

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

**SOCIOECONOMIC REPORT FOR
Proposed Amended Rule 1111—NO_x Emissions from Natural-Gas-Fired,
Fan-Type Central Furnaces**

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EXECUTIVE SUMMARY

A socioeconomic analysis was conducted to assess the impacts of Proposed Amended Rule (PAR) 1111—NO_x Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces. A summary of the analysis and findings is presented below.

<p>Elements of Proposed Amended Rule</p>	<p>PAR 1111—NO_x Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces—establishes NO_x standards for natural-gas-fired, fan-type central furnaces. Mobile home furnaces sold and installed in the South Coast Air Quality Management District would have to comply with the 40 nanograms/joule (ng/J) NO_x emission limit beginning on October 1, 2012 and 14 ng/J on October 1, 2018. Condensing, non-condensing, and weatherized furnaces are also required to comply with the 14 ng/J limit on October 1, 2014, October 1, 2015, and October 1, 2016, respectively. Compliant units are required to have proper labels displayed on them. Manufacturers of furnaces are required to demonstrate their compliance with an emission test protocol and test results. Furthermore, rebates would be offered to furnace manufacturers for their early compliance. Finally, sellers and installers of furnaces would have up to 300 days to clear their existing inventory.</p> <p>The proposed amendments would result in 2.5 tons of NO_x emission reductions per day in 2023 and less than one-tenth of a ton of NO_x emission reductions per day in 2014. The proposed amendments would not change the furnace replacement schedule.</p>
<p>Affected Facilities and Industries</p>	<p>The proposed amendments directly affect manufacturers of natural-gas-fired, fan-type central furnaces because burners would have to be re-designed to achieve the NO_x limits. However, no manufacturers are located in the four-county area. Since furnaces are sold through local distributors, they will be indirectly affected. Residential and commercial property owners (consumers and real estate lessors, respectively), as well as builders for new construction will pay a higher price (incremental manufacturing cost plus markup) resulting from the proposed amendments.</p>
<p>Assumptions of Analysis</p>	<p>The incremental cost of a mobile home furnace to consumers resulting from the NO_x emission limit of 40 ng/J in 2012 is estimated to be \$10. It is estimated that approximately 15 tests nationwide will be conducted to certify these compliant furnaces. One-third of such tests would be conducted in a testing lab in Los Angeles County at a cost of \$1,200 per test. It is assumed that the average incremental cost of a furnace meeting the 14 ng/J NO_x limit to consumers regardless of its type is \$174, which is the average of lower and upper end prices. This cost includes material costs and certification tests to furnace manufacturers, markups at various sales stages, and any other necessary cost to bring a furnace to consumers.</p>

	<p>The early compliance incentive will help to partially offset R&D costs for furnaces in the event manufacturers take advantage of it. The AQMD planned funding for product development and R&D plans might reduce the \$174 incremental cost.</p> <p>Based on the upper end price of a furnace at \$2,000, implementation of the proposed amendments would, at most, result in an average 8.7 percent increase in the price of a furnace. This increase is relatively small given the average 25-year life of a furnace.</p> <p>It is estimated that there are 4.5 million existing furnaces in the four-county area, of which four percent are mobile home furnaces, 26 percent are condensing furnaces, 60 percent are non-condensing furnaces, and 10 are percent weatherized furnaces. Since existing non-mobile home furnaces located in commercial properties are expected to be very low, staff assumed one percent for this analysis.</p> <p>The number of affected furnaces each year is estimated by assuming an annual four percent replacement rate on the existing 4.5 million furnace stock based on an average life of 25 years for a furnace plus the growth in the number of furnaces each year. The share of each county’s total number of furnaces in the four-county area is based on the number of housing units in each county in 2008.</p> <p>The socioeconomic analysis herein did not consider the impact of the rebate program for early compliance by furnace manufacturers because it is too speculative to predict which manufacturers would opt into the program.</p>
<p>Compliance Costs</p>	<p>The average annual cost (from the years 2011 to 2025) of the proposed amendments is projected to be \$30.4 million. Of the \$30.4 million cost, consumers would incur \$22.9 million (75 percent) due to furnace replacements, and home and commercial builders will incur \$7.3 million (24 percent) due to new construction. The \$0.2 million cost to real estate lessors represents furnace replacements in existing commercial properties. Furnace manufacturers in 2011 would also incur a minor cost for certification tests for mobile home furnaces.</p>
<p>Employment Impacts</p>	<p>A macroeconomic analysis was performed to assess the overall job impacts of the proposed amendments on the entire local economy. It is estimated that an average of 221 jobs will be forgone annually from 2013 to 2025 across all industries in the four-county area, which is 0.002 percent of the average baseline jobs during the same period. There would be an additional 62 jobs created in the wholesale sector where local distributors of furnaces belong.</p> <p>The sectors of construction, and real estate and rental and leasing,</p>

	<p>are projected to have an average of 47 and 36 annual jobs forgone, respectively. Consumers may reduce spending on other consumption items to compensate for increases in furnace prices. The most affected items would be those products and services sold by the industry of retail trade (NAICS 55). For example, there would be 50 annual jobs forgone in this sector.</p>
<p>Competitiveness</p>	<p>Compared to its national counterparts, the proposed amendments could result in an increase of 0.01 to 0.02 percent in the cost of production in the construction sector from 2015 to 2025. Similar increases are expected in the relative delivered price of products in that industry. The real estate and rental and leasing industry is projected to have increases in its relative cost of production and delivered prices by 0.01 percent at most. No changes in the cost of production or relative prices are observed in other industries. Overall, these impacts are not significant and thus would not affect the competitiveness of the four-county area.</p>

INTRODUCTION

The proposed amendments to Rule 1111 (Reduction of NO_x Emissions from Natural-Gas-Fired, Fan-type Central Furnaces) set NO_x standards for natural-gas-fired, fan-type central furnaces. Mobile home furnaces sold and installed in the South Coast Air Quality Management District would have to comply with the 40 nanograms/joule (ng/J) NO_x emission limit beginning on October 1, 2012 and 14 ng/J on October 1, 2018. Condensing, non-condensing, and weatherized furnaces are also required to comply with the 14 ng/J limit on October 1, 2014, October 1, 2015, and October 1, 2016, respectively. Compliant units are required to have proper labels displayed on them. Manufacturers of furnaces are required to demonstrate their compliance with an emission test protocol and test results. Furthermore, rebates would be offered to furnace manufacturers for their early compliance. Finally, sellers and installers of furnaces would have up to 300 days to clear their existing inventory.

The proposed amendments would result in 2.5 tons of NO_x emission reductions per day in 2023 and less than one-tenth of a ton of NO_x emission reductions per day in 2014. The proposed amendments would not change the furnace replacement schedule.

LEGISLATIVE MANDATES

The socioeconomic assessments at the AQMD have evolved over time to reflect the benefits and costs of regulations. The legal mandates directly related to the assessment of the proposed amendments include the AQMD Governing Board resolutions and various sections of the California Health & Safety Code (H&SC).

AQMD Governing Board Resolutions

On March 17, 1989 the AQMD Governing Board adopted a resolution that calls for preparing an economic analysis of each proposed rule for the following elements:

- Affected Industries
- Range of Control Costs
- Cost Effectiveness
- Public Health Benefits

On October 14, 1994, the Board passed a resolution which directed staff to address whether the rules or amendments brought to the Board for adoption are in the order of cost effectiveness as defined in the AQMP. The intent was to bring forth those rules that are cost effective first.

Health & Safety Code Requirements

The state legislature adopted legislation that reinforces and expands the Governing Board resolutions for socioeconomic assessments. H&SC Sections 40440.8(a) and (b), which became effective on January 1, 1991, require that a socioeconomic analysis be prepared for any proposed rule or rule amendment that "will significantly affect air quality or emissions limitations." Specifically, the scope of the analysis should include:

- Type of Affected Industries
- Impact on Employment and the Economy of the District
- Range of Probable Costs, Including Those to Industries
- Emission Reduction Potential
- Necessity of Adopting, Amending or Repealing the Rule in Order to Attain State and Federal Ambient Air Quality Standards
- Availability and Cost Effectiveness of Alternatives to the Rule

For the necessity of rule adoption and cost effectiveness of alternatives to the rule, please refer to the Staff Report for Proposed Amended Rule 1111. Additionally, the AQMD is required to actively consider the socioeconomic impacts of regulations and make a good faith effort to minimize adverse socioeconomic impacts. H&SC Section 40728.5, which became effective on January 1, 1992, requires the AQMD to:

- Examine the type of industries affected, including small businesses; and
- Consider Socioeconomic Impacts in Rule Adoption

H&SC Section 40920.6, which became effective on January 1, 1996, requires that incremental cost effectiveness be performed for a proposed rule or amendment relating to ozone, carbon monoxide (CO), oxides of sulfur (SO_x), oxides of nitrogen (NO_x), and their precursors. Incremental cost effectiveness is defined as the difference in costs divided by the difference in emission reductions between one level of control and the next more stringent control. Please refer to the rule Staff Report for such analysis.

AFFECTED FACILITIES

The proposed amendments would directly affect manufacturers of natural-gas-fired, fan-type central furnaces because burners would have to be re-designed to achieve the NO_x limits. However, no manufacturers are located in the four-county area. Since furnaces are sold through local distributors (NAICS 423730—Warm Air Heating and Air-Conditioning Equipment and Supplies Merchant Wholesalers) and installers (NAICS 238220—Plumbing, Heating, and Air-Conditioning Contractors), they will be indirectly affected. Residential and commercial property owners (consumers and real estate lessors, respectively), as well as builders for new construction will pay a higher price (incremental manufacturing cost plus markup) resulting from the proposed amendments. Local distributors and installers will benefit from markups on incremental costs through additional sales dollars.

Small Businesses

The AQMD defines a "small business" in Rule 102 as one which employs 10 or fewer persons and which earns less than \$500,000 in gross annual receipts. In addition to the AQMD's definition of a small business, the federal Small Business Administration (SBA), the federal Clean Air Act Amendments (CAAA) of 1990, and the California Department of Health Services (DHS) also provide definitions of a small business.

The SBA's definition of a small business uses the criteria of gross annual receipts (ranging from \$0.5 million to \$25 million), number of employees (ranging from 100 to 1,500), megawatt hours

generated (4 million), or assets (\$150 million), depending on industry type. The SBA definitions of small businesses vary by 6-digit North American Industrial Classification System (NAICS) code.

The CAAA classifies a facility as a "small business stationary source" if it: (1) employs 100 or fewer employees, (2) does not emit more than 10 tons per year of either VOC or NO_x, and (3) is a small business as defined by SBA.

There are no manufacturers of furnaces in the four-county area. Based on the information provided by the NAICS Association, there are 234 distributors of furnaces in the area, of which 191 are small businesses (fewer than 100 employees) under the federal SBA definition and 95 are small businesses under the AQMD definition. Emission data on distributors is not available to determine whether a business is small under the CAAA definition.

According to the 2007 County Business Patterns, there were 3,802 installers in the four-county area. However, the lack of data on sales, employment, and emissions prevents the assessment of small business status of a facility. Sales, employment, and emission data on affected lessors of real estate and affected home and commercial builders is not available either. Therefore, their small business status cannot be determined.

COMPLIANCE COSTS

The proposed amendments will affect several types of furnaces. Mobile home furnaces have a two-phase compliance schedule. AQMD staff assumes that the incremental cost of a mobile home furnace to consumers resulting from the NO_x emission limit of 40 ng/J in 2012 is estimated to be \$10. It is estimated that approximately 15 tests nationwide will be conducted to certify these compliant furnaces. One-third of such tests would be conducted in a testing lab in Los Angeles County at a cost of \$1,200 per test.

AQMD staff estimated that the incremental cost of a furnace meeting the 14 ng/J NO_x limit to consumers regardless of its type (mobile home, condensing, non-condensing, or weatherized) would be between \$108 and \$240, despite the compliance years being staggered by type of furnace (from 2014 to 2018). Please refer to the Staff Report for details of these estimates. For the purpose of the socioeconomic analysis herein, the average cost of \$174 [= (108 + 240)/2] per furnace is assumed. This cost includes material costs and certification tests to furnace manufacturers, markups at various sales stages, and any other necessary cost to bring a furnace to consumers. The early compliance incentive will help to partially offset R&D costs for furnaces in the event manufacturers take advantage of it. The AQMD planned funding for product development and R&D plans might reduce the \$174 incremental cost.

Based on the upper end price of a furnace at \$2,000, implementation of the proposed amendments would, at most, result in an average 8.7 percent increase in the price of a furnace. This increase is relatively small given the average 25-year life of a furnace.

The proposed amendments would affect new and replaced furnaces. It is estimated that there are 4.5 million existing furnaces in the four-county area, of which four percent are mobile home

furnaces, 26 percent condensing furnaces, 60 percent non-condensing furnaces, and 10 percent weatherized furnaces. Since existing non-mobile home furnaces located in commercial properties are expected to be very low, staff assumed one percent for this analysis.

The number of affected furnaces each year is estimated by assuming an annual four percent replacement rate (based on an average life of 25 years for a furnace) on the existing 4.5 million furnace stock plus the growth in the number of furnaces each year. A projection of the number of new furnaces between 2012 and 2025 was performed based on the existing furnace stock and the annual compounded growth rate of housing units between 2000 and 2008 for mobile homes and occupied housing units in each county, as shown in Table 1.¹ This data is based on more current data and more updated than the 2007 Air Quality Management Plan (AQMP), which was based on the 2002 data and did not include mobile home growth rate. For the purpose of the analysis herein, it is assumed that there would be no growth of mobile home furnaces between 2012 and 2025 in Orange County. The share of each county's total number of furnaces in the four-county area is based on the number of housing units in each county in 2008.

Table 1
Annual Compounded Growth Rates
by Type of Housing Units by County (2000 – 2008)

	Los Angeles	Orange	Riverside	San Bernardino
Mobile Homes	0.018%	-0.136%	0.524%	0.830%
Occupied Housing Units	0.497%	0.789%	3.586%	1.723%

Calculated based on data downloaded from http://www.dof.ca.gov/research/demographic/reports/estimates/e-5_2001-06/.

Based on the assumptions above, the average annual cost (from the years 2011 to 2025) of the proposed amendments is projected to be \$30.4 million, as shown in Table 2. Of the total annual \$30.4 million cost, consumers would incur \$22.9 million (75 percent) due to furnace replacements, and home and commercial builders will incur \$7.3 million (24 percent) due to new construction. The \$0.2 million cost to real estate lessors represents furnace replacements in existing commercial properties. The cost to furnace manufacturers in 2011 represents the certification tests for complying with the 40 ng/J NO_x limit for mobile home furnaces in 2012.

Table 2
Cost of Proposed Amendments by Industry (in millions of dollars)

Industry	2011	2012	2014	2015	2016	2018	2025	Average Annual (2011-2025)
Furnace Manufacturers	\$0.018	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.001
Consumers	\$0.000	\$0.072	\$8.134	\$26.738	\$29.839	\$31.019	\$31.019	\$22.856
Real Estate Lessors	\$0.000	\$0.000	\$0.081	\$0.269	\$0.301	\$0.301	\$0.301	\$0.224
Home & Commercial Builders	\$0.000	\$0.003	\$2.329	\$7.859	\$8.961	\$9.407	\$10.984	\$7.312
Total	\$0.018	\$0.075	\$10.544	\$34.867	\$39.100	\$40.727	\$42.304	\$30.394

¹http://www.dof.ca.gov/research/demographic/reports/estimates/e-5_2001-06/, downloaded September 11, 2009.

The socioeconomic analysis herein did not consider the impact of the rebate program for early compliance by furnace manufacturers because it is too speculative to predict which manufacturers would opt into the program.

TOTAL IMPACTS

The REMI model (PI+ v1.0.116) is used to assess the total socioeconomic impacts of a policy change (i.e., the proposed amendments). The model links the economic activities in the counties of Los Angeles, Orange, Riverside, and San Bernardino. The REMI model for each county is comprised of a five block structure that includes (1) output and demand, (2) labor and capital, (3) population and labor force, (4) wages, prices and costs, and (5) market shares. These five blocks are interrelated. Within each county, producers are made up of 165 private non-farm industries, three government sectors, and a farm sector. Trade flows are captured between sectors as well as across the four counties and the rest of U.S. Market shares of industries are dependent upon their product prices, access to production inputs, and local infrastructure. The demographic/migration component has 160 ages/gender/race/ethnicity cohorts and captures population changes in births, deaths, and migration.

The assessment herein is performed relative to a baseline of the existing Rule 1111. Direct effects of the policy change (proposed amendments) have to be estimated and used as inputs to the REMI model in order for the model to assess secondary and induced impacts for all the actors in the four-county economy on an annual basis and across a user-defined horizon (2011 to 2025). Direct effects of PAR 1111 include additional costs to the affected entities and additional sales of furnaces that meet the proposed limits by local vendors at the county level and by industry.

The job impact analysis considers the incremental prices to buyers of compliant furnaces. The buyers of replacement furnaces are homeowners and lessors of commercial real estate properties. In general, any rise in furnace prices would tend to reduce purchasing power of homeowners and increase the cost of doing business for the lessors (NAICS 5311—Lessors of Real Estate). For new housing units, a rise in furnace prices would also tend to increase the cost of doing business for home and commercial builders (NAICS 236—Construction of Buildings). On the other hand, the local distributors of furnaces (NAICS 42—Wholesale Trade) will benefit from the additional sales of furnaces and installers of furnaces will benefit from the price markup.² There would also be minor benefit to the industry of professional and technical services (NAICS 54) resulting from certification tests conducted in Los Angeles County. The following sections attempt to quantify the magnitude of impacts mentioned above, which are relatively minor compared to the overall economy.

Employment Impact by Industry

The total employment impact of the proposed amendments across industries in key years is shown in Table 3. It is estimated that an average of 221 jobs will be forgone annually from 2013

²The wholesale portion of the incremental cost is approximately 75 percent of the incremental cost based on the markups at various production/selling stages of residential furnaces (Table 5.7.1 in US DOE, 2007). The remaining 25 percent markup from installers to consumers becomes (proprietors') income to the installers.

to 2025 across all industries in the four-county area, which is 0.002 percent of the average baseline jobs during the same period. No job impacts are projected for 2012 and 2013. There would be an additional 62 jobs created in the wholesale sector where local distributors of furnaces belong. The job creation is due to the projected rise in furnace prices.

Increases in prices of furnaces are translated to reductions in consumers' purchasing power and the increased cost of doing business for affected industries. The sectors of construction, and real estate and rental and leasing are projected to have an average of 47 and 36 annual jobs forgone, respectively, resulting from purchasing compliant furnaces. Consumers may reduce spending on other consumption items to compensate for increases in prices of furnaces. The most affected items would be those products and services sold by the industry of retail trade (NAICS 55). For example, there would be 50 annual jobs forgone in this industry.

Table 3
Job Impact of Proposed Amendments by Industry by Year

Industry Title	NAICS	Year					Average Annual (2013 - 2025)
		2014	2015	2016	2018	2025	
Forestry, Fishing, Related Activities, and Other	113-115	0	0	0	0	-1	-1
Utilities	22	0	0	0	0	-1	0
Construction	23	-7	-27	-42	-56	-60	-47
Manufacturing	31 - 33	-2	-8	-13	-20	-31	-19
Wholesale Trade	42	27	85	88	80	53	62
Retail Trade	44 - 45	-11	-38	-47	-55	-69	-50
Transportation and Warehousing	48 - 49	0	0	-2	-5	-10	-5
Information	51	0	-1	-2	-3	-6	-3
Finance and Insurance	52	-1	-5	-9	-14	-23	-14
Real Estate and Rental and Leasing	53	-4	-17	-25	-36	-58	-36
Professional and Technical Services	54	1	0	-6	-15	-36	-18
Management of Companies and Enterprises	55	0	1	0	-1	-3	-1
Administrative and Waste Services	56	2	4	0	-8	-22	-10
Educational Services	61	0	0	-1	-4	-10	-5
Health Care and Social Assistance	62	0	-1	-6	-13	-36	-17
Arts, Entertainment, and Recreation	71	0	-1	-3	-5	-11	-6
Accommodation and Food Services	72	0	-2	-6	-13	-30	-15
Other Services, except Public Administration	81	-1	-3	-7	-11	-23	-12
Government	92	0	-1	-9	-22	-49	-25
Total		4	-14	-88	-203	-428	-221

Competitiveness

The additional costs resulting from the proposed amendments could increase the cost of production of the affected industries relative to their national counterparts. Changes in relative production costs would thus be a good indicator of changes in relative competitiveness. The

magnitude of the impact depends on the size and diversification of, and infrastructure in a local economy, as well as interactions among industries. A large, diversified, and resourceful economy would absorb the impact with relative ease. The relative cost of production in the construction industry is projected to rise by 0.01 percent in 2015 and by 0.02 percent from 2016 to 2025, compared to its national counterparts. The relative cost of production in the industry of real estate and rental and leasing would have a slight rise of 0.01 percent in 2016 only. Impacts on other industries are not observed.

Changes in production costs will affect prices of goods produced locally. The relative delivered price of a good is based on its production cost and the transportation cost of delivering the good to where it is consumed or used. The average price of a good at the place of use reflects prices of the good produced locally and imported elsewhere. The construction industry is projected to have the same magnitude of increases in its relative prices as in the cost of production. The increases in prices for the real estate and rental and leasing industry are projected to be 0.01 percent from 2015 to 2023. No projected price increases are forecasted for other industries.

RULE ADOPTION RELATIVE TO THE COST EFFECTIVENESS SCHEDULE

On October 14, 1994, the Governing Board adopted a resolution that requires staff to address whether rules being proposed for adoption are considered in the order of cost-effectiveness. The 2007 Air Quality Management Plan (AQMP) ranked, in the order of cost-effectiveness, all of the control measures for which costs were quantified. It is generally recommended that the most cost-effective actions be taken first.

The proposed amendments to Rule 1111 implement control measure CMB-03 (NO_x Reductions from Residential Space Heaters) in the 2007 AQMP. Cost-effectiveness of control measure CMB-03 was estimated to be \$10,000 per ton of NO_x reduced, which resulted in being ranked 7th out of 12 stationary source control measures. The cost-effectiveness of the proposed amendments is estimated to be between \$8,600 and \$19,000 per ton of NO_x reduced.

REFERENCES

California Department of Finance. E-5 City/County Population and Housing Estimates. Downloaded September 11, 2009 from http://www.dof.ca.gov/research/demographic/reports/estimates/e-5_2001-06/.

NAICS Association. June 26, 2009 Electronic Mail Message from mitch@naics.com on Facility List for Furnace Manufacturers and Distributors in the Counties of Los Angeles, Orange, Riverside, and San Bernardino.

Regional Economic Models, Inc. REMI PI+ version 1.0.116. Amherst, MA. 2009.

SCAQMD. Preliminary Draft Staff Report for Proposed Amended Rule 1111—NO_x Emissions from Natural-Gas-Fired, Fan-type Central Furnaces. Diamond Bar, CA. September 2009.

South Coast Air Quality Management District (SCAQMD). Final 2007 AQMP. Diamond Bar, CA. 2007.

U.S. Department of Energy (DOE). Energy Conservation Standards for Residential Furnaces and Boilers. Washington, DC. September 2007

U.S. Small Business Administration. Table of Small Business Size Standards. Washington. DC. 2008.