Proposed Amended Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters

Working Group Meeting #5

December 13, 2023, 9:00 AM (PST)

Join Zoom Meeting:

https://scaqmd.zoom.us/j/96893878030

Meeting ID: 968 9387 8030

Agenda

- Key Comments Received Since Working Group Meeting #4
- Updates to Baseline Emissions and Cost-Effectiveness
- Draft Rule Language Key Revisions
- Next Steps and Staff Contact

PAR 1146.2 Working Group Meeting #4

In the fourth Working Group Meeting, staff provided background on:

- Stakeholder Comments from Working Group Meeting #3
- Further Analysis on Restaurants, Hospitals, and Other Applications
- Challenges and Opportunities for New Buildings
- Baseline Emissions
- Updates to Cost-Effectiveness
- Key Rule Proposal

Meetings and Site Visits

Met with SoCalGas for discussion on cost-effectiveness analysis

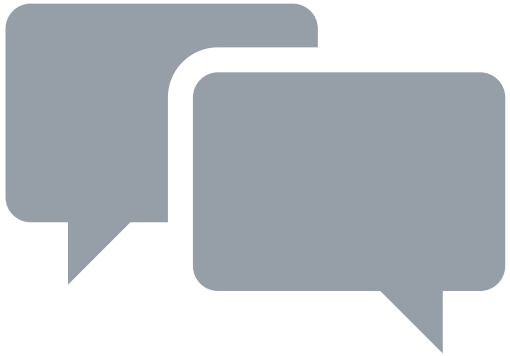
Met with a manufacturer for discussion on gas-fired tankless units

Conducted site visit to residence with gas-fired tankless water heater

Reaching out to hospitals, small restaurants, and others to gather more information and set up site visits

- Previously reached out to hospitals to gather information and visited a hospital
  - Currently reaching out to smaller hospitals to gather information
- Staff reached out to the California Restaurant Association
  - Open to visiting restaurants including small restaurants or fast food locations
- Currently setting up potential visits to other locations including grocery and hotel
  - Staff is open to any offers to visit

Key Comments Received Since Working Group Meeting #4



Key Comments Received Since Working Group Meeting #4

- One manufacturer opposed redefining boilers based on the ability to heat water to a temperature over 190 degrees Fahrenheit
  - The intent of the revised definition is to provide additional considerations for units that require higher temperatures since the technology is not as mature
    - Considering a new “High Temperature Unit” definition rather than specifying the temperature in the Boiler definition as previously proposed
- Manufacturer expressed concern over high temperature applications
  - Staff is proposing extended compliance dates for high temperature applications that may require more time for technology development or market penetration
  - Technology Assessment by 2027 would provide further opportunity to address technology or equity concerns related to the proposal prior to the compliance dates for high temperature applications

Comments located at http://www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules/rule-1146-2/comment-letters

Updates to Baseline Emissions and Cost-Effectiveness

Summary of Updates to Baseline Emissions and Cost-Effectiveness Calculation

The following slides include:

- Updates to baseline emission estimates:
  - Estimated Type 1 Pool Heater universe and baseline emission for category
  - Updated Type 1 and Type 2 Water Heater and Boiler categories' percentages of universe
- Updates to cost-effectiveness estimates:
  - Utilized 95 percent efficiency for gas-fired units (previous efficiency was not included for gas units)
  - Decreased useful life for Type 1 Water Heaters* from 25 years to 15 years
  - Included additional examples of cost-effectiveness estimates utilizing method suggested by a major manufacturer
  - Included additional scenario for Type 2 Water Heater** replacement

** Referring to Type 1 Units that are not High Temperature Units, Type 1 Pool Heaters, or Instantaneous (Tankless) Water Heaters*

*** Referring to Type 2 Units that are not High Temperature Units*

Updates to Baseline Emission Estimates

Updates to Baseline Emission Estimates

- Estimated Type 1 Pool Heater universe and updated the baseline emission estimate
  - According to 2019 Residential Appliance Saturation Study, 7% of homes in SoCalGas region have spas with gas heaters
  - Approximately 5.9 million homes in our region from the U.S. Census' 2021 American Housing Survey
  - Estimating 413,000 Type 1 Pool Heaters in the region and baseline emissions of 5.66 tons/day for this category
  - For context, the 2022 Air Quality Management Plan (AQMP) indicated a total of 351 tons/day of NOx emitted in 2018 (the base-year of the emissions inventory and modeling analysis in the plan)
- Updated Type 1 and Type 2 Water Heater and Boiler categories' percentage of universe based on AHRI certifications data

Equipment Category	Estimated Universe	Baseline Emissions Estimate (tons/day)
Type 1 Water Heaters	60,000	0.50
Type 1 Boilers		0.19
Type 2 Water Heaters and Boilers		1.39
Type 1 Pool Heaters	413,000	5.66
Tankless (Instantaneous)	300,000	0.28
Total	**773,000**	**8.02**

UPDATES TO COST-EFFECTIVENESS ASSUMPTIONS

Gas-Fired Unit Efficiency, Useful Life of Type 1 Water Heaters, and Alternate Method for Calculating Fuel Switching Costs

Update to Gas-Fired Unit Efficiency Assumption

A major manufacturer recommended utilizing 95 percent efficiency for gas-fired units in cost effectiveness calculations

- Some products in the market can reach higher efficiencies
- Manufacturers suggested that future U.S. Department of Energy or California Energy Commission standards may be raised to require 95 percent efficiency
- Staff previously did not include gas-fired unit efficiency in cost-effectiveness calculations

Staff will use 95 percent efficiency for gas-fired units in cost-effectiveness analysis

- Not all units currently achieve 95 percent efficiency, future units may if energy standards are raised
- Assumption may overestimate the cost to switch to zero-emission technologies

Update to Gas-Fired Unit Efficiency Assumption *(con't)*

- Table shows updates to cost-effectiveness estimates with the 95 percent efficiency assumption for gas-fired units
  - Assuming a lower percent efficiency would show even lower cost-effective values

Equipment Category	Replacement With	Cost-Effectiveness ($/Ton), No Panel	Cost-Effectiveness ($/Ton), Panel
Type 2 Water Heater	Six Heat Pumps (Integrated)	~~(26,000)~~(44,000)	~~(11,000)~~(29,000)
Type 1 Pool Heater	Heat Pump	~~148,000~~129,000	~~211,000~~192,000
	Heat Pump and Pool Cover	~~(40,000)~~(49,000)	~~24,000~~15,000
Tankless/ Instantaneous	Electric Resistance (Tankless)	~~1,855,000~~1,738,000	~~2,644,000~~2,527,000
	Electric Resistance (Tank Type)	~~4,307,000~~4,052,000	~~5,096,000~~4,841,000
	Heat Pump (Tank Type)	~~(44,000)~~(83,000)	~~745,000~~706,000
Type 1 Boiler	Electric Resistance	~~1,952,000~~1,827,000	~~1,971,000~~1,846,000
	Heat Pump	~~593,000~~570,000	~~611,000~~589,000
Type 2 Boiler (1 MMBtu)	Electric Resistance	~~1,951,000~~1,825,000	~~1,958,000~~1,833,000
	Heat Pump	~~347,000~~323,000	~~354,000~~330,000
Type 2 Boiler (2 MMBtu)	Heat Pump	~~263,000~~240,000	~~267,000~~244,000

Update to Equipment Useful Life Assumption for Type 1 Water Heaters

- Manufacturer site visit conversations indicated useful lifetimes of over 25 years for gas-fired water heaters and boilers
- U.S. Department of Energy indicated that storage water heaters last between 10 and 15 years and tankless water heaters may last over 20 years*
- Bay Area AQMD assumed 13 years in their zero-emission rulemaking analysis
- South Coast assumed 15 years for 2022 AQMP control Measure C-CMB-01 development
- Recent meetings with a manufacturer and utility advised lowering the useful life of Type 1 Water Heaters
- Staff has amended the Type 1 Water Heater useful life from 25 years to 15 years, and has updated baseline emission estimates and cost-effectiveness estimates accordingly

* *https://www.energy.gov/energysaver/tankless-or-demand-type-water-heaters*

Updates to Cost-Effectiveness Estimates for Type 1 Water Heaters

- Type 1 Water Heater lifetime is updated from 25 years to 15 years
  - Panel cost adjusted accordingly to $2,500 considering the longer useful lifetime of 30 years for panels versus 15 years for equipment
- Included 95 percent efficiency for gas-fired units, where previously gas-fired unit efficiency was not considered
- Cost-effectiveness calculation method and assumptions are detailed in Working Group Meeting #3 and Working Group Meeting #4 presentation slides

Equipment Category	Replacement With	Cost-Effectiveness ($/Ton), No Panel	Cost-Effectiveness ($/Ton), $2.5k Panel
Type 1 Water Heater	Heat pump example	(77,000)	20,000
	Previous 25-year Estimation*	~~(83,000)~~	~~15,000~~

** Previous estimation utilized 25-year lifetime for Type 1 Water Heater, $4.2k Panel*

Impacts of New Assumptions for Type 1 Water Heaters

Staff will now be utilizing 15-year unit lifetime for Type 1 Water Heaters

Type 1 Water Heaters are technically feasible and cost-effective to transition to zero-emission limits

- Decreasing the useful life assumption increased cost-effectiveness
- Type 1 Water Heaters remain below the 2022 AQMP cost screening threshold of $349,000, even with the shorter useful life

Staff considering backstop dates in the proposed rule to require Unit replacement at the end of useful life

- Shorter useful life assumption will result in earlier unit replacement requirements

Alternative Fuel Switching Cost Estimates and Cost-Effectiveness Estimates

Alternative Fuel Switching Cost Methodology

Staff estimated fuel switching costs based on electric input values (kWh) provided by equipment manufacturer, when available

- Methodology detailed in Working Group Meeting #3

Major equipment manufacturer suggested alternative method, which considers the energy Input

- Staff used this fuel switching calculation methodology when electric input values were not available

Slide from Working Group Meeting #3

Initial Fuel Switching Cost Calculation

- Independent comparison method:
  - Bottom-up calculation: individual units that fill similar roles from different categories
  - Daily energy demand for each unit (kWh)
    - For non-heat pump electric units, assuming 10% more efficient than existing gas units
    - Where manufacturer provided annual kWh energy demand, divided by 365 days
      - Where annual kWh not provided, divided gas-fired unit Btu by electric unit COP (or multiplied by 0.9 for electric resistance units), divided by 3412.14 Btu, multiplied by 24 hours/day, multiplied by capacity factor
    - Heat pumps assumed to be at least three times more efficient than existing gas units
      - Some manufacturers provided higher COP for their units
  - Total annual energy cost for each unit and fuel type: multiply annual energy demand by price per kWh or therm

Manufacturer-Suggested Method for Fuel Switching Cost Estimates

Energy Input Calculation Method: method suggested by a major manufacturer

- To determine fuel switching cost, this method does not utilize the annual or daily energy input (kWh) estimated by manufacturers and instead assumes the same amount of output via hot water
- This may not account for oversizing of heat pumps replacing gas-fired units
  - Cycling losses may not be represented
  - Conservative estimate

Energy Input Estimate Method: Staff utilized equipment energy input values (kWh) where provided by manufacturers to estimate fuel switching costs

- Equipment estimated annual energy input (kWh) not available in every case
  - Equipment values were available for certain categories
  - Where values were unavailable, staff had utilized the Energy Input Calculation Method as later suggested by the manufacturer

<u>Calculating Daily kWh Input:</u>

Btu/hr × 24 hours × capacity factor ÷ 3,412.14 Btu/kWh × 0.95 ÷ COP

- Gas Unit Size
- Gas Unit Capacity Factor
- 1 kWh = 3,412.14 Btu
- Gas Unit 95% Efficiency
- Heat Pump Efficiency

<u>Where energy input (kWh) for heat pump was provided by manufacturer:</u>

Annual kWh ÷ 365 days

Updated Cost-Effectiveness Estimates

- Table shows original and alternative cost-effectiveness estimates
  - Green column shows staff's previously presented cost effectiveness estimates
  - Blue shows alternative fuel switching methodology
  - Main difference is the annual fuel use estimated by the different methods

Equipment Category	Replacement With	Cost-Effectiveness ($/Ton), No Panel		Cost-Effectiveness ($/Ton), Panel	
		Energy Input Estimate Method	Energy Input Calculation Method	Energy Input Estimate Method	Energy Input Calculation Method
Type 1 Water Heater	Heat Pump	(77,000)	235,000	20,000	332,000
Type 2 Water Heater	Six Heat Pumps (Integrated)	(44,000)	251,000	(29,000)	266,000
Tankless/Instantaneous	Heat Pump (Tank Type)	(83,000)	174,000	706,000	963,000
Type 1 Pool Heater	Heat Pump	129,000	18,000	192,000	81,000

Updated Cost-Effectiveness Estimates *(con't)*

- Table shows original and alternative cost-effectiveness estimates
  - Green column shows previously presented cost effectiveness estimates,
    - Examples where staff already used the alternative fuel switching calculation methodology

Equipment Category	Replacement With	Cost-Effectiveness ($/Ton), No Panel		Cost-Effectiveness ($/Ton), Panel	
		Energy Input Estimate Method	Energy Input Calculation Method	Energy Input Estimate Method	Energy Input Calculation Method
Type 1 Boiler	Heat Pump	570,000	570,000	589,000	589,000
Type 2 Boiler (1 MMBtu)	Heat Pump	323,000	323,000	330,000	330,000
Type 2 Boiler (2 MMBtu)	Heat Pump	240,000	240,000	244,000	244,000

Summary of Cost-Effectiveness Estimates Using Manufacturer-Suggested Method

For gas-fired tankless units replaced by heat pumps, using the manufacturer-suggested method, there is a higher energy input (kWh) and higher fuel switching cost

- This may be oversizing and likely the estimated energy input (kWh) is too high

Both original method and the method suggested by a manufacturer may be useful in gauging cost-effectiveness

- The method suggested by the manufacturer may be a more conservative estimate
- While some categories are above the cost screening threshold, future effective compliance dates will allow for market growth in the next ten years

Staff is open to additional information including capacity factors of heat pumps and tankless units and panel upgrade costs

New Scenario for Type 2 Water Heaters

New Manufacturer-Suggested Scenario for Type 2 Water Heater Replacement

In Working Group Meeting #3, staff used a replacement scenario for Type 2 Water Heaters described by installer

- Assumed six zero-emission integrated heat pumps would replace one 500 kBtu natural gas-fired unit

A major manufacturer recommended a different replacement case for Type 2 Water Heaters

- Replace one 500 kBtu natural gas-fired unit with two large split heat pumps paired with a 400-gallon tank for an anticipated cost of $70,000
- Staff does not have manufacturer-provided energy input (kWh) for this scenario
  - In these cases, staff uses same method proposed by a manufacturer, detailed on Slide 19

Slide from Working Group Meeting #3

Preliminary Cost-Effectiveness Calculations – Type 2 (> 400 kBtu/h and ≤ 2 MMBtu/h) Cost Assumptions

Estimated costs from currently available data:

	Natural Gas Unit	Zero-Emission Unit: Heat Pumps (6 heat pump units)
Estimated Cost	14,000	$66,000 (cost of individual heat pump multiplied by 6)
Unit and Source Description	Rule 1146.2 May 2006 staff report estimated cost for 400-500 kBtu commercial tank type high efficiency unit adjusted to present value by CPI Inflation Calculator	Heat pump cost to customer provided by manufacturer * 6 Case study example: - Two 500 kBtu boilers were replaced by 7 heat pumps - Considering that second 500 kBtu/h boiler and seventh heat pump were for redundancy COP: 4.6 (4.6 times more efficient than conventional unit, resulting in lower operating cost) Annual kWh: 5,841 kWh (Los Angeles) * 6
Source Link	http://www.aqmd.gov/nav/about/governing-board/agendas-minutes	

Assumption: Six zero-emission units would replace one 500 kBtu/h natural gas-fired unit, based on case study

South Coast AQMD Rule 1146.2 44

New Manufacturer-Suggested Scenario for Type 2 Water Heater Replacement *(con't)*

Table shows cost-effectiveness for installer and manufacturer suggested Type 2 Water Heater replacement scenarios

- Both scenarios are below the cost-effectiveness screening threshold
  - Energy Input Calculation Method to determine fuel switching cost increases the cost-effectiveness estimates for the installer-suggested scenario with six heat pumps
  - New manufacturer-suggested scenario with two heat pumps shows slightly higher capital cost ($4,000 higher) but much higher fuel switching costs

Equipment Category	Replacement With	Increased Unit Capital Cost	Cost-Effectiveness ($/Ton), No Panel		Cost-Effectiveness ($/Ton), Panel	
			Energy Input Estimate Method	Energy Input Calculation Method	Energy Input Estimate Method	Energy Input Calculation Method
Type 2 Water Heater	Six Heat Pumps (Integrated)	$52,000	(44,000)	251,000	(29,000)	266,000
	Two Heat Pumps (Split)	$56,000	-	239,000	-	254,000

Staff Conclusions for Updates to Baseline Emissions and Cost-Effectiveness

- Updated baseline emission estimate: increased estimated baseline and potential emission reductions by 5.68 tons/day
- Updated cost-effectiveness estimates for Type 1 Water Heaters with 15-year useful lifetime (decreased from prior assumption of 25 years) and considered different scenario for Type 2 Water Heaters
  - Increased the cost-effectiveness values, but still below the screening threshold
- Staff will use original Type 2 Water Heater replacement scenario and the new manufacturer-provided scenario
  - Both scenarios are under the screening threshold
- Fuel switching cost method suggested by a manufacturer resulted in much higher cost-effectiveness estimates for categories that had utilized equipment energy input (kWh) values
  - Drawbacks to this method are that gas units are often oversized, which can cause short cycling and other efficiency losses not accounted for by this method
  - Staff may show this method alongside staff's original method
- Staff recommendation: Zero-emission limits for all categories with future effective dates to allow technology to mature

Draft Rule Language
Key Revisions

Summary of Draft Rule Language Key Revisions

Draft Rule Language Key Revisions	Add several new definitions
	Set different compliance dates based on cost-effectiveness and feasibility
	Modify requirements related to equipment useful life, burner modification, and others
	Add labeling requirement related to unit installation in new buildings
	Clarify exemptions
	Remove obsolete requirements
Technology assessment by 2027 language will be included in the Resolution document	Staff recognizes the challenges of projecting costs into the future, particularly with some proposed compliance dates ten years away
	PAR 1146.2 Resolution will include a Technology Check-in by 2027 which will assess costs and market for zero-emission technologies

New Unit (Point-of-Sale) Requirements

- The table below shows the emission limits for new units in the current rule and proposed revisions in PAR 1146.2

	Unit Type	Compliance Date	Emission Limit	PAR 1146.2 Revision
Rule 1146.2 (c)(1)	Type 2	2000	30 ppm NOx; 400 ppm CO	Obsolete; section removed
Rule 1146.2 (c)(2)	Type 1	2001	40 ng/J NOx (55 ppm NOx)	Obsolete (except for pool heaters); section removed
Rule 1146.2 (c)(2)	Type 1 Pool Heaters	2001	40 ng/J NOx (55 ppm NOx)	Current limits; now included in PAR 1146.2 (c)(1) and Table 1
Rule 1146.2 (c)(7)	Type 2	2010	14 ng/J NOx (20 ppm NOx)	
Rule 1146.2 (c)(8)	Type 1 (w/o Pool Heaters)	2012	14 ng/J NOx (20 ppm NOx)	
Additional PAR 1146.2 proposal for zero-emission requirements for new units installed in new and existing buildings; included in PAR 1146.2 (c)(2) and Table 2				

Phase-out/Retrofit Requirements

- Phase-out/retrofit was required in Rule 1146.2 for unregulated old units to phase into the emission limits

	Unit Type	Unit Age	Compliance Date	Emission Limit	PAR 1146.2 Revision
Rule 1146.2 (c)(3)-(c)(5)	Type 2	Manufactured prior to 2000	2002-2006	30 ppm NOx; 400 ppm CO	Obsolete; section removed
Rule 1146.2 (c)(11)	Type 2	Manufactured and purchased prior to 2010 and sold/installed by December 31, 2010	Until Dec 31, 2010	30 ppm NOx; 400 ppm CO	Should have met the limits; now included in PAR 1146.2 (c)(6) as a compliance tool if a non-compliant unit is found
Rule 1146.2 (c)(12)	Type 1	Manufactured and purchased prior to 2012 and sold/installed by December 31, 2012	Until Dec 31, 2012	40 ng/J NOx (55 ppm NOx)	Should have met the limits; now included in PAR 1146.2 (c)(7) as a compliance tool if a non-compliant unit is found
Additional PAR 1146.2 proposal requires units reaching their useful life after Table 2 zero-emission compliance dates of their applicable categories to phase into zero-emission requirement as specified in PAR 1146.2 (c)(3)					

Draft Rule Language Key Revisions

Separate Purpose and Applicability into two sections:

(a) Purpose ~~and Applicability~~

The purpose of this rule is to reduce Oxides of Nitrogen (NOx) emissions from natural gas-fired ~~w~~Water ~~h~~Heaters, ~~b~~Boilers, and ~~p~~Process ~~h~~Heaters as defined in this rule. ~~This rule applies to units that have a rated heat input capacity less than or equal to 2,000,000 BTU per hour. Type 1 Units as defined in this rule are typically, but not exclusively, large water heaters or smaller-sized process heaters in the above range. Type 2 Units as defined in this rule are typically, but not exclusively, small boilers or larger-sized process heaters in this range. Beginning, January 1, 2000, the provisions of this rule are applicable to manufacturers, distributors, retailers, refurbishers, installers and operators of new units. Beginning, July 1, 2002, the provisions of this rule are also applicable to operators of existing Type 2~~

(b) Applicability

The provisions of this rule are applicable to manufacturers, distributors, retailers, Resellers, installers, owners, and operators of natural gas-fired Units that have a Rated Heat Input Capacity less than or equal to 2,000,000 British Thermal Units (BTU) per hour. The provisions of this rule are not applicable to manufacturers, distributors, retailers, Resellers, installers, owners, and operators of Units subject to the limits in South Coast AQMD Rule 1121 – Control of Nitrogen Oxides from Residential Type, Natural Gas-fired Water Heaters.

Draft Rule Language Key Revisions *(con't)*

Modify Definitions:

- Remove definitions not used elsewhere in rule language
- Add new definitions

(3) EXISTING BUILDING means a building that is not a New Building as defined in this rule.

(6) HIGH TEMPERATURE UNIT means any Unit as defined in this rule that is used to produce steam or to heat water above 190 degrees Fahrenheit.

(9) MULTIFAMILY STRUCTURE means any structure which is designed for, and used exclusively as, a dwelling for more than four families, and where such equipment is used by the owner or occupant of such a dwelling.

(10) NEW BUILDING means a building that has never been used or occupied for any purpose, or a building with a major alteration which changes the occupancy classification of a building.

- For example, an office building might be renovated for some other use with a different occupancy classification

Draft Rule Language Key Revisions *(con't)*

Modify Requirements:

- Present current limits in table format

(1) No person shall manufacture, supply, sell, offer for sale, or install, for use within the South Coast AQMD, any Unit unless the Unit is certified pursuant to subdivision (f) not to exceed the applicable NOx and CO emission limits specified in Table 1, prior to the compliance dates specified in Table 2.

Table 1 – NOx and CO Emission Limits

Equipment Category	NOx Emission Limit*	CO Emission Limit*
Type 1 Units (excluding Pool Heaters)	14 ng/J or 20 ppmv	400 ppmv
Type 2 Units		
Type 1 Pool Heater	40 ng/J or 55 ppmv	

* Nanograms per Joule (ng/J) of NOx (calculated as NO_2) of Heat Output or the specified parts per million by volume (ppmv) of NOx or CO at 3 percent oxygen (O_2) correction, on a dry basis.

Draft Rule Language Key Revisions *(con't)*

Modify Requirements:

- Present future effective limits in table format

(2) No person shall manufacture, supply, sell, offer for sale, or install, for use in the South Coast AQMD, any Unit subject to this rule, unless such Unit does not exceed the applicable NOx and CO emission limit and compliance date set forth in Table 2.

Table 2 – NOx and CO Emission Limits, Compliance Schedule, and Unit Useful Life

Equipment Category	NOx and CO Emission Limits (ppmv)	Building Type	Compliance Date	Useful Life (years)
Type 1 Unit*	0	New	January 1, 2025	15
		Existing	January 1, 2029	
Instantaneous Water Heater	0	New	January 1, 2025	25
		Existing	January 1, 2029	
Type 1 Pool Heater	0	New	January 1, 2027	15
		Existing	January 1, 2031	
Type 2 Unit**	0	New	January 1, 2027	25
		Existing	January 1, 2031	
Type 1 High Temperature Unit	0	New	January 1, 2029	25
		Existing	January 1, 2033	
Type 2 High Temperature Unit	0	New	January 1, 2029	25
		Existing	January 1, 2033	

* Referring to a Type 1 Unit that is not a High Temperature Unit, Type 1 Pool Heater, or Instantaneous Water Heater.

** Referring to a Type 2 Unit that is not a High Temperature Unit.

Draft Rule Language Key Revisions *(con't)*

Modify Requirements:

- Add useful life requirement
- Include retrofit requirement

(3) On and after the compliance dates in Table 2, an owner or operator of a Unit shall not operate a Unit which does not meet the applicable emission limit in Table 2 once the Unit age that is determined pursuant to subdivision (e) reaches its Useful Life in Table 2.

(4) The owner or operator of a Unit may modify a Unit and demonstrate it meets the NOx and CO emission limits in subdivision (d) by causing:

(A) A Certified Retrofit Kit to be installed; or

(B) A source test to be conducted by an Independent Testing Laboratory according to the Protocol.

(5) An owner or operator that modifies or replaces a burner in a Unit shall comply with the applicable emission limit:

(A) In Table 1 if the modification or replacement occurs prior to the applicable compliance dates in Table 2; and

(B) In Table 2 if the modification or replacement occurs on and after the applicable compliance dates in Table 2.

Draft Rule Language Key Revisions *(con't)*

Modify Requirements:

- Include old requirements for compliance purposes

(6) An owner or operator shall not operate any Type 2 Unit manufactured prior to January 1, 2010, in the South Coast AQMD which does not meet the emission limit of 30 ppmv (corrected at 3 percent O_2 correction, on a dry basis) or 0.037 pounds NOx per million BTU of heat input and no more than 400 ppm of carbon monoxide (at 3 percent O_2, dry).

(7) An owner or operator shall not operate any Type 1 Unit manufactured prior to January 1, 2012, in the South Coast AQMD which does not meet the emission limit of 55 ppmv (corrected at 3 percent O_2 correction, on a dry basis).

(8) The owner or operator of any Unit shall maintain on-site a copy of the manufacturer's and/or distributor's written instructions and retain a record of the maintenance activity for a period of not less than three years.

Draft Rule Language Key Revisions *(con't)*

Include Unit Age determination:

(e) Unit Age

(1) For all Unit age determinations in this rule, an owner or operator of a Unit shall determine the Unit age as follows:

(A) Unit age shall be based on the original date of manufacture determined by:

(i) Invoice from purchase of Unit provided by manufacturer;

(ii) Original Unit manufacturer's identification or rating plate permanently affixed to the Unit; or

(iii) Any other method of determining Unit age that can be substantiated through written information as approved by the Executive Officer.

(B) The Unit shall be deemed at the end of its useful life as of January 1, 2024, for any Unit where the Unit age cannot be determined pursuant to subparagraph (e)(1)(A).

Draft Rule Language Key Revisions *(con't)*

Modify Identification and Verification of Compliant Units:

- Add labeling requirement

(4) Labeling Requirement

Effective on and after the compliance date in Table 2, for any Unit that is for distribution or sale inside of the South Coast AQMD that is not compliant with the emission limits for New Buildings in Table 2, the Unit shall display a label identifying the Unit as not to be installed or used for New Buildings.

Draft Rule Language Key Revisions *(con't)*

Modify low use exemption:

(2) Until the effective dates in Table 2, ~~T~~the NOx and CO ~~provisions of paragraphs (c)(3), (c)(4), and (c)(5)~~ emission limits in the rule shall not apply to~~:~~

~~(A) Any residential unit.~~

~~(B)~~ Units with a ~~r~~Rated ~~h~~Heat ~~i~~Input ~~c~~Capacity greater than 400,000 BTU per hour, but less than or equal to 2,000,000 BTU per hour, that are demonstrated to use less than 9,000 therms during every calendar year. ~~Compliance with the exemption limit shall be demonstrated by a calculation based on the annual fuel consumption recorded by an in line fuel meter or the annual operating hours recorded by a timer and using one of the following methods.~~

~~(i) Annual therm usage recorded by fuel meter and corrected to standard pressure; or~~

~~(ii) Amount of fuel (i.e., in thousand cubic feet of gas corrected to standard pressure) converted to therms using the higher heating value of the fuel; or~~

~~(iii) Annual therm usage calculated by multiplying the number of hours fuel is burned by the rated heat input capacity of the unit converted to therms.~~

Draft Rule Language Key Revisions *(con't)*

Residential exemption:

(3) The provisions of paragraphs (d)(3), (d)(4), (d)(5), and (d)(8) shall not apply to Units installed or used for Residential or Multifamily Structures.

- (d)(3) on backstop dates to require Unit replacement at the end of useful life
- (d)(4) on Unit modification
- (d)(5) on modification or replacement of a burner
- (d)(8) on recordkeeping by operators
- Note that most of the units subject to PAR 1146.2 are utilized for commercial buildings, but some units such as tankless units are installed in residential settings

Next Steps and Staff Contact

Next Steps

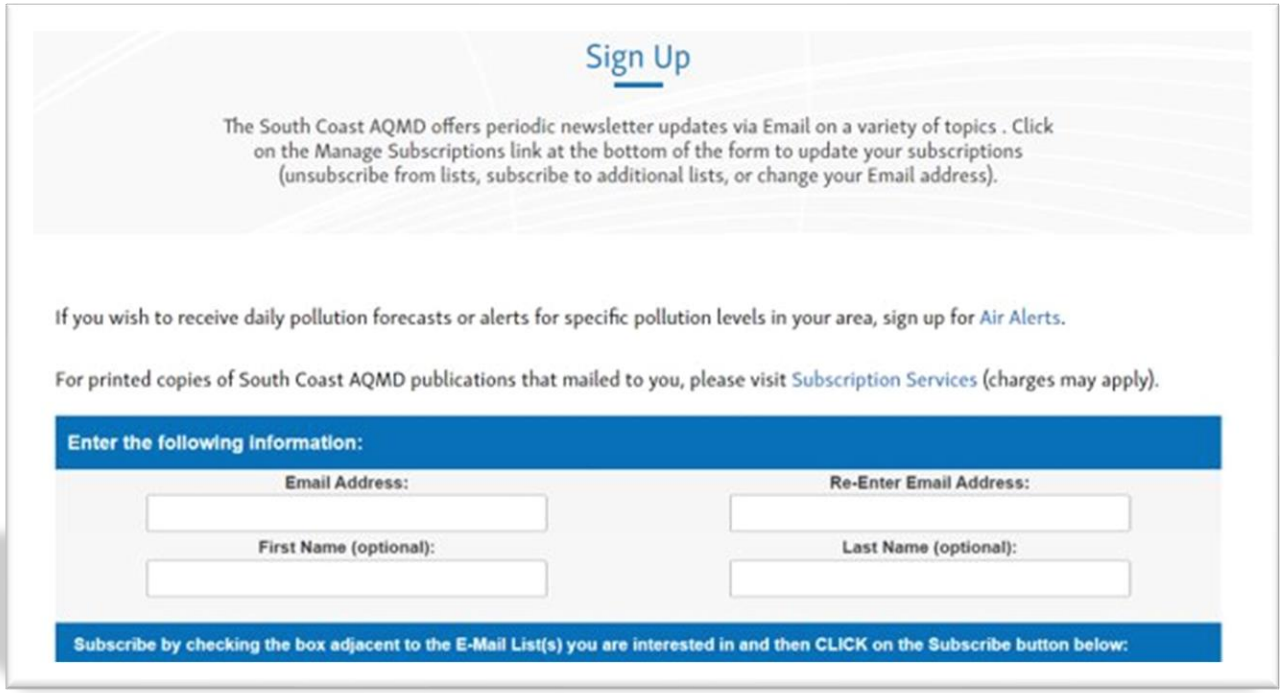
Anticipated Schedule for Proposed Amended Rule 1146.2 (subject to change):

- Continue Public Process and Stakeholder Meetings
- Preliminary Draft Documents – January 19, 2024
- Public Workshop – Early February 2024
- Stationary Source Committee – February 16, 2024
- Public Hearing – April 5, 2024 (subject to change)

Webpage for more information on Building Appliances Rules:
http://www.aqmd.gov/home/rules-compliance/residential-and-commercial-building-appliances

Sign Up for Notifications

- To receive newsletter updates via email for notifications regarding the 1146.2 rule development and other forthcoming building appliances rules, please subscribe by checking the **Rule 1146.2** and **Building Appliances** check boxes located under Rule Updates: *http://www.aqmd.gov/sign-up*



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