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

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
AREAS OF FOCUS

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

- 14 ng/J Furnaces
  - Update on compliant 14 ng/J furnaces
  - Availability
  - Any issues (noise or overheating)
  - CLEANair 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

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 CLEANair 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
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

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
FURNACE REBATE PROGRAM UPDATE

<table>
<thead>
<tr>
<th>Furnace Rebate Program Statistics</th>
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<tbody>
<tr>
<td>Type</td>
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<tr>
<td>----------------------</td>
</tr>
<tr>
<td>Condensing</td>
</tr>
<tr>
<td>Non-Condensing</td>
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<tr>
<td><strong>Total</strong></td>
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End of Mitigation Period
Condensing and Non-Condensing Furnaces

Applications are still being processed

COMPLIANCE DEADLINES

- **Condensing and Non-Condensing Furnaces**: October 1, 2019
- **High Altitude Installations (≥4,200 feet)**: October 1, 2020
- **Weatherized Furnaces**: October 1, 2020
- **Mobile Home Furnaces**: October 1, 2021

Focus of today’s meeting
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:

<table>
<thead>
<tr>
<th>High Altitude (≥4,200 feet)</th>
<th>Products available up to 7,800 feet and 7,500 feet</th>
<th>Expressed interest for higher altitude certifications</th>
<th>Expressed no interest for higher altitude certifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 out of 7 Manufacturers</td>
<td>2 out of 7 Manufacturers</td>
<td>3 out of 7 Manufacturers</td>
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</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Weatherized Furnaces (Residential)</th>
<th>Weatherized Furnaces (Commercial)</th>
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<tbody>
<tr>
<td>Expected to Meet October Deadline</td>
<td>Expected to Meet October Deadline</td>
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<tr>
<td>Expected After October Deadline</td>
<td>Expected After October Deadline</td>
</tr>
<tr>
<td>Development Suspended or Pending Update</td>
<td>Development Suspended or Pending Update</td>
</tr>
<tr>
<td>5 out of 7 Manufacturers</td>
<td>1 out of 7 Manufacturers</td>
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<td>1 out of 7 Manufacturers</td>
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<td>1 out of 7 Manufacturers</td>
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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
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

AVAILABILITY OF DUAL FUEL HEATING SYSTEMS WITH 14 NG/J FURNACE

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

USE OF DUAL FUEL HEATING SYSTEMS

- 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.


* 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.
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

CONTACTS

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<thead>
<tr>
<th>Rule 1111 Staff</th>
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<tbody>
<tr>
<td>Shawn Wang</td>
</tr>
<tr>
<td>Air Quality Specialist</td>
</tr>
<tr>
<td>(909) 396-3319</td>
</tr>
<tr>
<td><a href="mailto:SWang@aqmd.gov">SWang@aqmd.gov</a></td>
</tr>
<tr>
<td>Gary Quinn, P.E.</td>
</tr>
<tr>
<td>Program Supervisor</td>
</tr>
<tr>
<td>(909) 396-3121</td>
</tr>
<tr>
<td><a href="mailto:GQuinn@aqmd.gov">GQuinn@aqmd.gov</a></td>
</tr>
<tr>
<td>Yanrong Zhu</td>
</tr>
<tr>
<td>Air Quality Specialist</td>
</tr>
<tr>
<td>(909) 396-3289</td>
</tr>
<tr>
<td><a href="mailto:YZhu1@aqmd.gov">YZhu1@aqmd.gov</a></td>
</tr>
<tr>
<td>Michael Krause</td>
</tr>
<tr>
<td>Planning and Rules Manager</td>
</tr>
<tr>
<td>(909) 396-2706</td>
</tr>
<tr>
<td><a href="mailto:MKrause@aqmd.gov">MKrause@aqmd.gov</a></td>
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