



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

Public Consultation

February 23, 2024, 9:00 AM (PST)

Join Zoom Meeting:

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

Meeting ID: 968 9387 8030

Agenda

Updates Since Public Workshop

Updates to Cost-Effectiveness

Updates to PAR 1146.2 Preliminary Draft Rule Language

Next Steps and Staff Contact

Updates Since Public Workshop

-
- Staff received several comment letters and met with stakeholders
 - Added some proposed amendments to address stakeholder concerns
 - Revised cost-effectiveness for all equipment categories, due to updated:
 - Projected utility rates;
 - Pool heater assumptions; and
 - Incremental installation cost
 - Delayed Stationary Source Committee presentation to March 15th
 - Public Hearing delayed to May 3rd



Updates to Cost-Effectiveness

Updates to Pool Heater Data

Pool Heater Universe

Previous estimate: 413,000 units

Based on RASS* estimate for percent of homes with spa heaters

Update: 708,000 units

Based on RASS* estimate for percent of homes with gas pool/spa heaters

Annual Unit Operational Hours and Efficiency

Previous estimate:

Capacity factor of 7.16%, or 627 operating hours and 95% efficiency

Based on previous Rule 1146.2 study

Update: 211 hours and 84% efficiency

Based on U.S. Department of Energy (DOE) estimate for units in California and new DOE efficiency requirement for gas pool heaters by 2028

Pool Heater Baseline Emissions

Previous Estimate:

5.66 tpd

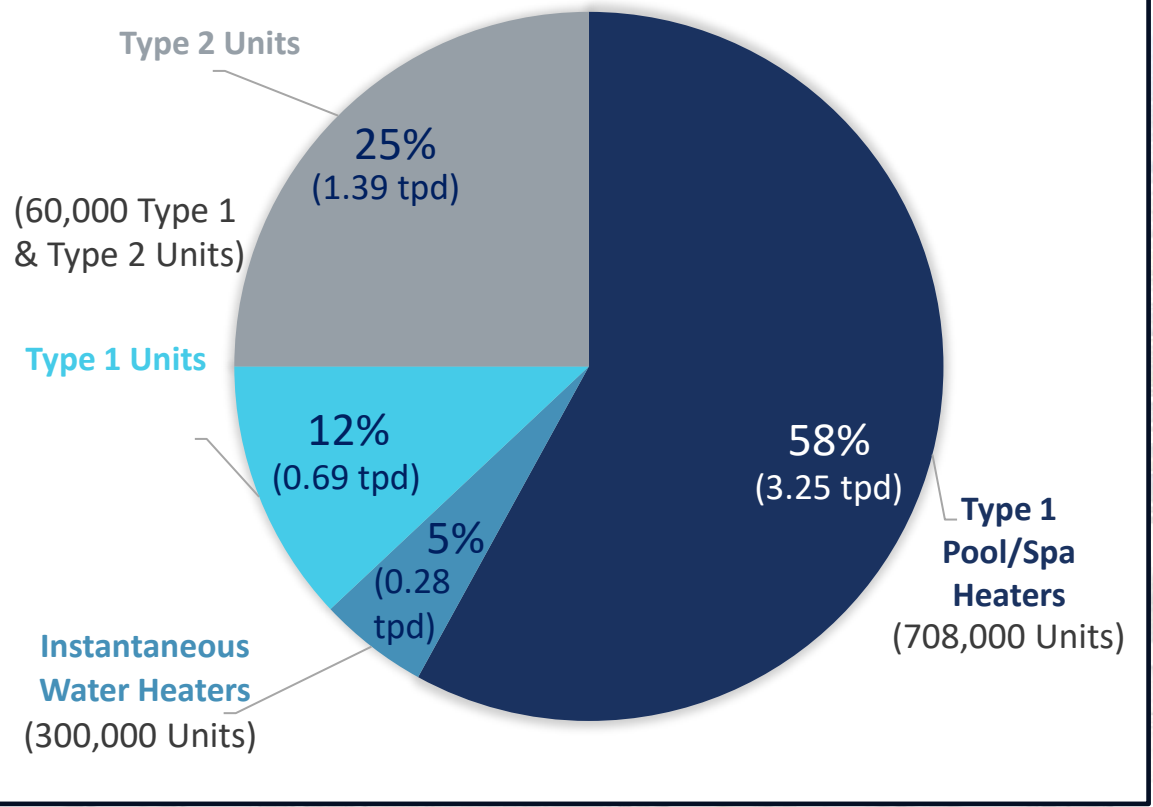
Update:

3.25 tpd

Based on updated universe, annual operational hours, and efficiency

*CEC Residential Appliance Saturation Survey (RASS)

PERCENT OF BASELINE NOx EMISSIONS ESTIMATE



Updated PAR 1146.2 Baseline Emissions

Utility Rate Projection

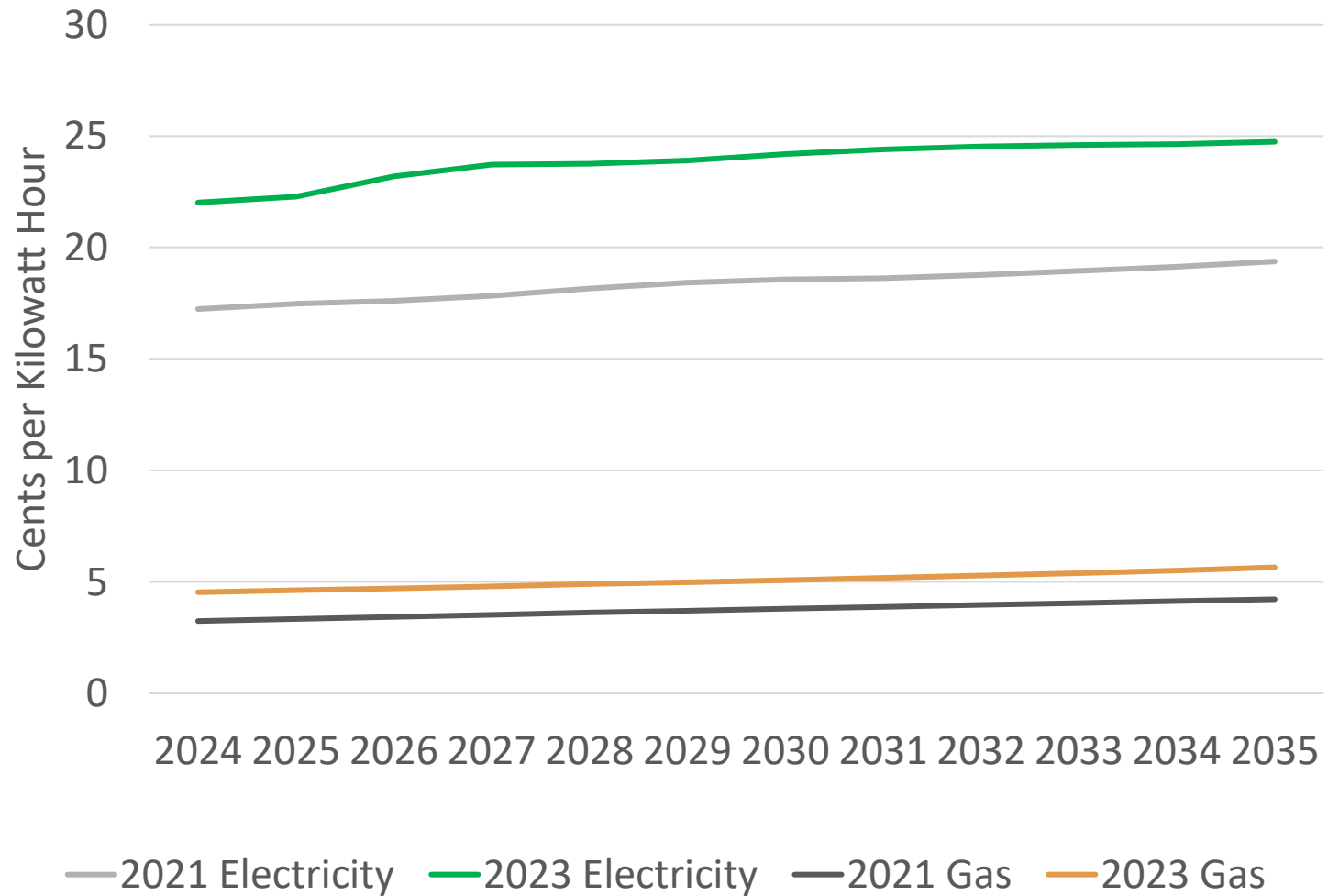
The California Energy Commission (CEC) releases the Integrated Energy Policy Report (IEPR) every two years

- Reports projected future rates of gas and electricity
- Staff was relying on 2021 IEPR for the PAR 1146.2 cost effectiveness assessment
 - Impacts the cost to switch from natural gas-fired units to heat pumps
- Newest IEPR released on January 1, 2024:
 - Projected natural gas rate to increase 40%
 - Projected electricity cost to have a more moderate increase of 28%
- New projected rates will decrease cost-effectiveness estimates

Update to Utility Rate Projections:

Utility Rate (cents per kWh)	2021 IEPR	2023 IEPR
Natural Gas	3.25	4.54 (↑ 40%)
Electricity	17.24	22.01 (↑ 28%)

Projected Rates



Projected Rates
from IEPR

Installation Costs

Stakeholders have commented that installation costs for heat pumps are higher than that of gas units (not including equipment costs)

- Previously, cost-effectiveness analysis for upfront cost was based on the incremental equipment cost
- Staff increased cost of the heat pump units in the cost-effectiveness analysis by 20% to represent additional installation costs

Cost-Effectiveness

- Updates to the utility rate forecasts lowered cost-effectiveness estimates; increasing installation costs raised cost-effectiveness estimates
 - Overall impact moderately lowered cost-effectiveness estimates

Equipment Category	Cost-Effectiveness (\$/Ton), No Panel	Cost-Effectiveness (\$/Ton), with Panel
Type 1 Unit (Not High Temperature Unit, Type 1 Pool Heater, or Instantaneous)	(83,000) (190,000)	(15,000) (93,000)
Type 2 Unit (Not High Temperature Unit or Instantaneous)	(44,000) (178,000)	(29,000) (164,000)
Type 1 Pool Heater	129,000 11,000	192,000 58,000
Instantaneous Water Heater	(83,000) (185,000)	706,000 12,000
Type 1 High Temperature Unit	570,000 559,000	589,000 577,000
Type 2 High Temperature Unit (1 MMBTU)	323,000 257,000	330,000 264,000
Type 2 High Temperature Unit (2 MMBTU)	240,000 152,000	244,000 155,000

Staff Conclusions

Updates lowered cost-effectiveness estimates for all equipment categories

Consistent with previous analysis:

- High temperature units have higher cost-effectiveness than other categories
- All equipment categories, except for Type 1 high temperature units, are below the 2022 AQMP cost-effectiveness screening threshold of \$349,000 (adjusted to 2022 dollars with the Consumer Price Index)

Staff recommends maintaining the proposed zero-emission compliance with some adjustments presented in later slides

An aerial photograph of a city, likely Los Angeles, showing a dense urban landscape with various buildings, streets, and green spaces. In the far distance, a prominent skyline of skyscrapers is visible against a clear sky. The overall scene is captured from a high angle, providing a comprehensive view of the city's layout.

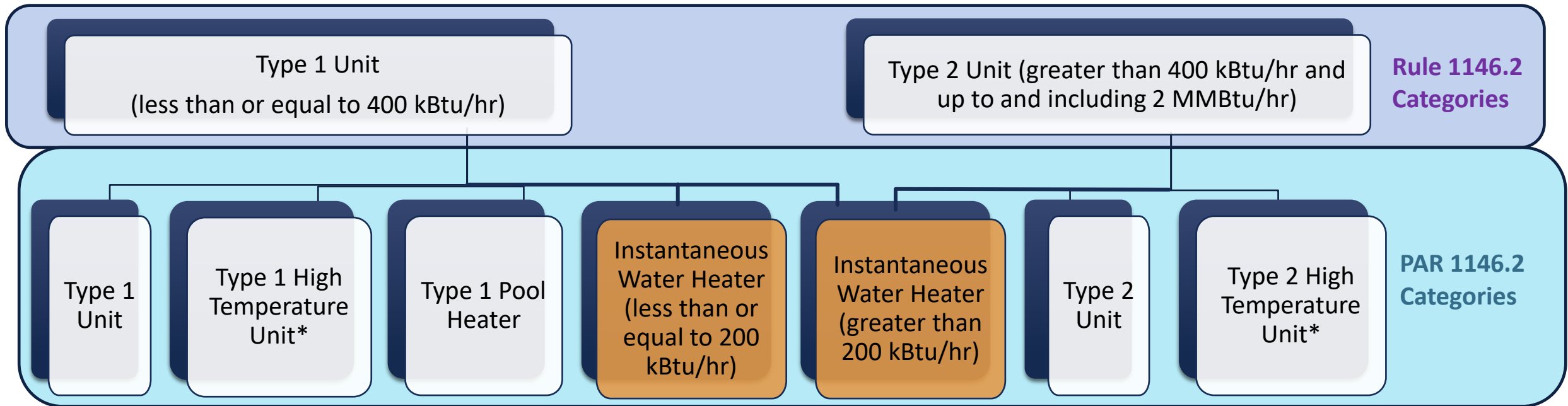
Updates to PAR 1146.2 Preliminary Draft Rule Language

Summary of Key New Changes to Rule Language

- Separated compliance schedule from Table 2 (emission limits, unit age) to the new Table 3
- Revised compliance schedule for several equipment categories in new buildings
- Divided instantaneous water heaters into two categories by heat input capacities
- Added subdivision (i) for alternative compliance options
- Added subdivision (j) for labeling and reporting requirements
- Provided a new low-use exemption
- Specified a compliance schedule for failing to demonstrate low-use
- Removed the initially proposed retrofit exemption for units installed or used for multifamily structures

Updated Applicable Units Recategorization

- PAR 1146.2 defines additional categories for Type 1 and Type 2 units
- New change: Divided instantaneous water heaters into two categories by heat input capacities



* High temperature units defined as units designed to produce steam or heat water above 180 degrees Fahrenheit

Updated Rule Structure Overview

Current Rule 1146.2

- (a) Purpose and Applicability
- (b) Definitions
- (c) Requirements
- (d) Certification
- (e) Modification (Retrofit) Provisions and Demonstration of Compliance With Emission Limits
- (f) Identification of Compliant Units
- (g) Enforcement
- (h) Exemptions
- (i) Progress Reports



PAR 1146.2

- (a) Purpose
- (b) Applicability
- (c) Definitions
- (d) Requirements
- (e) Unit Age
- (f) Certification
- (g) Demonstrations of Compliance With Emission Limits
- (h) Identification and Verification of Compliant Units
- (i) Alternative Compliance Options
- (j) Labeling and Reporting Requirement
- (k) Exemptions

Update to Applicability Subdivision

(b) Applicability

- Removed redundant language
- Exemption of Rule 1121 is already included in subdivision (k)

PAR 1146.2

(b) Applicability

The provisions of this rule are applicable to manufacturers, distributors, retailers, Resellers, installers, owners, and operators of 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.~~

Revised and New Definitions

(c) Definitions

- Revised high temperature unit definition by changing temperature threshold from 190 to 180 degrees Fahrenheit
 - Recommended by stakeholders to align with the Code of Federal Regulations definition for “residential-duty commercial water heater” for outlet water temperature
- Added new definition (c)(10) for mobile home
- Modified new definition (c)(11) for new building with more specification for occupancy classification

PAR 1146.2 (c)

(7) HIGH TEMPERATURE UNIT means any Unit that is ~~used~~ designed to produce steam or to heat water above 190~~180~~ degrees Fahrenheit.

(10) MOBILE HOME means a prefabricated structure on a permanently attached chassis.

(11) NEW BUILDING means a building that ~~has never been used or occupied for any purpose,~~ is newly constructed or a building with a major alteration which changes the occupancy classification of a building, which means a change in the formal designation of the primary purpose of the building pursuant to 2022 Title 24 California Building Code Part 2 Chapter 3 for occupancy classification and use, and does not have a Unit installed prior to the applicable Table 3 compliance dates.

Zero-Emission Compliance Schedule

(d) Requirements: (d)(2) Zero-Emission Limits, Compliance Schedule, and Unit Age

- Separated (d)(2) compliance schedule from Table 2 (emission limits, unit age) to the new Table 3
- Streamlined the compliance schedules into three phases
 - Extended both Phase I and Phase II for new buildings by one year
- Divided instantaneous water heaters into two categories by rated heat input capacities
 - Larger units have more time to comply

Table 2 – Zero-Emission Limits, Compliance Schedule, and Unit Age

Equipment Category	NOx and CO Emission Limits (ppmv)	Compliance Schedule	Unit Age (years)
Type 1 Unit*	0	Phase I	15
Instantaneous Water Heater <= 200,000 Btu/hr	0		25
Instantaneous Water Heater > 200,000 Btu/hr	0	Phase II	25
Type 1 Pool Heater	0		15
Type 2 Unit**	0	Phase III	25
Type 1 High Temperature Unit	0		25
Type 2 High Temperature Unit	0		25

* 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 or Instantaneous Water Heater.

PAR 1146.2 (d)

Table 3 – Compliance Dates for Zero-Emission Limits

Phase	Building Type	Compliance Date
Phase I	New	January 1, 2025 January 1, 2026
	Existing	January 1, 2029
Phase II	New	January 1, 2027 January 1, 2028
	Existing	January 1, 2031
Phase III	New	January 1, 2029
	Existing	January 1, 2033

Unit Age Determination

(e) Unit Age

- Changed the deemed end of unit age from January 1, 2024, to January 1, 2025, under subparagraph (e)(1)(B)
- More appropriate to be a date after rule adoption

PAR 1146.2

(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 Unit age as of January 1, 20242025, for any Unit where the Unit age cannot be determined pursuant to subparagraph (e)(1)(A).

Alternative Compliance Option for Utility Upgrades

- Added paragraph (i)(1) to provide an alternative compliance option for when utility upgrades delay compliance with zero-emission limits
 - Requiring notification 90 days prior to the compliance date, approval, and recordkeeping

(i) Alternative Compliance Options

(1) Alternative Compliance Option for Utility Upgrades

If an owner or operator of a Unit required to meet the Table 2 emission limits will encounter delays beyond the reasonable control of the owner or operator in meeting the applicable Table 3 compliance date or paragraph (d)(3) because the applicable utility company is unable to provide the necessary power to operate the Unit, the owner or operator shall:

(A) Call 1-800-CUT-SMOG® at least 90 days prior to the Unit's applicable compliance date to notify the Executive Officer and request an extension of no longer than one-year from the applicable compliance date;

(B) Obtain a letter from the Executive Officer prior to the Unit's compliance date approving the extension;

(C) Provide a follow-up notification to the Executive Officer once the Unit complying with the Table 2 emission limits has been installed by calling 1-800-CUT-SMOG® within 24 hours of the installation; and

(D) Maintain records for up to three years, and make them available to the Executive officer upon request, that demonstrate the power supply and the utility company's progress on providing the necessary power including but not limited to:

(i) An official document signed by the responsible party of the utility company that services the facility that includes:

(A) An explanation of the service upgrades required by the utility company;

(B) Communications with the utility provider when the service upgrade was requested;

(C) The estimated date the utility company will complete the service upgrades;

(D) Additional information to substantiate that an additional time is necessary; and

(E) Documentation which demonstrates that the delays are outside of the control of the owner or operator.

Alternative Compliance Option for Multiple Units

- Added paragraphs (i)(2) and (i)(3) to provide an alternative compliance option for when an owner or operator has five or more units that are required to meet zero-emission limits in the same calendar year
 - Requiring an alternative compliance plan one year prior to the compliance date and an approval process

PAR 1146.2 (i)

(2) Alternative Compliance Option for Multiple Units

An owner or operator of five or more Units that are required to meet the Table 2 emission limits in the same calendar year pursuant to paragraph (d)(3) may request an alternative compliance date by:

(A) Submitting an alternative compliance plan at least one year prior to the applicable compliance date, with a filing fee payment pursuant to Rule 306 – Plan Fees; and

(B) Specifying a compliance date in the alternative compliance plan for the number of units to meet the Table 2 emission limits as below:

(i) Three or at least 30 percent of the Units by the applicable compliance date;

(ii) At least 30 percent of the Units one year after the applicable compliance date; and

(iii) The remaining Units two years after the applicable compliance date.

(3) Approval of Alternative Compliance Option for Multiple Units

The Executive Officer shall review the request for alternative compliance date submitted pursuant to paragraph (i)(2) and provide written approval or disapproval based on whether the following criteria are met:

(A) The owner or operator demonstrated they are operating five or more Units that are required to be replaced based on Unit age pursuant to paragraph (d)(3) to meet Table 2 emission limits in the same calendar year;

(B) The request was submitted at least one year prior to the applicable compliance date; and

(C) The proposed alternative compliance date meets the criteria specified in subparagraph (i)(2)(B).

Alternative Compliance Option for Emergency Replacements

- Added paragraph (i)(4) to provide an alternative compliance option for emergency replacement when electrical upgrade for more power supply capacity is required to comply with zero-emission limits
 - Allowing the use of a temporary unit that complies with Table 1 emission limits for up to six months

PAR 1146.2 (i)

(4) Alternative Compliance Option for Emergency Replacements

If an owner or operator of a Unit that requires short term replacement due to sudden Unit failure after the applicable Table 3 compliance date and an electrical upgrade is required to increase the power supply capacity to operate a Unit that complies with Table 2 emission limits may elect to:

(A) For Units used in buildings that are not Residential Structures:

(i) Install and operate a temporary Unit that complies with Table 1 emission limits for up to six months prior to installing a Unit that complies with Table 2 emission limits;

(ii) No later than 24 hours after the date the temporary Unit was installed, notify the Executive Officer by calling 1-800-CUT-SMOG® to report the date the existing Unit failed and the date the temporary Unit was installed; and

(iii) No later than 24 hours after the date the new Unit was installed, notify the Executive Officer by calling 1-800-CUT-SMOG® to report the date the temporary Unit was disconnected and the date the Unit complying with Table 2 emission limits was installed; and

(B) For Units used in Residential Structures, install and operate a Unit that complies with Table 1 emission limits for up to six months prior to installing a Unit that complies with Table 2 emission limits.

Alternative Compliance Option for Existing Mobile Homes

- Added paragraph (i)(5) to provide more time to comply with zero-emission limits for mobile homes with an existing instantaneous water heater
 - On and after January 1, 2033, a zero-emission unit would be required upon replacement at end of unit age

PAR 1146.2 (i)

(5) Alternative Compliance Option for Existing Buildings that are Mobile Homes

An owner or operator of an Instantaneous Water Heater installed prior to [Date of Rule Adoption] in a Mobile Home may elect to install an Instantaneous Water Heater that complies with the Table 1 emission limits until January 1, 2033, in lieu of the Table 3 compliance dates. On and after January 1, 2033, the Unit must comply with the Table 2 emission limits upon replacement.

Low Use Exemption in Paragraph (k)(2)

- Specified the applicable unit's manufacture date for the 9,000 therms per year low use exemption from any emission limit in paragraph (k)(2)
 - Existing rule exemption intended for Type 2 units manufactured prior to January 1, 2000, with NOx emissions higher than 30 ppm NOx
 - Proposed to phase out this exemption when zero-emission implementation starts

PAR 1146.2 (k)

- (2) ~~Until the applicable Table 3 compliance dates, the Table 1 provisions of paragraphs (e)(3), (e)(4), and (e)(5) emission limits shall not apply to:~~
- ~~(A) — Any residential unit.~~
 - ~~(B) — Type 2 Units manufactured prior to January 1, 2000 with a rated heat input 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.~~

Low Use Exemption in Paragraph (k)(3)

- Provided a new low-use exemption from Table 2 zero-emission requirements in paragraph (k)(3)
 - For a Type 2 unit meeting Table 1 emission limits with fuel use less than 3,000 therms per year
 - Annual use of 3,000 therms is about 16% normal fuel use for a 1 MMBtu/hr unit and 40% normal fuel use for a 400 kBtu/hr unit

PAR 1146.2 (k)

(3) Table 2 emission limits shall not apply to Type 2 Units that meet Table 1 emission limits and are demonstrated to use less than 3,000 Therms during every calendar year.

Compliance Schedule if Failing to Demonstrate Low Use

- Added paragraph (d)(10) to specify a compliance schedule if an owner or operator failed to demonstrate the annual low use pursuant to paragraph (g)(2)
 - For low use exemptions provided by paragraphs (k)(2) and (k)(3)
 - Units failing to demonstrate low use will be subject to the applicable emission limits within 180 days

PAR 1146.2 (d)

- (10) An owner or operator of a Unit that elects to comply with the low-use exemptions in paragraph (k)(2) or (k)(3) shall:
- (A) Not operate the Unit that exceeds the applicable Table 1 emission limits within 180 days of failing to demonstrate compliance with paragraph (k)(2) pursuant to paragraph (g)(2); or
 - (B) Not operate the Unit that exceeds the applicable Table 2 emission limits within 180 days of failing to demonstrate compliance with paragraph (k)(3) pursuant to paragraph (g)(2).

Labeling Requirement

- PAR 1146.2 is proposing a labeling requirement under the new subdivision (j) for the period between new building compliance date and existing building compliance date of an equipment category
 - Paragraph (j)(1) requires labeling for units to be installed in existing buildings
 - Paragraph (j)(2) requires labeling for instantaneous water heaters rated less than or equal to 200,000 Btu/hr installed in mobile homes
- Labeling requirements were previously proposed and removed, however concerns were raised for how the limits will be enforced when new buildings are required to have zero-emission units limits installed and existing buildings can have units with 20 ppmv NOx limits installed

PAR 1146.2 (j)

(j) Labeling and Reporting Requirement

- (1) Pursuant to the labeling schedule in Table 4, any Unit that is supplied or offered for sale for use within the South Coast AQMD prior to the applicable Table 3 compliance dates that complies with the Table 1 emission limits, but not the Table 2 emission limits, shall prominently display the statement “For Installation and Use in Existing Buildings Only.”

Table 4 – Labeling Schedule

<u>Unit’s Compliance Schedule</u>	<u>Labeling Requirements</u>	
	<u>Start Date</u>	<u>End Date</u>
<u>Phase I</u>	<u>January 1, 2026</u>	<u>January 1, 2029</u>
<u>Phase II</u>	<u>January 1, 2028</u>	<u>January 1, 2031</u>
<u>Phase III</u>	<u>January 1, 2029</u>	<u>January 1, 2033</u>

- (2) Effective January 1, 2029 to January 1, 2033, an Instantaneous Water Heater with rated heat input capacity of less than or equal to 200,000 Btu/hr supplied or offered for sale for use in a Mobile Home within the South Coast AQMD and complying with the alternative compliance date in paragraph (i)(5) shall prominently display the statement “For Installation and Use in Mobile Homes Only.”

Reporting Requirement

- PAR 1146.2 is proposing a reporting requirement in the new subdivision (j)
 - Paragraph (j)(3) requires the manufacturer to submit annual reports for the number natural-gas fired units sold into South Coast AQMD after the Table 3 compliance dates
 - After zero-emission compliance dates, only natural gas-fired units meeting the low-use exemption or sold for use under one of the alternative compliance schedules should be sold
 - Reported data will be used for future assessment of these provisions and to determine their emission impacts

PAR 1146.2 (j)

(3) Annual Reporting Requirement

Effective on and after the Table 3 compliance dates for Existing Buildings, manufacturers of natural gas-fired Unit(s) shall submit a report by March 1st of the following calendar year to the Executive Officer. The report shall include:

(A) Name of the product manufacturer;

(B) List of product model(s);

(C) Number of Units and Rated Heat Input Capacity of each model that was sold into or within the South Coast AQMD; and

(D) The applicable equipment category in Table 2.

Exemption From Retrofit Requirement

- Retained the exemption from retrofit requirement after unit age for units in residential structures
 - Previously proposed to include units for multifamily for this exemption
 - Removed multifamily to retain the intent of existing rule for residential only
 - Exemption for these businesses would not be equitable as they are commercial entities

PAR 1146.2 (k)

(4) The provisions of paragraphs (d)(3), (d)(4), (d)(5), (d)(6), (d)(7), and (d)(8) and subparagraph (i)(1)(D) shall not apply to Units installed or used for Residential ~~and Multifamily~~ Structures.



Next Steps and Staff Contact

Next Steps

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

- Draft Rule Language and other supporting documents will be released – April 2, 2024
- Set Hearing – April 5, 2024
- Public Hearing – May 3, 2024 (subject to change)

Webpage for more information on Proposed Rules and Proposed Rule Amendments:

<https://www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules>

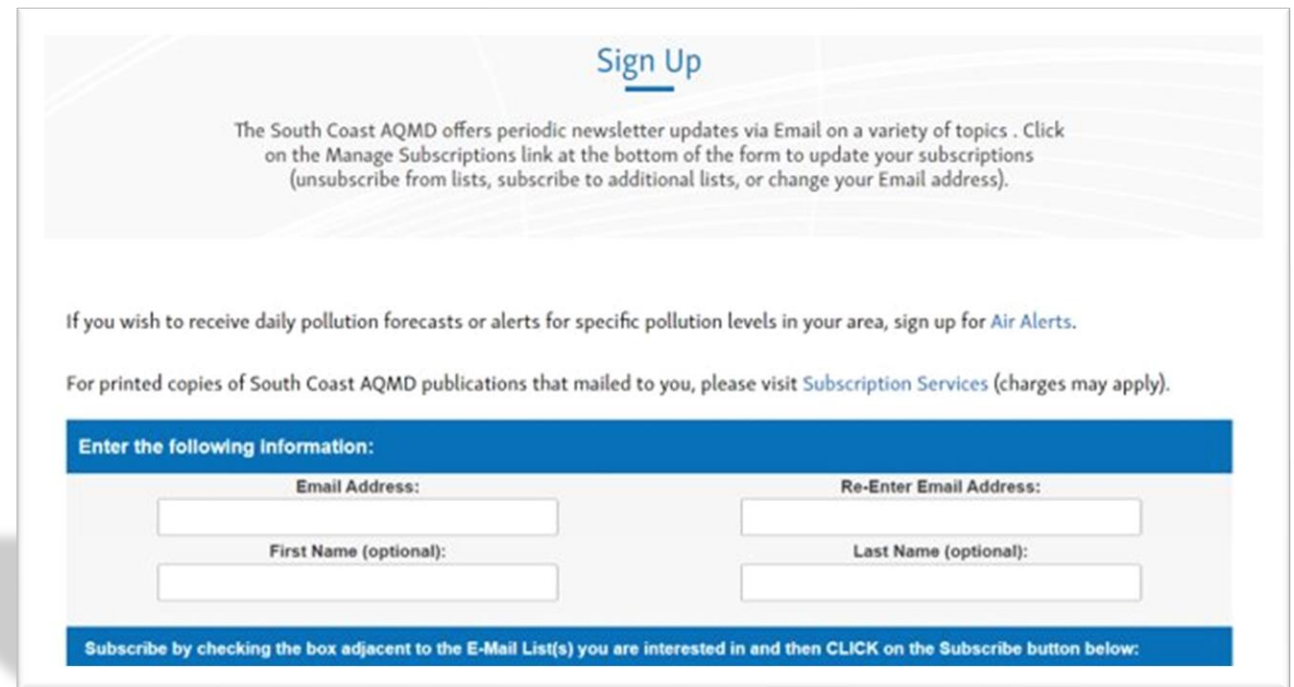
Webpage for more information on Building Appliances Rules:

<http://www.aqmd.gov/home/rules-compliance/residential-and-commercial-building-appliances>

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- To receive newsletter updates via email for notifications regarding the development of Rule 1146.2 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>



The screenshot shows a web form titled "Sign Up". The header text reads: "The South Coast AQMD offers periodic newsletter updates via Email on a variety of topics . Click on the Manage Subscriptions link at the bottom of the form to update your subscriptions (unsubscribe from lists, subscribe to additional lists, or change your Email address)." Below this, there are two lines of text: "If you wish to receive daily pollution forecasts or alerts for specific pollution levels in your area, sign up for Air Alerts." and "For printed copies of South Coast AQMD publications that mailed to you, please visit Subscription Services (charges may apply)." The form itself is titled "Enter the following Information:" and contains four input fields: "Email Address:", "Re-Enter Email Address:", "First Name (optional):", and "Last Name (optional):". At the bottom of the form, there is a blue bar with the text: "Subscribe by checking the box adjacent to the E-Mail List(s) you are interested in and then CLICK on the Subscribe button below:".

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Staff Contact – PAR 1146.2

Emily Yen	Assistant AQ Specialist	eyen@aqmd.gov	909.396.3206
Peter Campbell	AQ Specialist	pcampbell@aqmd.gov	909.396.3185
Jennifer Vinh	AQ Specialist	jvinh@aqmd.gov	909.396.2148
Yanrong Zhu	Program Supervisor	yzhu1@aqmd.gov	909.396.3289
Heather Farr	Planning and Rules Manager	hfarr@aqmd.gov	909.396.3672
Michael Krause	Assistant DEO	mkrause@aqmd.gov	909.396.2706