APPENDIX 12A. MANUFACTURER IMPACT ANALYSIS INTERVIEW GUIDE

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Small Electric Motors Rulemaking
Manufacturer Analysis Interview Guide

April 22, 2009

As part of the rulemaking process for new energy conservation standards for small electric motors (SEMs), the Department of Energy (DOE) conducts the manufacturer impact analysis (MIA). In this analysis, DOE uses publicly available information and information provided by manufacturers during interviews to assess possible impacts on manufacturers due to new energy conservation standards. DOE is currently considering 8 efficiency levels (EL) for polyphase and capacitor-start, induction-run motors and 9 ELs for capacitor-start, capacitor-run motors, including a baseline efficiency level. In responding to this questionnaire, please refer to the efficiency levels in the table below. DOE analyzed one representative combination of horsepower (hp) and number of poles for each SEM motor category (e.g. Polyphase, CSIR, or CSCR) and extrapolated the results to other horsepowers, and number of poles.

Efficiency Levels under Consideration for Small Electric Motors

Equipment Class	Efficiency Metric	Baseline Efficiency Level	EL 1	EL 2	EL 3	EL 4	EL 5	EL 6	EL 7	EL 8
Polyphase, 1 hp, 4-pole	Full Load Efficiency	77.0%	78.5%	80.0%	81.5%	82.5%	85.0%	86.5%	88.0%	
Capacitor-Start, Induction-Run (CSIR), ½ hp, 4-pole	Full Load Efficiency	57.5%	59.5%	62.0%	64.0%	68.5%	71.0%	73.0%	77.0%	
Capacitor-Start, Capacitor-Run (CSCR), ¾ hp, 4-pole	Full Load Efficiency	71.0%	74.5%	78.5%	80.5%	81.5%	82.5%	83.5%	85.5%	87.0%

12A.1. KEY ISSUES

1.1 In general, what are the key issues for your company regarding new energy conservation standards for SEMs and this rulemaking?

1.2 For the issues identified, how significant are they at each listed efficiency level?

1.3 How can we most effectively incorporate these issues in the MIA?

12A.2. COMPANY OVERVIEW AND ORGANIZATIONAL CHARACTERISTICS

DOE is interested in understanding manufacturer impacts at the plant or profit center level directly pertinent to SEMs. However, the context within which the plant operates and the details of plant production and costs are not readily available from the published literature. Therefore, DOE invites you to provide these details confidentially in your own words to the extent possible and practical. Understanding the organizational setting around the SEM industry profit center will help DOE understand the probable future of the manufacturing activity with and without new energy conservation standards.

2.1 Do you have a parent company, and/or any subsidiaries relevant to the SEM industry?

2.2 Do you manufacture any equipment other than SEMs? If so, what other equipment do you manufacture?

2.3 What percentage of your total manufacturing corresponds to Polyphase motors, CSIR motors, and CSCR motors covered by this rulemaking?

2.4 Where are your production facilities located, and what type of equipment is manufactured at each location? Could you provide figures for your company's manufacturing at each location by equipment type (i.e. Polyphase motors, CSIR motors, and CSCR motors), horsepower, number of poles and efficiency?

2.5 At your manufacturing facilities, would potential SEM redesigns be difficult to implement? If so, would your company modify the existing facility or develop a new facility?

2.6 What are your employment levels at each of these facilities?

2.7 What are your product lines, niches, and relative strengths in the SEMs market?

2.8 What is your company's approximate market share for Polyphase motors, CSIR motors, and CSCR motors?

2.9 Would you expect your market share to change once new energy conservation standards become effective?

12A.3. MANUFACTURER PRODUCTION COSTS AND SELLING PRICES

For the MIA, DOE defines manufacturer production cost as all direct costs associated with manufacturing a piece of equipment. It includes direct labor, direct materials,[1] and overhead (which includes depreciation costs). The breakdown of manufacturer production cost has implications for the quantitative impacts on SEMs manufacturers. The per unit production costs are necessary for DOE to estimate labor expenditures and other cash flow calculations.

Manufacturer selling price is the average cost manufacturers charge their first consumers, but does not include costs along distribution channels. The manufacturer selling price includes a per unit research and development cost; selling, general, and administrative expense; shipping cost; and profit. The manufacturer markup is a multiplier applied to manufacturer production cost to cover the per-unit research and development, selling, general, and administrative expense, shipping, and profit.

In the engineering analysis, DOE developed manufacturer production costs for one representative motor in each motor category. By multiplying the manufacturer production costs by the manufacturer markup, DOE calculated the manufacturer selling prices for these motors at each efficiency level. In order to determine manufacturer selling prices for all other equipment classes (72 total), DOE is planning to scale the manufacturer selling prices to all covered equipment classes (i.e., scale the prices developed using the motors analyzed in the engineering analysis by horsepower and the number of poles). For scaling, DOE is using catalog prices as a basis for examining how prices vary by horsepower, and the number of poles.

To calculate manufacturer production costs for all other covered equipment (i.e., all equipment classes other than the three representative motors), DOE will divide the scaled manufacturer selling prices by the manufacturer markup. As shown in Equation 12-1 below, the manufacturer selling price divided by the baseline manufacturer markup would convert the scaled manufacturer selling price to manufacturer production costs.

[1] Included in direct materials are the costs associated with the handling of material (loading into assembly or winding equipment) and the scrap material that cannot be used in the production of a finished small electric motor (e.g., lengths of wire too short to wind).

Equation 12-1. Calculation of Manufacturer Production Costs and Manufacturer Selling Price

$$\frac{\text{Manufacturer Selling Price}}{\text{Manufacturer Markup}} = \text{Manufacturer Production Cost}$$

3.1 Table 12-1 through Table 12-3 provide DOE's estimates of the manufacturer production costs and manufacturer selling prices for SEMs at the representative horsepower, number of poles, and each efficiency level being considered. Could you please provide any comments on the estimated values?

Table 12-1 Estimated Manufacturer Production Costs and Manufacturer Selling Prices for Polyphase, 1 hp, 4-pole Motors

Efficiency Level (Full Load Efficiency)	DOE's Manufacturer Production Cost Estimates* (2009$)	DOE's Manufacturer Selling Price Estimates (2009$)	Manufacturer Comments or Revised Estimates
Baseline Level (77.0%)	$64.33	$93.27	
EL 1 (78.5%)	$68.25	$98.96	
EL 2 (80.0%)	$70.26	$101.88	
EL 3 (81.5%)	$74.07	$107.40	
EL 4 (82.5%)	$76.70	$111.22	
EL 5 (85.0%)	$151.21	$219.25	
EL 6 (86.5%)	$154.75	$224.38	
EL 7 (88.0%)	$1,163.41	$1,686.94	

*DOE's manufacturer production cost estimates use the Producer Price Index to develop a five-year average of material prices from 2004 to 2008.

Table 12-2 Estimated Manufacturer Production Costs and Manufacturer Selling Prices for CSIR, ½ hp, 4-pole Motors

Efficiency Level (Full Load Efficiency)	DOE's Manufacturer Production Cost Estimates* (2009$)	DOE's Manufacturer Selling Price Estimates (2009$)	Manufacturer Comments or Revised Estimates
Baseline Level (57.5%)	$63.55	$92.14	
EL 1 (59.5%)	$66.49	$96.41	
EL 2 (62.0%)	$68.33	$99.08	
EL 3 (64.0%)	$69.06	$100.14	
EL 4 (68.5%)	$78.74	$114.17	
EL 5 (71.0%)	$81.32	$117.91	
EL 6 (73.0%)	$122.94	$178.26	
EL 7 (77.0%)	$794.93	$1,152.65	

*DOE's manufacturer production cost estimates use the Producer Price Index to develop a five-year average of material prices from 2004 to 2008.

Table 12-3 Estimated Manufacturer Production Costs and Manufacturer Selling Prices for CSCR, ¾ hp, 4-pole Motors

Efficiency Level (Full Load Efficiency)	DOE's Manufacturer Production Cost Estimates* (2009$)	DOE's Manufacturer Selling Price Estimates (2009$)	Manufacturer Comments or Revised Estimates
Baseline Level (71.0%)	$79.36	$115.07	
EL 1 (74.5%)	$82.68	$119.88	
EL 2 (78.5%)	$95.88	$139.02	
EL 3 (80.5%)	$99.71	$144.58	
EL 4 (81.5%)	$102.95	$149.27	
EL 5 (82.5%)	$108.04	$156.66	
EL 6 (83.5%)	$164.36	$238.32	
EL 7 (85.5%)	$169.39	$245.61	
EL 8 (87.0%)	$1,176.39	$1,705.77	

*DOE's manufacturer production cost estimates use the Producer Price Index to develop a five-year average of material prices from 2004 to 2008.

3.2 Please compare your manufacturer production cost percentages[2] to the estimates tabulated below. The manufacturer production cost breakdown is used to calculate the total cost of goods sold (COGS) for the industry. Having an accurate estimate of the production costs for the industry allows DOE to better examine impacts on profitability and employment due to new energy conservation standards. Are the different percentages of each cost representative of your company or the SEM industry? Please explain any differences. As mentioned in section 3, the overhead component of the manufacturer production cost includes depreciation. In the tables below could you separate depreciation from overhead and include it as a percentage of manufacturer production cost?

2 The manufacture production cost percentages shown in Table 12-4 through Table 12-6 are the values that make up COGS. These are percentages of total COGS.

Table 12-4 Breakdown of Manufacturer Production Costs for Baseline Polyphase, 1 hp, 4-pole Motors

Components of Manufacturer Production Cost	DOE's Estimated Percentage of Manufacturer Production Cost	Manufacturer Feedback
Materials	67.1%	
Labor	21.8%	
Overhead	11.1%	
Depreciation	Included in overhead	

Table 12-5 Breakdown of Manufacturer Production Costs for Baseline CSIR, ½ hp, 4-pole Motors

Components of Manufacturer Production Cost	DOE's Estimated Percentage of Manufacturer Production Cost	Manufacturer Feedback
Materials	69.7%	
Labor	19.2%	
Overhead	11.1%	
Depreciation	Included in overhead	

Table 12-6 Breakdown of Manufacturer Production Costs for Baseline CSCR, ¾ hp, 4-pole Motors

Components of Manufacturer Production Cost	DOE's Estimated Percentage of Manufacturer Production Cost	Manufacturer Feedback
Materials	73.5%	
Labor	15.4%	
Overhead	11.1%	
Depreciation	Included in overhead	

3.3 Do the percentages presented on tables Table 12-4 through Table 12-6 change at higher efficiencies? Please explain any differences.

3.4 Within a motor category, does the production cost breakdown change with horsepower? Does it vary with the number of poles?

12A.4. MARKUPS AND PROFITABILITY

One of the primary objectives of the MIA is to assess the impact of new energy conservation standards on industry profitability. In this section, DOE would like to understand the current markup structure of the industry and how setting a new energy conservation standard would impact your company's markup structure and profitability. As discussed in Section 3, the manufacturer markup is a multiplier applied to manufacturer production cost to cover per unit research and development, selling, general, and administrative expenses, shipping costs, and profit. Currently, DOE estimates an industry-wide markup of 1.45 for SEM equipment classes.

4.1 Do profit levels currently vary by equipment class? Do profit levels vary by efficiency level? Please explain why or why not.

4.2 Within each motor category, do profit levels vary by horsepower and number of poles?

4.3 DOE currently assumes that the manufacturer markup does not vary by motor category, efficiency level, or equipment class. DOE would like to understand how the manufacturer markup changes at higher efficiency levels. If so, could you provide your company's markup for any motors that meet the efficiency levels shown below?

Table 12-7 Manufacturer Markups for Polyphase, 1 hp, 4-pole Motors

	Polyphase, 1 hp, 4-pole Motor
Efficiency Level (Full Load Efficiency)	Estimated Manufacturer Markup
Baseline (77.0%)	
EL 1 (78.5%)	
EL 2 (80.0%)	
EL 3 (81.5%)	
EL 4 (82.5%)	
EL 5 (85.0%)	
EL 6 (86.5%)	
EL 7 (88.0%)	

Table 12-8 Manufacturer Markups for CSIR, ½ hp, 4-pole Motors

	CSIR, ½ hp, 4-pole Motor
Efficiency Level (Full Load Efficiency)	Estimated Manufacturer Markup
Baseline (57.5%)	
EL 1 (59.5%)	
EL 2 (62.0%)	
EL 3 (64.0%)	
EL 4 (68.5%)	
EL 5 (71.0%)	
EL 6 (73.0%)	
EL 7 (77.0%)	

Table 12-9 Manufacturer Markups for CSCR, ¾ hp, 4-pole Motors

	CSCR, ¾ hp, 4-pole Motor
Efficiency Level (Full Load Efficiency)	Estimated Manufacturer Markup
Baseline (71.0%)	
EL 1 (74.5%)	
EL 2 (78.5%)	
EL 3 (80.5%)	
EL 4 (81.5%)	
EL 5 (82.5%)	
EL 6 (83.5%)	
EL 7 (85.5%)	
EL 8 (87.0%)	

4.1 Could you explain how the manufacturer markup varies for each motor category as the horsepower and number of poles vary.

4.2 Would you expect changes in your estimated profitability following a new energy conservation standard? If so, please explain why.

12A.5. SHIPMENT PROJECTIONS AND MARKET SHARES

A new energy conservation standard can change overall shipments by altering equipment attributes, marketing approaches, equipment availability, and price. The industry revenue calculations are based on the shipment projections developed by DOE's shipments model. The shipments model includes forecasts for the base case shipments (i.e., total industry shipments absent new energy conservation standards) and the standards case shipments (i.e., total industry shipments with new energy conservation standards).

5.1 Please compare DOE's projections of annual industry-wide shipments for covered SEMs with your company's projections of industry-wide shipments.

Table 12-10 Annual Industry-Wide Shipment Projections for Polyphase Motors Absent Amended Energy Conservation Standards

	2008 Total Industry-Wide Shipments	Projected Total Industry-Wide Shipments in 2015*	Projected Total Industry-Wide Shipments in 2025	Projected Total Industry-Wide Shipments in 2035
DOE's Estimate for Total Industry Shipments (Millions)	.750	.838	.990	1.22
Manufacturer Feedback				

* 2015 is estimated effective date of new energy conservation standards for SEMs.

Table 12-11 Annual Industry-Wide Shipment Projections for CSIR Motors Absent Amended Energy Conservation Standards

	2008 Total Industry-Wide Shipments	Projected Total Industry-Wide Shipments in 2015*	Projected Total Industry-Wide Shipments in 2025	Projected Total Industry-Wide Shipments in 2035
DOE's Estimate for Total Industry Shipments (Millions)	3.10	3.61	4.50	5.94
Manufacturer Feedback				

* 2015 is estimated effective date of new energy conservation standards for SEMs.

Table 12-12 Annual Industry-Wide Shipment Projections for CSCR Motors Absent Amended Energy Conservation Standards

	2008 Total Industry-Wide Shipments	Projected Total Industry-Wide Shipments in 2015*	Projected Total Industry-Wide Shipments in 2025	Projected Total Industry-Wide Shipments in 2035
DOE's Estimate for Total Industry Shipments (Millions)	.280	.326	.406	.536
Manufacturer Feedback				

* 2015 is estimated effective date of new energy conservation standards for SEMs.

5.2 DOE's shipments analysis estimates industry-wide shipments in 2015 would remain at their current levels irrespective of higher standard levels (i.e., industry-wide shipments remain constant regardless of the standard level set by DOE). Could you provide any qualitative information on expected changes in total industry shipments shown in Table 12-10 through Table 12-12?

12A.6. EQUIPMENT MIX

Equipment mix describes the distribution of current shipments by efficiency level. Changes in the equipment mix due to new energy conservation standards can have a large impact on industry revenues. Having an accurate estimate of the current equipment mix allows DOE to better estimate how revenues might change due to new energy conservation standards.

6.1 Does your company offer multiple product lines at different efficiency levels? Could you provide a description of your company's product lines and their respective efficiency levels?

6.2 Table 6-1 through Table 12-15 show DOE's estimate for the mix of shipments by efficiency in 2015, the anticipated effective date of new energy conservation standards. Could you provide feedback on DOE's estimates based on your knowledge of the industry? Note: Though the efficiency levels defined in the introduction of this interview guide apply to one representative motor in each motor category, the ELs in the following tables are meant to represent levels that would require manufacturers to implement similar design options for all horsepower and number of pole combinations for a given motor category.

Table 12-13 Percentage of Industry-Wide Shipments by Efficiency Level for Polyphase Motors in 2015

Percentage of Total Shipments at Each Efficiency	Baseline	EL 1	El 2	EL 3	EL 4	EL 5	EL 6	EL 7
DOE's Estimate (2015)	95%	5%	0%	0%	0%	0%	0%	0%
Manufacturer Feedback								

Table 12-14 Percentage of Industry-Wide Shipments by Efficiency Level for CSIR Motors in 2015

Percentage of Total Shipments at Each Efficiency	Baseline	EL 1	El 2	EL 3	EL 4	EL 5	EL 6	EL 7
DOE's Estimate (2015)	95%	5%	0%	0%	0%	0%	0%	0%
Manufacturer Feedback								

Table 12-15 Percentage of Industry-Wide Shipments by Efficiency Level for CSCR Motors in 2015

Percentage of Total Shipments at Each Efficiency	Baseline	EL 1	El 2	EL 3	EL 4	EL 5	EL 6	EL 7	EL 8
DOE's Estimate (2015)	95%	5%	0%	0%	0%	0%	0%	0%	0%
Manufacturer Feedback									

6.1 Are the projected distributions of efficiencies representative of SEMs shipments by equipment class? Do you expect the equipment mix to change over time? If so, please explain why.

6.2 A new energy conservation standard affects the equipment mix by eliminating the sale of equipment below the minimum efficiency level. DOE assumes that all equipment that fall below the standard would roll-up to the efficiency level set by a new energy conservation standard. DOE assumes the distribution of efficiencies above the efficiency level set by the energy conservation standard will not change. In other words, those customers already purchasing more-efficient equipment will continue to do so irrespective of new energy conservation standards. How do you think new energy conservation standards will

impact the sales of more efficient equipment? For example, would customers continue to buy equipment that exceeds the energy conservation standard level? Would your response change at higher efficiency levels?

12A.7. FINANCIAL PARAMETERS

Navigant Consulting, Inc. (NCI) has developed a "strawman" model of the SEM industry financial performance called the Government Regulatory Impact Model (GRIM) using publicly available data. This section attempts to understand how your company's financial situation differs from our industry aggregate picture.

Please compare your financial parameters to the GRIM parameters tabulated below.

Table 12-16 Financial Parameters for Small Electric Motor Manufacturers

GRIM Input	Definition	Industry Estimated Value	Your Actual (If Significantly Different from DOE's Estimate)
Income Tax Rate	Corporate effective income tax paid (percentage of earnings before taxes, EBT)	32.0%	
Discount Rate	Weighted average cost of capital (inflation-adjusted weighted average of corporate cost of debt and return on equity)	9.7%	
Working Capital	Current assets less current liabilities (percentage of revenues)	16.0%	
SG&A	Selling, general, and administrative expenses (percentage of revenues)	18.0%	
R&D	Research and development expenses (percentage of revenues)	2.0%	
Depreciation	Amortization of fixed assets (percentage of revenues)	3.0%	
Capital Expenditures	Outlay of cash to acquire or improve capital assets (percentage of revenues, not including acquisition or sale of business units)	2.7%	
Cost of Goods Sold	Includes material, labor, overhead, and depreciation (percentage of revenues)	69.0%	

7.1 How would you expect an amended energy conservation standard to impact any of the financial parameters for the industry?

12A.8. Conversion Costs

New energy conservation standards may cause your company to incur capital and equipment conversion costs to redesign existing equipment and make changes to existing production lines to be compliant with the new energy conservation standards. Capital conversion costs are one-time investments in plant, property, and equipment (PPE) necessitated by a new energy conservation standard. These may be incremental changes to existing PPE or the replacement of existing PPE. Replacing existing PPE could strand existing assets before the end of their useful lives. In addition to capital conversion costs, equipment conversion costs are costs related research,

product development, testing, marketing and other costs for redesigning equipment necessitated by a new energy conservation standard. For the industry cash flow model, DOE must estimate the conversion costs for all covered equipment. It is difficult to estimate these costs due to variations in efficiency between equipment classes. The questions below attempt to capture the capital and equipment conversion costs that would be required to convert all covered equipment at the efficiency levels studied by DOE.

8.1 Are different motor categories manufactured on the same line? Within a motor category, are motors of varying horsepower and number of poles manufactured on the same line?

8.2 Does the production equipment and manufacturing processes used to manufacturer motors differ by motor category, horsepower, or number of poles?

8.3 Are production lines shared between covered general purpose motors and non-covered motors?

8.4 Could you please describe what equipment is produced on each of your production lines? Please include the motor category (both covered and non-covered), the range of horsepower and number of poles for each line.

In the tables below, DOE asks you to provide your expected capital and equipment conversion costs for the representative combination of horsepower and number of poles for each SEM motor category. Following the tables, DOE asks a series of questions to determine how the capital conversion and equipment conversion costs for these motors compare to costs to convert the remaining combinations of horsepowers and number of poles.

Table 12-17 Conversion Costs for Polyphase, 1 hp, 4-pole Motors

Efficiency Level (Full Load Efficiency)	Polyphase, 1 hp, 4-pole Motors		
	Capital Conversion Costs (2009$)	Equipment Conversion Costs (2009$)	Stranded Assets (2009$)
Baseline (77.0%)			
EL 1 (78.5%)			
EL 2 (80.0%)			
EL 3 (81.5%)			
EL 4 (82.5%)			
EL 5 (85.0%)			
EL 6 (86.5%)			
EL 7 (88.0%)			

Table 12-18 Conversion Costs for CSIR, ½ hp, 4-pole Motors

Efficiency Level (Full Load Efficiency)	CSIR, ½ hp, 4-pole Motors		
	Capital Conversion Costs (2009$)	Equipment Conversion Costs (2009$)	Stranded Assets (2009$)
Baseline (57.5%)			
EL 1 (59.5%)			
EL 2 (62.0%)			
EL 3 (64.0%)			
EL 4 (68.5%)			
EL 5 (71.0%)			
EL 6 (73.0%)			
EL 7 (77.0%)			

Table 12-19 Conversion Costs for CSCR, ¾ hp, 4-pole Motors

Efficiency Level (Full Load Efficiency)	CSCR, ¾ hp, 4-pole Motors		
	Capital Conversion Costs (2009$)	Equipment Conversion Costs (2009$)	Stranded Assets (2009$)
Baseline (71.0%)			
EL 1 (74.5%)			
EL 2 (78.5%)			
EL 3 (80.5%)			
EL 4 (81.5%)			
EL 5 (82.5%)			
EL 6 (83.5%)			
EL 7 (85.5%)			
EL 8 (87.0%)			

8.5 Within each motor category, will the conversion costs presented above be shared across equipment with different horsepowers and number of poles. For example, will the conversion costs for Polyphase, 1 hp, 4-pole motors include the conversion costs for

Polyphase 1.5 hp, 6-pole motors, Polyphase 0.5 hp, 2-pole motors, etc.

8.6 For the conversion costs provided above, would any these conversion costs be shared across different motor categories?

In the tables below, DOE asks you to provide your expected capital and equipment conversion costs to increase the efficiency of all covered Polyphase, CSIR, and CSCR motors by the same relative percentage increase (not a nominal increase in Full Load Efficiency percentage).

Table 12-20 Conversion Costs for all Covered Polyphase Motors

Efficiency Level (Percentage increase over baseline)	Covered Polyphase Motors		
	Capital Conversion Costs (2009$)	Equipment Conversion Costs (2009$)	Stranded Assets (2009$)
Baseline			
EL 1 (2%)			
EL 2 (4%)			
EL 3 (6%)			
EL 4 (7%)			
EL 5 (10%)			
EL 6 (12%)			
EL 7 (14%)			

Table 12-21 Conversion Costs for all Covered CSIR Motors

Efficiency Level (Percentage increase over baseline)	Covered CSIR Motors		
	Capital Conversion Costs (2009$)	Equipment Conversion Costs (2009$)	Stranded Assets (2009$)
Baseline			
EL 1 (3%)			
EL 2(8%)			
EL 3 (11%)			
EL 4 (19%)			
EL 5 (23%)			
EL 6 (27%)			
EL 7 (34%)			

Table 12-22 Conversion Costs for all Covered CSCR Motors

Efficiency Level (Percentage increase over baseline)	Covered CSCR Motors		
	Capital Conversion Costs (2009$)	Equipment Conversion Costs (2009$)	Stranded Assets (2009$)
Baseline			
EL 1 (5%)			
EL 2 (11%)			
EL 3 (13%)			
EL 4 (15%)			
EL 5 (16%)			
EL 6 (18%)			
EL 7 (20%)			
EL 8 (23%)			

8.7 In order to increase the efficiencies by the percentages shown in the tables above, would non-covered motors also require a corresponding improvement in efficiency?

12A.9. CUMULATIVE REGULATORY BURDEN

Cumulative regulatory burden refers to the burden that industry faces from overlapping effects of new or revised DOE standards, voluntary standards, and/or other regulatory actions affecting the same equipment or industry.

9.1 Are there other recent or impending regulations that SEM manufacturers face (from DOE or otherwise)? If so, could you identify the regulation and the corresponding possible effective dates for those regulations?

9.2 What level of expense are you expecting to incur as a result of these regulations?

9.3 Under what circumstances would you be able to coordinate any expenditures related to these other regulations with a new energy conservation standard, thereby lessening the cumulative burden?

12A.10. DIRECT EMPLOYMENT IMPACT ASSESSMENT

The impact of new energy conservation standards on employment is an important consideration in the rulemaking process. This section of the interview guide seeks to explore current trends in SEM production employment and solicit manufacturer views on how domestic employment patterns might be affected by new energy conservation standards.

10.1 Would your domestic employment levels be expected to change significantly under new energy conservation standards? If so, please explain how they would change if higher efficiency levels are required.

10.2 Would the workforce skills necessary under new energy conservation standards require extensive retraining or replacement of employees at your manufacturing facilities?

12A.11. EXPORTS / FOREIGN COMPETITION / OUTSOURCING

Disparity between domestic and foreign energy conservation standards could impact exports or imports. Labor content and material changes, resulting from amended energy conservation standards, may impact sourcing decisions.

11.1 What percentage of your company's SEMs sales is domestic? Absent new energy conservation standards, are production facilities being relocated to foreign countries? Would new energy conservation standards impact your domestic vs. foreign manufacturing decision?

11.2 If applicable, to what foreign countries or regions do you export your equipment? What percentage of sales can be attributed to each?

11.3 Would a new energy conservation standard be expected to affect your export sales? What would the resulting impact be, if any, on your manufacturing operations and profitability?

11.4 Are your foreign exports affected by new energy conservation standards in other countries?

11.5 What percentage of the U.S. market for SEM is imported? Would new energy conservation standards have an impact on foreign competition?

11.6 What is your outlook for SEMs exports?

12A.12. Consolidation

New energy conservation standards can alter the competitive dynamics of the market. This can include prompting companies to enter or exit the market, or to merge. DOE and the Department of Justice are both interested in any potential reduction in competition that would result from new energy conservation standard.

12.1 Please comment on industry consolidation and related trends over the last 5 years.

12.2 In the absence of new energy conservation standards, do you expect any further industry consolidation? Please describe your expectations.

12.3 How would new energy conservation standards affect your ability to compete?

12A.13. Impacts on small business

13.1 The Small Business Association (SBA) denotes a small business in the SEM industry as having less than 1,000 employees[3]. By this definition, is your company considered a

[3] DOE uses the small business size standards published on August 22, 2008, as amended, by the Small Business

small business?

13.2 Are there any reasons that a small business might be at a disadvantage relative to a larger business under new energy conservation standards? Please consider such factors as technical expertise, access to capital, bulk purchasing power for materials/components, engineering resources, and any other relevant issues.

13.3 Are there any niche manufacturers, small businesses, and/or component manufacturers for which the adoption of amended energy conservation standards would have a severe impact? If so, would manufacturers of these motors have different incremental impacts from implemented amended energy conservation standards than from the rest of the industry?

12A.14. Supplemental Engineering

14.1 DOE was unable to directly analyze all equipment classes and must scale the efficiencies from the motors analyzed in the engineering analysis to the remaining equipment classes. DOE has examined the product lines of various manufacturers and created efficiency relationships based on data found in manufacturer catalogs. Is it appropriate to assume that manufacturers will use the same design options for a given product line and thus create a line of motors with similar efficiency ratings for their given equipment class?

14.2 There have been drastic fluctuations in metal prices over the past few years. To account for these fluctuations, DOE uses a 5-year average of metal prices from the Bureau of Labor Statistics Producer Price Indices (PPIs) spanning 2004 to 2008 with an adjustment to 2008$. Shown below is the 5-year average of metal prices that DOE calculated using the PPI and prices in 2008$. Do these numbers seem appropriate? If not, can you provide another estimate?

Administration (SBA) to determine whether a company is a small business. To be categorized as a small business, a SEMs manufacturer and its affiliates may employ a maximum of 1,000 employees. The 1,000 employee threshold includes all employees in a business's parent company and any other subsidiaries.

Table 14.4 Five Year Average Metal Prices

Item	Unit of Measure	Cost per Unit of Measure	Manufacturer Feedback
Rotor Aluminum	lb	$0.6018	
Rotor Copper	lb	$1.6130	
Cu Wire, Gauge 18	lb	$2.5643	
Cu Wire, Gauge 18.5	lb	$2.5740	
Cu Wire, Gauge 19	lb	$2.5824	
Cu Wire, Gauge 19.5	lb	$2.5920	
Cu Wire, Gauge 20	lb	$2.6017	
Cu Wire, Gauge 20.5	lb	$2.6113	
Cu Wire, Gauge 21	lb	$2.6213	
Cu Wire, Gauge 21.5	lb	$2.6312	
Cu Wire, Gauge 22	lb	$2.6411	
24M56 Steel	Lamination , lb	$0.1285 , N/A	
24M19 Steel	Lamination , lb	$0.2099 , N/A	
29M15 Steel	Lamination , lb	$0.3248 , N/A	
0.028 M56 Steel	Lamination , lb	$0.1285 , N/A	
Hiperco 50 0.006 Steel	Lamination , lb	$1.5972 , N/A	

14.3 DOE seeks feedback for those components of SEMS that have had relatively stable prices over time. The table below lists DOE's estimates of the costs for those components. Do these costs seem appropriate? If not, can you provide another estimate?

Table 14.5 Small Electric Motor Purchased Components

Item	Unit of Measure	Cost per Unit of Measure	Manufacturer Feedback
Rotor Bearings	each	$1.1000	
Thermal Switch (Polyphase)	each	$2.0000	
Housing	lb	$0.9500	
Thermal Switch (CSIR/CSCR)	each	$1.5600	
Start Capacitor (340-408 mfd)	each	$7.0200	
Start Capacitor (400-480 mfd)	each	$10.2000	
Run Capacitor (7.5 mfd)	each	$1.8000	
Run Capacitor (20 mfd)	each	$2.2000	
Run Capacitor (25 mfd)	each	$2.7500	
Run Capacitor (35 mfd)	each	$3.8500	
Run Capacitor (40 mfd)	each	$4.4000	
Run Capacitor (45 mfd)	each	$4.9500	

14.4 Part of the manufacturing selling prices calculation relates to labor expenses. DOE applied a fully burdened labor rate to estimated manufacturing time. DOE estimates that additional manufacturing time needed to implement all of the design options shown below, with the exception of die-casting a copper rotor, would be negligible. Is this a fair assumption? If not, how much of a change in manufacturing time would you expect by implementing each of the design options listed?

Table 14.6 Additional Manufacturing Times for Design Options

Design Option	Additional Time
Increasing Slot Fill (50% to 65%)	
Lengthening Stack (20% increase)	
Changing Grades of Steel	
Die-Casting Copper Rotor Cage	

14.5 For the efficiency levels that have been provided, what changes to the baseline design (e.g., lengthening stack, moving to higher steel grade, etc.) would you use in order to achieve the listed efficiencies? Are there significant burdens (e.g. replacing undepreciated tooling equipment or R&D) that would be associated with any particular design options?

Table 14.7 Design Options and Associated Burdens for Polyphase, 1 hp, 4-pole Motor

Efficiency Level	Design Options	Associated Burden
Baseline (77.0%)		
EL 1 (78.5%)		
EL 2 (80.0%)		
EL 3 (81.5%)		
EL 4 (82.5%)		
EL 5 (85.0%)		
EL 6 (86.5%)		
EL 7 (88.0%)		

Table 14.8 Design Options and Associated Burdens for CSIR, ½ hp, 4-pole Motor

Efficiency Level	Design Options	Associated Burden
Baseline (57.5%)		
EL 1 (59.5%)		
EL 2 (62.0%)		
EL 3 (64.0%)		
EL 4 (68.5%)		
EL 5 (71.0%)		
EL 6 (73.0%)		
EL 7 (77.0%)		

Table 14.9 Design Options and Associated Burdens for CSCR, ¾ hp, 4-pole Motor

Efficiency Level	Design Options	Associated Burden
Baseline (71.0%)		
EL 1 (74.5%)		
EL 2 (78.5%)		
EL 3 (80.5%)		
EL 4 (81.5%)		
EL 5 (82.5%)		
EL 6 (83.5%)		
EL 7 (85.5%)		
EL 8 (87.0%)		

14.6 At DOE's preliminary analysis public meeting in January 2009, manufacturers expressed a concern for increasing the length of the motor so much so that the new motor would not necessarily be a replacement for the original motor. Therefore NEMA recommended that the more efficient motor designs do not increase in stack length by more than 20%. What percentage of the OEM applications would be bound to that restriction? What percentage of these OEM applications will not take any additional length? What percentage of the OEM applications would not be space constrained? Can you provide examples of these applications?

14.7 Could you provide contact information for OEMs from which DOE could collect information regarding costs and space constraints for covered SEMs?

14.8 DOE is considering the following applications for covered SEMs: conveyors, pumps, air compressors, fans, blowers, and miscellaneous/general industrial applications. Are there other applications of covered SEMs which you feel DOE should analyze?