

RULE 1111 IMPLEMENTATION UPDATE

SOUTH COAST AQMD
JUNE 10, 2020

Zoom Meeting: <https://scaqmd.zoom.us/j/99598021381>
Meeting ID: 995 9802 1381

Conference Call: +1 669 900 6833 US (San Jose)
+1 346 248 7799 US (Houston)

AGENDA

- ❑ Summary of Previous Rule Amendment
- ❑ Impacts of COVID-19
- ❑ Areas of Focus and Tracking of Rule 1111 Activities
- ❑ Status of Compliant Units
 - Furnace Rebate Program
- ❑ Compliance Deadlines and Development Update
 - High Altitude Condensing/Non-Condensing Furnaces
 - Weatherized Furnaces (aka. Packaged Units)
- ❑ Dual Fuel Heating Systems
- ❑ Staff Recommendations

SUMMARY OF PREVIOUS RULE AMENDMENT

December 6, 2019 amendments to Rule 1111

- Provided exemption for condensing and noncondensing furnace installations at high elevations (4,200 feet above sea level or higher)
- Exemption ends on October 1, 2020

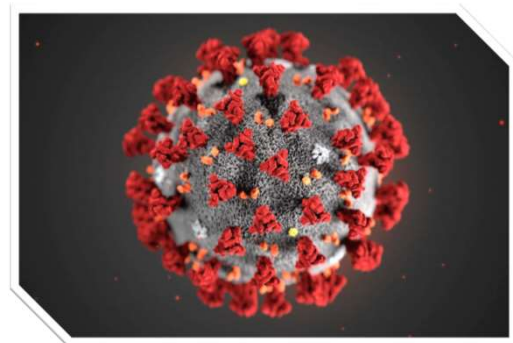
Staff included in the Board Resolution to return to the Stationary Source Committee to provide updates on concerns raised

- Supervisor Rutherford requested that staff continue working with manufacturers, distributors and dealers regarding:
 - Availability of high altitude and weatherized furnaces (package units) by October 1, 2020
 - Consideration for natural gas and electric dual fuel heating systems as an alternative compliance option
 - Issues with 14 ng/J NOx furnaces

3

IMPACTS OF COVID-19

- ❑ Multiple furnace manufacturers have reported manufacturing delays or interruptions in the supply chain as a result of COVID-19
- ❑ Other COVID-19 effects
 - Plant closures to incorporate social distancing in operations – generally 2 weeks
 - Lower production rates with social distancing
 - High rate of absenteeism
 - Need for plant-wide downtime when COVID-case for deep cleaning and quarantines
 - Company travel restrictions for worker safety
 - Changes in business decisions for commercializing compliant furnaces



4

AREAS OF FOCUS



14 ng/J Furnaces

- Update on compliant 14 ng/J furnaces
- Availability
- Any issues (noise or overheating)
- *CLEAN*air Furnace Rebate Program



High Altitude Furnaces

- Availability of high altitude furnaces for the October 1, 2020 compliance date



Weatherized Furnaces

- Availability of weatherized (package units) furnaces for the October 1, 2020 compliance date



Dual Fuel Systems

- Consideration of non-compliant furnace for dual fuel heating and cooling systems

Based on stakeholder input and direction from the Stationary Source Committee, four areas of focus were identified

5

TRACKING OF RULE 1111 ACTIVITIES

Since previous rule amendment, staff has:

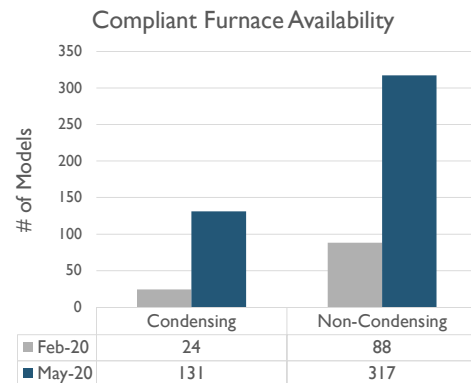
- ❑ Held multiple check-in meetings with each furnace manufacturer
- ❑ Kept track of compliant unit availability and future development
 - ✓ High efficiency condensing and non-condensing furnaces
 - ✓ Weatherized furnaces
 - ✓ High Altitude furnaces
- ❑ Maintained the *CLEAN*air Furnace Rebate Program
 - Updated qualified furnace listing
 - Program outreach
- ❑ Conducted assessments on dual fuel hybrid heating systems
- ❑ Closely monitored impacts from the COVID-19 pandemic

6

STATUS OF COMPLIANT FURNACES

Mitigation fee period for condensing and non-condensing home furnaces ended on October 1, 2019

- ❑ As of May 2020, there are a total of 448 models available from all seven furnace manufacturers
 - Furnaces range from 40,000 to 110,000 BTU/hr
- ❑ Initially received possible concerns for excessive noise
 - Manufacturers did not report complaints regarding excessive noise
- ❑ Well before the October 1, 2019 compliance date, an early model had an overheating issue
 - Manufacturer modified and resolved the issue
 - No overheating issues have been reported to the manufacturers from distributors or installers or to the South Coast AQMD staff



7

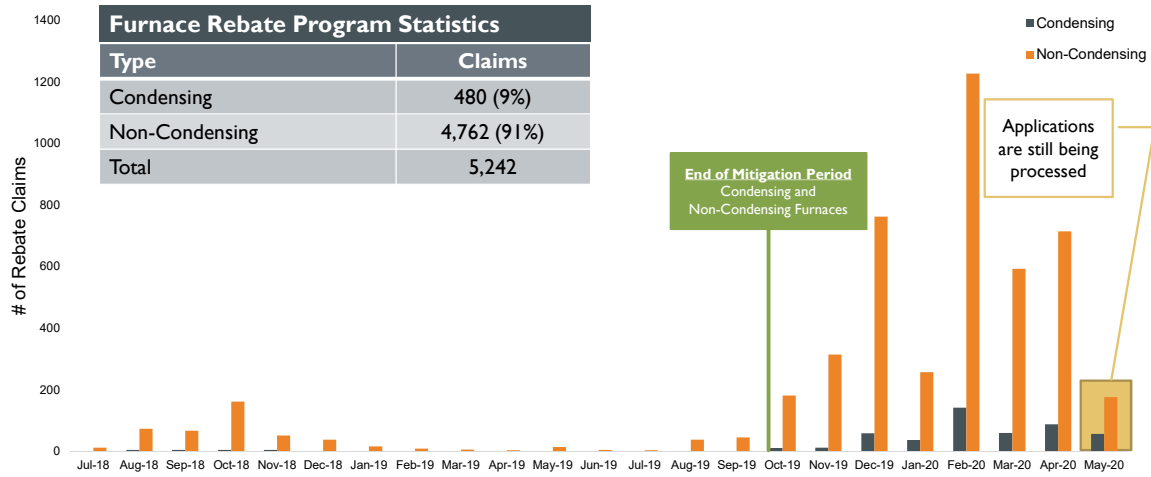
FURNACE REBATE PROGRAM UPDATE

- ❑ Staff developed the *CLEANair* Rebate Program in conjunction with the March 2018 rule amendment to assist in commercialization of the new furnace technology
 - The South Coast AQMD Governing Board approved an initial funding of \$3,000,000 to the furnace rebate program
 - Rebate website launched on June 28, 2018
 - Designed and maintained by the Electric & Gas Industries Association (EGIA)
- ❑ As of May 2020, 5,242 furnace rebates were issued with ~300 rebates to be processed
 - Initial funding of \$3,000,000 has been exhausted
- ❑ The *CLEANair* Furnace Rebate Program is currently suspended



8

FURNACE REBATE PROGRAM UPDATE



9

COMPLIANCE DEADLINES

Condensing and Non-Condensing
Furnaces

October 1, 2019



High Altitude Installations
(≥4,200 feet)

October 1, 2020

Focus of
today's
meeting

Weatherized Furnaces

October 1, 2020

Mobile Home Furnaces

October 1, 2021

10

Revised

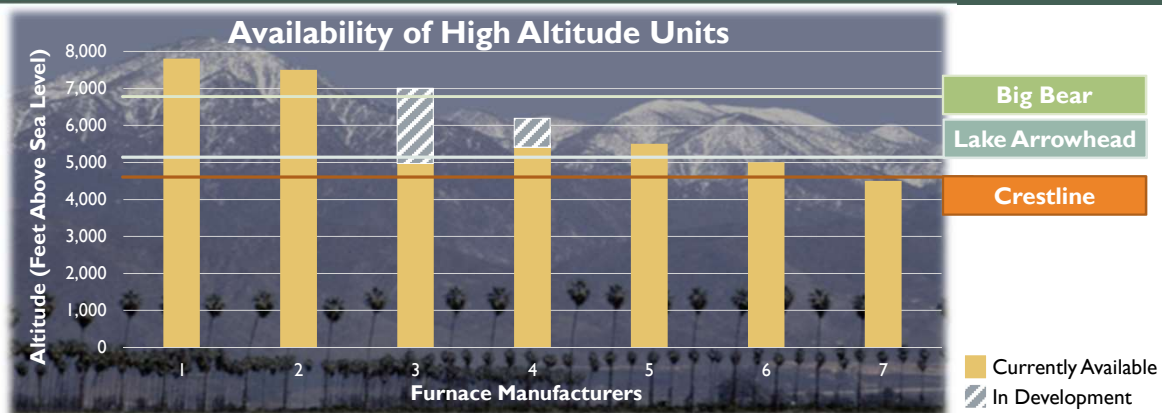
DEVELOPMENT UPDATE PROGRESS OF COMPLIANT FURNACES

- ❑ Rule 1111 was amended on December 6, 2019 to provide additional time for furnace manufacturers to test and develop units to service communities located at high elevations
- ❑ Travel restrictions due to COVID-19 pandemic has delayed testing for high altitude furnaces
- ❑ Current Progress of Development:



11

DEVELOPMENT UPDATE PROGRESS OF COMPLIANT FURNACES



Staff recommends to delay compliance date of condensing and non-condensing installed at altitudes above 4,200 ft until April 1, 2021

12

Revised

DEVELOPMENT UPDATE PROGRESS OF COMPLIANT FURNACES

- ❑ Current end of mitigation period is October 1, 2020
- ❑ Weatherized furnaces subject to Rule 1111 are developed for both residential and commercial applications

	5 out of 7 Manufacturers	1 out of 7 Manufacturers	1 out of 7 Manufacturers
Weatherized Furnaces (Residential)	Expected to Meet October Deadline	Expected After October Deadline	Development Suspended or Pending Update
	1 out of 7 Manufacturers	5 out of 7 Manufacturers	1 out of 7 Manufacturers
Weatherized Furnaces (Commercial)	Expected to Meet October Deadline	Expected After October Deadline	Development Suspended or Pending Update

13

Revised

INITIAL RECOMMENDATION FOR WEATHERIZED FURNACES

- ❑ Multiple furnace manufacturers have expressed concern of supply chain impacts from COVID-19
 - Potential delays in product launch for weatherized furnaces
- ❑ Development of weatherized furnaces for commercial and residential applications are separate
- ❑ Staff is seeking additional feedback from stakeholders on how to define commercial and residential applications for weatherized furnaces

Staff recommends to extend mitigation fee period of weatherized furnaces from October 1, 2020 to April 1, 2021

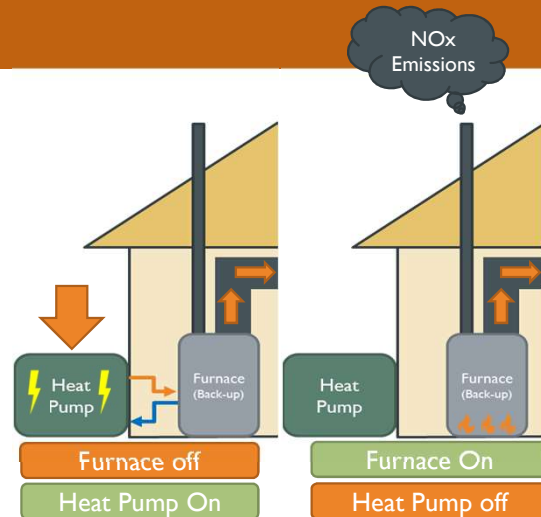
- Extension will potentially apply to only commercial weatherized furnaces

14

DUAL FUEL HEATING SYSTEMS

What is a Dual Fuel Heating System?

- ❑ Dual fuel heating system is a natural gas home furnaces paired with an electric heat pumps
- ❑ Gas-fired furnace used as auxiliary heating
 - Primary heating provided by heat pump
- ❑ Furnaces in dual fuel heating systems are used less than those in conventional heating systems[^]



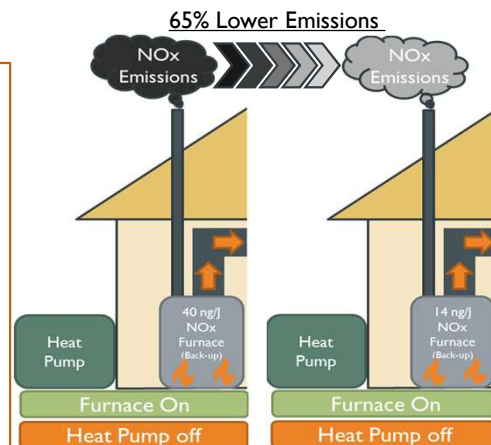
[^] Dichter, N. 2020. Analysis of NOx Emissions Hybrid Heating Technologies in California. WCEC Tech. Report WCEC 2020-01, 11 p (<https://wcec.ucdavis.edu/wp-content/uploads/Analysis-of-NOx-Emissions.WCEC-Technical-Report.2020-01.pdf>)

15

DUAL FUEL HEATING SYSTEMS WITH AN ULTRA LOW-NO_x (14 NG/J) FURNACE

Availability of Dual Fuel Heating Systems with 14 ng/J Furnace

- ❑ All seven furnace manufacturers have **14 ng/J NO_x** dual fuel systems available for sale
- ❑ Dual fuel systems equipped with **14 ng/J NO_x** furnaces emit 65% lower NO_x than equivalent systems with **40 ng/J NO_x** furnaces
 - While the furnace is operating, independent of system switchover temperature



16

New Slide

USE OF DUAL FUEL HEATING SYSTEMS

- ❑ The Western Cooling Efficiency Center of UC Davis conducted a study[^] funded by Trane Technologies to analyze NOx emissions from hybrid heating technologies in California
- ❑ Study assumed that the switchover temperature from a heat pump to a furnace is 32°F
- ❑ Based on the study:
 - Heating would be provided by the electric heat pump and the gas furnace would not operate in most areas of Southern California
 - Since all heating was provided by electric heat pump, assumes no emissions from furnace would occur

Staff Observations

- ❑ According to furnace manufacturers, the switchover temperature can be modified by the end user
- ❑ Since it is less expensive* to operate the gas furnace, no assurance that the end user
 - Will not increase switchover temperature
 - Will not bypass the heat pump
- ❑ If gas furnace is truly not needed, homeowners can install an electric heat pump without the furnace

[^] Dichter, N. 2020. Analysis of NOx Emissions Hybrid Heating Technologies in California. WCEC Tech. Report WCEC 2020-01, 11 p (<https://wcec.ucdavis.edu/wp-content/uploads/Analysis-of-NOx-Emissions.WCEC-Technical-Report.2020-01.pdf>)

* Assuming average California residential natural gas cost of \$13.69/MSCF and residential electricity cost of \$0.21/kwh as of March 2020 per data obtained from the U.S. Energy Information Administration

17

Revised

DUAL FUEL HEATING SYSTEMS

Takeaway Points

- ❑ South Coast AQMD staff supports dual fuel heating systems with a **14 ng/J NOx** furnaces
- ❑ All seven furnace manufacturers have **14 ng/J NOx** dual fuel systems available for sale
- ❑ Allowing **40 ng/J NOx** dual fuel systems would undercut dual fuel systems with **14 ng/J NOx** units by ~20%⁺
- ❑ Enforcement concerns regarding systems paired with **40 ng/J NOx** furnaces
 - Provides pathway for 40 ng/J NOx furnaces to enter the District
 - No assurance that resident will operate heat pump instead of gas furnace

⁺ Installation costs associated with 14 ng/J NOx and 40 ng/J NOx dual fuel systems are assumed to be identical and excluded from price comparison

18

STAFF RECOMMENDATIONS

- ❑ Suspend the *CLEANair* Furnace Rebate Program
- ❑ Support dual fuel units with compliant 14 ng/J NOx furnace
- ❑ Amend Rule 1111 to:
 - Delay compliance date of condensing and non-condensing high altitude furnaces from October 1, 2020 to April 1, 2021
 - Extend mitigation fee period of weatherized furnaces from October 1, 2020 to April 1, 2021
 - Potentially apply to only commercial weatherized furnaces
 - Delay compliance dates until after the heating season to allow for smoother transition
- ❑ Proposed amendments would result in a delay of up to 1.35 lb/day NOx for six months

19

CONTACTS

Rule 1111 Staff

Shawn Wang
Air Quality Specialist
(909) 396-3319
SWang@aqmd.gov

Gary Quinn, P.E.
Program Supervisor
(909) 396-3121
GQuinn@aqmd.gov

Yanrong Zhu
Air Quality Specialist
(909) 396-3289
YZhu1@aqmd.gov

Michael Krause
Planning and Rules Manager
(909) 396-2706
MKrause@aqmd.gov

20