estimated the 2015 SCC at \$23.8/ton (2007\$). Adjusting for inflation gives a 2015 SCC of \$26.35/ton (2012\$). The ratio of this latter number to the SCC used in the DOE’s analysis of \$40.8/ton, multiplied by the global benefits from reductions in CO₂, produces the result stated above. See James Broughel, “Energy Conservation Program: Energy Conservation Standards for Metal Halide Lamp Fixtures” (Public Interest Comment, Mercatus Center at George Mason University, Arlington, VA, October 21, 2013) <http://mercatus.org/publication/energy-conservation-program-energy-conservation-standards-metal-halide-lamp-fixtures>.

11. RIN 1904–AB86 at 55788.

12. Gayer and Viscusi, “Overriding Consumer Preferences,” 2013. Much earlier, Harold Demsetz, “Information and Efficiency: Another

to conserving future energy resources in business decision making. Economists would say that the DOE is implicitly claiming there is a difference between a lower social discount rate to be applied in valuing future energy resources and an inappropriately high private discount rate used by citizens and leading to more use of energy in the present.

It was customary to justify the use of a lower “social discount rate” favoring resource conservation by citing the absence of some private risks when making a decision from a social perspective (e.g., taxes might increase in future years for the investor, but since the tax payment would be spent by government, the money would not be lost to society as a whole).¹³ These days, the argument for weaker “social” discounting has moved into the domain of behavioral economics¹⁴ and typically cites observed irrational private patterns of discounting future benefits, such as “hyperbolic discounting.” A rational individual would apply a constant interest rate raised to a power equal to the number of years of waiting in discounting a future benefit, but economists have observed some individuals increasing the interest rate, not just raising the power factor, when discounting to a present value. We do not know how pervasive hyperbolic discounting is and the basis on which the DOE concludes that consumers are typically shortsighted is anyway not entirely clear, but, whether based on risk differences or hyperbolic discounting, no one has ever identified the social rate of discount as a practical matter. The analysis amounts to nothing more than a claim that the people should make different choices and that the regulator knows best. Actually, we have the people we do, and their preferences are the ones that count.

4. An Odd Calculation

The DOE makes use of a quite extraordinary oddity in its calculations of the benefits of reducing energy use in walk-in coolers and freezers. It carried out its standard life cycle cost (LCC) savings calculations for buyers of walk-in coolers and freezers and worked out payback periods for the adoption of the new standards. It is easy to criticize both LCC and payback for irrationality from an economic perspective: some opportunity costs are likely to be missed and payback draws an arbitrary bright line in counting the benefits from the reduction in energy use. The oddity is not related to these conventional criticisms of arbitrary accounting approaches to economic decision making. Rather, there is an odd rebuttable presumption arising from enabling legislation that an energy standard may be considered to be economically justified if it costs the consumer no more than three times the first year’s value of energy savings.¹⁵ The clear implication is that a technology with a price tag three times the first year’s energy savings, but which then yields no further cost savings, is regarded as efficient. This rule of thumb approach is a good example of the behavioral irrationality of legislators and the regulators who follow their orders.¹⁶ The presumption, which was used in the calculations associated with the proposed rulemaking, will bias regulatory decision making in favor of adopting a new standard with low future returns.

5. Interview Data

A further worrying aspect of the DOE’s analysis is that many of the costs of its proposals were calculated on the basis of data gleaned from interviews with manufacturers. Few details are given of these interviews, but it would be sensible to assume that interviewees have an incentive to make statements aimed at influencing the regulations. It is difficult to assess the impact of interview bias, but there is a danger that firms would

Viewpoint,” *Journal of Law and Economics* 12, no. 1 (Apr. 1969): 1–22, identified the regulatory fallacy of “the people could be different” in his critique of standard welfare economics.

13. Talbot Page, *Conservation and Economic Efficiency* (Baltimore: John Hopkins University Press, 1977).

14. Koopman and Ghei, “Behavioral Economics,” 2013.

15. The presumption in the 1975 Energy Policy and Conservation Act is identified in the DOE proposal, *ibid* at 55789.

16. Gayer and Viscusi, “Overriding Consumer Preferences,” 2013, also identify examples of regulatory behavioral irrationality, as do Michael Marlow and Sherzod Abdulkadirov, “Fat Chance: An Analysis of Anti-Obesity Efforts” (Working Paper No. 12-10, Mercatus Center at George Mason University, Arlington, VA, March 2012).

press for regulations that they could achieve, but which would create disproportionate costs for other firms wishing to enter the industry. The DOE gives no consideration to possible anticompetitive effects following from its involving existing firms in providing information flows that then underlie the formulation of the regulatory proposals. Similarly, firms may have an incentive to overreport their costs in order to avoid implementation of a regulation they view as burdensome.

6. Framing Effects

The system for accepting alternate technical standards creates a rebuttable presumption that manufacturers' technology is not efficient. This has an unfortunate framing effect that shifts a costly burden of proof to manufacturers while creating the impression that manufacturers will typically get things wrong. The approach seems particularly harsh given the expectation that manufacturers will provide the unpriced environmental benefits for overseas residents required by shadowing the Kyoto agreement. The new regulatory proposal requires manufacturers to pay to change their technology, or incur costs of proving its acceptability, whereas they receive no payment for conferring the reduction in the total global SCC. The costs for manufacturers could be eased by introducing a scheme to reimburse the costs of successfully demonstrating the compliance of existing production runs. If a reimbursement scheme were to operate, there would be a need for an independent review to avoid creating an incentive for the regulator to just say no. Why should a private firm meet the costs of showing its technology is adequate just because the authority does not have the information?

CONCLUSION

Energy use is not the only element of importance to purchasers of walk-in coolers and freezers. The DOE's calculation of net benefits is heavily dependent on its narrow focus on energy saving and on treating overseas environmental benefits as though they accrued in the United States. The national social cost of carbon should be applied to benefits rather than the much larger global estimate, and at least some recognition should be given to the value of non-energy product characteristics. At present, American manufacturers are expected to bear the cost of conferring overseas environmental benefits and face costs of showing that their production technology meets required standards. Where is the systemic problem to be addressed? It is at least plausible that current energy efficiency, arrived at through market processes, is optimal, given the range of energy and non-energy product characteristics influencing buyers and sellers. If the problem is meeting shadow Kyoto requirements for carbon emissions, it seems improper to let the costs fall on American manufacturers and consumers of energy-intensive products without further debate. As this is at a proposal stage, we can hope that public discussion will encourage the DOE to reconsider alternative standards, including leaving current ones alone, based on a more rational, detailed analysis.