

CHAPTER 12. PRELIMINARY MANUFACTURER IMPACT ANALYSIS

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CHAPTER 12. PRELIMINARY MANUFACTURER IMPACT ANALYSIS

12.1 INTRODUCTION

The purpose of the manufacturer impact analysis (MIA) is to identify the likely impacts of amended energy conservation standards on manufacturers. The U.S. Department of Energy (DOE) will conduct this analysis with input from manufacturers and other interested parties and will apply this methodology to its evaluation of amended energy conservation standards for automatic commercial ice makers. DOE will also consider financial impacts and a wide range of quantitative and qualitative industry impacts that might occur following the amendment of an energy conservation standard. For example, a particular energy conservation standard level, if adopted by DOE, could require changes to automatic commercial ice maker manufacturing practices. DOE will identify and come to understand these impacts through interviews with manufacturers and other interested parties during the notice of proposed rulemaking (NPR) stage of its analysis.

DOE announced changes to the MIA format through a report issued to Congress on January 31, 2006 (as required by section 141 of the Energy Policy Act of 2005 (EPACT 2005)), titled “Energy Conservation Standards Activities.”^a Previously, DOE did not report any MIA results until the NPR phase; however, under this new format, DOE has collected, evaluated, and reported preliminary information and data during the preliminary phase (the phase preceding the NPR) of this rulemaking. DOE solicited this information during the engineering analysis manufacturer interviews and reports the results below.

12.2 METHODOLOGY

DOE conducts the MIA in three phases and further tailors the analytical framework based on comments from interested parties. In Phase 1, DOE creates an industry profile to characterize the industry and conducts a preliminary MIA to identify important issues that require consideration. The preliminary technical support document (preliminary TSD) presents the results of the Phase 1 analysis. In Phase 2, DOE prepares an industry cash-flow model and an interview questionnaire to guide subsequent discussions. In Phase 3, DOE interviews manufacturers and assesses the impacts of amended energy conservation standards both quantitatively and qualitatively. Using the Government Regulatory Impact Model (GRIM), DOE assesses industry and subgroup cash flow and net present value. Then, DOE assesses impacts on competition, manufacturing capacity, employment, and regulatory burden based on manufacturer interview feedback and discussions. The NPR TSD presents results of the Phase 2 and 3 analyses.

^a This report is available on the DOE website at http://www.eere.energy.gov/buildings/appliance_standards/2006_schedule_setting.html.

12.2.1 Phase 1: Industry Profile

In Phase 1 of the MIA, DOE collects pertinent qualitative and quantitative financial and market information. This includes automatic commercial ice maker manufacturer market shares, corporate operating ratios, wages, employment, and production cost ratios. Sources of information may include reports published by industry groups, trade journals, the U.S. Census Bureau, copies of Securities Exchange Commission (SEC) 10-K filings, and interviews with manufacturers. DOE also relies on information from its market and technology assessment, engineering analysis, life-cycle cost analysis, markup analysis, and analysis of capital expenditure requirements.

12.2.2 Phase 2: Industry Cash-Flow Analysis and Interview Guide

In Phase 2, DOE will perform a preliminary industry cash-flow analysis and prepare written guidelines for interviewing manufacturers.

12.2.2.1 Industry Cash-Flow Analysis

DOE uses the GRIM to analyze the financial impacts of amended energy conservation standards on the automatic commercial ice maker industry. Standards will likely require additional investment, raise production costs, and affect revenue through higher prices and, possibly, lower sales. The GRIM uses several factors to determine a series of annual cash flows for the year standards become effective and for several years after implementation. These factors include annual expected revenues, costs of sales, selling and general administration costs, and taxes, as well as capital expenditures, depreciation, and maintenance related to new standards. Inputs to the GRIM include manufacturing costs, shipments forecasts, and price forecasts developed in other analyses. Another input, financial information, will be developed based on publicly available data and confidentially submitted manufacturer information. DOE compares the results of the GRIM against baseline projections where no standards are in place. The financial impact of amended energy conservation standards is the difference between the two sets of discounted annual cash flows.

12.2.2.2 Interview Guide

DOE will conduct interviews with manufacturers to gather information on the effects of standards on revenues and finances, direct employment, capital assets, and industry competitiveness. Before the interviews, DOE will distribute an interview guide that will provide a starting point to identify relevant issues and help identify the impacts of standards on individual manufacturers or subgroups of manufacturers. DOE anticipates that the interview guide will cover current organizational characteristics, industry infrastructure, manufacturer cash-flow analysis, a competitive impacts assessment, an employment impacts assessment, and a manufacturing capacity impacts assessment.

12.2.3 Phase 3: Subgroup Analysis

Phase 3 activities will take place after the publication of the NOPR documents and will include manufacturer interviews, revision of the industry cash-flow analysis,

manufacturer subgroup cash-flow analysis, competitive impact assessment, manufacturing capacity impact, employment impact, and cumulative regulatory burden.

12.2.3.1 Manufacturer Interviews

The information gathered in Phase 1 and the cash-flow analysis performed in Phase 2 will be supplemented with information gathered during interviews with manufacturers during Phase 3. The interview process has a key role in the MIA, since it provides an opportunity for interested parties to express their views privately on important issues, allowing confidential or sensitive information to be considered in the rulemaking decision.

DOE will conduct detailed interviews with as many manufacturers as necessary to gain insight into the range of potential impacts of standards. During the interviews, DOE will solicit information on the possible impacts of standards on sales, direct employment, capital assets, and industry competitiveness. Both qualitative and quantitative information are valuable. Interviews will be scheduled well in advance to provide every opportunity for key individuals to be available for comment. Although a written response to the questionnaire will be acceptable, DOE prefers an interactive interview process because it helps clarify responses and provides the opportunity to identify additional issues.

All information transmitted will be considered, as appropriate, in DOE's decision-making process. Interview participants will be asked to identify all confidential information provided in writing or orally; no confidential information will be made available in the public record. Participants will also be asked to identify all information they wish included in the public record but do not want to have associated with their interview. This information will be incorporated into the public record but reported without attribution.

12.2.3.2 Revised Industry Cash-Flow Analysis

In Phase 2 of the MIA, DOE will provide manufacturers with a preliminary GRIM for review and evaluation. During the interviews, DOE will seek comment and suggestions regarding the values selected for the parameters. Upon completion of the interviews, DOE will revise its industry cash-flow model based on manufacturer feedback.

12.2.3.3 Manufacturer Subgroup Analysis

Using average cost assumptions to develop an industry cash-flow estimate is not adequate for assessing differential impacts among subgroups of manufacturers. Smaller manufacturers, niche players, or manufacturers exhibiting a cost structure that differs largely from the industry average could be more negatively affected. Ideally, DOE would consider the impact on every firm individually; however, it typically uses the results of the industry characterization to group manufacturers exhibiting similar characteristics. During the interview process, DOE will discuss the potential subgroups and subgroup members that have been identified for the analysis. DOE will look to the manufacturers

and other stakeholders to suggest what subgroups or characteristics are most appropriate for the analysis.

12.2.3.4 Competitive Impact Assessment

Section 342(6)(B)(i)(V) of the Energy Policy Act of 1992 (EPACT 1992) directs DOE to consider any lessening of competition likely to result from imposition of standards. It further directs the U.S. Attorney General to determine the impacts, if any, of any decrease in competition. DOE will make a determined effort to gather and report firm-specific financial information and impacts. The competitive analysis will focus on assessing the impacts on smaller, yet significant, manufacturers. The assessment will be based on manufacturing cost data and information collected from interviews with manufacturers. The manufacturer interviews will focus on gathering information that would help in assessing asymmetrical cost increases to some manufacturers, the potential increase in business risks from an increased proportion of fixed costs, and potential barriers to market entry (*e.g.*, proprietary technologies).

12.2.3.5 Manufacturing Capacity Impact

One of the significant outcomes of standards could be the obsolescence of existing manufacturing assets, including tooling and investment. The manufacturer interview guide will have a series of questions to help identify impacts on manufacturing capacity, specifically capacity utilization and plant location decisions in North America with and without a standard; the ability of manufacturers to upgrade or remodel existing facilities to accommodate the new requirements; the nature and value of stranded assets, if any; and estimates for any one-time restructuring and other charges, where applicable.

12.2.3.6 Employment Impact

The impact of amended energy conservation standards on employment is an important consideration in the rulemaking process. To assess how domestic employment patterns might be affected, the interview will explore current employment trends in the automatic commercial ice maker industry. The interview will also solicit manufacturer views on changes in employment patterns that may result from increased standard levels. The employment impacts section of the interview guide will focus on current employment levels associated with manufacturers at each of their production facilities, expected future employment levels with and without a standard, and differences in workforce skills and issues related to the retraining of employees.

12.2.3.7 Cumulative Regulatory Burden

DOE recognizes and seeks to mitigate the overlapping effects on manufacturers of amended energy conservation standards and other regulatory actions affecting the same products. DOE will analyze and consider the impact on manufacturers of multiple, product-specific regulatory actions. Based on its own research and discussions with manufacturers, DOE identified several regulations and proposed regulations relevant to automatic commercial ice maker manufacturers such as foodservice equipment sanitation certification, potential limits on greenhouse gas (GHG) emissions, including

hydrofluorocarbon (HFC) refrigerants and foam-blowing agents, standards for other products made by automatic commercial ice maker manufacturers, state energy conservation standards, and international energy conservation standards. DOE will study the potential impacts of these cumulative burdens in greater detail in the MIA conducted during the NOPR phase, and factor into the MIA analysis those issues that are appropriate for consideration.

12.3 PRELIMINARY MANUFACTURER IMPACT ANALYSIS

During the preliminary rulemaking phase, DOE conducted a preliminary evaluation of the impact of potential amended energy conservation standards on manufacturer financial performance, manufacturing capacity and employment levels, and product utility and innovation. A primary focus was to identify the cumulative burden that industries face from the overlapping effect of new or recent DOE energy conservation standards and/or other regulatory action affecting the same products or industries.

The primary sources of information for this analysis were on-site or telephone interviews with manufacturers of automatic commercial ice makers conducted in early 2011. To maintain confidentiality, DOE did not identify the individual manufacturers that disclosed information. The evaluation only reports aggregated information and does not disclose sensitive or company-specific information.

For the preliminary MIA, DOE conducted interviews with manufacturers primarily to identify key issues and gain insights into the qualitative impacts of amended energy conservation standards. DOE used an interview guide to gather responses from multiple manufacturers on many issues. Appendix 12A contains a copy of the interview guide for automatic commercial ice makers.

12.3.1 General Interview Structure

The manufacturer interviews included questions relating to the following topics. DOE received responses to most, if not all, of these topics from various manufacturers.

12.3.1.1 Key Issues

Perhaps the most important aspect of the preliminary MIA is the opportunity to identify key manufacturer issues early in the development of amended energy conservation standards. During the interviews, DOE engages manufacturers in a discussion about what they perceive to be the key issues in the rulemaking. Key issues, once identified, are added to the list of topics explored during the interviews. For example, key issues in previous rulemakings have included concerns over patent protections that might prevent some companies from implementing higher efficiency designs.

12.3.1.2 Shipment Projections

Shipment projections can be a significant factor in determining the impacts of amended energy conservation standards. The interviews provide an opportunity for manufacturers to share information that can help DOE quantify the magnitude of any changes in shipments resulting from amended energy conservation standards. DOE is interested in information relating to the current number of product shipments, broken down by product class, capacity rating, and efficiency level. DOE also seeks input on the forecast of future shipments absent amended energy conservation standards. Manufacturers are asked how they would expect shipments to change for the industry as a whole as a function of standard levels and why they expect these changes might occur. More specific questions aim to derive a price elasticity estimate for use in the national impact analysis spreadsheet.

Another aspect of the shipments discussion is to understand the impacts of a reduction in shipments on individual manufacturers of automatic commercial ice makers.

12.3.1.3 Profitability

DOE requests manufacturers' views on what they perceive to be the possible impact of potential amended energy conservation standards on their future profitability. Amended energy conservation standards could affect financial performance in several different ways. Several of these impacts are captured in previous sections. For instance, the capital and product conversion outlays needed to upgrade or redesign products and product platforms before they have reached the end of their useful life can engender significant conversion costs that otherwise would not be expended, resulting in reduced cash flow and stranded investments. Higher energy efficiency standards also can result in higher per-unit costs that may deter some consumers from purchasing the products, or cause some consumers to delay purchase or seek to purchase used products, thereby reducing shipments.

12.3.1.4 Product Mix

DOE is interested in understanding if amended energy conservation standards might change a manufacturer's product mix and if this change affects profits. For example, higher energy efficiency standards might limit a manufacturer's ability to differentiate and market premium products that command higher profit margins.

The interview guide also investigates how amended energy conservation standards might affect a manufacturer's consumer mix and its distribution channels, and how in turn this might change profitability.

12.3.1.5 Conversion Costs, Manufacturing Capacity, and Employment Levels

During the interviews, DOE asks manufacturers to quantify and explain both the capital and product conversion costs necessary to raise the energy efficiency of their product lines to the proposed standard levels. In some instances, manufacturers may be

able to meet proposed standard levels by modifying existing products. In other cases, the necessary changes may entail a complete product-line redesign. In these situations, an increase in efficiency standards will cause manufacturers to incur one-time conversion capital expenditures and product conversion expenses. Conversion capital expenditures are one-time investments in property, plant, and equipment. Product conversion expenses include one-time investments in research, product development, testing, and marketing.

One of the significant outcomes of amended energy conservation standards could be the obsolescence of existing manufacturing assets, including tooling and other capital investment. The interview guide includes questions to identify impacts on manufacturing capacity. DOE developed these questions to understand the impact of potential amended standards on:

- North American manufacturing capacity;
- capacity utilization and plant location decisions in North America both with and without standards;
- the ability of manufacturers to upgrade or remodel existing facilities to accommodate a new product mix; and
- the nature and value of stranded assets, if any.

The impact of amended energy conservation standards on employment is an important consideration in the rulemaking process. DOE uses the interviews to explore current trends in production employment and solicit manufacturer views on changes in employment patterns resulting from amended energy conservation standards. Questions regarding employment impacts help to develop an understanding of:

- current employment levels associated with manufacturing the subject products at each production facility;
- expected future employment levels both with and without amended standards; and
- differences in workforce skills and issues related to retraining employees.

12.3.1.6 Market Shares and Industry Consolidation

Amended energy conservation standards can alter the competitive dynamics of the marketplace. This can include prompting companies to enter the market, exit the market, or merge with other companies. The preliminary MIA interview questions ask manufacturers to share their perspectives on industry consolidation both in the absence of amended standards and assuming amended standards at various efficiency levels. The interview questions focus on gathering information that helps in assessing:

- disproportionate cost increases to some manufacturers;
- increased proportion of fixed costs potentially increasing business risks; and
- potential barriers to market entry (*e.g.*, proprietary technologies).

DOE assesses anti-competitive effects of proposed standards to protect the interests of the consumer. During the interviews, DOE solicits information to understand

if amended standards could result in disproportionate economic or performance penalties for particular consumer/user subgroups.

DOE also asks manufacturers if amended energy conservation standards could result in products that will be more or less desirable to consumers due to changes in product functionality, utility, or other features.

12.3.1.7 Product Utility and Innovation

Amended energy conservation standards can force manufacturers to compromise product utility to consumers by eliminating energy consuming features. During the interviews, DOE requests information on the effects of proposed standards on product utility.

Amended energy conservation standards may require investment in conversion costs, including research and development. This required spending may force a manufacturer to reduce funding usually allocated to product innovation. Amended energy conservation standards may also force manufacturers to eliminate innovative energy consuming features from their products. During the interviews, DOE requests information on the effect of proposed standards on innovation.

12.3.1.8 Impact on Small Manufacturers

DOE will consider the possibility of small businesses being affected by the promulgation of amended energy conservation standards for automatic commercial ice makers. Should any small business manufacturers be identified, DOE will study the potential impacts on these small businesses in greater detail during the MIA.

12.3.1.9 Cumulative Burden

While any one regulation may not impose a significant burden on manufacturers, the combined effects of several impending regulations may have serious consequences for some manufacturers, groups of manufacturers, or entire industries. Assessing the impact of a single regulation may overlook this cumulative regulatory burden.

Expenditures associated with meeting other regulations are an important aspect of DOE's consideration of the "cumulative regulatory burden" the industry faces. The interviews help DOE identify the level and timing of investments manufacturers are expecting to incur as a result of these regulations. Manufacturers are also asked under what circumstances they might be able to coordinate expenditures related to these regulations and efficiency standards.

In addition to the amended energy conservation standards for automatic commercial ice makers, several other Federal regulations and pending regulations apply to other products these manufacturers make. DOE will investigate these cumulative regulatory burdens in greater detail during the NOPR phase of the rulemaking.

12.3.1.10 State Energy Conservation Standards

DOE identified and described regulatory programs at the state level in the market and technology assessment (chapter 3 of the preliminary TSD) for the products covered in this rulemaking. Multiple states have requirements for products covered under this rulemaking. Accommodating multiple state standards in addition to national standards raises costs for manufacturers.

12.3.1.11 International Energy Conservation Standards

DOE discussed regulatory programs from certain other countries, such as Canada and Australia, in the market and technology assessment, (chapter 3 of the preliminary TSD). Several manufacturers sell a portion of their total production to countries outside the United States. In these cases, the products must meet the standards for each country. Companies may design some units to meet more stringent standards than those imposed by the United States in order to minimize the number of product variations.

12.4 AUTOMATIC COMMERCIAL ICE MAKER PRELIMINARY MANUFACTURER IMPACT ANALYSIS RESULTS

During the preliminary MIA interview, manufacturers identified key issues surrounding DOE's rulemaking for automatic commercial ice makers and provided feedback regarding the potential impact of amended energy conservation standards. DOE summarizes the feedback below.

12.4.1 Key Issues

One of the main questions in the preliminary interview guide was: "What are the key issues for your company regarding the automatic commercial ice maker energy conservation standards rulemaking?" This open question initiated dialogue with the manufacturers, enabling them to identify key points that DOE would explore and discuss during the interview. This section describes the key issues manufacturers felt were of the highest importance in relation to the energy conservation standards rulemaking for automatic commercial ice makers and that would have the most significant impact on the industry. Manufacturers indicated that, for the most part, the risks associated with these issues increase with more stringent energy conservation standards. The issues are overall concerns that many manufacturers expressed, and in some cases are dependent on the equipment class.

Automatic commercial ice maker manufacturers cited concerns regarding a number of issues that are covered in greater detail elsewhere in this chapter. These issues include questioning the necessity of regulation, separation of batch and continuous ice makers into different equipment classes, addressing the varying quality (hardness) of ice in continuous ice makers, and the availability of substitute goods and services. Detailed descriptions of these manufacturer concerns are provided in the appropriate sections that follow; only brief descriptions are provided here.

- *Necessity of regulation*: A number of manufacturers stated that product efficiency is already a deciding factor for customers as this affects the economics of their businesses. In recognizing this, several manufacturers questioned the necessity of further regulation, instead preferring that market pressures dictate the appropriate equipment efficiency levels.
- *Separation of equipment classes*: Several manufacturers suggested that a common standard for both continuous and batch commercial ice makers would push the market to favor one class over the other and in turn disproportionately reduce utility for customers who would have otherwise purchased a different style of commercial ice maker.
- *Variation in ice quality from continuous commercial ice makers*: Manufacturers of continuous ice makers explained that the different forms of ice their products produce are of value to their customers. To make a level comparison of product efficiency, they suggested a correction factor is needed to adjust for the residual liquid water associated with the different types of ice product delivered.
- *Availability of substitute goods and services*: Manufacturers expressed concern over the readily available alternatives to automatic commercial ice makers such as bagged ice delivery. Such alternative goods and services offer a clear alternative should the economics favor this option, and thus they allow customers to further discriminate based on price.

The other issues of key importance to manufacturers are the conversion costs associated with new efficiency standards, costs from efficiency testing, customer reaction to price increases, and the threat to domestic manufacturing jobs.

- *Conversion Costs*: Manufacturers expressed concern over the costs they would incur to meet new efficiency standards. Several firms noted that the burden of these costs comes in addition to that created by the recent rise in raw materials costs and pressures from overseas competitors.
- *Testing Burden*: Several manufacturers indicated that any increase in the testing requirements for product certification would pose a substantial burden because of the relatively large number of automatic commercial ice maker models they produce as compared to the size of their organization. Manufacturers expressed concern over this issue for both the additional time and financial resources that efficiency testing requires, noting that these impacts come at the same time as changing standards for NSF/ANSI foodservice equipment certification testing.
- *Customer Reaction to Price Increases*: Manufacturers noted the limitations in access to capital of their customer base and cited the disproportionately severe effects this standard would have on the market. In particular, manufacturers pointed to consistently high turnover in the restaurant industry as a barrier to investment in more efficient products as the ability to realize payback faces greater uncertainty.

- *Impact to Jobs:* Manufacturers noted that if new efficiency standards can only be achieved with more expensive high efficiency components, manufacturing jobs may move to parts of the world with inexpensive labor to keep overall costs down.

12.4.2 Profitability, Product Mix, and Shipments

DOE asked manufacturers during the preliminary manufacturer interviews how amended energy conservation standards would affect their overall shipments, profitability, and product mix. Nearly all manufacturers stated that amended energy conservation standards as proposed would have little to no effect on industry total shipments, citing reasons ranging from strong ongoing market demand to relatively high repair costs as compared to the purchase of a new replacement unit. Manufacturers suggested that small increases in manufacturer production costs on the order of 5 percent are within the bounds of normal periodic price fluctuations for components and raw materials used in producing commercial ice makers. Hence, manufacturers expressed no particular concern if efficiency standards led to elevated costs of this magnitude.

At a 10 to 20 percent increase, manufacturers commented that overall shipments would begin to be impacted as potential customers would seek alternatives to purchasing new commercial ice makers. Manufacturers cited several options along these lines, including maintenance and repair, the purchase of a used product, serving refrigerated beverages, and the purchase of bagged ice. An estimated 75 percent of the current market for automatic commercial ice makers stems from replacement units. If customers were to attempt to extend the life of their ice makers, favoring repair over replacement, this could have a substantial impact on shipments. A shift to purchase of used products would have a similar effect. Some manufacturers also suggested that parts of the market may shift to serve refrigerated beverages rather than using ice to provide cool drinks at this level. On average, only after increases in manufacturer production cost on the order of 40 to 50 percent did manufacturers suggest that customers would begin to make the switch to sourcing bagged ice made offsite, as this switch still incurs the penalty of maintaining cold storage for the ice prior to use.

Individual manufacturers stated that the effects on their shipments and market shares would not deviate substantially from the industry average effects provided the amended standards are even across the industry, specifically as it relates to the differences between batch and continuous ice makers. Several manufacturers stated that standards that favor one type of system over another would spur a shift in product mix reflecting this bias. Additionally, at least one manufacturer pointed out that those companies whose products already adhere to proposed future standards would be at an advantage through this rulemaking because they would not need to incur the same conversion costs as those whose products do not presently conform to proposed future standards. Several manufacturers also noted the disproportionate effects that capital conversion costs would have on smaller businesses because they have fewer shipments over which to spread out these costs. In contrast, as gains in efficiency would likely come from improvements in components as sourced from a supply base and no manufacturers

of commercial ice makers are vertically integrated, the effect on manufacturer production cost of units is expected to be flat across the industry.

12.4.3 Conversion Costs, Manufacturing Capacity, and Employment Levels

DOE asked manufacturers what level of conversion costs they anticipate if amended energy conservation standards were to take effect. Manufacturers said that while most efficiency levels could be met with component swaps, conversion costs would be significant if amended standards require new product platforms. Several manufacturers cited new evaporator designs as well as changes to compressors and cabinets as the deciding factors behind clean sheet platform redesigns. On average, manufacturers reported that energy reductions on the order of 10 to 15 percent would require changes of this nature. The cost of such changes varies by manufacturer, depending on the volume of production and the mix of capital, tooling, and engineering investments required. Manufacturers indicated that conversion costs could range from less than \$1 million to \$10 million dollars.

When asked about impacts to manufacturing capacity and the potential for stranded assets as a result of this rulemaking, most manufacturers believed they would see little to no effect, citing the flexibility of their production equipment. However, some larger manufacturers suggested that changes in evaporator and cabinet design may require new dies and tooling, potentially stranding existing production assets. Further, if amended standards were to adversely impact demand, manufacturing asset utilization would go down as manufacturers curtail production.

Amended standards that decrease demand would have a similar impact on employment levels. While most manufacturers believed that modest increases would bear no effect on domestic employment levels, and higher component costs would not prompt a move in production, some suggested that they might move operations involving the production of components with high labor content abroad to maintain overall margins if amended standards prompted a sufficient rise in cost to justify this decision.

12.4.3.1 Impact on U.S. Production and Jobs

The impact of amended energy conservation standards on employment is an important consideration in the rulemaking process. As indicated in section 12.4.3, significant increases to the energy efficiency standards for automatic commercial ice makers may cause some manufacturers to shift some elements of domestic manufacturing outside of the U.S. Manufacturers with existing facilities abroad indicated that they may expand or modify those facilities rather than build entirely new plants.

12.4.3.2 Foreign Labor

Several manufacturers expressed their commitment to keeping production in the U.S., citing reasons including both the proximity to markets and availability of a skilled workforce. However, a few manufacturers with existing foreign production facilities suggested that they may shift more production to these facilities both as a cost saving

measure in response to amended efficiency standards and to be closer to growing foreign markets for commercial ice makers.

12.4.4 Industry Consolidation

Some manufacturers suggested that disproportionate effects resulting from amended standards could create anti-competitive pressure and lead to industry consolidation. Three companies now account for the vast majority of U.S. sales of automatic commercial ice makers. The relative market share among these companies and between these companies and other manufacturers varies depending on product class. In certain product classes, other manufacturers have a much stronger presence in the market. In recent years, the Department of Justice blocked Manitowoc's attempt at consolidation by requiring that Manitowoc divest Enodis's entire U.S. ice machine business in order to proceed with the acquisition of Enodis. As such, the consensus among manufacturers is that industry consolidation resulting from amended efficiency standards is very unlikely.

12.4.5 Impact on Innovation and Product Utility

Amended energy conservation standards can affect purchasers of automatic commercial ice makers by increasing or decreasing the utility of such products. Most manufacturers agree that stringent energy efficiency standards would decrease innovations and reduce product utility. They believe that innovation and product utility would be impacted primarily by two mechanisms: the diversion of finite human and capital resources away from creating other product innovations and the direct impact of certain energy efficient design options on product performance. Several manufacturers specifically cited the size of their engineering teams as a limiting factor in pursuing product innovation on multiple fronts.

Regarding product utility, manufacturers cited multiple points of impact brought about by stricter standards including price and size of the equipment, and quality of the ice produced. Manufacturers agree that amended standards would increase the costs of automatic commercial ice makers across the board. Manufacturers believe that the price increases would force some lower income customers out of the market altogether, forcing them instead to buy bagged ice produced offsite. Some manufacturers also raised concern over the need for commercial ice makers to become physically larger to deliver the same ice-making capacity at the new efficiency standard. As such, for customers with significant space constraints, for example small restaurants with low ceilings, amended standards may force them to accept a lower capacity machine. Several manufacturers also suggested that if amended standards disproportionately favored either batch or continuous ice makers, the resulting increase in cost for one equipment class may drive some customers from purchasing one type of ice maker to another where the ice produced is less suited to their application.

12.4.6 Cumulative Burdens

Based on its own research and discussions with manufacturers, DOE identified several regulations relevant to automatic commercial ice makers, including:

- foodservice equipment sanitation certification,
- potential climate change and greenhouse gas (GHG) regulation,
- standards for other products made by commercial ice maker manufacturers,
- other state energy conservation standards, and
- international energy conservation standards.

Complying with such regulations requires corporations to invest both human and capital resources. The following subsections discuss in greater detail regulations affecting the automatic commercial ice maker industry.

12.4.6.1 Food Service Equipment Sanitation Certification

Several manufacturers stated that NSF International (formerly the National Sanitation Foundation) is in the process of amending criteria for foodservice equipment sanitation certification pertaining to automatic commercial ice makers. New standards would specify low-lead materials to be used in gaskets in the product assemblies and require additional testing in the certification process.

12.4.6.2 Potential Climate Change and Greenhouse Gas Legislation

Several manufacturers expressed concern about potential climate change legislation. Manufacturers mentioned that climate change bills that would regulate the use and emissions of GHGs have been proposed in Congress, and that such a bill could potentially be passed at some point in the future. Such a bill could restrict or phase out the use of hydrofluorocarbons (HFCs), which are currently the most commonly used refrigerants. This presents a problem for manufacturers because designs based on alternative refrigerants have not been developed sufficiently to fully understand the cost implications. Conversion to alternative refrigerants from the currently used refrigerants, R-404A and HFC-134a, would require product redesign and, depending on choices regarding the alternative refrigerants, could cause issues associated with safety certification compliance under UL regulations. The potential for such legislation presents uncertainty for manufacturers as they consider designs to meet future energy standards.

12.4.6.3 Standards for Other Products Made by Automatic Commercial Ice Maker Manufacturers

In addition to the efficiency regulations for automatic commercial ice makers, several other Federal regulations and pending regulations apply to other products manufactured by the companies that manufacture automatic commercial ice makers. Many of these companies also manufacture commercial refrigeration equipment and walk-in coolers and freezers, both of which are also subject to Federal efficiency regulations. DOE is currently conducting rulemakings to consider amending energy conservation standards and prescribing new test procedures for commercial refrigeration equipment. The test procedure for walk-in coolers and walk-in freezers was published on April 15, 2011 (76 FR at 21850), with two subsequent corrections published in June 2011 (76 FR 31795 (June 2, 2011) and 76 FR 33631 (June 9, 2011)), and an energy conservation standard rulemaking for these products is currently in progress.

12.4.6.4 State and International Standards

Manufacturers stated that there are a number of state and international standards that they must adhere to in addition to those currently under consideration in this rulemaking. European standards such as the Restriction on the Use of Hazardous Substances (RoHS), Waste Electrical and Electronic Equipment (WEEE), and the Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH) create additional compliance costs for manufacturers that compete in Europe. Manufacturers indicated that California has programs similar to these that either are already in place or are currently in development. Additionally, different efficiency standards in foreign countries and individual states add to the range of regulations that manufacturers must meet. DOE will investigate these cumulative regulatory burdens in greater detail during the MIA analysis.

12.4.7 Impact on Small Manufacturers

The Small Business Administration (SBA) defines small business manufacturing enterprises for North American Industry Classification System (NAICS) code 333319, *Other Commercial and Service Industry Machine Manufacturing*, as companies with 500 or fewer employees and code 333415, *Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing*, as companies with 750 or fewer employees. SBA lists small business size standards that are matched to industries as they are described in the NAICS. The size standard defines the maximum allowable size of a for-profit small business for Federal Government programs. Size standards are generally based on the average annual receipts or the average number of employees at a firm.

The manufacturer interviews indicated that smaller manufacturers of automatic commercial ice makers typically have smaller corporate research and development and engineering staff than larger manufacturers. Smaller manufacturers often produce niche or specialty products and focus on providing products that other larger manufacturers do not produce. Although small manufacturers often have a more limited product range than larger manufacturers, the effort to address some aspects of regulations are relatively fixed and do not scale directly with the number of products or product platforms produced. Consequently, the cumulative burden of regulations will tend to place more of a burden on smaller manufacturers because of their more limited resources.

DOE will study the potential impacts to these small businesses in greater detail during the MIA.