
IMPLEMENTATION STATUS OF RULE 1111

NOX EMISSIONS FROM NATURAL-GAS-FIRED, FAN-TYPE CENTRAL FURNACES

TASK FORCE MEETING

APRIL 27, 2017

SCAQMD HEADQUARTERS
DIAMOND BAR, CALIFORNIA

1

AGENDA

- Summarize Rule 1111 background
- Discuss implementation status and product availability
- Recommendations provided by the Manufacturers
- Rule 1111 considerations
- Future activities and schedules

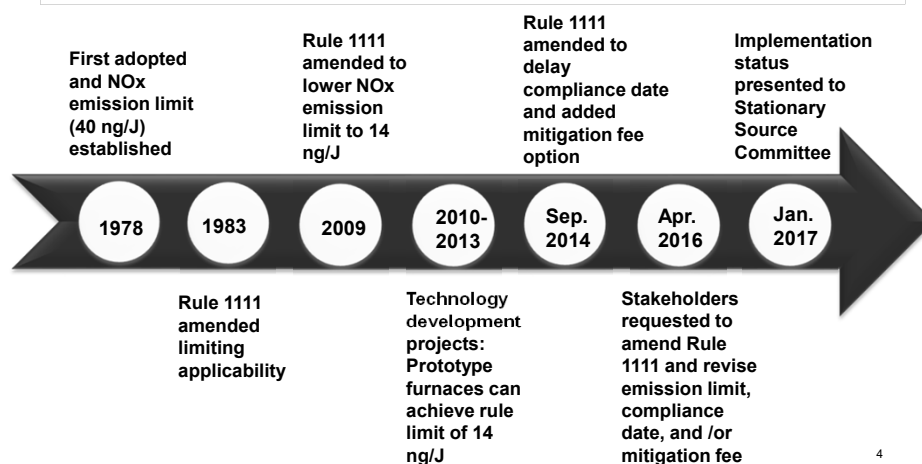
2

RULE 1111 BACKGROUND

- Applies to residential and commercial natural gas-fired fan-type central furnaces
- Regulates manufacturers, distributors, sellers and installers of these units
- NO_x emission reductions needed to achieve compliance with the ambient air quality standards

3

RULE 1111 BACKGROUND



4

SUMMARY OF CURRENT RULE 1111 COMPLIANCE DATES WITH MITIGATION FEE OPTION

	Condensing (High Efficiency)	Non-condensing (Standard)	Weatherized	Mobile Home
Compliance Date	April 1, 2015	October 1, 2015	October 1, 2016	October 1, 2018
Compliance Date Extension with Mitigation Fee	April 1, 2018	October 1, 2018	October 1, 2019	October 1, 2021
Mitigation Fee (per unit)	\$200	\$150	\$150	\$150

5

MEETING WITH MANUFACTURERS

- 14 ng/J emission standard and compliance dates were established as part of the 2009 amendment
- Rule 1111 was amended in 2014 to:
 - Postpone the compliance date for condensing units; and
 - Add a mitigation fee option for all units
- In April 2016, stakeholders requested to amend Rule 1111 stating that compliance cannot be achieved
 - In response staff conducted a survey with manufacturers in May – July, 2016 and have been closely monitoring the technology development status

6

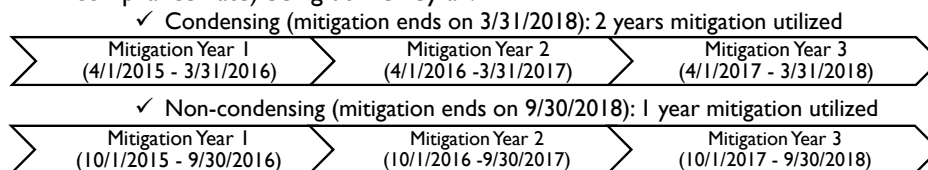
MEETING WITH MANUFACTURERS - continued

- In March – April, 2017, staff met individually with 8 original equipment manufacturers (OEM), 2 burner manufacturers, and 1 burner technology institute (Individual meetings were needed to maintain confidentiality regarding development status)
- Purpose of the individual meetings was to obtain information regarding:
 - Development status of achieving the 14 ng/J emission standard
 - Products under development
 - Issues encountered
 - Mitigation fee
 - Compliance schedule

7

IMPLEMENTATION STATUS

- One OEM has a certified standard unit
- Some OEMs have demonstrated compliance with Rule 1111 NOx limits with field tests underway for standard units, applications for certifications expected
- Compliant furnaces have not been introduced into the market to meet Rule 1111 NOx emission limit; however, commercialization schedules have been proposed by some of the OEMs
- Alternative compliance option (paying mitigation fee for up to 3 years post compliance date) being utilized by all:



IMPLEMENTATION CHALLENGES

- Temperature management: Heat exchanger temperature control and fatigue
- Reliability and safety: high temperature may result in material and system leakage, which can cause further problems, such as flash back and high CO or NOx emissions, depending on the place of leakage
- Ignition: to assure good ignition, a premix burner may need to start with rich burn, which could cause NOx emission spikes
- Noise
- Narrow band of operation
- Shorter run time in Southern California climate
- Interference with other regulations: counter to Department of Energy (DOE) regulation for fan energy rating (FER) (effective 7/3/2019)
- Low market for high efficiency unit

PRODUCT AVAILABILITY

	Condensing (High Efficiency)	Non-condensing (Standard)	Weatherized	Mobile Home
Compliance Date	April 1, 2015	October 1, 2015	October 1, 2016	October 1, 2018
Mitigation End Date	April 1, 2018	October 1, 2018	October 1, 2019	October 1, 2021
Product Availability proposed by US OEMs (as of April 2017)[# of OEMs]	2018 [1]/No scheduled proposed	2017[1]/2018 [2]/2019[2]/2020 [1]	2019 [1]/No scheduled proposed	No scheduled proposed
Product Availability by Burner Manufacturers	Burners available for Licensing			
Product Availability In Other Nations	<ul style="list-style-type: none"> • A series of furnaces by one manufacturer meet Rule 1111 NOx ≤14 ng/J limit • On the market last August in Belgium and Netherlands and in the process to UK market. • Available capacities: 34,000 btu/hr, 51,000 btu/hr, 68,000 btu/hr, 102,000 btu/hr, 136,000 btu/hr, and 170,000 btu/hr. • Offering technology to US OEMs. 			

10

MANUFACTURERS' RECOMMENDATIONS

- Emission limit and mitigation option extension
 - All OEMs target the 14 ng/J standard for their furnace development, but one OEM recommended 20 ng/J emission limit, one OEM recommended 29 ng/J, and two OEMs recommended 30 ng/J; No distinction made for which type of furnace
 - With the 14 ng/J standard for condensing units, two OEMs recommended one year extension for mitigation option while two other OEMs recommended two years extension
 - With the 14 ng/J standard for non-condensing units, one OEM recommended no change for mitigation option, one OEM recommended one year extension, and another OEM recommended two years extension
 - With the 14 ng/J standard for weatherized units, three OEMs recommended one year extension for mitigation option
 - One OEM recommended two years extension for a 30 ng/J emission limit and another OEM recommended three years extension for the 14 ng/J limit. Neither OEM made a distinction for which furnace type
- Mitigation fee change
 - One OEM recommended \$150 for all Furnace types
 - Two OEMs recommended phased approach for mitigation fee for limit from 40 to 30 then 14 ng/J.

11

STAFF CONSIDERATIONS REGARDING RULE 1111

- OEMs who have developed compliant standard units need assurance that the Rule 1111 emission limit of 14 ng/J is maintained so that they have the proper incentive to proceed with the capital investment to commercialize their units
- Continue to maintain a competitive market among OEMs and burner manufacturers; this will help ensure more reasonably priced units for the consumers

12

STAFF CONSIDERATIONS REGARDING RULE 1111 - continued

- Ensure that the compliant products adequately cover the size ranges
- Ascertain the impacts of extending and/or adjusting the amount of the mitigation fee; currently the OEMs have passed the cost of mitigation fee to the consumer
- Make sure that there is a clear path for the augmentation of the higher efficiency furnaces; the application of high efficiency equipment is in line with the 2016 AQMP goal

13

FUTURE ACTIVITIES AND SCHEDULES

- Continue stakeholder meetings
- Next Task Force meeting
 - May 25, 2017
- Staff recommendations
 - Stationary Source Committee – June 16, 2017

14