

# **SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT**

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## **Draft Staff Report Proposed Amended Rule 1111 – Reduction of NO<sub>x</sub> Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces**

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## **EXECUTIVE SUMMARY**

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## EXECUTIVE SUMMARY

Rule 1111 reduces emissions of nitrogen oxides (NO<sub>x</sub>) from residential and commercial gas-fired fan-type space heating furnaces with a rated heat input capacity of less than 175,000 BTU per hour or, for combination heating and cooling units, a cooling rate of less than 65,000 BTU per hour. The rule applies to manufacturers, distributors, sellers, and installers of such furnaces.

Rule 1111 was adopted by the SCAQMD Governing Board in December 1978 and amended in 1983, 2009, 2014, and March 2018. The more significant changes included: (1) the 2009 amendment lowering the NO<sub>x</sub> emissions from 40 to 14 nanograms per Joule (ng/J); (2) the 2014 amendment providing an alternate compliance option that allows the original equipment manufacturers (OEMs) to pay a per unit mitigation fee of \$200 for each condensing furnace and \$150 for each other type of furnace, in lieu of meeting the new lower NO<sub>x</sub> emission limit of 14 ng/J, for up to 36 months past the applicable compliance date; and (3) the March 2018 amendment extending the mitigation fee alternate compliance option by 1.5 years for condensing furnaces and one year for non-condensing and weatherized furnaces, and increasing the mitigation fee to a range of \$300 to \$450, depending on the furnace type and heat input capacity, with no fee change for mobile home units.

In 2018, staff also established a rebate program to incentivize consumers to purchase and install compliant 14ng/J furnaces in the SCAQMD instead of the 40 ng/J units that are subject to a mitigation fee. The SCAQMD executed the contract with Electric & Gas Industries Association (EGIA) on May 4, 2018, for the rebate program. EGIA is currently working with furnace manufacturers, distributors, and contractors on consumer outreach programs, which focus on consumer points of sale.

At the March 2018 Public Hearing for the Rule 1111 amendment, the Governing Board approved the proposed amendments and directed staff to return to the Board with a labeling requirement for units that are subject to the mitigation fee alternate compliance option. The objective is to better inform consumers that when they are purchasing a 40 ng/J furnace, that furnace is subject to the mitigation fee, while there are other compliant furnaces (14 ng/J) that are commercially available and eligible for a consumer rebate.

Based on feedback from manufacturers, distributors, and contractors, as well as additional direction from members of the Governing Board, staff proposes to add a Consumer Notification Requirement for all informative materials made available for any furnace that is utilizing the mitigation fee alternate compliance option, instead of including the information on a label on the furnace and/or shipping container. This requirement will notify consumers on all consumer brochures, technical specification sheets, and the manufacturer's website that the unit is subject to a mitigation fee and is not eligible for the Clean Air Furnace Rebate Program.

## **CHAPTER 1: BACKGROUND**

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INTRODUCTION

REGULATORY HISTORY

EQUIPMENT AND PROCESS

REQUIREMENTS AND TESTS FOR NEW TECHNOLOGY

AFFECTED INDUSTRIES

PUBLIC PROCESS

## INTRODUCTION

The purpose of Rule 1111 – Reduction of NO<sub>x</sub> Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces is to reduce NO<sub>x</sub> emissions from residential and commercial gas-fired fan-type space heating furnaces with a rated heat input capacity of less than 175,000 BTU per hour or, for combination heating and cooling units, a cooling rate of less than 65,000 BTU per hour. The rule applies to manufacturers, distributors, sellers, and installers of such furnaces. It requires manufacturers to certify that each furnace model offered for sale in the SCAQMD complies with the emission limit using specific test methods approved by the SCAQMD and U.S. EPA. In lieu of meeting the lower emission limit, the current rule provides manufacturers an alternate compliance option of paying a per-unit mitigation fee for up to 3 to 4.5 years past the applicable compliance date, depending on the furnace type. Most single family homes, many multi-unit residences, and some small commercial building in the SCAQMD use this type of space heating equipment.

## REGULATORY HISTORY

Rule 1111 was adopted by the SCAQMD Governing Board in December 1978, addressing all sizes of space heating furnaces. The original rule required all residential and commercial space heating furnaces to meet a NO<sub>x</sub> emission limit of 40 nanograms per Joule (ng/J) of heat output (equivalent to 61 ppm at a reference level of 3% oxygen and 80% Annual Fuel Utilization Efficiency (AFUE)) beginning January 1, 1984. At the December 1978 rule adoption Hearing, a rule requirement that all space heating furnaces meet a 12 ng/J NO<sub>x</sub> emission limit by 1995 was considered by the Governing Board but not adopted.

Rule 1111 was later amended in July 1983 in order to limit applicability based on a unit's size and to exempt larger commercial space heaters. The rule amendment limited applicability to furnaces with a heat input of less than 175,000 Btu per hour or, for combination heating and cooling units, a cooling rate of less than 65,000 Btu per hour. The July 1983 amendment also exempted units manufactured for use in mobile homes (manufactured housing), revised the definition of efficiency, and clarified testing procedures.

In November 2009, Rule 1111 was amended to be consistent with the objectives of the 2007 Air Quality Management Plan (AQMP) Control Measure CMB-03. The 2009 amendment established a new lower NO<sub>x</sub> emission limit of 14 ng/J (equivalent to 22 ppm at a reference level of 3% oxygen and 80% AFUE), and required the three major categories of residential furnace – condensing (high efficiency), non-condensing (standard), and weatherized – to meet the new limit by October 1, 2014, October 1, 2015, and October 1, 2016, respectively. Furthermore, new mobile home heating units, which were unregulated prior to the 2009 amendment, had to meet a NO<sub>x</sub> limit of 40 ng/J by October 1, 2012, with a future limit of 14 ng/J on October 1, 2018. The new lower NO<sub>x</sub> emission limit of 14 ng/J reflects a 65% reduction from the then current limit of 40 ng/J. To facilitate the depletion of existing inventories and to ensure a smooth transition to the new limits, Rule 1111 also provided a temporary 10-month exemption (a sell-through period) for units manufactured and delivered into the SCAQMD prior to the compliance date.

To encourage and accelerate technology development, the 2009 Rule 1111 amendment provided an incentive for early compliance with the 14 ng/J NO<sub>x</sub> emission limit, and a \$3 million fund was approved for this purpose. Manufacturers that delivered 14 ng/J furnaces into the SCAQMD prior to the applicable compliance date were given the opportunity to receive a payment of \$75 for each standard efficiency furnace and \$90 for each high-efficiency unit sold and delivered into the SCAQMD 90 days prior to the applicable compliance date. However, to date, no manufacturer has applied for this incentive.

The 2009 Rule 1111 amendment also required a technology assessment and status report to the Governing Board. This technology assessment evaluated both the feasibility of the new lower NO<sub>x</sub> emission limit and the rule implementation schedule. The SCAQMD Technology Advancement Office (TAO) initiated a Request for Proposals (RFP) to develop prototype residential furnaces that meet the new 14 ng/J NO<sub>x</sub> limit. The technology development projects were initiated in 2010 and completed in 2013. The total cost of the four projects was \$1,447,737 with \$447,737 provided by The Gas Company and \$50,000 provided by the San Joaquin Valley Unified Air Pollution Control District. The prototype furnaces developed through these four projects demonstrated that the new lower Rule 1111 NO<sub>x</sub> limit is achievable in all of the types of forced air residential heating furnaces produced for the United States market. However, additional time may have been needed to commercialize 14 ng/J furnaces. This technology assessment was presented at the Governing Board meeting on January 10, 2014.

Rule 1111 was later amended in September 2014 to delay the compliance date for condensing furnaces and provide an alternate compliance option. The alternate compliance option allows manufacturers subject to Rule 1111 to pay a per unit mitigation fee of \$200 for each condensing furnace and \$150 for each other type of furnace distributed or sold into the SCAQMD, in lieu of meeting the new lower NO<sub>x</sub> emission limit. The mitigation fee alternate compliance option can be used for up to 36 months past the applicable compliance date. Depending on furnace type, the mitigation fee option had an end date, and the NO<sub>x</sub> limit of 14 ng/J was phased in, over the period from April 1, 2018, to October 1, 2021. Industry endorsed the mitigation fee approach. The 2014 amendment was State Implementation Plan (SIP)-approved in March 2016, with the mitigation fee used to offset foregone emissions reductions.

Rule 1111 was last amended in March 2018. Based on considerations of technology development and implementation status, stakeholders' input, and the need to encourage development and sale of compliant products, the following amendments were made to Rule 1111: (1) increasing the mitigation fee in two phases to a range of \$300 to \$450, depending on the furnace type and heat input capacity; (2) extending the mitigation fee alternate compliance option by 1.5 years for condensing furnaces, and one year for non-condensing and weatherized furnaces; (3) providing an exemption from the mitigation fee increase for units encumbered in a contractual agreement by OEMs and distributors for new construction, if contracts were signed prior to January 1, 2018; (4) providing an exemption of rule applicability for natural gas furnaces to be installed with propane conversion kits for propane firing only, with a defined labeling requirement; and (5) removing the 120 day lead time requirement for certification application submittal.



In March 2018, staff also proposed to establish a rebate program for consumers who purchase and install compliant furnaces in the SCAQMD to benefit consumers and incentivize the purchase of lower emitting compliant furnaces. The SCAQMD executed the contract with Electric & Gas Industries Association (EGIA) on May 4, 2018, to administer the rebate program. Current funding for this rebate program includes the previously authorized \$3 million and the incremental increase of Rule 1111 mitigation fees in the March 2018 amendment, specified as \$500 per furnace for the first 6000 rebates, and \$300 per condensing furnace and \$200 per each other type of furnace thereafter. The SCAQMD will be closely monitoring the program with a “real-time” dashboard, and may seek additional funds or make other adjustments based on program performance. EGIA is anticipated to start receiving application in June 2018 for this Clean Air Furnace Rebate Program.

At the March 2018 Public Hearing for the Rule 1111 amendment, the Governing Board expressed concern that consumers should be informed that they are paying a fee for non-compliant furnaces sold in the marketplace and that there are compliant units commercially available that are eligible for money back through the rebate program. The Board directed staff to return to the Board adding a labeling requirement to the rule to address these concerns. At the May 2018 Stationary Source Committee Meeting and the June 2018 Governing Board Meeting, members of the Governing Board requested that the rule not require the manufacturers to label the furnace. Instead the rule should require notification language on any written materials specifying information about or advertising furnaces being sold pursuant to the alternate compliance option.

## **EQUIPMENT AND PROCESS**

Fan-type gas-fired furnaces heat a building by circulating air from inside the building (office, home, apartment, etc.) through the furnace. In a fan-type furnace, air is heated when it passes through a heat exchanger. Combustion gases heat up the inside of the heat exchanger, and air from the building that is moving past the outside of the heat exchanger removes heat from the outside surface. A blower (fan) pulls air through one or more intake ducts and pushes the air past the heat exchanger and through another set of ducts, which direct the heated air to different parts of the building. The heated air circulates through the building before it is again pulled into the intake ducts and re-heated. This process continues until a specific temperature is detected by a thermostat in the building, which then shuts off the furnace. When the temperature at the thermostat goes below a set point, the thermostat sends a signal for the furnace to turn on.

## **REQUIREMENTS AND TESTS FOR NEW TECHNOLOGY**

Gas furnaces in the United States must meet the ANSI Z21.47/CSA 2.3 standard referred as CSA certification, mainly to ensure safety. To be sold and installed in the SCAQMD jurisdiction, they must also be certified by the SCAQMD for Rule 1111 NOx emission limit compliance by specific test methods approved by the SCAQMD and U.S. EPA. OEMs may also participate in AHRI certification program for verification test of output heating capacity and annual fuel utilization efficiency. As gas furnaces should be installed according to building heating,

ventilation, and air conditioning (HVAC) requirements, manufacturers have training programs for installers.

## **AFFECTED INDUSTRIES**

Proposed Amended Rule 1111 affects manufacturers (NAICS 333), distributors and wholesalers (NAICS 423), and retailers and dealers (NAICS 444) of residential furnaces. Because heating units regulated by the rule are used in most residential and many commercial settings for heating small buildings, construction and building contractors and installers (NAICS 238 and 811) related to residential furnaces are also affected by PAR 1111. The Air Conditioning Heating and Refrigeration Institute (AHRI), the major manufacturer's trade organization, indicates that there are no manufacturers of fan-type gas-fired residential furnaces in the SCAQMD. However, these companies do maintain regional sales offices and distribution centers in the SCAQMD and there are manufacturers of other types of heating furnaces in the SCAQMD.

## **PUBLIC PROCESS**

The proposed labeling or labeling requirements were discussed at the March 28, 2018, Working Group meeting. The proposal was also discussed at the April 13, 2018, Public Consultation, and the April 20, 2018 and May 18, 2018, Stationary Source Committee (SSC) meetings, as well as the June 1, 2018, Governing Board meeting. The Public Hearing for PAR 1111 is scheduled for July 6, 2018.

## **CHAPTER 2: SUMMARY OF PROPOSED AMENDED RULE 1111**

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### **PROPOSED AMENDMENTS TO RULE REQUIREMENTS**

## PROPOSED AMENDMENTS TO RULE REQUIREMENTS

In lieu of meeting the 14 ng/J NO<sub>x</sub> emission limit, paragraph (c)(5) provides furnace manufacturers that are subject to Rule 1111 an option to pay a per unit mitigation fee for up to 3 to 4.5 years past the Table 1 compliance date, depending on the type of furnace. The SCAQMD Clean Air Furnace Rebate Program provides consumers an incentive to purchase and install furnaces that are certified to meet the 14 ng/J NO<sub>x</sub> emission limit. The incentive is \$500 per furnace for the first 6000 rebates, and thereafter \$300 per condensing furnace and \$200 per other types. The consumer notification requirements are intended to inform the consumer market that non-compliant furnaces are subject to the mitigation fee, while compliant furnaces are commercially available and eligible for a consumer rebate.

### Consumer Notification Requirements

At the March 2018 Board meeting to adopt amendments to extend and increase the mitigation fee option, the Board directed staff to add a labeling requirement to the Rule that would inform the consumers when they are purchasing a furnace that is subject to a mitigation fee. During the rule development process for the proposed amendments, manufacturers suggested that consumers could be more effectively informed of the mitigation fee and rebate program by including information in brochures and on their websites as most consumers do not see the unit prior to purchase, or even after installation (e.g., attic furnaces).

On this basis, staff proposes to add new paragraph (e)(3) to require, no later than October 1, 2018, that the manufacturer of any furnace that is using the alternate compliance option and paying a mitigation fee because the unit is not certified to meet the 14 ng/J certification limit, include approved language in the consumer brochure and technical specification sheet for that furnace, as well as on the manufacturer's website. The notification language must read: "For installation in SCAQMD only: This furnace does not meet SCAQMD Rule 1111 14 ng/J NO<sub>x</sub> emission limit, and thus is subject to a mitigation fee of up to \$450. This furnace is not eligible for the Clean Air Furnace Rebate Program: [www.CleanAirFurnaceRebate.com](http://www.CleanAirFurnaceRebate.com)." In lieu of the specified language, however, manufacturers may use alternative language that is approved by the SCAQMD Executive Officer no later than August 31, 2018. This alternative language must be submitted to the Executive Officer no later than August 1, 2018. If the alternative language is not approved, the manufacturer would be required to use the specified language.

In addition, the portion of the SCAQMD website detailing the Clean Air Furnace Rebate Program will include a public outreach program. EGIA, which is administering the rebate program, is also working with furnace manufacturers, distributors, and contractors on plans to target consumers at points of sale. Consumer awareness of the incentive and mitigation fee will be enhanced by these rebate program outreach activities.

## **CHAPTER 3: IMPACT ASSESSMENT**

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**EMISSION REDUCTIONS AND COST EFFECTIVENESS**

**CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) ANALYSIS**

**SOCIOECONOMIC IMPACT ASSESSMENT**

**DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY  
CODE SECTION 40727**

**INCREMENTAL COST-EFFECTIVENESS**

**COMPARATIVE ANALYSIS**

**CONCLUSION AND RECOMMENDATIONS**

## **EMISSION REDUCTIONS AND COST EFFECTIVENESS**

The proposed amendments do not result in any significant effect on air quality and do not result in any changes on emissions. As a result, a cost effectiveness analysis is not required. Implementation of PAR 1111 may better inform consumers so that they will select a 14 ng/J unit instead of a 40 ng/J unit that is subject to a mitigation fee, thereby increasing the quantity of compliant units purchased.

## **CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) ANALYSIS**

Pursuant to the California Environmental Quality Act (CEQA) and SCAQMD Rule 110, the SCAQMD, as lead agency for the proposed project, has reviewed the proposed amendments to Rule 1111 pursuant to: 1) CEQA Guidelines Section 15002(k) – General Concepts, the three-step process for deciding which document to prepare for a project subject to CEQA; and 2) CEQA Guidelines Section 15061 – Review for Exemption, procedures for determining if a project is exempt from CEQA. SCAQMD staff has determined that it can be seen with certainty that there is no possibility that the proposed amendments to Rule 1111 may have a significant adverse effect on the environment. Therefore, the project is considered to be exempt from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) – Activities Covered by General Rule. A Notice of Exemption will be prepared pursuant to CEQA Guidelines Section 15062 – Notice of Exemption. If the proposed project is approved, the Notice of Exemption will be filed with the county clerks of Los Angeles, Orange, Riverside, and San Bernardino counties.

## **SOCIOECONOMIC IMPACT ASSESSMENT**

The proposed amendments to Rule 1111 add consumer notification requirements for informational materials, including marketing brochures, technical specification sheets, and manufacturers' websites, for furnaces that are not certified to meet the 14 ng/J NO<sub>x</sub> limit and are participating in the alternate compliance option. The proposed amendments are administrative in nature and cost impacts to manufacturers are expected to be minimal; as such there are no significant adverse socioeconomic impacts. The proposed amendments do not require that the manufacturers generate additional brochures or specification sheets. Instead, the requirement is to add information to brochures, technical specification sheets, and their website, which they already create, maintain, and distribute. In addition, the proposed amendments do not significantly affect air quality and emission limitations, and therefore, no Socioeconomic Impact Assessment is required under California Health and Safety Codes sections 40440.8 and 40728.5.

## **DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY CODE SECTION 40727**

California Health and Safety Code Section 40727 requires that prior to adopting, amending, or repealing a rule or regulation, the SCAQMD Governing Board shall make findings of necessity, authority, clarity, consistency, non-duplication, and reference based on relevant information presented at the public hearing and in the staff report. In order to determine compliance with

Sections 40727, 40727.2 require a written analysis comparing the proposed amended rule with existing regulations.

The following provides the draft findings.

**Necessity:** A need exists to amend Rule 1111 to provide consumer notification requirements for any furnace that is utilizing the mitigation fee alternate compliance option to better inform the consumer that a unit is subject to a mitigation fee and that there are other units that are eligible for a consumer rebate.

**Authority:** The SCAQMD obtains its authority to adopt, amend, or repeal rules and regulations from California Health and Safety Code Sections 39002, 40000, 40001, 40440, 40440.1, 40702, 40725 through 40728, 41508, and 41700.

**Clarity:** PAR 1111 has been written or displayed so that its meaning can be easily understood by the persons affected by the rule.

**Consistency:** PAR 1111 is in harmony with, and not in conflict with or contradictory to, existing federal or state statutes, court decisions, or federal regulations.

**Non-Duplication:** PAR 1111 does not impose the same requirement as any existing state or federal regulation, and is necessary and proper to execute the powers and duties granted to, and imposed upon, the SCAQMD.

**Reference:** In amending this rule, the SCAQMD hereby implements, interprets, or makes specific reference to the following statutes: Health and Safety Code sections 39002, 40001, 40702, 40440(a), and 40725 through 40728.5.

## INCREMENTAL COST-EFFECTIVENESS

Health and Safety Code section 40920.6 requires an incremental cost-effectiveness analysis for Best Available Retrofit Control Technology (BARCT) rules or emission reduction strategies when there is more than one control option that would achieve the emission reduction objective of the proposed amendments, relative to ozone, CO, SO<sub>x</sub>, NO<sub>x</sub>, and their precursors. The proposed amendment does not include new BARCT requirements; therefore this provision does not apply to the proposed amendment.

## COMPARATIVE ANALYSIS

H&S Code section 40727.2(g) for comparative analysis is applicable when the proposed amended rules or regulations impose, or have the potential to impose, a new emissions limit or standard, or other air pollution control requirements. In this case, a comparative analysis is not required.

## **CONCLUSION AND RECOMMENDATIONS**

The proposed amendments are needed to inform consumers that noncompliant furnaces are subject to the mitigation fee, while compliant furnaces are commercially available and eligible for a consumer rebate, and thus steer the consumer choice toward the compliant furnaces for much needed NOx emission reduction.



## **REFERENCES**

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## REFERENCES

SCAQMD, 2009. *Staff Report: Proposed Amended Rule 1111 – NOx Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces*. South Coast Air Quality Management District, November 2009.

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SCAQMD, 2017. *Final 2016 Air Quality Management Plan*. South Coast Air Quality Management District, March 2017.

SCAQMD, March 2018. *Staff Report: Proposed Amended Rule 1111 – NOx Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces*. South Coast Air Quality Management District, September 2014.

SCAQMD, March 2018. *Board letter: Execute Contract to Implement Consumer Rebate Program for Rule 1111 Compliant Natural Gas-Fired, Fan-Type Central Furnaces*

## **RESPONSE TO COMMENTS**

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## RESPONSE TO COMMENTS

SCAQMD staff held a public consultation meeting on April 13, 2018, at the SCAQMD Diamond Bar headquarters. There were no comment letters or emails received by the comment end date of April 24, 2018, nor as of to date. However, stakeholders did offer comments at the March 28, 2018, Working Group meeting, April 13, 2018, public consultation meeting, and the April 20 and May 18, 2018, Stationary Source Committee meetings. The comments and staff's responses are summarized below:

### **Mitigation Fee Increase**

- 1. Comment:** Labeling both the shipping box and furnace is burdensome to the manufacturers.

**Response:** The Proposed Rule language has been modified to eliminate the requirement to label the shipping box and furnace.
- 2. Comment:** The label on the furnace may not inform consumers.

**Response:** The Proposed Rule language has been modified to eliminate the requirement to label the shipping box and furnace.
- 3. Comment:** Consumers could be more effectively informed by websites and manufacturer and contractor literature.

**Response:** Staff is recommending the consumer notification language be required on informational materials, including consumer brochures, technical specification sheets, and manufacturers' websites promoting products. The SCAQMD website will also provide information on the rebate program and mitigation fee.