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PUBLIC INTEREST COMMENT

Energy Conservation Program: Energy Conservation Standards for Commercial Refrigeration Equipment

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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 the efficiency and efficacy of this proposed rule from an economic point of view. 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

Under the authority of the Energy Policy and Conservation Act of 1975 (EPCA),[1] the Department of Energy (DOE) is proposing new energy conservation standards for commercial refrigeration equipment.[2,3] According to the DOE, these new, more stringent standards will lower energy use. This reduction in energy use

1. Energy Policy and Conservation Act (EPCA), Public Law 94–163, as amended through P.L. 112–210, enacted December 18, 2012, http://www.house.gov/legcoun/Comps/EPCA.pdf.
2. Title III, Part C of the Energy Policy and Conservation Act of 1975 (EPCA), Public Law 94–163 (42 U.S.C. 6311–6317, as codified), added by P. L. 95–619, Title IV, section 441(a), established the Energy Conservation Program for Certain Industrial Equipment. This program covers commercial refrigeration.
3. US Department of Energy, Office of Energy Efficiency and Renewable Energy, "Energy Conservation Program: Energy Conservation Standards for Commercial Refrigeration Equipment; Proposed Rule," 78 Fed. Reg. 161 (September 11, 2013).

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will lower the costs of operating commercial refrigeration equipment and reduce the emissions of pollutants, such carbon dioxide, sulfur dioxide, and mercury, which are generated in the production of electricity.

Unfortunately, the DOE's use of the Capital Asset Pricing Model assumes that the risks and returns associated with refrigeration units is equal to the average risk and returns associated with all capital expenditures. The assumption that the refrigeration units are subject to the same average depreciation rate as other capital equipment results in the DOE underestimating the discount rate on refrigeration equipment and consequently overestimating the private expected benefits of this rule. This error drives the DOE's reasoning that purchasers of refrigeration equipment are behaving irrationally when in fact, their behavior is entirely rational. Correcting this measurement error has the potential to result in a net negative welfare effect on users of refrigeration equipment, because the estimated private benefits represent anywhere from 56 to 93 percent of the total benefits provided by the proposed rule.

It must also be noted that between 77 and 93 percent of the benefits from reductions in CO_2 emissions resulting from this regulation will be captured by foreigners, not by Americans. These numbers are derived from the interagency working group report that generated the original estimate for the social cost of carbon (SCC) in 2010.[4] While global benefits are useful general information, they should be excluded from the calculation of net benefits from the rule because these are not benefits to American taxpayers, whom the DOE is tasked to serve, in accordance with guidance from the Office of Budget and Management (OMB).[5] In addition, the DOE should refrain from using the most recent estimate of the SCC until such time as the public has had a chance to comment on the technical support document that generated this new number. Evidence suggests that the interagency working group that arrived at this number left out important evidence from recent academic literature.[6]

RISK OF INVESTMENT IN REFRIGERTION UNITS

The TSD estimates that most of the regulatory options analyzed result in a net benefit for those operating the new, more stringent energy saving refrigeration equipment when compared to the typical equipment currently in use by grocery stores, convenience stores, restaurants, and other retail outlets.[7] Although the upfront cost of purchasing and installing is greater, the resulting maintenance costs and energy usage are lower so that the payback period for most options ranges from about 6 months to three years. Thus, the new equipment results in a net present value savings for the end user over the 10–15 year lifetime of the equipment.

Yet, according to the DOE, grocery stores, convenience stores, restaurants, and other retail outlets are not using low-energy refrigeration equipment. If the users would be better off in net present value terms, as reported in the costs calculations, for the 10–15 years of expected service, why are consumers not purchasing and producers not selling the more efficient equipment and as a way for users to lower their future energy expenses?

The DOE claims that these more efficient units are not being purchased because consumers either lack the information, the ability to process the information, or face high transaction costs of gathering the informa-

4. Interagency Working Group on Social Cost of Carbon, "Technical Support Document, Social Cost of Carbon for Regulatory Impact Analysis under Executive Order 12866," February 2010.
5. 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."
6. See, for example, Patrick Michaels and Paul Knappenberger, Public Interest Comment on Energy Conservation Program for Consumer Pro¬ducts: Landmark Legal Foundation; Petition for Reconsideration, Cato Institute (September 13, 2013), http://object.cato.org/sites/cato.org/files/articles/michaels_knappenberger_cato_comments.pdf.
7. US Department of Energy—Office of Energy Efficiency and Renewable Energy. Preliminary Technical Support Document (TSD): Energy Conservation Program for Certain Commercial and Industrial Equipment: Commercial Refrigeration Equipment (September 2013), http://www.regulations.gov/#!documentDetail;D=EERE-2010-BT-STD-0003-0051.

tion. However, this gulf between the DOE's estimated benefits and the benefits estimated by firms producing and consuming refrigeration equipment may be the difference between the overall risk of operating an establishment and the risks associated with purchasing a refrigeration unit.

The DOE uses a Capital Asset Pricing Model (CAPM) to estimate the discount rate that should be used to determine the present value of future expenditures or revenue. "The cost of capital is commonly used to estimate the present value of cash flows to be derived from a typical company project or investment" (p. 8–29). CAPM is "among the most widely used models to estimate the cost of equity financing [and] assumes that the cost of equity is proportional to the amount of systemic risk associated with a company" (p. 8–29). However, CAPMs estimate the average overall return, including risk, of all capital used by the company. That is, the CAPM is a weighted average of "the cost to the company of equity and debt financing" and the expense associated with type of capital used in product. For instance, a restaurant will not only purchase various types of refrigeration units, but other items such as buildings, stoves, ovens, and the like. This estimated present value of cash flows is an average of the flows generated by all equipment used.

Thus, the CAPM return includes the risk associated a firm's failure, but it does not estimate the risk associated with any individual item used in by the firm, nor does it estimate the failure risk associated with a particular site of operation. One machine may have a high return, while another may not; one site may be more risky than others. If a firm or location fails, the lender will liquidate the assets to get back a portion of the loan amount due.

Some items, such as the building or ice machine, may maintain their value and result in little difference between the dollars generated in operation and its salvage value. But this does not appear to be the case for refrigeration units. The DOE interviewed a number of industry experts who "generally agreed that the salvage value of used [refrigeration] equipment was very low compared to the initial purchase price. This is due to both cosmetic concerns and the custom nature of much of the equipment. The difficulty in collecting used equipment of the same 'look' for planned display case line-ups in retail stores was cited as another reason for the low price of used equipment. A survey in the Pacific Northwest reported that for small, independent grocery stores (<20,000 square feet) and independently owned convenience stores, the fraction of owners who would consider purchase of refurbished equipment was 25 and 16 percent, respectively. For larger regional chains, this fraction was approximately 11 percent. None of the large grocery chains surveyed had plans to purchase refurbished equipment" (RIA 3-24).

This is not problematic if most firms/sites continue to operate throughout most of the expected life of the unit. However, a large percentage of firms providing perishable goods fails within the first few years of use. For example, according to Parsa et al. (2005), 26 percent of restaurants fail in their first year; by year three the rate of failure is just over 60 percent.[8] Because the payoff periods of a number of these refrigeration units occur in two to three years, it is *not* rational to purchase the more efficient unit if the firm is likely to fail before realizing a net benefit. In any case, if potential owners face such high rate of failure, the DOE must include salvage price of the specific type of capital being regulated.

Each type of capital has a unique depreciation rate. This unique depreciation rate is based on flow of future value generated by that particular piece of equipment. It can be found either through the revenue generated from operation multiplied by the expected probability of operation or the salvage market price multiplied by the probability of that the business fails. Although the DOE recognizes "the salvage value to the original purchaser is very low" elsewhere in the regulation, the DOE fails to acknowledge this fact when estimat-

8. Parsa, H. G., John T. Self, David Njite, and Tiffany King, "Why Restaurants Fail," *Cornell Hotel and Restaurant Administration Quarterly* 46, no. 3 (2005): 304–322.

ing the risk and returns (RIA 8-27). By assuming the depreciation rate associated with refrigeration units is equal to the average depreciation rate of all capital, the DOE likely underestimates the discount rate and therefore overestimates the private expected benefits of this rule.

The "DOE emphasizes . . . that Executive Order 13563 requires agencies to use the best available techniques to quantify anticipated present and future benefits and costs as accurately as possible" (p. 55982). Given this charge, the DOE could enhance its measure of benefits by estimating the depreciation rate associate with refrigeration units alone, instead of using an average across all capital.

NATIONAL VERSUS GLOBAL EMISSIONS BENEFITS

Using the DOE's primary estimate of the SCC ($40.8/ton), estimated total benefits from reductions in CO_2 emissions resulting from the halide lamp rule are $75 million (2012$). Given that the 2013 interagency working group that calculated the new SCC the DOE uses in this regulation did not take comments from the public, and that the DOE has been petitioned to reconsider a rule that incorporated the new SCC elsewhere, the DOE should continue to use the old SCC until such time as the public has had a chance to comment sufficiently on the methodology used in the interagency working group report and the report has been subjected to peer review.[9,10] If the DOE had used the SCC from the 2010 interagency working group report on the SCC, the global benefits from CO_2 reductions would have been approximately $48.5 million (2012$) instead of $75 million (2012$).[11]

Although it is helpful to know the global effects of the proposed rule, OMB has requested that global benefits be excluded from the benefit-cost analysis.[12] The DOE is charged with serving the United States public, not with redistributing resources from the United States to other countries. While the recent Technical Support Document (TSD) updating the SCC recommends that agencies include global benefits in their analyses, that recommendation was made without taking comments from the public or submitting the report to outside peer review.

CONCLUSION

The DOE has issued this regulation as a result of the authority granted to it by the Energy Policy and Conservation Act. According to EPCA statute, the DOE must consider to the greatest extent practicable both the "economic impact of the standard on manufacturers and consumers of the equipment subject to the standard" and the "savings in operating costs throughout the estimated average life of the covered equipment in the type (or class) compared to any increase in the price, initial charges, or maintenance expenses for the covered equipment that are likely to result from the imposition of the standard." Unfortunately, the DOE has failed to properly estimate the economic impact on the consumers of the equipment. The DOE would be well advised to present a more realistic net benefit calculation, one that includes the specific risks associated with purchasing more efficient refrigeration equipment, before making any recommendation. By

9. Interagency Working Group on Social Cost of Carbon, "Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866" (May 2013). US Department of Energy, Office of Energy Efficiency and Renewable Energy.
10. US Department of Energy, Office of Energy Efficiency and Renewable Energy, "Energy Conservation Program for Consumer Products: Landmark Legal Foundation; Petition for Reconsideration," 78 Fed. Reg. 159 (August 16, 2013).
11. 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 CO_2, gives the estimate of $48.5 million stated above. For more information, see James Broughel, Public Interest Comment, Department of Energy, Energy Conservation Program: Energy Conservation Standards for Metal Halide Lamp Fixtures, Mercatus Center at George Mason University, Arlington, VA, October 2013. http://mercatus.org/sites/default/files/Public-Interest-Comment-Energy-Conservation-Standards-for-Metal-Halide-Lamp-Fixtures.pdf.
12. 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."

using the average risk associated with capital, the rule underestimates the discount rate and thus overestimates the expected benefit of purchasing and operating a new, more efficient unit. The DOE should only use the CO_2 emissions cost values from the 2010 working group report until the 2013 working group report has been thoroughly reviewed. Finally, the DOE should only include emission benefits that accrue to those in the United States. Though it is helpful to estimate the global effects, these values should not be included in the net benefits calculation used to support the proposed rule.