SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Draft Staff Report

Proposed Amended Rule 1153.1 – Emissions of Oxides of Nitrogen from Commercial Food Ovens

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EXECUTIVE SUMMARY

Proposed Amended Rule 1153.1 – Emissions of Oxides of Nitrogen from Commercial Food Ovens (PAR 1153.1), seeks further emission reduction of oxides of nitrogen (NOx) in the South Coast air district and is part of a suite of "landing" rules for facilities regulated under the REgional Clean Air Incentives Market (RECLAIM) or under another existing source specific rule. The goal is to conduct a Best Available Retrofit Control Technology (BARCT) analysis to ensure that emissions from all equipment subject to PAR 1153.1 are controlled to achieve the maximum technically feasible, cost-effective emission reductions. Control Measure CMB-05 of the Final 2016 Air Quality Management Plan (AQMP) included a five tons per day (tpd) NOx emission reduction as soon as feasible but no later than 2025, and the adoption resolution for the 2016 AQMP directed staff to transition the RECLAIM program to a command-and-control regulatory structure requiring BARCT as soon as practicable. In addition, the 2022 AQMP established NOx reduction targets that require the transition to zero-emission technologies wherever feasible.

PAR 1153.1 regulates NOx emissions from commercial food ovens that are used to prepare food or products for making beverages for human consumption and require South Coast AQMD permits. PAR 1153.1 would affect approximately 97 facilities that operate approximately 218 commercial food ovens. Six facilities operating commercial food ovens are currently part of the RECLAIM program. The emissions limits in the latest version of this rule adopted in 2014 ranged from 40 ppmv to 60 ppmv based on the process temperature. After a comprehensive BARCT assessment which included an analysis of technical feasibility and cost-effectiveness, PAR 1153.1 proposes lower limits for all commercial food oven categories. Upon rule adoption, PAR 1153.1 includes a 30 ppmv Phase I NOx emission limit for commercial food ovens, other than tortilla ovens that fire infrared burners only, which have a 15 ppmv NOx limit. In addition, PAR 1153.1 includes zero-emission NOx limits for four oven categories at a future effective date. The zero-emission limit is technology forcing for most categories, meaning there are currently not a lot of commercially available units. The rule establishes a zero-emission limit at a future effective date of January 1, 2027, for categories where staff has identified comparable zero-emission units under Phase II emission limits; these are mostly smaller units with lower energy demand. Units with a zero-emission limit will not require permits to limit the NOx or CO (Carbon Monoxide) emissions and will not have any source test requirements resulting in time and cost savings for the facilities.

PAR 1153.1 also includes an Alternative Compliance Schedule Plan to address additional time that might be needed for a utility to provide the necessary energy to the facility to power the electric oven(s). An alternative compliance schedule will only be considered for unit upgrades that are outside the control of the facility.

The public process for PAR 1153.1 consisted of eight working group meetings, two public workshops, and multiple meetings with industry stakeholders and technology vendors to obtain feedback. The total NOx emissions inventory for PAR 1153.1 is approximately 0.26 tpd based on 2019 emissions. Estimated NOx emission reductions are 0.11 tpd at full implementation.

CHAPTER 1 : BACKGROUND

INTRODUCTION

The South Coast Air Quality Management District (South Coast AQMD) Governing Board adopted the REgional Clean Air Incentives Market (RECLAIM) program in October 1993. The purpose of RECLAIM was to reduce NOx and Sulfur Oxides (SOx) emissions through a market-based approach for facilities with NOx or SOx emissions greater than or equal to four tons per year. The 2016 Final Air Quality Management Plan (2016 AQMP) included Control Measure CMB-05: Further NOx Reductions from RECLAIM Assessment (CMB-05) to achieve five tpd of NOx emission reductions as soon as feasible but no later than 2025. Further, the adopted resolution for the 2016 AQMP directed staff to transition the RECLAIM program to a command-and-control regulatory structure requiring BARCT as soon as practicable. In addition, the 2022 AQMP established NOx reduction targets that require the transition to zero-emission technologies wherever feasible.

As facilities transition out of NOx RECLAIM, a command-and-control rule that includes NOx emission standards that reflect BARCT is needed. PAR 1153.1 is a "landing" rule for RECLAIM facilities with permitted commercial food ovens and will establish NOx and CO emissions limits for units subject to the rule at RECLAIM, non-RECLAIM, and former RECLAIM facilities. Staff is proposing zero-emission NOx limits where technology has been identified as technically feasible and cost-effective.

REGULATORY BACKGROUND

On November 7, 2014, South Coast AQMD adopted Rule 1153.1 – Emissions of Oxides of Nitrogen from Commercial Food Ovens (Rule 1153.1). Rule 1153.1 is applicable to commercial food ovens not participating in the RECLAIM program (non-RECLAIM) and establishes NOx and CO limits based on the process temperature.

Table 11-1. Rule 1153.1 NOx Emission Limits

NOx Emission Limit for In-Use Units	
NOx Emission Limit PPMV @ 3% O_2, dry or Pound/MMBtu heat input	
Process Temperature	
≤ 500°F	*> 500°F*
40 ppmv or 0.042 lb/MMBtu	60 ppmv or 0.073 lb/MMBtu

Prior to the adoption of Rule 1153.1, commercial food ovens were regulated under Rule 1147 – NOx Reductions from Miscellaneous Sources (Rule 1147). In 2014, staff proposed to regulate food ovens, roasters, and smokehouses under a new rule, Proposed Rule 1153.1, which was specific to commercial food ovens. Rule 1153.1 had higher NOx emissions limits than the corresponding ones in Rule 1147 and delayed compliance dates to address the specific challenges to commercial food ovens. The adoption of Rule 1153.1 allowed commercial food ovens to be placed on a more suitable compliance schedule with achievable emission limitations.

RECLAIM PROGRAM

The RECLAIM program is a market-based program that was adopted in 1993 and applies to facilities with NOx or SOx annual emissions greater than or equal to four tons per year. RECLAIM replaced a series of existing and future command-and-control rules and was designed to achieve BARCT in aggregate. At the start of RECLAIM, facilities received an allocation of RECLAIM Trading Credits (RTCs). At the end of each compliance year, facilities were required to hold RTCs that are equal to or greater than their actual annual emissions.

Under RECLAIM, facilities can install pollution control equipment to reduce NOx emissions or buy or trade RTCs. Any unused RTCs from over control, reduction in throughput, or equipment shutdowns, can be sold or traded. Allocations were based on the facility's reported emission rate since there were no proposed BARCT limits at the time. In response to concerns regarding actual emission reductions and implementation of BARCT under RECLAIM, Control Measure CMB-05 of the 2016 AQMP committed to an assessment of the RECLAIM program to achieve further NOx emission reductions of five tpd, including actions to transition the program and ensure future equivalency to command-and-control regulations. During the adoption of the 2016 AQMP, the adoption resolution directed staff to modify Control Measure CMB-05 to achieve the five tpd NOx emission reduction as soon as feasible but no later than 2025, and to transition the RECLAIM program to a command-and-control regulatory structure requiring BARCT-level controls as soon as practicable. PAR 1153.1 is needed to transition RECLAIM facilities with commercial bakery ovens to a command-and-control regulatory structure. PAR 1153.1 will apply to corresponding facilities while they are in RECLAIM and after their transition out of RECLAIM when they become a former RECLAIM facility.

AFFECTED INDUSTRIES

PAR 1153.1 affects manufacturers and operators of commercial food ovens, roasters, and smokehouses produce food and beverage products (NAICS 311 and 312). Staff identified 97 facilities with a total of 218 commercial food ovens that are regulated by PAR 1153.1. Six out of 97 facilities are currently in the RECLAIM program and approximately 51 commercial food oven units are currently located at RECLAIM facilities with the remaining 167 units located at non-RECLAIM facilities. A breakdown of unit categories is shown in Figure below.

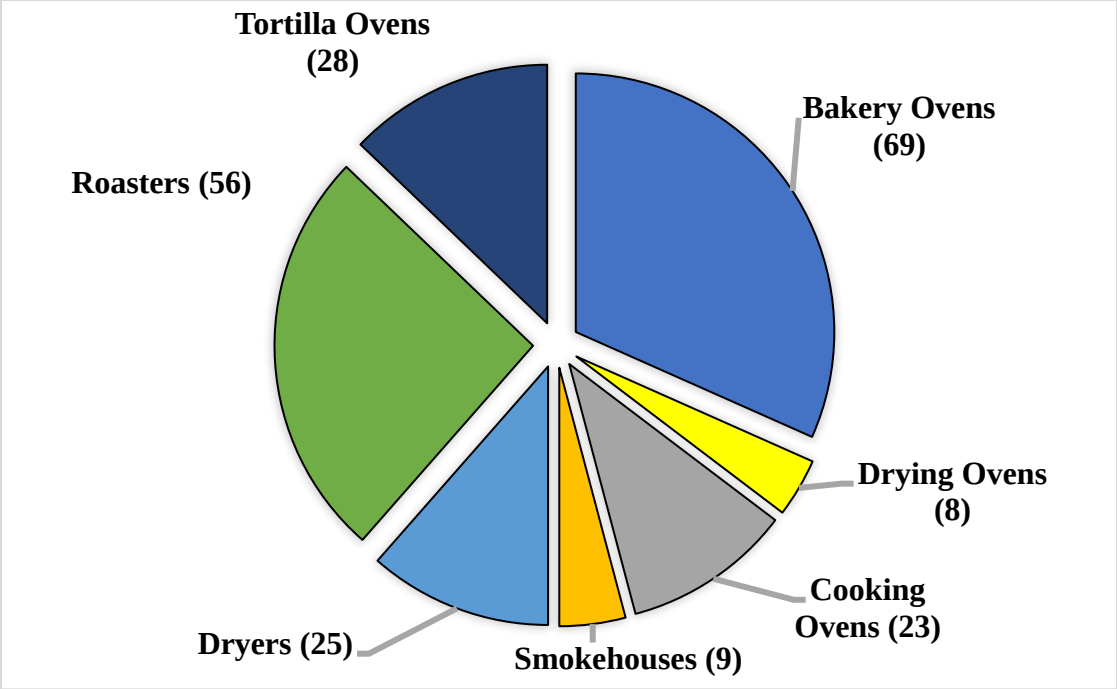

Figure 1-1. Commercial Food Oven Categories Subject to PAR 1153.1

The dryers category includes both spray dryers and rotary type dryers. The roasters category includes both coffee roasters and nut roasters, which are mostly small units with emissions less than or equal to one pound per day of NOx; as such, they may elect to demonstrate compliance with the rule by limiting their NOx emissions to one pound of NOx per day rather than complying with the Table 1 Emission Limits.

PUBLIC PROCESS

PAR 1153.1 was developed through a public process that included a series of Working Group Meetings. The table below summarizes the Working Group Meetings held throughout the development of PAR 1153.1 and provides a summary of the key topics discussed at each of the Working Group Meetings. Staff began the rule development process in the second quarter of 2021 and has conducted eight Working Group Meetings to date. Staff also held individual stakeholder meetings as needed and conducted several site visits to the affected facilities. The Working Group is composed of affected facilities, consultants, equipment vendors, and environmental groups. The purpose of the Working Group Meetings was BARCT assessment and development of the proposed amendments and NOx limits for PAR 1153.1.

Table 11-2. Summary of Working Group Meetings

Date	Meeting Title	Highlights
July 9, 2021	Working Group Meeting #1	• Rule Development Process • RECLAIM background • Rule 1153.1 background • Potential universe • Equipment types and NOx emissions • BARCT analysis overview
June 8, 2022	Working Group Meeting #2	• Background and Regulatory commitments • Status of Rule Development • Stakeholder comments • Initiated BARCT Assessment (first three steps) • Emission data evaluation for all equipment
July 27, 2022	Working Group Meeting #3	• Follow-up to stakeholder comments from WGM#2 • Baseline emissions • Technology demonstration project and emerging technology • Rondo Energy heat battery system presentation • Continuation of the BARCT Assessment • Presented the results from the fourth step of the technology assessment – "Assessment of Pollution Control Technology" • Proposed initial BARCT limit of 30 ppmv
August 31,2022	Working Group Meeting #4	• Micron Fiber-Tech presented on their metal fiber gas burners and combustion systems • Continued BARCT Assessment and discussed commercial oven categories and burner types • Proposed BARCT limits for categories • Presented cost-effectiveness analysis and Proposed BARCT limits
September 23, 2022	Working Group Meeting #5	• Rule language and structure changes overview
September 16, 2022		Released Preliminary Draft Rule and Staff Report
October 6, 2022		Public Workshop
October 21, 2022		Stationary Source Committee
December 2, 2022		Governing Board Approves 2022 AQMP
February 2, 2023	Working Group Meeting #6	• 2022 AQMP and updated cost-effectiveness threshold • BARCT re-assessment and revised proposal to include zero-emission NOx limits
March 3, 2023		Released March Pre-Preliminary Draft Rule Language
March 8, 2023	Working Group Meeting #7	• Rule language updates • Updated compliance schedule

Date	Meeting Title	Highlights
March 17, 2023		Released Third Preliminary Draft Rule Language and Staff Report
March 30, 2023		Public Workshop
June 2, 2023		Set Hearing
June 2,2023		Released Fourth Preliminary Draft Rule Language
June 7, 2023	Working Group Meeting #8	• Revised cost-effectiveness with consideration of fuel switching costs • Revised zero-emission proposal • Revised Rule Language
June 16, 2023		Stationary Source Committee
August 4, 2023 (subject to change)		Public Hearing

CHAPTER 2 : BARCT ASSESSMENT

BARCT ASSESSMENT

EQUIPMENT CATEGORIES AND PROCESSES

BARCT ASSESSMENT

COST-EFFECTIVENESS AND INCREMENTAL COST-EFFECTIVENESS

BARCT ASSESSMENT

The purpose of a BARCT assessment is to assess available pollution controls to establish emission limits for specific equipment categories consistent with the state law. Under California Health and Safety Code Section 40406, BARCT is defined as:

> "An emission limitation that is based on the maximum degree of reduction achievable by each class or category of source, taking into account environmental, energy, and economic impacts."

The BARCT assessment follows a framework through the rule development process and includes public participation. The figure below shows the overall BARCT assessment approach.

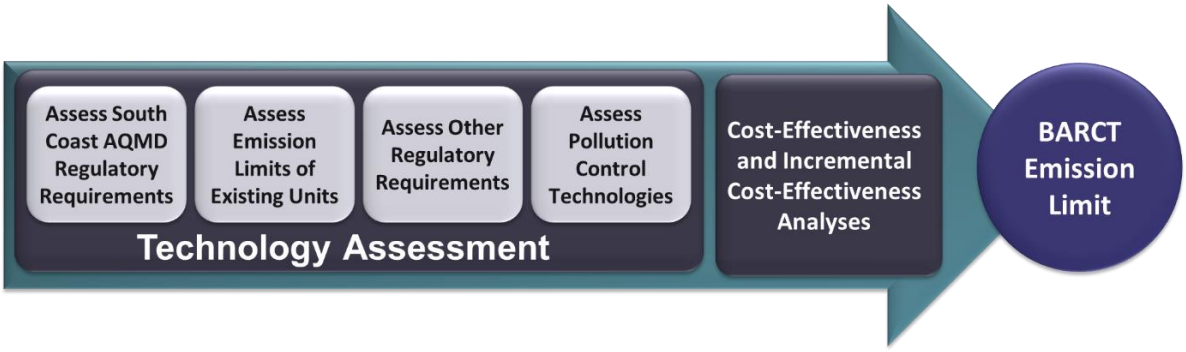

Figure 2-1. BARCT Assessment Approach

Technology Assessment

Staff conducted a thorough technology assessment to evaluate the NOx control technologies that will achieve the BARCT level for commercial food oven equipment at facilities subject to PAR 1153.1. The technology assessment consists of four steps including the assessment of South Coast AQMD requirements, a complete assessment of emission limits of existing units, review of other regulatory requirements, and an assessment of available pollution control technologies.

Class and Category of Equipment

One of the first steps in the BARCT assessment is to establish the class and category of equipment. Staff collaborated with the stakeholders to establish the class and category by accounting for the type of equipment, burner type, zero-emission units, and other unique operational features of the units. Figure 2-2 lists the category of equipment established for the BARCT assessment of the equipment subject to PAR 1153.1. Based on the BARCT technology assessment, staff initially did not consider categories of equipment by class since the size or maximum rated heat input for most units are less than 12.3 MMBtu/hr, and only four major categories of commercial food oven equipment were identified. However, after meeting with several stakeholders, staff further separated the bakery ovens into three subcategories based on oven type and unit size.

Equipment Categories and Processes

There are two main types of commercial food ovens – continuous tunnel ovens and batch ovens. Continuous tunnel ovens continually take in food items, cook them, and deliver the cooked product to an area where it cools prior to packaging. One subcategory of a continuous type of oven is a conveyorized type of oven that is often used for hot dog, hamburger bun, and panned bread production. Batch ovens take in food items that are removed when the process is complete. Most bakery and tortilla ovens are conveyor type whereas smokehouse ovens and roasters are batch

operations. Regardless of operation type, most commercial food ovens operate at temperatures less than 700°F with tortilla ovens operating near the higher temperature operating range. Food ovens are designed with a specific type of burner so that the oven can produce specific food products. There are primarily three types of burners used in commercial food ovens: Ribbon burners, infrared burners, and traditional nozzle-mix cone type burner such as a Maxon Ovenpak or Eclipse Winnox. Each cooked product requires a specific taste, texture, appearance, and other specific qualities unique to the product; therefore, food producers require specific oven and burner combinations. Staff evaluated facility permits and identified commercial food ovens that require specific burner characteristics and categorized commercial food ovens into seven main categories with several subcategories as follows.

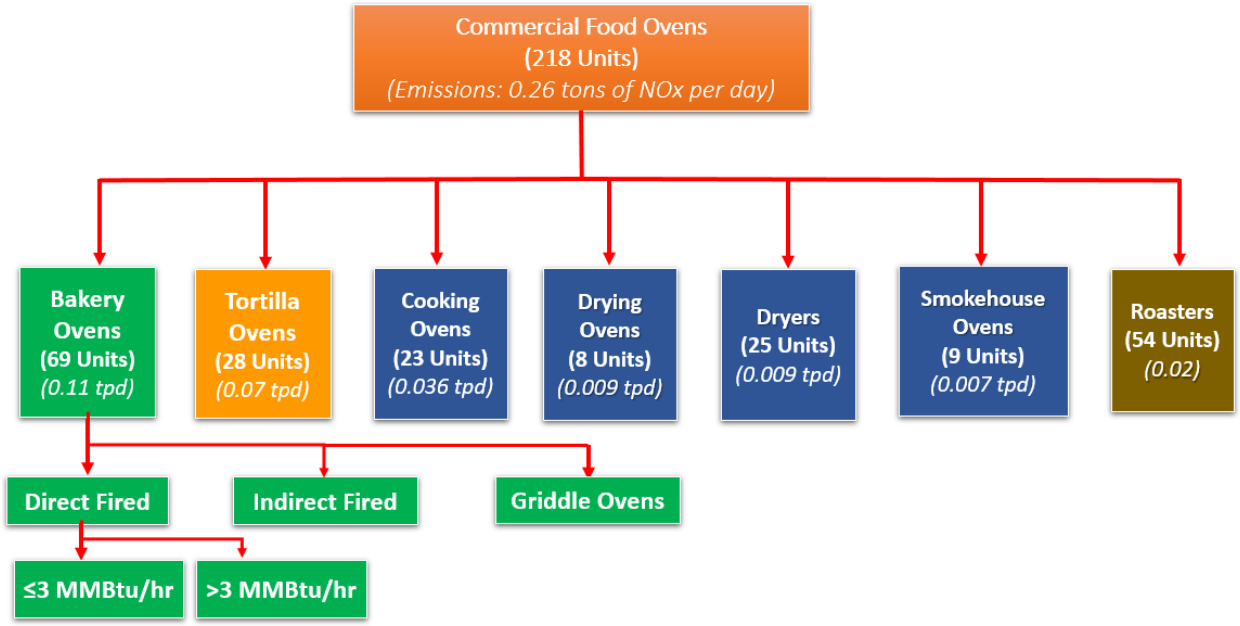

Figure 2-2. Commercial Food Oven Categories

The four categories of commercial food ovens initially identified are bakery ovens, tortilla ovens, other food ovens, and roasters. The other food oven category grouped cooking ovens, drying ovens, spray dryers, dryers, and smokehouses in one category because these ovens have similar heating and burner characteristics. The roasters category uses similar type of burners as the other food oven category, but units in the roasters category differ primarily because they are indirect-fired units where the heat and hot air heats a hotplate or surface in which the product is roasted. Food ovens by design can have multiple burners in a single oven and the number of burners is determined by the type of food product being produced. Depending on size, large conveyor type bakery ovens and tortilla ovens can have from 12 to 181 individual ribbon or infrared burners in a single oven and are often separated into several different heating zones, whereas the other food oven category will have one or two nozzle-mix cone type burners. This difference also results in a difference in burner costs. Based on discussions and meeting with technology vendors and industry stakeholders, ribbon burners and infrared burners typically have a higher cost. To ensure that burner costs and cost-effectiveness is evaluated and captured properly, staff separated the food ovens into the four main categories in which the BARCT assessment will be conducted. The table below summarizes the initial evaluation of commercial food ovens and the various type of burners

used in each category along with considerations gathered from the vendor and industry stakeholder meetings.

Table 22-1. Burner Type used by Commercial Food Oven Categories

Category	Description	Burner Type	Considerations
Bakery and Tortilla Ovens	• 97 units in Category • Ovens are Used to cook bakery or tortilla products • Conveyor type or tunnel type • Air heater • 2019 NOx Emissions: 0.18 tpd	• Ribbon Burners • Infrared (IR) Burners • Low NOx Burners (i.e., Maxon OvenPak type Eclipse Winnox) • Mesh fiber burners	• Ribbon Burners, and LNB can achieve 30 ppm • IR Burners can achieve 15 ppm • Commercially available • AMF offers an electric tunnel oven, but very few real-world installations
Other Food Ovens	• 65 units in Category • Spray Dryers • Dryers • Cooking Ovens • Smokehouse Ovens • 2019 NOx Emissions: 0.06 tpd	• Low NOx Burners (i.e., Maxon OvenPak type, Eclipse Winnox) • Mesh fiber burners	• Traditional OvenPak style LNB options available • Two smokehouse ovens are electric, but also uses steam • Some units such as dryers use steam as a heat source
Roasters	• 54 units in Category • Coffee Roasters • Nut Roasters • 2019 NOx Emissions: 0.02 tpd	• Low NOx Burners (i.e., Maxon OvenPak type, Eclipse Winnox) • Mesh fiber burners	• Indirect-fired units • Single burner • Most are small units exempted with permit conditions limiting operation

The 2022 AQMP adopted on December 2, 2022, lays a path for improving air quality and meeting federal air pollution standards by striving for zero-emission technologies across all sectors. The 2022 AQMP also establishes a cost-effectiveness screening threshold of $325,000 ($349,000 adjusted by CPI to 2022-dollar year) per ton of NOx. Staff re-assessed the BARCT technology assessment with an emphasis on zero-emission technologies for all oven categories to meet the control measure emission targets.

Assessment of South Coast AQMD Regulatory Requirements

Staff reviewed existing South Coast AQMD NOx regulations for commercial bakery ovens and similar equipment. The combustion equipment used for producing food products for human consumption consist of seven main source categories previously discussed (see Figure 2-1). In addition, staff evaluated current South Coast AQMD NOx regulations for other similar combustion equipment to assess potential technology transfer. Since commercial food ovens were originally included in Rule 1147, staff evaluated the current requirements of Rule 1147 and included a review

of existing BACT determinations for food ovens. The following table summarizes the current South Coast AQMD NOx rules that staff evaluated as part of the BARCT technology assessment.

Table 22-2. South Coast AQMD Regulatory Requirements

Regulation/Rule Title	Relevant Unit/Equipment	Emission Limits ppmv at 3% O2, dry
Rule 1153.1 – Emissions from Gaseous- and Liquid-Fueled Engines	Commercial Food Ovens	40 ppmv (≤ 500°F) or 60 ppmv (>500°F)
Rule 1147 – NOx Reductions from Miscellaneous Sources	Oven, Dehydrators, Cookers, Roasters	20 ppmv (≤ 1,200°F) or 30 ppmv (>1,200°F)
Rule 1147.1 – NOx Reductions from Aggregate Dryers	Aggregate Dryers (dryers, rotary dryers, fluidized bed, rotary kilns)	30 ppmv
Best Available Control Technology (BACT) Guidelines for Food Ovens	Ribbon Burners, Infrared Burners, Other Direct Fired Burners	• Ribbon Burners: 30 ppmv (≤ 500°F) or 60 ppmv (>500°F) • Other Direct Fired Burners: 30 ppmv • Infrared Burners: 30 ppmv

Assess Emission Limits of Existing Units

To assess emissions of existing units, staff evaluated source test data for various equipment categories to confirm existing limits were achievable. The assessment confirmed the current performance of NOx control controls for commercial food oven applications. The source test data showed that many units were already performing at or below 30 ppmv with only one unit performing at the 60 ppmv level. Further review of additional permit information, facility survey data, and source test data confirmed that approximately 131 out of the 218 food ovens were already performing below the 30 ppmv level and most units have an existing permit limit of 30 ppmv; 14 of these units were new units which were required to meet Best Available Control Technology (BACT). For the tortilla oven category, staff identified 12 tortilla ovens that recently installed IR burners utilizing metal fiber technology from Micron Fiber-Tech, and all were achieving 15 ppmv or less NOx measured at 3 percent oxygen. All source test measurements were conducted by a third-party company approved by South Coast AQMD. As a result, staff proposed an additional category for tortilla ovens solely firing IR burners at 15 ppmv NOx since it is currently achieved-in-practice.

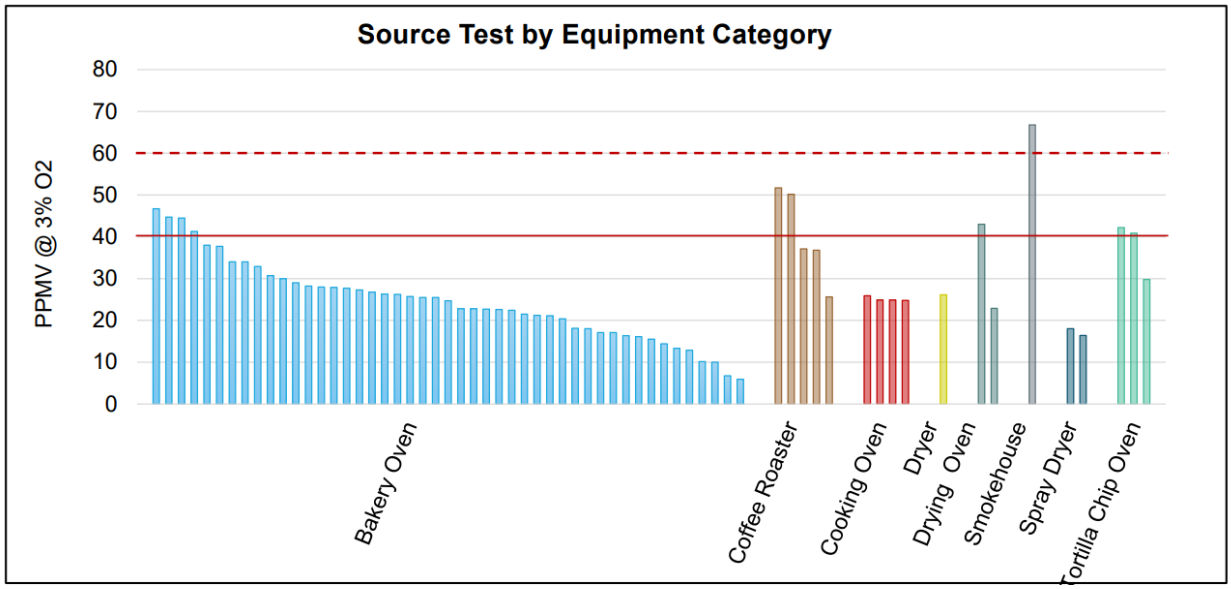

Figure 2-3. Source Test Data for Commercial Food Oven Categories

Assess Other Regulatory Requirements

Other Regulatory Requirements

The next step of the technology assessment is to identify other agencies that regulate the same or similar equipment and compare the regulatory requirements and emissions limits. The purpose of this step is to evaluate if there are applicable emissions limits that should be considered. The table below includes the list of regulations by other agencies which staff reviewed for applicable emissions limits. The specific emission limits and their impact on the BARCT assessment is discussed later in this document for each of the equipment categories.

Table 22-32. Other Regulatory Requirements

Regulatory Entity	Regulation/Rule Title	Relevant Units/Equipment
San Joaquin Valley Air Pollution Control District	Regulation 4309 – Dryers, Dehydrators, and Ovens (Units with a total rated heat input capacity of 5 MMBtu/hr or greater) – *Exempts smokehouses, roasting units, and units used to bake or fry food for human consumption*	Milk, Cheese, and Dairy Processing <20 MMBtu/hr: 3.5 ppmv (19% O_2) or ~32 ppmv (3% O_2)
		Milk, Cheese, and Dairy Processing ≥20 MMBtu/hr: 5.3 ppmv (19% O_2) or ~49 ppmv (3% O_2)
		Other processes (dryers, dehydrators, or ovens): 4.3 ppmv (19% O_2) or ~40 ppmv (3% O_2)
Ventura County Air Pollution Control District	Rule 74.34 – NOx Reductions from Miscellaneous Sources (units with total rated heat input capacity of 5 MMBtu/hr or greater)	Ovens, Dryers (besides asphalt, sand, or paper dryer)
		<1,200°F: 30 ppmv or 0.036 lb/MMBtu
		<1,200°F: 60 ppmv or 0.072 lb/MMBtu
Sacramento Metropolitan Air Quality Management District	Rule 419 – NOx from Miscellaneous Combustion Units (≥ 2MMBtu/hr)	Cooking Units
		< 500°F: 40 ppmv or 0.049 lb/MMBtu
		≥ 500°F: 60 ppmv or 0.073 lb/MMBtu

Assessment of Pollution Control Technologies

The next step is to research the commercially available emission control technologies and seek information on any emerging emission control technologies. As part of this assessment, staff met with multiple combustion control vendors and distributors each with over 30 years of experience working on NOx emissions control technologies; some also specialized in tuning and optimizing all burner types to achieve the lowest level of NOx emissions possible. Staff invited several vendors to present at the Working Group Meetings to address the issue of available and applicable technologies for the purpose of NOx emission reduction performance and its applicability to commercial food ovens. One of the companies invited was Rondo Energy which offers a unique heat storage battery system that may be potentially transferable to commercial food oven applications. Another company that presented was BABBCO, a manufacturer of several types of tunnel ovens which includes combustion ovens, hybrid ovens, and electric zero-emission ovens.

Staff assessed different pollution control technologies as part of the BARCT assessment. Staff presented and discussed the pollution control technology assessment in Working Group Meetings #3 and #6 which were held on July 27, 2022, and February 2, 2023, respectively. The objective is to identify and evaluate control technologies, approaches, and potential emission reductions. Staff considered the following:

- Commercially available NOx control technologies
    - Combustion control
    - Post-Combustion Control
- Zero-emission emission technology

The following vendors and manufacturers were contacted for information regarding burner control technologies, post-combustion control technologies, and zero-emission technologies. Each vendor representative has over 25 years of experience with combustion systems and various commercial food oven technology. All provided technical input and cost estimates were included in the BARCT assessment and cost-effectiveness analysis of the staff report.

- AMF Den Boer
- BABBCO
- Flynn Burners
- Honeywell/Maxon
- Maurer-Atmos
- Micron Fiber-Tech
- Peerless
- Reading Bakery Systems
- Umicore
- WP Bakery Group

There are several options for reducing NOx emissions from commercial food ovens subject to PAR 1153.1. NOx control techniques can be divided into two control techniques: (1) combustion control and (2) post-combustion control. Combustion control involves retrofit of the existing burners with the latest generation low-NOx design, whereas post-combustion control involves treatment of the flue gas. The other option is to replace the unit with a zero-emission electric unit, which is the most effective option to reduce NOx emissions. One manufacturer offers a retrofit option for tunnel-type ovens where the burners are replaced with electric heating elements, but this option may be limited to a few types of ovens. The likely pathway for implementation of zero-emission electric units is to replace the entire combustion unit with a new zero-emission electric unit.

Combustion Control Technology for Food Ovens

For commercial food ovens, the most frequent option to reduce NOx emissions is by replacing the burner system with newer low-NOx burner (LNB) technology. In some situations, burners installed within the last 10 years may potentially be tuned and optimized to reduce NOx formation rather than undergoing a complete burner replacement, which will result in cost savings for the facilities. Combustion controls are techniques that reduce NOx by modifying the combustion zone through installation of LNBs. This control technique employs air staging or fuel staging techniques

to maximize NOx reduction. This technique reduces the adiabatic peak flame temperature and is effective at reducing thermal NOx formation.

Low NOx Burners Combustion Systems

The current NOx limit for Rule 1153.1 is between 40 to 60 ppmv corrected to 3% O_2. According to the vendor discussions for commercial food oven applications, a lower NOx limit of 30 ppmv or less is achievable without any issue and is technically feasible in commercial food ovens. Commercial food ovens operate at lower temperatures than most industrial application, and burner vendors will guarantee 30 ppmv NOx levels up to 1,600°F; therefore, higher NOx limits for process temperatures over 500°F, as Rule 1153.1 currently allows, is not necessary for commercial food oven applications. One vendor provided a case study for a ribbon burner retrofit in a commercial bakery where their ribbon burners achieved sub-9 ppmv NOx based on a handheld meter (e.g., diagnostic check) but not demonstrated in a source test conducted by a third-party. Staff reviewed South Coast AQMD's source test data for existing units with similar burners, which confirmed that existing units can perform between 20 to 30 ppmv NOx. In addition, staff identified 131 commercial food ovens that currently have a NOx permit limit of 30 ppmv.

Staff held several meetings with combustion system manufacturers and most confirmed that they will guarantee NOx emissions of a maximum of 30 ppmv up to 1,600°F. Most commercial food ovens regardless of type operate from 130°F to 700°F, which are relatively low temperatures when compared to other industrial processes requiring heat. For this reason, staff believes a high NOx limit of 60 ppmv is no longer required for commercial food ovens that operate above 500°F.

Based on discussion with vendors, in some instances, ovens with ribbon burners or other types LNBs will only require tuning and regular maintenance to lower NOx emissions. In other cases, burners will have to be replaced with newer LNB technologies and/or the burner control system will have to be upgraded to the one with lower NOx emissions. As previously mentioned, commercial food ovens can either be batch or conveyor-type food ovens. Conveyor-type ovens are typically manufactured with ribbon burners, infrared burners, or air heating type burners such as Maxon Ovenpak or Eclipse Winnox burner, which are the most common burners for this application.

Ribbon Burners

Ribbon burners are similar to pipe burners which are long sections of pipes with holes down the entire length of the pipe. Fuel gas and a small amount of air is introduced into the pipe where it mixes and exits through the holes along the length of the pipe where it is lit with a pilot flame. The secondary air is provided by the oven and mixes with the gas. Ribbon burners incorporate a ribbon-type insert along the length of the pipe that allows for better control of the flame. These ribbon inserts are also designed to provide better premixing of the air with fuel for more efficient combustion and control. The newest types of ribbon burners are made in various configurations to help achieve better mixing and distribution of fuel gas in the burner, which helps lower NOx emissions by reducing peak flame temperature, and they can achieve NOx emission level of 30 ppmv.

One manufacturer presented a ribbon burner that incorporates a metal fiber mesh across the length of the burner where overall flame temperature is reduced, resulting in lower NOx emission levels. These types of mesh metal fiber ribbon burners can run in blue fame or radiant mode. According

to the vendor the burner can achieve 9 ppmv or less, but there have been no independent third-party source test data that can validate the performance. The test was primarily done with a handheld meter. However, the vendor has stated that they will provide a vendor performance guarantee of 30 ppmv for the ribbon burners in commercial food oven applications.

Air Heating Burners

Air heating-type burners are traditional nozzle-mix type burners similar to the Maxon OvenPak or Eclipse Winnox burners used in a majority of commercial food oven categories. This type of burner is used in convection ovens where the burner is not in close proximity to the food product being cooked. Air heating burners consists of cylindrical housing projecting into the oven where the burner flame is contained. These burners are typically flanged mounted with the blowers mounted externally. They fire into a small space and the external blowers move the air through the main chamber of the oven. Air heating burners can achieve NOx emission level of 30 ppmv.

One manufacturer presented a low-NOx versions of these types of burners that utilize a metal fiber mesh on the inside cone or sleeve of the burner. The metal fiber mesh aids in lowering the peak flame temperature which lowers overall NOx emissions. According to the vendor the burner can achieve 9 ppmv or less; however, no third-party source data was provided to validate the performance of the burner. The vendor confirmed that they will provide a vendor performance guarantee of 30 ppmv for the burner in commercial food oven applications.

Infrared Burners

Food ovens can also use radiant systems called infrared (IR) burners. Similar to ribbon burners, IR burners have long sections that consist of ceramic or metal fibers across the length which act as a flame holding surface that produce infrared radiation and a red glow. This type of burners can achieve very low NOx emission levels. IR burners are primarily used in tortilla ovens. Based on source test data of existing food ovens, IR burners can achieve 9 ppmv or less in small tortilla ovens with a rated heat input capacity of approximately one MMBtu/hr. Larger tortilla ovens with a rated heat input capacity of approximately 2 MMBtu/hr that solely fire IR burners, generated source test data between 12 to 14.2 ppmv.

Indirect Fired Units

Using the heat generated by a steam boiler or thermal fluid heater can be an efficient and cost-effective method to heat a process. The heat transfer process requires the use of a heat exchanging system (air-to-air heat exchanger) to warm and heat the incoming air that enters the process chamber and heats the food product. These types of units are called indirect fired units since they use the heat generated from another unit's combustion process. In this heating arrangement, there are no NOx emissions being emitted from the commercial food oven and essentially zero-emissions, but NOx emissions are generated from the combustion process of other units regulated by other South Coast AQMD NOx rules. There are several examples of these types of units in bakery ovens, dryers, and smokehouse ovens that are currently in use. One unique example of this heating method is a smokehouse oven that is currently in operation, which uses an electric burner (14.9 kW) and high-pressure steam as the two sources of heat. Some indirect-fired units use LNB as the source of heat, but they typically have small burners with a rated heat input of one MMBtu/hr or less.

Post-Combustion Control Technology for Food Ovens

Post-combustion control technologies are used to treat the flue gas by converting the NOx to a different chemical form through either chemical reaction or oxidization.

Selective Catalytic Reduction

Selective Catalytic Reduction (SCR) is a post-combustion control technology that is commercially available and used to control NOx on a variety of NOx sources. A typical SCR system consist of a reactor where the catalyst is contained, ammonia storage tank, ammonia vaporizer, and ammonia injection system. The technology uses catalyst that consist of a mixture of metals, with vanadium being the primary metal in various proportions. The catalyst selectively reduces the NOx on the presences of ammonia to nitrogen and water. Minimum operating temperature for SCRs is between 600°F to 900°F which is above the process temperature of most commercial food ovens. To reach optimal reaction temperatures, supplementary firing from additional duct burners would be necessary which will increase NOx emissions.

LoTOx™ with Wet Gas Scrubber

LoTOx™ stands for "Low Temperature Oxidation" process where ozone is injected into the flue gas stream to oxidize insoluble NOx compounds into soluble NOx compounds. These soluble compounds can then be removed by various neutralization reagents (caustic solution, lime, or limestone). LoTOx™ is a low temperature operating system in a range of 140°F–325°F, but the optimal temperature is generally less than 300°F.

The LoTOx™ process requires oxygen supply for ozone generation. Unlike SCR technology which requires ammonia storage, the LoTOx™ technology modulates ozone generation on demand as required by the process. A ratio of NOx to ozone of about 1.75–2.5 is needed to achieve 90–95% NOx conversion and reduction. The ozone that does not react with NOx in the LoTOx™ process is scavenged by sulfite in the scrubber solution. The ozone slip is in a range of zero to three ppmv.

Some advantages of LoTOx™ application in comparison to SCR are as follow:

- LoTOx™ does not require heat input to maintain operational efficiency and enables maximum heat recovery of high temperature combustion gases.
- LoTOx™ can be integrally connected to a wet (or semi-wet) scrubber and become a multi-component air pollution control system that can reduce NOx, SOx, and PM in one system whereas SCR is primarily designed to reduce only NOx.
- There is no ammonia slip, SO_3, and ammonium bisulfate issue associated with LoTOx™ application.

Potential drawbacks with LoTOx™ include:

- A significant amount of water is needed for the process, and it consequently generates waste effluent that requires an effluent treatment system. Thus, a water supply and effluent treatment system must be constructed to accommodate the LoTOx™ system.
- Since the LoTOx™ system requires high electrical power usage and oxygen demand, annual operating costs for the ozone generator could be potentially high.
- Nitrates in wastewater effluent may be a concern for treatment and/or discharge of the wastewater.

Below is a summary of combustion control and post-combustion control.

Table 22-4. NOx Control Technologies Evaluated and Initial Conclusions

Potential Control Technologies			
Control Type	**Key Feature**	**Considerations**	**Initial Conclusions**
LoTOx™ w/ Wet Gas Scrubber	• Low Operating temperature • Multi-pollutant control	• Requires wastewater treatment • Large space requirements • High capital and operating costs	• Not technically feasible due to space requirements • Not cost effective due to low emissions and high costs
Selective Catalytic Reductions (SCR)	• High NOx removal • Required high operating temperatures	• Large space requirements • Hazardous chemical storage • Waste disposal • High capital and operating costs	• Not technically feasible due to temperature and space requirements • Not cost effective due to low emissions and high costs
Low-NOx Burners (LNB)	• Low operating cost • Most ovens can be retrofitted with low-NOx burners reducing overall costs	• Can have complex designs • May need further fan capacity	• Most feasible option • Several options and burner types available for various applications

Post-combustion control requires significant capital investment, has a high annual operating cost, requires a large footprint, and there are currently no existing installations for commercial food oven applications. SCRs and LoTOx systems can achieve NOx emission levels of 5 ppmv or less, but both systems are typically employed in large process heater applications that are 30 MMBtu/hr or greater due to the cost versus overall NOx emission reductions. All commercial food ovens are less than 12.3 MMBtu/hr, and due to high capital and annual operating costs, post-combustion technology was ruled out as a feasible control option for PAR 1153.1 equipment. Vendors' feedback and cost estimates also confirmed staff's conclusion that post-combustion control is not feasible due to the low operating temperatures of commercial food ovens and significant capital investment necessary for low emission reductions. Furthermore, post-combustion control technologies such as selective catalytic reduction (SCR) require high flue gas temperatures which is beyond the operating temperature of most commercial food ovens and may require supplementary firing from additional burners to raise the flue gas temperature to the optimal operating temperature range between 600°F to 800°F. This will potentially add additional capital costs, NOx emissions, and fuel cost. In addition, post-combustion control requires the use of hazardous chemicals at food manufacturing facilities. Therefore, combustion control technologies such as LNBs and reducing NOx at the point of formation are the most feasible option to reduce NOx emissions from commercial food oven applications.

Zero-Emission Technology

Staff met with industry stakeholders and equipment vendors to inquire about commercial availability, price ranges, installation costs, operation maintenance costs, and electrical upgrade costs for zero-emission technology across all established equipment categories. While staff did not identify zero-emission technology suitable for commercial production across all equipment categories, staff will continue to monitor the status and development for those categories. The categories where zero-emission ovens have been identified as technically feasible are shown below.

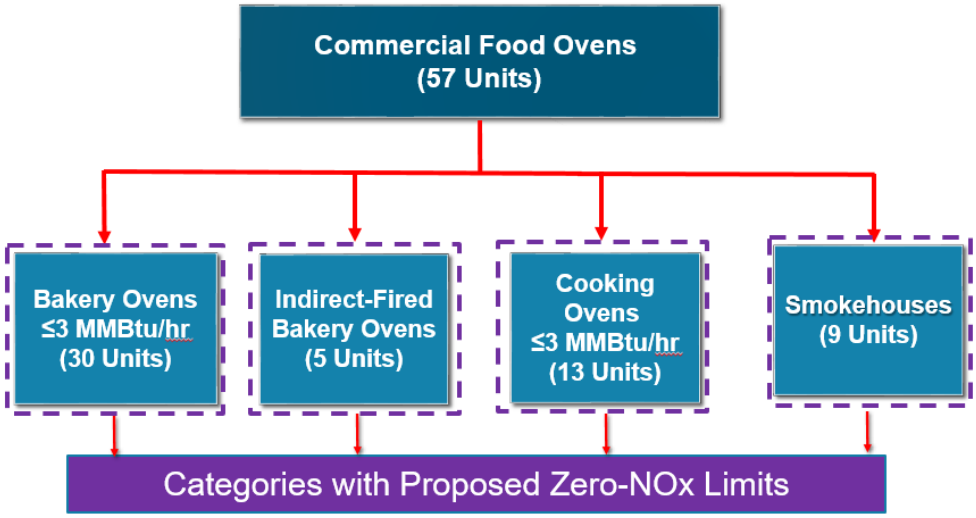

Figure 2-4. Zero-Emission Commercial Food Oven Categories Identified

Several categories of commercial food ovens were identified where zero-emission technology is commercially available. Based on staff's discussions with a vendor of zero-emission ovens and Southern California Edison (SCE) regarding the challenges for zero-emission commercial food ovens, staff further subcategorized commercial bakery ovens based on the oven type and size. The commercial bakery oven category was separated into direct-fired and indirect-fired bakery ovens. Direct-fired bakery ovens will have the energy or heat source inside the baking chamber, and the heat source can be gas burner or electric heating elements. The heat transfer process is primarily done by radiation from the flames or electrical heating elements. In contrast, an indirect gas-fired bakery oven is also a radiant-type oven but uses exchangers connected to a burning zone that is not within the baking chamber. The baking chamber is indirectly heated by the exchanger, so the baking products do not come in contact with the product of combustion. The direct-fired bakery oven category was further subcategorized based on the unit size: ovens greater than 3 MMBtu/hr and ovens less than or equal to 3 MMBtu/hr. Staff also identified a unique proprietary griddle oven used in English muffin production which has a moving griddle that can either be a flat or grooved metal plate and operates between 550°F to 900°F. The griddle oven will be classified as a subcategory under bakery ovens. SCE advised staff that any commercial bakery oven requiring more than one megawatt (MW) of power would require further evaluation of the electrical grid capacity for the surrounding area of the facility and more than likely require additional time to accommodate necessary upgrades due to the energy requirements. The 3 MMBtu/hr threshold is equivalent to approximately 900 kW electrical energy demand. For the indirect-fired bakery oven category, staff also identified several bakery units operating in the South Coast AQMD that already

operate at zero NOx emission level; for those units the heat source comes from another process or unit.

The following technologies were explored as part of the BARCT assessment:

- One electric zero-emission tunnel oven is currently in operation and used to produce bread. The oven is a conveyor driven type tunnel oven. The bakery tunnel oven is custom designed by Sellars Manufacturing and its dimensions are 6'-0' W x 85'-0"L x 10'-0" with an electric heater rated at 705 kW (2.4 MMBtu/hr); the max amount of dough processed through this oven is 87,600 lbs/day. This unit was permitted in 2006.
- Two facilities use smokehouse ovens equipped with electric burners that use electricity to supply heat to the process. One facility uses a smokehouse oven manufactured by Friedrich Metal Products, Model FMP-4000-ST (2x2 Tunnel) heated with an electric burner rated at 14.9 kW and high-pressure steam. The unit has dimensions of 10'-10"W x 8'-2.5"L x 8'-4" H. Another facility uses two smokehouse ovens that are electrically heated.
- Electric bakery tunnel and batch oven technology are currently commercially available from BABBCO, WP Bakery Group, and Coastline Equipment, Inc. One of the challenges of this technology is the amount of electricity required to operate these ovens, limited real-world installations, and potential product quality issues that may need to be addressed when transitioning to electric cooking.
- Electric nut and coffee roaster technology currently available from Ozstar Machinery and Bellwether but is limited to small applications that roast approximately 20 pounds per load. The technology is currently not available for commercial size applications which can roast up to 2,000 pounds per load.
- Electric meat cooking ovens and smokehouse technology is currently available and in use manufactured by Friedrich Metal Products and Maurer-Atmos.
- Electric bakery tunnel oven technology is currently available from AMF Den Boer, but there are very few real-world installations. The necessary heat is generated by electrical elements directly above and under the product line. One of the challenges of this technology is the amount of electricity required to operate the oven.
- Hybrid electric-ribbon burner technology is available from Flynn Burners. This new technology is currently in the development phase with no real-world installations yet. This technology may be a potential replacement option for bakery tunnel ovens that utilize ribbon burners. The technology uses a gas ribbon burner and electric heating elements where it can be initially fired on gas, then switch to electric mode under normal baking operations. One of the current challenges is the increased electricity needed to operate the burners. Some bakery tunnel ovens can use up to 181 ribbon burners.
- Hybrid gas/electric tunnel oven is a new bakery oven design offering from BABBCO. This type of oven can operate on both gaseous fuels and electric heating elements as a source of heat. The hybrid oven technology can achieve 30 ppmv NOx when operating in combustion mode and then transition to electric after initial "cold" start-up which can decrease the overall electrical demand of a fully electric oven. The hybrid oven also gives the operator the flexibility to transition to full electric operation at a later stage.

- Rondo heat battery system was a zero-emission technology evaluated as a potential technology process. The technology is an emerging technology used in other industrial processes as a heat source and consists of a high temperature brick storage system that generates and stores heat from standard electrical input. The bricks store the thermal energy at temperatures up to 2,100°F and an air blower passes air over the brick; the air can then be used to heat a process or generate steam. This technology has not been used in commercial food oven applications.

Several manufacturers offer electric oven options, but they are not widely used at this time. As regulatory agencies and companies who operate large commercial food ovens work to decarbonize and lower emissions, more zero-emission commercial oven installations are anticipated to be developed. Electric ovens are more commonly installed in areas where natural gas supplies are not readily available. An example presented by BABBCO during Working Group Meeting #7 of a large electric commercial oven in Africa. In 2010, BABBCO installed a dual fuel hybrid oven that can operate on electricity or liquid fuels.

BABBCO is also working to commission an electric test oven at their innovation technology facility in Fall 2023. The facility provides the medium for bakery product manufacturers to compare product bake characteristics using gas and electric since one of the major concerns of commercial bakers is a potential adverse impact that application of electric ovens could have on the product quality. A test facility would allow bakers to test bake their specific products and recipes using the electric oven to ensure whether they can produce the same quality products.

One of the concerns raised regarding the use of zero-emission technologies was the electrical requirements necessary to operate commercial electric bakery and cooking equipment. Working with an industry stakeholder who owns and operates two large commercial bakery facilities and several hundred worldwide, staff evaluated and compared the electrical demand necessary to run three electrical ovens at one of their facilities. The stakeholder provided daily electrical consumption for normal day-to-day operations as a baseline for comparison for the one facility. The baseline was compared to the increased electrical demand as listed in the table below.

Table 22-5. Electricity Increase Requirement for Bakery Ovens

Facility	Average Daily Electricity Consumption (kWh)	Average Daily Electricity Consumption w/Electric Ovens (kWh)	Average Daily Electricity Consumption w/Electric Ovens (kWh)
Facility One	37,300 per day	51,400 per day	140% (for 3 Ovens)
Facility Two	9,051 per day	34,300 per day	360% (for 2 Ovens)

Based on the assessment, one facility would require approximately 140% more electricity daily and the other facility would require over 360% more electricity to operate three ovens. This would require the facility to make significant electrical upgrades to handle the increase in the electrical load. The additional costs for the electrical upgrades at the facility will be taken into consideration in the cost-effectiveness assessment.

As mentioned above, one potential option to address this concern is to transition to hybrid ovens that use a combination of electricity and combustion to mitigate part of the power demand. Hybrid ovens may serve as a bridge to achieving zero-emissions for large commercial bakery ovens.

BABBCO recently introduced a multi-fuel hybrid technology that uses gas and electricity as the source of heat. The "hybrid" design can generate heat from standard fuels such as natural gas and electricity. The hybrid design provides bakers the ability to actively switch from one energy source to another or at a specific stage. BABBCO currently can offer the hybrid three ways: (1) All electric, (2) gas/hydrogen and electric, or 3) gas and electric. The advantage of this technology is that it can reduce the high electrical demand during start-up heating of the bakery oven.

Electric ovens, are more energy efficient in term of using heat or thermal energy due to the ability maintain even heat across the oven; electric ovens have smaller variations in temperature during the oven cycle. In addition, electric ovens are more efficient because there are no products of combustion in the flue gas which need to be removed. Combusting natural gas creates byproducts such as carbon dioxide, CO, and NOx, which need to be removed and vented from the heating chamber of the oven. Since generating heat with electric elements does not produce byproducts, venting is not required which minimizes heat losses. Based on discussions with SCE and electric oven manufacturers, the average typical efficiency increase with electric ovens is approximately 20% over that of gas-fired ovens. Staff will reassess this efficiency gain assumption as more electric ovens are developed.

Based on feedback from technology vendors regarding the availability and progress of zero-emission commercial food ovens for most categories, staff believes zero-emission limit is feasible or will be feasible at a future date. The inclusion of a future effective date will allow additional time for the technology to emerge and for facilities to address concerns regarding the product quality. Staff's conclusion on the technology feasibility is based in part on electric ovens operating in our jurisdiction, for example the electric bakery oven rated at 705 kW that is currently in operation and used to produce bread.

INITIAL BARCT EMISSION LIMIT AND OTHER CONSIDERATIONS

Upon completion of technology assessment, staff recommends an initial BARCT NOx emission limit established using information gathered from the technology assessment. All provided emission concentration values (i.e., initial and final) in this report have the unit of part per million by volume (ppmv) based on a dry basis. Additionally, staff evaluates other considerations that could affect the emission limits that represent BARCT, including limits for those units operating close to the BARCT NOx limits. In addition, staff evaluates units that are considered outliers due to low-emissions, low-use, or high cost-effectiveness. Summary of the BARCT assessment and staff's initial recommendations based on feasibility are shown below in Table 2-6.

Table 22-6. Initial BARCT Recommendation for Proposed Amended Rule 1153.1[1]

	Rule 1153.1	Existing Units	Other Regulatory Agencies	Technology Assessment	Initial BARCT Limit
Bakery Ovens	40 and 60 ppmv	0-45ppmv	40 and 60 ppmv	0 to 30 ppmv	30 and 0 ppmv
Tortilla Ovens	40 and 60 ppmv	8.4–52 ppmv	40 and 60 ppmv	0 to 30 ppmv	30 and 0 ppmv
Cooking Ovens	40 and 60 ppmv	25-30 ppmv	40 and 60 ppmv	0 to 30 ppmv	30 and 0 ppmv
Drying Ovens	40 and 60 ppmv	30-40 ppmv	40 and 60 ppmv	0 to 30 ppmv	30 and 0 ppmv
Spray Dryers	40 and 60 ppmv	0-26 ppmv	40 and 60 ppmv	30 ppmv	30 ppmv
Smokehouse Ovens	40 and 60 ppmv	0-52 ppmv	40 and 60 ppmv	0 to 30 ppmv	30 and 0 ppmv
Coffee and Nut Roasters	40 and 60 ppmv	25-37 ppmv	40 and 60 ppmv	0 to 30 ppmv	30 and 0 ppmv

[1]*Emission limits are corrected to 3% O_2*

COST-EFFECTIVENESS AND INCREMENTAL COST EFFECTIVENESS ANALYSIS

South Coast AQMD routinely conducts cost-effectiveness analyses regarding proposed rules and regulations that result in the reduction of criteria pollutants (NOx, SOx, VOC, PM, and CO). The analysis is used as a measure of relative effectiveness of a proposal. It is generally used to compare and rank rules, control measures, or alternative means of emissions control relating to the cost of purchasing, installing, and operating control equipment to achieve the projected emission reductions. The major components of the cost-effectiveness analysis are capital and installation costs, operating and maintenance costs, emission reductions, discount rate, and equipment life. The cost-effectiveness analysis for PAR 1153.1 were completed using the discounted cash flow method explained below.

Discounted Cash Flow (DCF)

The DCF method converts all costs, including initial capital investments and costs expected to be incurred in the present and all future years of equipment life, to present value. Conceptually, it is as if calculating the number of funds that would be needed at the beginning of the initial year to finance the initial capital investments and to be set aside to pay off the annual costs as they occur in the future. The fund that is set aside is assumed to be invested and generates a rate of return at the discount rate chosen. The final cost-effective measure is derived by dividing the present value of total costs by the total emissions reduced over the equipment life. The equation below is used

for calculating cost-effectiveness with DCF. The equation was presented in the 2016 AQMP Socioeconomic Report Appendix 2-B (p. 2-B-3).

$$Cost - effectiveness = \frac{Initial\ Capital\ Investments\ +\ (Annual\ O\&M\ Costs\ \times\ PVF)}{Annual\ Emission\ Reductions\ \times\ Years\ of\ Equipment\ Life}$$

Where:

$$PVF = \frac{(1+r)^N - 1}{r * (1+r)^N}$$

Where:

r = real interest rate (discount rate)
N = years of equipment life

Incremental Cost Effectiveness Assessment

California Health and Safety Code Section 40920.6(a)(3) states that an incremental cost-effectiveness assessment should be performed on identified potential control options that meet air quality objectives. To determine the incremental cost-effectiveness, South Coast AQMD calculates the difference in the dollar costs divided by the difference in the emission reduction potentials between each progressively more stringent potential control option as compared to the next less expensive control option. Once the BARCT assessment is complete and NOx limits are established, staff considers incrementally more stringent options to demonstrate that the NOx limit represents the "maximum degree of reduction achievable by each class or category" that can be cost-effectively achieved. The equation for incremental cost-effectiveness (I-CE) is below:

$$I\text{-}CE\left(^{\$}/_{tons\ NOx\ reduced}\right) = \frac{Incremental\ Difference\ in\ Cost\ (Present\ Worth\ Value)}{Incremental\ Difference\ in\ Emission\ Reductions\ (Lifetime\ Reductions)}$$

Cost -Effectiveness Screening Threshold

The South Coast AQMD Governing Board adopted the 2022 AQMP on December 2,2022, which establishes a new cost-effectiveness screening threshold of $325,000 per ton of NOx reduced. The new threshold utilizes a health-based approach and uses a public health monetized benefit value for reducing pollution. This is a similar approach to the one used by CARB and U.S. EPA where the associated costs with a rule are compared to the monetized benefits associated with the resulting emission reductions. The $325,000 threshold was based on U.S. EPA established monetized benefit value of $307,636 and 2016 AQMP monetized benefit value of $342,000 per ton of NOx reduced. The 2022 AQMP states that the benefits-based screening threshold of $325,000 would be inflated through time to the dollar-year used in the control measure-specific socioeconomic analysis. The screening threshold will be inflated using the annual California Consumer Price Index (CPI) for consistency with how the benefits-based threshold was inflated to 2021-dollars in the 2022 AQMP and 2022 AQMP socioeconomic report. Using CPI is more appropriate than using the Marshall & Swift Index, because the screening threshold is health-benefits based. The inflation-adjusted screening threshold is not conducted for every rulemaking but rather annually based on the year the costs are brought into analysis. In the case of PAR 1153.1, the cost used in the assessment was based on 2022-dollars and the health-based screening threshold

of $325,000 was based on 2021-dollars. Below is an example of how the screening cost-effectiveness threshold will be adjusted from 2021-dollars to 2022-dollar year using the CPI for 2022 and 2021.

$$Inflation\ Adjusted\ Threshold\ in\ 2022\ = Threshold\ in\ 2021\ x\ \left(\frac{CPI\ in\ 2022}{CPI\ in\ 2021}\right)$$

$$Inflation\ Adjusted\ Threshold\ in\ 2022\ = \$325{,}000\ x\ \left(\frac{319.224}{297.371}\right)$$

$$Inflation\ Adjusted\ Threshold\ in\ 2022\ = \$349{,}000$$

The adjusted cost-effectiveness screening threshold in 2022-dollars is $349,000 per ton of NOx reduce which is $24,000 higher than the $325,000 threshold in the 2022 AQMP.

Summary of Cost Assumptions

In order to determine cost-effectiveness for the proposed BARCT limits, cost information and estimates for the control equipment were obtained. Staff met with multiple burner manufacturers, oven manufacturers, vendors, distributors, and stakeholders to gather cost data and estimates for various types of burners and ovens. In addition, staff sent out a survey to the facilities to gather equipment data and cost information for recent NOx control projects.

Burner Technology Costs

To estimate the costs of burner technologies, staff evaluated: (1) Ribbon burners; (2) Infrared (IR) burners; and (3) Air heater cone type burners. Based on quotes and cost estimates, ribbon and IR burners are more expensive than air heating cone type burners. Food ovens such as bakery ovens and tortilla ovens can use up to 181 burners in a single oven, so cost can be significantly more than other types of food ovens. The other types of food ovens such as dryers, smokehouses, cooking ovens, and roasters will typically have one or two burners. Overall burner cost depends on size, type, and number of burners. The useful life for the burner control equipment was assumed to be 25 years. Staff also identified several units who have recently retrofitted their units with new burners to meet the existing 40 ppmv or 60 ppmv NOx limits. These facilities will face difficulties with respect to stranded assets. To address the issue of stranded assets, staff is incorporating a compliance schedule that will require facilities to meet the proposed Phase I Emission Limits upon burner replacement or when the burner is 10 years of age.

Ribbon and Infrared Burner Costs

For ribbon and IR burners staff received several budget quotes from two manufacturers for various sizes ranging from 1 to 12 MMBtu/hr. In addition, staff received cost estimates from two facilities for recent ribbon and IR burner projects which ranged from $300,000 to $4,200,000. The $4,200,000 is for an oven replacement. The vendor estimates for ribbon burners were based on 2.5” diameter which is commonly used in food ovens for gentle heating and included mounting plates, igniter, and flame sensors. Installation costs were assumed to be three times the capital cost of the burners due to the necessary support structure to mount the burners. Total installed cost for ribbon and IR burners ranged from $30,000 to $226,000.

Air Heater Cone Type Low NOx Burners (LNBs)

For these types of traditional nozzle-mix type LNB, budget quotes were received from vendors and installation costs were assumed to be 50% of the burner capital costs. Total installed costs quotes ranged from $14,000 to $45,000 and if a unit required multiple burners, the costs was multiplied by the number of burners.

Once staff complied cost estimates for the types of burners, the next step was to develop a cost-curve based on the cost data to determine budgetary estimates for units where no cost information was available. The cost curve developed will be used in the Rule of Sixth-Tenths, a ratio and proportioning method used to estimate budgetary costs for similar equipment. The cost curve will be used to obtain equation by using a power curve fit of the data.

Rule of Sixth-Tenths or 0.6 Power Factor Rule

This methodology is typically used in an engineering design to obtain budget pricing when there is not enough assets to obtain firm cost numbers for a project which is a major undertaking and requires a complete engineering analysis. The equation for the Rule of Sixth-Tenths is below.

$$C_B = C_A \left(\frac{S_B}{S_A}\right)^N$$

Where:

C_B = approximate cost of equipment having size S_B (MMBtu/hr, ho, scfm, etc.)
C_A = known cost ($) of equipment having corresponding size S_A (same units as S_B)
S_B/S_A = ratio size factor
N = size size exponent (varies 0.3 to > 1.0, but average is 0.6)

The equation is derived from the budgetary quotes received. The costs are then converted to a dollar per MMBtu/hr by dividing the cost by the size of the burner which is then plotted. Using a power curve fit, the plotted data will give us the equation above where "N" is the size exponent and "C_A" is the cost of equipment with corresponding size. The equation can be used to extrapolate cost for units where no budgetary cost is available.

The following cost-curves were obtained from the cost data. One cost curve was generated for ribbon and IR burners and another cost-curve was generated for air heater cone type LNBs.

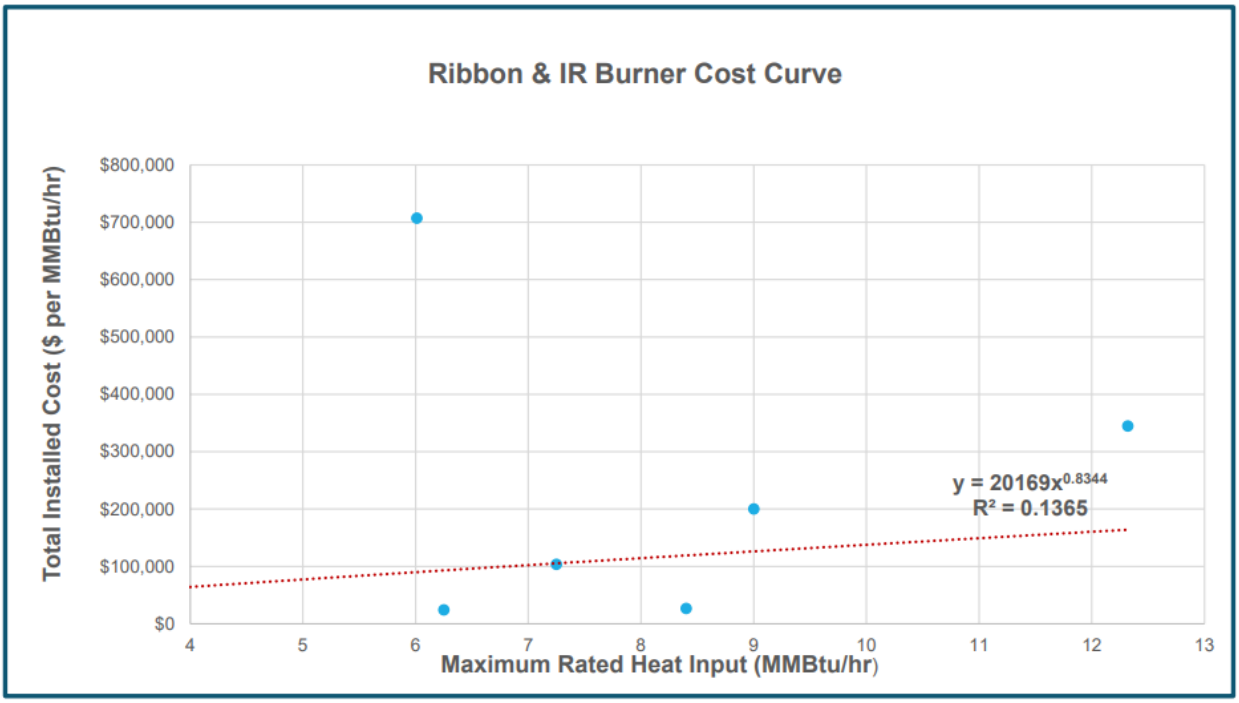

Figure 2-5. Ribbon and IR Burner Cost Curve

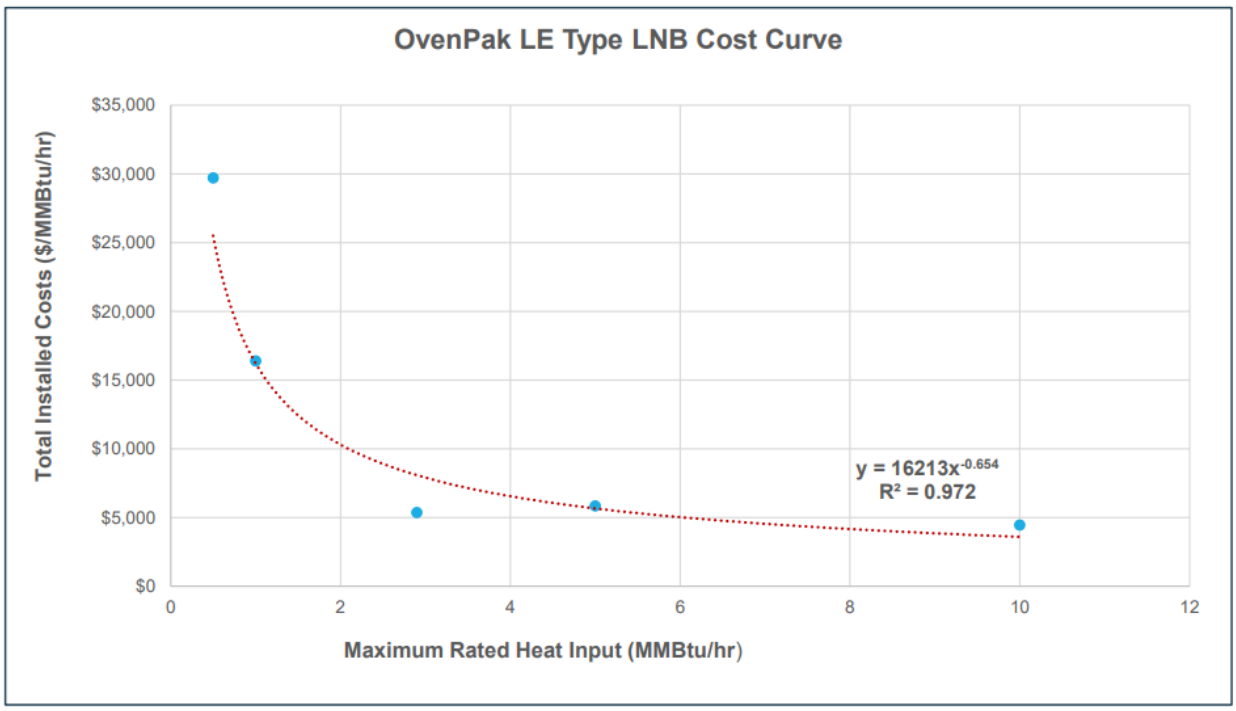

Figure 2-6. OvenPak Type LNB Burner Cost Curve

Burner Operating and Maintenance Cost Assumptions

For annual operating and maintenance costs of burners, staff initially assumed $2,000 for Ribbon and IR burners and $1,000 for air heater cone type traditional LNBs. Total annual operation and

maintenance cost which included compliance and source test cost was assumed to be $4,000 every five years based on the proposed source test schedule. However, the new burners would not require any additional cost compared to the existing burners, so no operational and maintenance costs were considered in the cost-effectiveness calculation. There was some concern from stakeholders about the frequency of component replacement from the use of newer burner control technology and anticipated useful life. Stakeholders commented that burner useful life should be 10 years as opposed to staff's initial proposal of 25 years. This was consistent with the feedback staff received from burner manufacturers and therefore, revised the cost-effectiveness for combustion-based limits to be based on a 10-year equipment life. This resulted in an increase in the cost-effectiveness which is higher than what was presented in Working Group Meeting #4, but overall, the average cost-effectiveness for each category remains below the screening threshold of $325,000 ($349,000 adjusted to 2022-dollar year) per ton of NOx reduced with some categories labeled as "no additional cost" since these units are already meeting the proposed BARCT limit, such as the category for tortilla oven solely firing IR burners.

Electric Oven Cost Assumptions

Staff initially separated food oven categories into four main categories based on combustion characteristics. The categories were bakery ovens, tortilla ovens, roasters, and other food ovens. The other food ovens category consisted of several sub-categories that include cooking ovens, drying ovens, dryers, and smokehouse ovens. For the zero-emission analysis, staff believe it was appropriate to assess these categories individually since zero-emission ovens may not be available for each individual equipment under a single category. Furthermore, it was appropriate to assess the bakery oven category based on subcategories identified.

Some ovens can potentially change or alter their process, so heat is generated by electricity. This method is the most effective in reducing overall emissions and will more than likely require unit replacement. One manufacturer offers a retrofit option for existing combustion tunnel ovens, but due to variation in oven design, the retrofit option may be limited to a few oven types. For most facilities transitioning to zero-emission electric oven technology, installation of a brand-new unit will be the preferred option. In order to estimate the cost for zero-emission electric commercial food ovens, staff identified two main types of commercial food ovens:

- Tunnel Ovens which are large continuous ovens that typically uses a conveyor to move the product through the tunnel. These oven types are primarily used when high volume of product throughput is required. Tunnel ovens are mostly used in large commercial bakeries and due to their size, they have relatively higher equipment costs. Bakery ovens and tortilla ovens will typically fall into this category.

- Batch ovens which consist of rack type or multi deck type ovens. This type of ovens requires manual product input and removal when the cooking or baking process is complete. Batch ovens are typically used for lower product throughput and will have lower equipment costs compared to tunnel ovens. Most cooking ovens, drying ovens, and smokehouse ovens fall within this type of ovens. However, some bakery ovens can also be batch type ovens.

Overall, zero-emission electric oven cost is dependent on type and size measured in rated heat input capacity. Staff used the existing size equivalent in MMBtu/hr to estimate equivalent kW

energy demand for electric ovens. Staff used the equation below to convert between MMBtu/hr to kW equivalent. The zero-emission equipment useful life for both oven types were assumed to be 25 years.

$$kW = \frac{MMBtu}{hr} \times \frac{scf}{1050\ Btu} \times 0.293 \frac{kWh}{scf}$$

Staff reached out to several vendors and facilities to gather data for zero-emission electric equipment costs quotes (capital cost) and gas-fired equipment cost. Staff received quotes for the different equipment categories and grouped them accordingly based on whether the units were tunnel type or batch type ovens. The grouping was used to generate a cost curve similar to the rule of sixth-tenths methodology that was used for the low-NOx burners cost estimation. Staff assumed the installation costs to be 25 percent of the estimated capital costs. In addition, staff acknowledges that electrical upgrades will be needed to accommodate the increased electrical demand and estimated the corresponding cost to be 10% of the estimated capital cost. In addition, staff included the cost of utility-side upgrades that the facility may incur. This cost will vary depending on the facilities location and 100 percent of the cost will not be passed on to the facility solely. According to SCE, costs can be allocated, and the facility may only pay a portion of the entire amount. Based on examples provided by SCE, staff assumed the partial cost passed to the facility to be $2,000 for units rated less than or equal to 3 MMBtu/hr and $50,000 for units greater than 3 MMBtu/hr. Total installation costs for electric units will include capital cost, installation costs, and utility and electrical upgrades costs. The total installation costs will be used to calculate cost-effectiveness.

Using the rule of sixth-tenths along with the gathered cost data staff generated the two cost-curves shown in the following figures. Quotes from vendors were in kW, and staff converted the kW to MMBtu/hr which was further used to calculate a dollar per MMBtu/hr. Cost curve was generated separately for tunnel ovens and batch ovens. Similarly, staff generated two cost-curves for gas-fired ovens. Generated cost curve allowed staff to estimate the cost for zero-emission units.

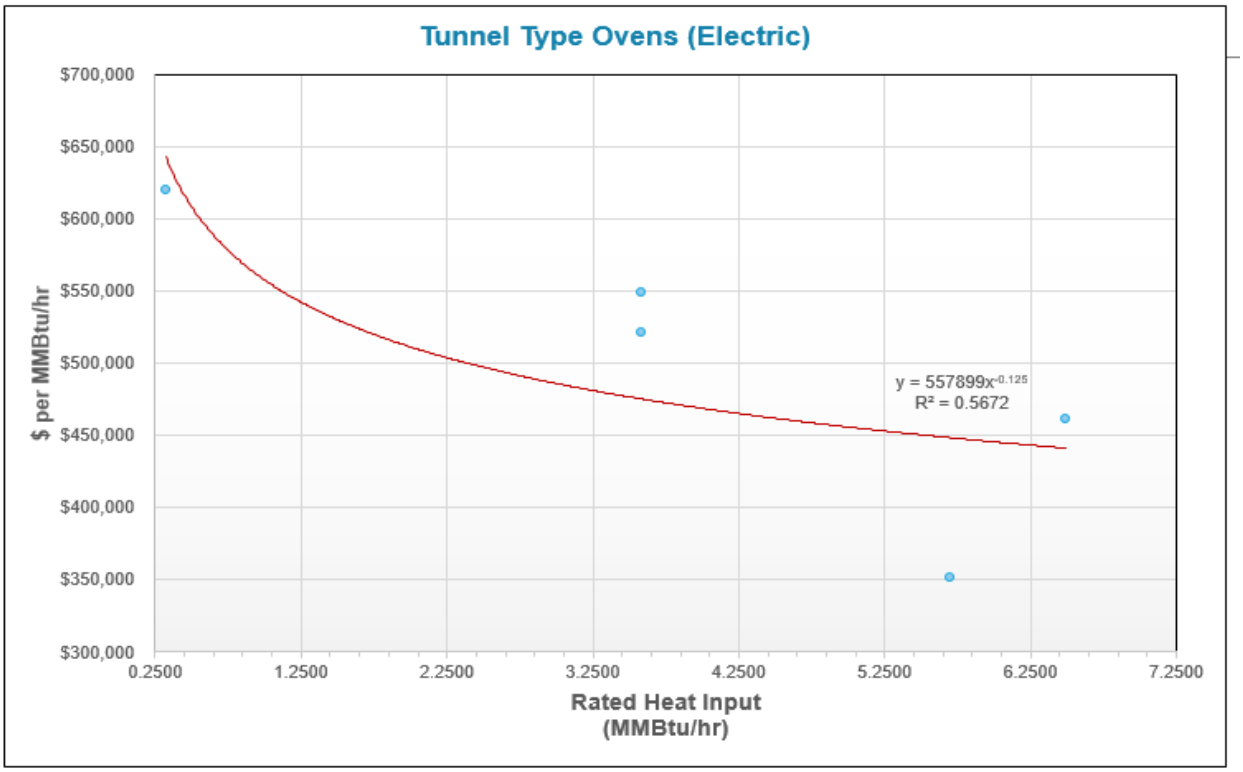

Figure 2-7. Electric Tunnel Oven Cost Curve

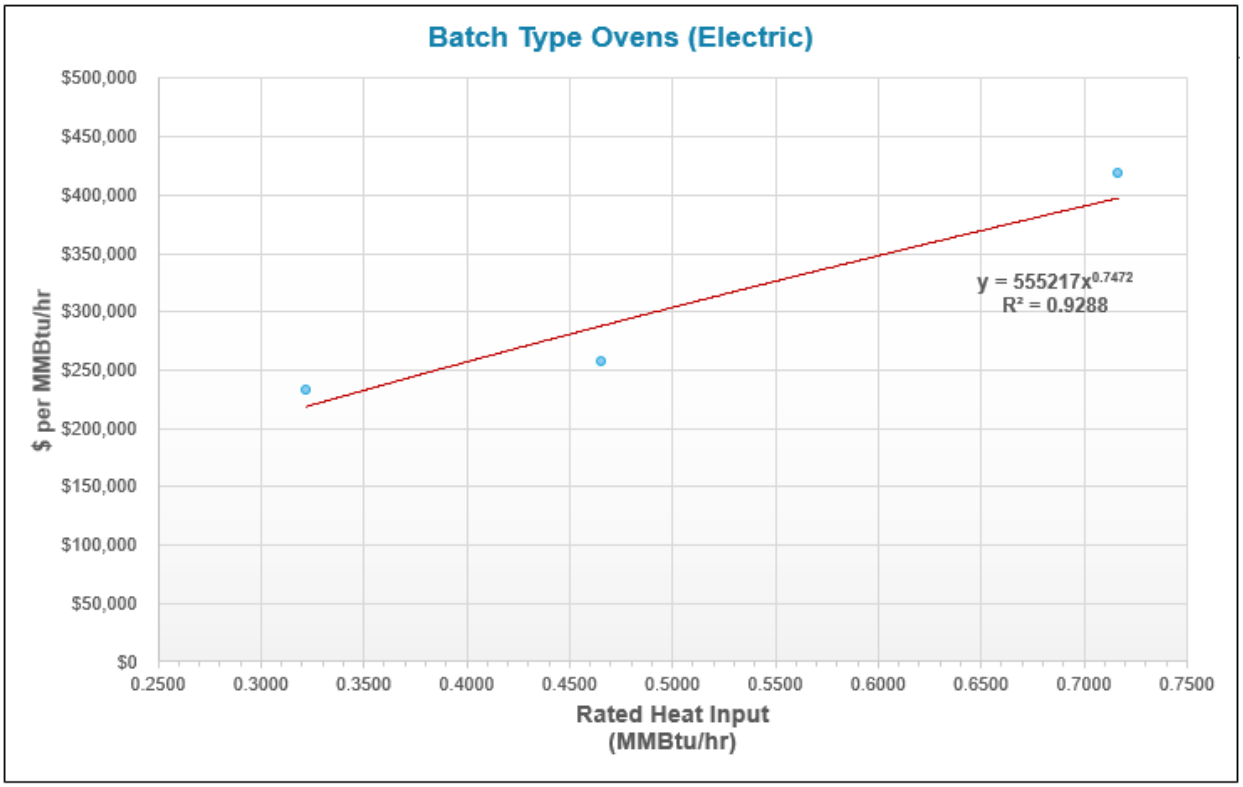

Figure 2-8. Electric Batch Oven Cost Curve

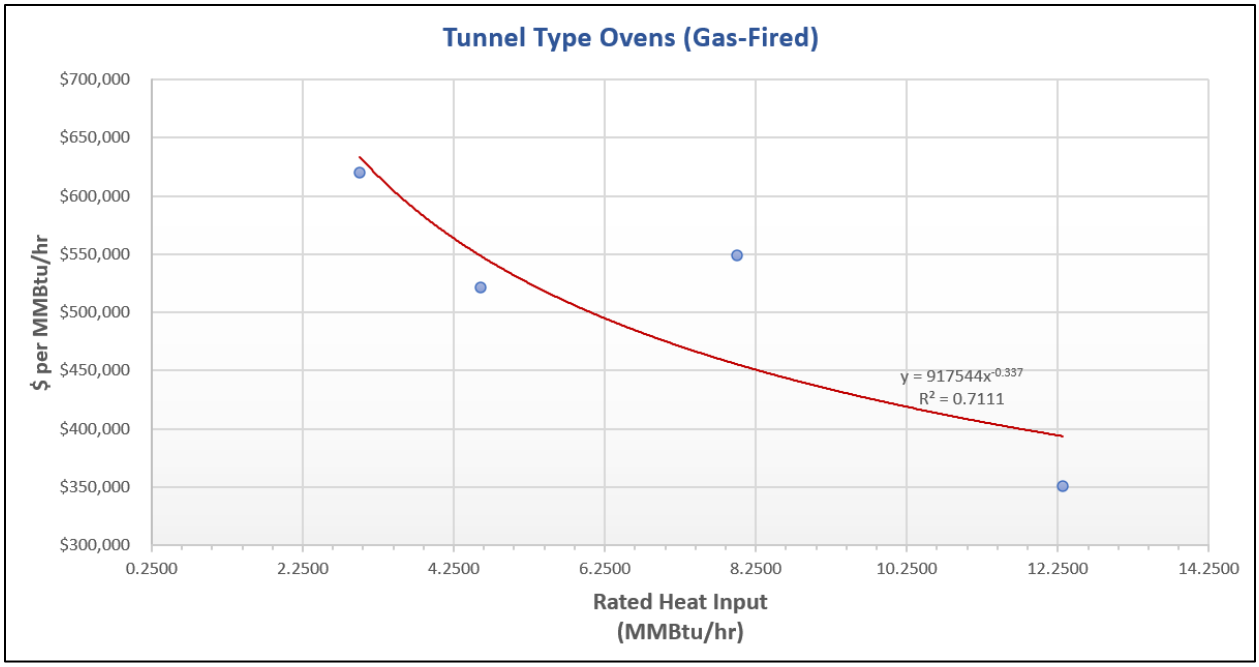

Figure 2-9. Gas-Fired Tunnel Oven Cost Curve

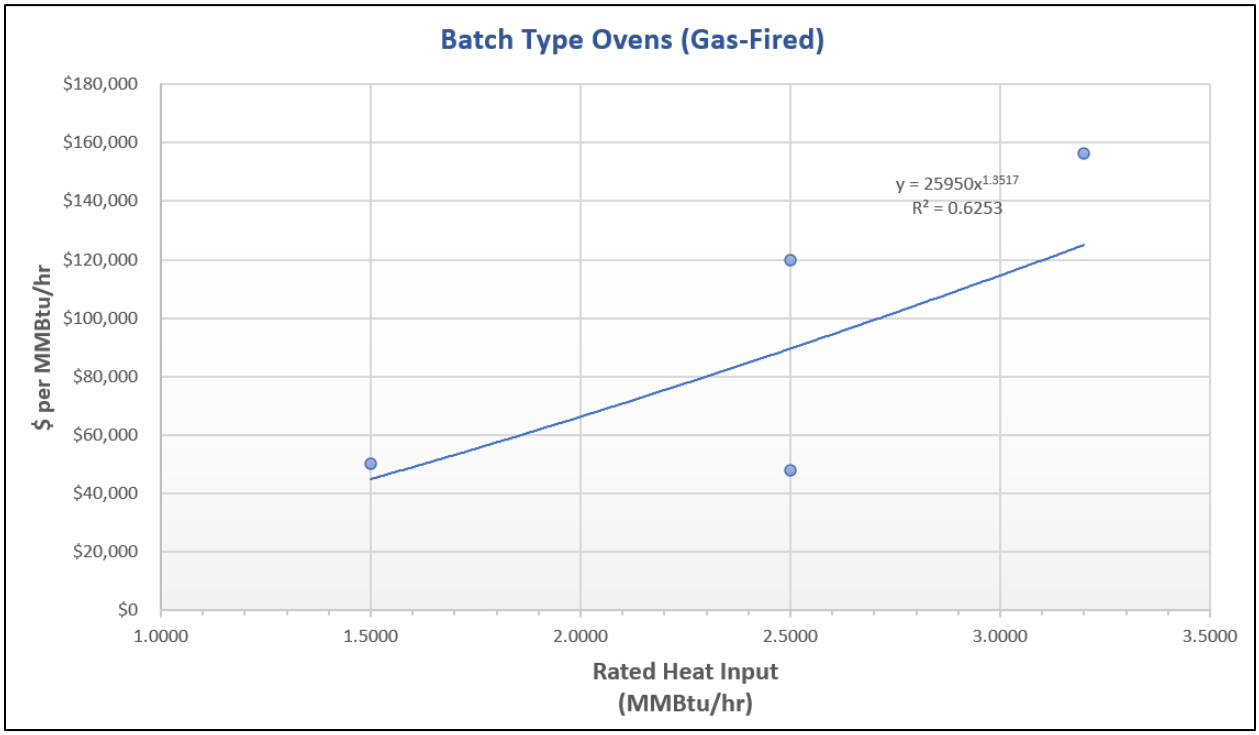

Figure 2-10. Gas-Fired Batch Oven Cost Curve

Fuel Switching Cost Assumptions

Fuel switching costs are the difference between annual electricity costs and annual natural gas costs which are included in the cost-effectiveness calculation as annually recurring operating and maintenance (O&M) costs. There is a significant uncertainty in estimating fuel switching costs as future rates for electricity and natural gas cannot be forecast with certainty. Utility rates are impacted by many parameters, including demand projection, fuel prices, interest rate, and availability. Some factors that contribute to rate fluctuations are difficult to predict, for example, the sharp rise in natural gas rates that occurred in January of 2023. Despite the recent anomaly in natural gas prices, there are some potential market signals of change in natural gas prices. According to the May EIA Short-Term Energy Outlook (STEO), the U.S. benchmark Henry Hub natural gas spot price is expected to increase through 2023 and 2024[1].

Due to the uncertainties in utility rates staff relied on best available data from the California Energy Commission (CEC) and Energy Information Administration (EIA). CEC assesses and forecasts the state's energy systems and trends using models which can be used to predict electricity costs over the course of next 10 years, whereas the EIA collects, analyzes, and disseminates energy information. The information provided by each agency is used to promote policy making, efficient markets, and public understanding of energy and its interaction with the economy and environment. Based on currently available data, electricity is traditionally more expensive than natural gas and can range from five to seven times higher than natural gas. Below is an example of future CEC forecasted rates for both electricity and natural gas cost – natural gas was converted from therms to kWh for comparison purposes.

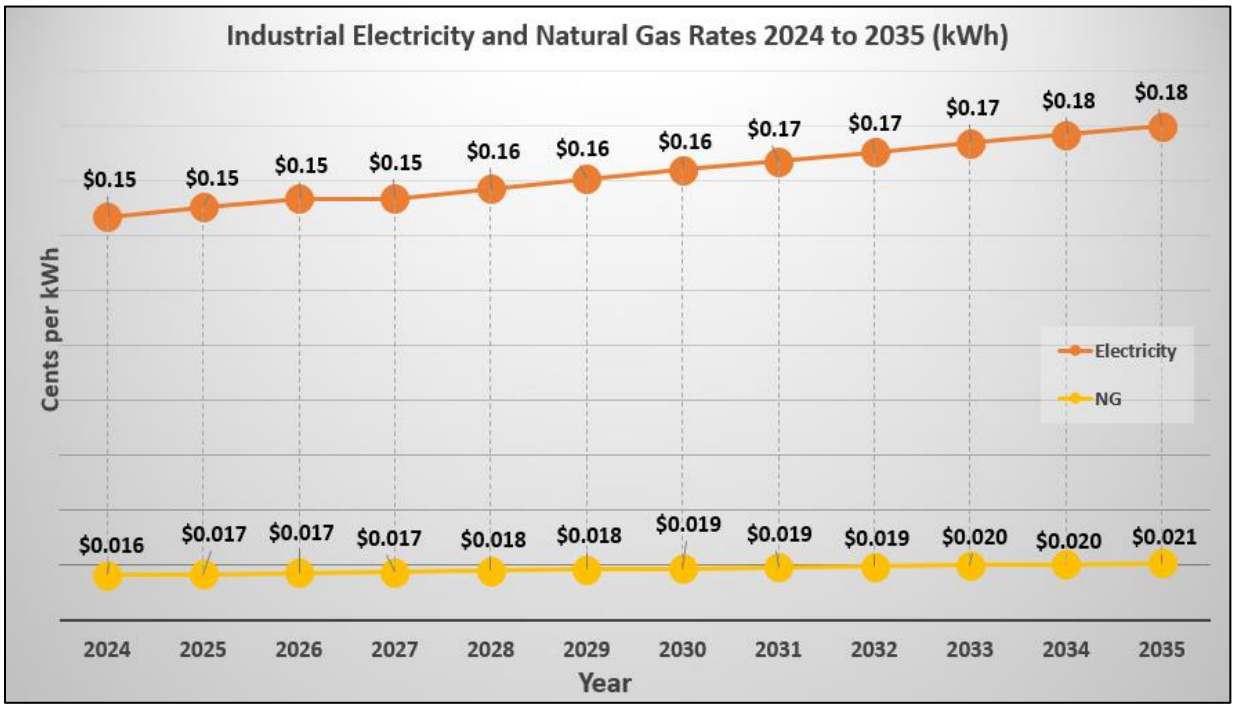

Figure 2-11. 12Projected Electricity Rates and Natural Gas Rates in kWh

[1]U.S. Energy Information Administration - EIA - Independent Statistics and Analysis

In order to capture a more representative picture of the utility rates and fuel switching costs, staff looked at the recent utility rates using the average recent SoCal Gas natural gas rates for the previous 24 months and most recent industrial electricity rates as reported by EIA. Natural gas rates related to industrial businesses are a tiered structure and dependent upon natural gas usage. The average recent rate for natural gas is 62 cents per therm. Below is a summary of staff's assessment for utility rates:

- Recent rates: 14.82 cents per kWh for electricity and 62 cents per therm for natural gas
- Future forecasted rate (2024 to 2035): 16.29 cents per kWh for electricity and 0.54 cents per therm for natural gas

Staff calculated the cost-effectiveness using each of the rates above and relied on the average of the two-cost-effectiveness numbers to provide a balanced approach. Below is the methodology staff used to calculate the cost-effectiveness:

- **Step One:** Convert MMBtu/hr to kW which will give the instantaneous power demand.
- **Step Two:** Calculate the kWh that unit will use in a year. Multiply the calculated kW in step one by hours of operation per year. Staff assumed 50% operation per year, so the calculated kW is multiplied by 4,380 hours (8,760 hours in a year).
- **Step Three:** Calculate the estimated annual electricity costs. Since electricity rates are in kWh, the kWh from step two is multiplied by the electricity rate. Staff used two electricity rates: 14.82 cents per kWh for the recent rates and 16.29 cents per kWh for the projected future rates. The annual electricity costs were then multiplied by 80% to account for efficiency gains of the electric unit. This is the annual electricity costs.
- **Step Four:** Calculate estimated annual natural gas costs. Staff converted the calculated kWh in step two into therms since natural gas rates are measured in therms. One kWh is equivalent to 0.034121 therms. This gave the number of therms the unit will use annually. The value in therms is then multiplied by 62 cents per therm for recent rates and 54 cents per therm for future projected rates.
- **Step Five:** Calculate the fuel switching costs which is the difference between the annual electricity costs calculated in step three and the annual natural gas costs calculated in step four. Since staff used two rates for both electricity and natural gas costs, two different fuel switching costs were obtained.
- **Step Six:** Staff used the two fuel switching costs to calculate the present worth value for the unit; one being the most recent rates and the other being the future projected rates.
- **Step Seven:** Staff repeated the present worth value calculations for each unit in each category. Staff had two present worth values for each unit; one for the recent rates and one for the projected rates.
- **Step Eight:** The present worth value was summed for the entire equipment category and then divided by the lifetime emission reductions for the category to calculate cost-effectiveness. Staff ended up with two const-effectiveness values: recent rates C/E and projected rates C/E. Staff averaged the two to get the final cost-effectiveness number.

Staff will continue to monitor fuel switching costs, utilities costs, regulations that are incentivizing decarbonization, and programs that incentivize voluntary transition to zero-emission standards and help defer some of the costs. A few programs that may impact future fuel costs are:

California Energy Commission's (CEC) Industrial Decarbonization and Improvements to Grid Operations (INDIGO) Program, related under Assembly Bill (AB) 209. This new program is designed to help distribute the $90 million allocated by the legislature in 2022. The program will contribute to the state's decarbonization efforts by providing opportunities to industries that can benefit the electrical grid, reduce food processing industry, overall grid reliability will increase and potentially decrease electricity cost.

Based on energy rate data evaluated by staff, forecasting energy prices involves a level of uncertainty and the actual rates will differ from the forecasted rates in any given year due to various factors. Staff acknowledges this uncertainty and notes that the methodology used in the analysis for PAR 1153.1 is not precedential. Staff will update the forecasts and cost assumption methodologies for energy rates in future rulemakings, based on the best practices and the latest energy price forecasts including but not limited to the forecasts by the California Emission Commission Integrated Energy Policy Report (IEPR).

PAR 1153.1 Cost Effectiveness

After cost information was obtained through a bottom-up approach which evaluated each unit subject to PAR 1153.1, cost-effectiveness analysis was conducted on a per equipment basis. Baseline emissions for each equipment were calculated using the 2019 Annual Emissions Reporting (AER), if available. For units without AER information, staff used the assumption methodology which is outlined earlier in this section and Figure 2-1.

Initial cost-effectiveness for all commercial food oven categories in PAR 1153.1 were below $325,000 ($349,000 adjusted to 2022-dollar year) per ton of NOx and all categories were cost-effective for both proposed NOx limit of 30 ppmv and zero ppmv. However, the costs increased significantly when staff incorporated the energy cost the facilities will incur when transitioning from natural gas fired ovens to electric ovens.

A summary of the cost-effectiveness for each category is summarized in the table below.

Table 22-7. Cost-Effectiveness Summary with Fuel Switching Cost

Equipment Categories	Cost-Effectiveness at 30 ppmv	Cost-Effectiveness at 0 ppmv
Direct-Fired Bakery Ovens (≤ 3MMBtu/hr)	$93,000	$290,000
Direct-Fired Bakery Ovens (>3 MMBtu/hr)		$400,000
Griddle Ovens	$94,000	$514,000
Indirect-Fired Bakery Ovens	$0	$0
Tortilla Ovens	$29,000	$400,000
Cooking Ovens (≤ 3MMBtu/hr)	$0	$190,000
Cooking Ovens (>3 MMBtu/hr)	$0	$560,000
Drying Ovens	$43,000	$350,000
Dryers	$18,000	N/A
Smokehouses	$43,000	$60,000
Roasters	$85,000	$820,000

Fuel switching cost had a large impact on overall cost-effectiveness for each commercial food oven category which resulted in several categories not being cost-effective for zero-emission technology. To reduce and offset the cost of fuel switching, staff evaluated potential options below:

- Photovoltaic systems or solar systems: Commercial solar array systems are currently used to offset baseline energy demands. Considering the required space, most commercial options are typically installed on roofs or in parking lots. A typical commercial solar panel can provide up to 540 watts of power and typical installation will consist of 70 to 100 panels. Electricity generation is impacted by location and sun intensity throughout the day. In fact, one large commercial bakery is installing a microgrid system that will reduce the facilities baseline energy usage by 25%. The 25% reduction is for the current operation that does not include the use of electric food ovens.

- Fuel cell systems: Fuel cells can either use hydrogen, natural gas, or propane as a fuel source to generate electricity. A typical fuel cell consists of series of "cells" arranged in a stack consisting of a cathode and anode similar to a battery. Passing the fuel through the

anode and oxygen through the cathode along with a catalyst in the middle, generates electricity. Fuels cells can be used in a wide range of applications such as stationary, emergency backup power, and transportation. Combining these systems increases the complexity of managing the energy systems at the facility, but the efficiency in converting energy can be an ideal alternative due to energy savings and reduced emissions.

Staff reached out to several vendors for quotes for each type of system. The cost varied depending on the size of the system and type of fuel used. For a solar array system, staff assumed a baseload of electricity generation based on 100 panels with each panel capable of generating 540 watts. Estimated total installed cost of the system was approximately $196,000 for a system that can generate approximately 107 MWh electricity annually. Fuel cell systems cost assumptions were calculated based on a dollar per kilowatt basis equivalent to the demand of the electric unit. Installation was estimated to be 4% of the calculated capital cost. In addition, the fuel cell option also included an annual recurring O&M cost for the hydrogen or natural gas rate – hydrogen fuel cost rate used is $6.11 per kilogram and natural gas rate used is 62 cents per therm. The additional annual recurring fuel switching cost ranged from $200,000 to $2.5 MM per year. An annual service contract for the fuel system was also included in the recurring cost and ranged from $49,000 to $590,000. Below is a summary of the cost-effectiveness values with consideration of offsetting options for categories that were not cost-effective for zero-emission technology.

Table 22-8. Cost-Effectiveness with Options to Offset Electricity Costs

Equipment	Phase II Cost-Effectiveness	Solar Array	Hydrogen Fuel Cells	Natural Gas Fuel Cells
Bakery Ovens (>3 MMBtu/hr)	$414,000	$472,000	$2.4 MM	$879,000
Tortilla Ovens	$417,000	$370,000	$3 MM	$756,000
Cooking Ovens (>3 MMBtu/hr)	$580,000	$489,000	$1.7 MM	$1.4 MM
Drying Ovens	$359,000	$372,000	$1.6 MM	$753,000
Roasters	$842,000	$562,000	$3.6 MM	$1.7 MM

The alternative options staff evaluated did not significantly reduce the cost, and in some cases the costs increased due to the additional capital and associated installation costs. Fuel cell costs increased the cost-effectiveness significantly due to the capital and annual recurring cost necessary for the system to operate.

Proposed BARCT Emission Limit

According to California Health and Safety Code Section Sections 40920.6(a)(1) and 40920.6(a)(2), potential controls to meet an air quality objective, which is to assess the BARCT emission limits, must be identified and the cost-effectiveness assessment should be conducted thereafter. The final proposed BARCT emission limit for each class and category is the emission limit that achieves the maximum degree of emission reductions and is determined to be cost-effective. Staff evaluated the cost-effectiveness for the most stringent initial BARCT emission limit. If the most stringent initial BARCT limit is not cost-effective, the next less stringent limit was assessed. The following table summarizes the proposed NOx limits that represent BARCT, and the applicable CO limits for each class and category.

Table 22-9.-2-10 Proposed NOx and CO Emission Limits for Commercial Food Ovens (ppmv[1])

Equipment Categories		Phase I[2]		Phase II[3]	
		NOx	CO	NOx	CO
Direct-Fired Bakery Oven	≤3 MMBtu/hr	N/A	800	0	0
	>3 MMBtu/hr	30	800	N/A	N/A
Indirect-Fired Bakery Ovens		30	800	0	0
Griddle Ovens		30	800	N/A	N/A
Tortilla Ovens	Heated solely by IR Burners	15	800	N/A	N/A
	All Other Tortilla Ovens	30	800	N/A	N/A
Cooking Ovens	≤3 MMBtu/hr	30	800	0	0
	>3 MMBtu/hr	30	800	N/A	N/A
Drying Ovens		30	800	N/A	N/A
Smokehouses		30	800	0	0
Dryers		30	800	N/A	N/A
Roasters		30	800	N/A	N/A

[1]*All NOx Limits are in ppmv referenced at 3% O_2*

[2]*Phase I Emission Limits apply on and after [Date of Adoption]*

[3]*Phase II Emission Limits, when applicable, apply on and after January 1, 2027*

The combustion-based limits of 30 ppmv and 15 ppmv are referred to as Phase I Emission Limits and are BARCT limits which become effective upon rule adoption. Phase I Emission Limits are commercially available and achievable with current technology. Phase II Emission Limits are zero-emission based BARCT limits that become effective at a future effective date to provide time for the technology to mature. The Phase II Emission Limits is a technology forcing limit, meaning the limits are based on a technology that is not widely available at the time of rule adoption. When the South Coast AQMD adopts technology forcing rules, the limits are given a future implementation date to provide sufficient time for the technology to develop. BARCT limits evolve over time as technology improves or new pollution control technologies emerge; setting future effective emission limits is appropriate and the approach has been used and upheld in the courts. Therefore, future effective dates of January 1, 2027, for Phase II is established which is based on unit age of 25 years and the burner age of 10 years when the unit is replaced.

Staff's proposal that was released after the adoption of the 2022 AQMP included technology forcing zero-emission limits for nearly all commercial food oven categories. The proposal required commercial food ovens that did not have a zero-emission Phase II emission limit, to transition to

zero-emission as a Phase III requirement with a future effective date of January 1, 2030. Phase III emission limits would have required bakery ovens (>3 MMBtu/hr), cooking ovens (>3 MMBtu/hr), tortilla ovens, and roasters category to meet the zero-emission limits after January 1, 2030, upon replacement, e.g., once the unit reaches 25 years of age and the burner is 10 years. For the tortilla and roasters category, technical feasibility was based on small scale electric units used in restaurant applications and coffee shops, and not based on existing large-scale industrial applications. The zero-emission limit was based on the potential of scaling up for these small units for industrial applications. The intent was to send a market signal for zero-emission technology development. To address the technical feasibility concern, staff was including a technology assessment in the rule language. However, with the uncertain technical feasibility, high costs of fuel switching cost, and low emission inventory for these categories, staff revised the proposal to remove the Phase III emission limits.

Commercial food oven technology has continually improved over the past several decades and has become more efficient in terms of energy use and reducing overall emissions. Most of the efficiency gain is a direct result of improved burner control technology and oven design. Burner and oven manufacturers have recognized that environmental regulations are becoming more stringent and as a result, have responded to meet the increasing demand by offering more efficient and cleaner options to food manufacturers. Many countries have a renewed focus on reducing GHG emissions and reducing overall global emissions over the next 50 years by shifting away from fossil fuels. This shift in focus has increased the demand for zero-emission equipment in all sectors including the commercial food and beverage manufacturing sectors. Staff identified several electric commercial food equipment currently in operation and several manufacturers are offering or developing zero-emission commercial food ovens. As zero-emission commercial food oven technology continues to be developed and improved, the technology will become more efficient and economical to operate. Staff will continue to evaluate and monitor the status of the technology for all commercial food oven categories; the technology status update/check-in will be included as part of the resolution and reported back to committee two years prior to the future effective date of Phase II. Since fuel switching costs had a significant impact on the overall cost-effectiveness for each equipment category, staff will also evaluate utility rates to assess the impacts of fuel switching cost. Utility rates tend to fluctuate overtime and are difficult to predict, so an evaluation of utility rates is appropriate at the time of the technology status update/check-in.

CHAPTER 3 : SUMMARY OF PROPOSALS

INTRODUCTION

PROPOSED AMENDED RULE STRUCTURE

PROPOSED AMENDED RULE 1153.1

INTRODUCTION

The main objective of Proposed Amended Rule 1153.1 is to propose NOx limits that represent BARCT requirements for applicable equipment and to remove the exclusion of RECLAIM facilities. PAR 1153.1 also proposes periodic monitoring requirements, removes outdated rule language, reorganizes the rule structure to be consistent with recently amended or adopted rules, and includes an Alternative Compliance Schedule Plan. The proposed revised rule structure and key provisions are discussed below.

PROPOSED AMENDED RULE STRUCTURE

The proposed amended rule separates the purpose and applicability to be consistent with recently adopted and amended rules and several new subdivisions were added to support the rule requirements. The following figure shows a comparison of rule structure of Rule 1153.1 versus PAR 1153.1.

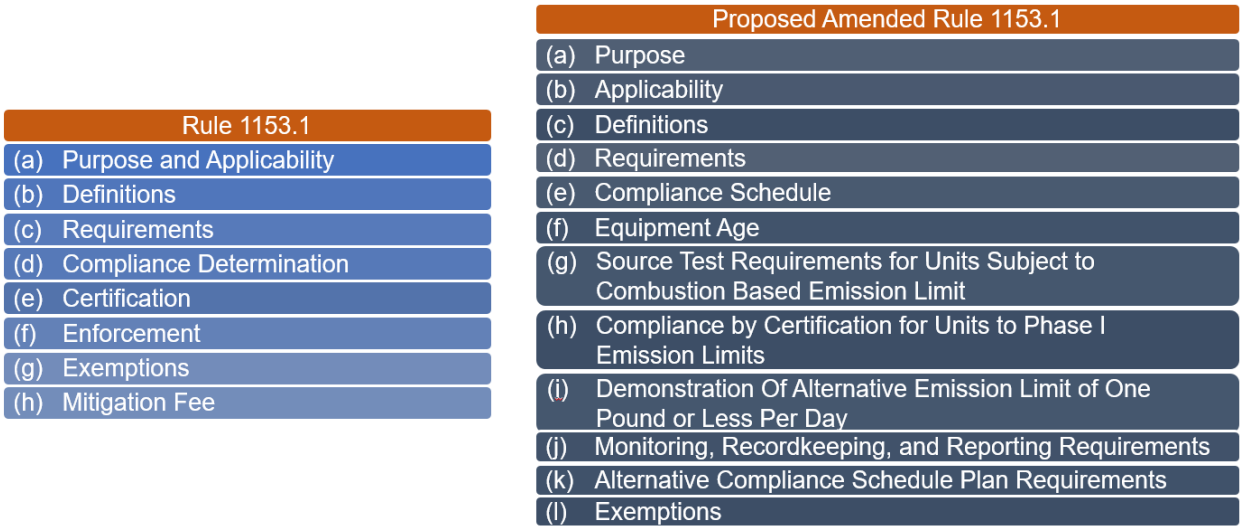

Figure 3-1. Rule 1153.1 and Proposed Amended Rule Structure Comparison

SUMMARY OF PROPOSED AMENDED RULE 1153.1

The following is a summary of the proposed amendments to Rule 1153.1.

Purpose [Subdivision(a)]

The purpose of this rule is to reduce emissions of Oxides of Nitrogen and Carbon Monoxide from gaseous and liquid fuel-fired Commercial Food Ovens as defined in this rule.

Applicability [Subdivision(b)]

PAR 1153.1 applies to owners or operators of Units that require South Coast Air Quality Management District (SCAQMD) permits and are used to prepare food or products for making beverages for human consumption. Food ovens that are exempt from requiring a permit under Rule 219 – Equipment Not Requiring a Written Permit Pursuant to Regulation II are not regulated under PAR 1153.1. Zero-NOx emission ovens will not require a permit condition that limits the NOx to zero to comply with Rule 1153.1; however, they may require a permit condition that limits the VOC emissions to comply with Rule 1153 – Commercial Bakery Ovens.

Definitions [Subdivision(c)]

The following are key definitions for PAR 1153.1 which distinguish the new equipment categories identified as part of BARCT assessment as well as additional definitions necessary for the transition of RECLAIM facilities into PAR 1153.1. For all definitions, refer to the draft of PAR 1153.1 released with this staff report.

ALTERNATIVE COMPLIANCE SCHEDULE PLAN in paragraph (c)(1), which means:

> *"a compliance plan that allows an owner or operator of a Unit(s) required to meet the Phase II Emission Limit to apply for an alternative compliance schedule if the electrical upgrades required by their utility company will result in a delay in meeting the rule deadlines and are beyond the control of the facility."*

BAKERY OVEN in paragraph (c)(2), which means:

> *"a Commercial Food Oven used to heat, cook, or prepare baked products. Bakery ovens include, but are not limited to, tunnel ovens, conveyor ovens, tray ovens, and griddle ovens."*

COMMBUSTION-BASED EMISSION LIMITS in paragraph (c)(3), which means:

> *"emission limits that rely on technologies that combust gaseous or liquid fuel and include Phase I Emission Limits."*

COMMERCIAL FOOD OVEN in paragraph (c)(5), which means:

> *"a cooking device used to heat, cook, dry, or prepare food or products for making beverages for human consumption that is used as part of a business."*

COOKING OVEN in paragraph (c)(6), which means:

> *"a Commercial Food Oven used to cook food products including, but is not limited to, meat, fish, poultry, or vegetables. Cooking ovens do not include Bakery Ovens, Tortilla Ovens, Drying Ovens, and Smokehouses."*

DECOMMISSION in paragraph (c)(7), which means:

> *"to permanently shut down a Unit by removing the fuel, air, electricity, or other utility source connected to it and to inactivate the Unit's applicable South Coast AQMD permit."*

DIRECT-FIRED BAKERY IOVEN in paragraph (c)(8), which means:

> *"a Bakery Oven where the energy or heat source is placed directly inside the baking chamber and heat transfer is primarily carried out by radiation from the flames, electrical resistance, or hot surface.*

DRYER in paragraph (c)(9), which means:

> *"a Commercial Food Oven, using either a direct or indirect heat source, to dry food products using a rotating drum. Dryers include spray dryers which are a Commercial Food Oven where liquids or a slurry are atomized and dried into powder form by spraying the feed into a heated chamber."*

DRYING OVEN in paragraph (c)(10), which means:

"a Commercial Food Oven used to remove water or moisture to dry food products."

ELECTRIC HEATING ELEMENT (c)(11), which means:

"any component of a Commercial Food Oven used to transform electrical energy into heat."

FORMER RECLAIM FACILITY in paragraph (c)(12), which means:

"a facility, or any of its successors, that was in the REgional Clean Air Incentives Market (RECLAIM) program as of January 5, 2018, as established in Regulation XX, that has received a final determination notification, and is no longer in the RECLAIM program."

GASEOUS FUEL in paragraph (c)(13), which means:

"natural gas; compressed natural gas (CNG); liquefied petroleum gases (LPG), including but not limited to propane and butane; synthetic natural gas (SNG); or other fuel that is a gas at ambient temperature and atmospheric pressure."

GRIDDLE OVEN in paragraph (c)(14), which means:

"a Commercial Food Oven that uses a moving griddle, which is a flat or grooved metal plate, that is heated between 550°F to 900°F to produce baked products such as, but not limited to, English muffins."

HEAT INPUT in paragraph (c)(15), which means:

"the higher heating value of the fuel to the burner or Unit measured as Btu per hour."

HEAT OUTPUT in paragraph (c)(16), which means:

"The enthalpy of the working fluid at the output of a burner or Unit."

INDIRECT-FIRED UNIT in paragraph (c)(17), which means:

"a Bakery Oven that uses heat exchangers connected to the burning zone to indirectly heat the baking chamber, where the product being baked does not contact the combustion gases."

INFRARED BURNER (IR Burner) in paragraph (c)(18), which means:

"a burner with ceramic, metal fiber, sintered metal, or perforated metal flame-holding surface; with more than 50 percent of the Heat Output as infrared radiation; that is operated in a manner where the zone above the flame-holding surface is red and does not produce observable blue or yellow flames in excess of ½ inch (13 mm) in length; and with a Rated Heat Input Capacity per square foot of flame-holding surface of 100,000 Btu per hour or less."

OXIDES OF NITROGEN (NOx) EMISSIONS in paragraph (c)(19), which means:

"the sum of nitrogen oxide and nitrogen dioxide, collectively expressed as nitrogen dioxide."

PARTS PER MILLION BY VOLUME (ppmv) in paragraph (c)(20), which means:

"for the purpose of this rule, Parts Per Million By Volume of a pollutant corrected to three percent oxygen on a dry basis at Standard Conditions."

PHASE I EMISSION LIMITS in paragraph (c)(21), which means:

"the NOx and CO emission limits specified in Table 1."

PHASE II in paragraph (c)(22), which means:

"the NOx and CO Emission limits specified in Table1, where applicable."

RATED HEAT INPUT CAPACITY in paragraph (c)(23), which means:

"the gross Heat Input of the combustion Unit specified on a permanent rating plate attached by the manufacturer to the device. If the Unit or Combustion System has been altered or modified such that its gross Heat Input is higher or lower than the rated Heat Input capacity specified on the original manufacturer's permanent rating plate, the modified gross Heat Input shall be considered as the Rated Heat Input Capacity."

RECLAIM FACILITY in paragraph (c)(24), which mean

"a facility, or any of its successors, that was in the RECLAIM program as of January 5, 2018, as established in Regulation XX."

RESPONSIBLE OFFICIAL in paragraph (c)(25), which means:

"(A) For a corporation: a president or vice-president of the corporation in charge of a principal business function or a duly authorized person who performs similar policy-making functions for the corporation;

(B) For a partnership or sole proprietorship: general partner or proprietor, respectively; or

(C) For a government agency: a duly authorized person."

ROASTERS in paragraph (c)(26), which means:

"a Commercial Food Oven used to dry roast food products that include, but are not limited to, nuts, coffee beans, or other plant seeds. Roasters include Units with an integrated afterburner which consists of a single burner used as the heat source for the afterburner and Roaster."

SMOKEHOUSE in paragraph (c)(27), which means:

"a Commercial Food Oven in which meat products is cured using smoke and heat."

SOURCE TEST PROTOCOL in paragraph (c)(28), which means:

"a South Coast AQMD approved set of test procedures for determining compliance with emission limits for applicable equipment."

STANDARD CONDITIONS in paragraph (c)(29), which means:

"is as defined by Rule 102 – Definition of Terms."

THERM in paragraph (c)(30), which means:

> "100,000 Btu."

TORTILLA OVEN in paragraph (c)(31) which means:

> *"a Commercial Food Oven used to cook, toast, or bake tortilla chips and other tortilla products."*

UNIT in paragraph (c)(32), which means:

> *"any Commercial Food Oven, including, but not limited to, Bakery Oven, Cooking Oven, Direct-Fired Bakery Oven, Dryer, Drying Oven, Indirect-Fired Bakery Oven, Roaster, Smokehouse, or Tortilla Oven used to prepare food or products for making beverages for human consumption."*

Requirements [Subdivision(d)]

Paragraph (d)(1) - PAR 1153.1 BARCT Emission Limit

PAR 1153.1 establishes updated BARCT NOx emission limits for applicable equipment as shown in the table below. The rule will require an owner or operator of an existing or new unit subject to the rule to not operate the unit in a manner that exceeds the applicable NOx and CO emission limits, in ppmv corrected to three percent oxygen, on a dry basis, specified in PAR 1153.1 Table 1 according to the compliance schedule in subdivision (e). The emission limits in PAR 1153.1 Table 1 are separated into two Phases. Phase I Emission Limits are combustion-based limits that are effective upon rule adoption. Phase II Emission Limits are zero-emission limits and will take effect on January 1, 2027. The requirements are separated based on whether the unit was installed and in operation prior to the date of rule adoption or whether a unit is placed in operation after rule adoption.

- Subparagraph (d)(1)(A) applies to a unit that is installed and in operation prior to rule adoption. All existing units have to meet the Phase I Emission Limits in accordance with the compliance schedule in paragraph (e)(1). If the unit is subject to the applicable Phase II Emission Limits, the unit will need to meet the Phase II Emission Limits on or after January 1, 2027.
- Subparagraph (d)(1)(B) applies to a unit that is placed in operation on or after rule adoption. If the unit is subject to the Phase I Emission Limit, but does not have an applicable Phase II Emission Limit, the unit will be required to meet the Phase I Emission Limit as soon as it starts operating. If the unit is subject to both Phase I and Phase II Emission Limits, the unit will be allowed to meet the Phase I Emission Limit as soon as it starts operating if a complete permit application is submitted before January 1, 2024. The unit will be required to meet the Phase II Emission Limit pursuant to compliance schedule in paragraph (e)(2). However, if a complete permit application is submitted on or after January 1, 2024, the unit will be required to meet the Phase II Emission Limit as soon as it starts operating. The reason for this requirement is to build in additional time for the permit approval process and construction/installation of the new unit.

A complete permit application consists of the required information as defined in Regulation II – List and Criteria identifying Information Required of Applicants Seeking A Permit to Construct From the South Coast Air Quality Management District. A permit application that is submitted by the required date but determined by Engineering and Permitting staff to be incomplete does not meet the requirement.

Table 33-1. PAR 1153.1 – (NOx and CO Emission Limits (ppmv)[1]

Equipment Categories		Phase I		Phase II	
		NOx	CO	NOx	CO
Direct Fired Bakery Ovens	≤3 MMBtu/hr	30	800	0	0
	>3 MMBtu/hr	30	800	N/A	N/A
Indirect-Fired Bakery Ovens		30	800	0	0
Griddle Oven		30	800	N/A	N/A
Tortilla Ovens	Heated solely by IR Burners	15	800	N/A	N/A
	All Other Tortilla Ovens	30	800	N/A	N/A
Cooking Ovens	≤3 MMBtu/hr	30	800	0	0
	>3 MMBtu/hr	30	800	N/A	N/A
Drying Ovens		30	800	N/A	N/A
Smokehouses		30	800	0	0
Dryers		30	800	N/A	N/A
Roasters		30	800	N/A	N/A

[1] Parts per million by volume (ppmv) corrected to three percent oxygen, dry

Paragraph (d)(2) – Emission Rate Limits

An owner or operator may also elect to comply with an emission rate equivalent to the applicable limit specified in PAR 1153.1 Table 1. The owner or operator must comply with an emission rate of 0.036 lb/MMBtu in lieu of 30 ppmv or an emission rate of 0.018 lb/MMBtu in lieu of 15 ppmv.

Paragraph (d)(3) - Interim Concentration Limits

Units located at non-RECLAIM facilities are already subject to the existing limits in Rule 1153.1; however, there are six RECLAIM facilities that will transition out of RECLAIM and into a

command-and-control regulatory structure. PAR 1153.1 includes an interim NOx limit for any Unit that does not have a permitted NOx limit before the facility exits RECLAIM but is subject to a future NOx limit in PAR 1153.1. Interim limits ensure an enforceable regulatory limit remains in place to prevent emission backsliding when facilities exit RECLAIM. For PAR 1153.1, RECLAIM units that do not have an existing NOx concentration limit will be subject to an interim limit of 102 ppmv NOx, which is equivalent to the RECLAIM default emission factor of 130 lbs/MMScf of natural gas.

Paragraph (d)(4) – One Pound or less of NOx per Day Emission Limit

Paragraph (d)(4) of PAR 1153.1 provides an owner or operator of a unit two methods to comply with the alternative NOx emission limit of one pound or less per day through demonstration of a daily level of emission or, the new option of averaging daily NOx emissions over a calendar month. Both options shall be demonstrated in accordance with subdivision (i). In addition, both methods of compliance will require the owner or operator to install and maintain a unit specific non-resettable totalizing time meter or a unit specific non-resettable totalizing fuel meter in accordance with paragraph (j)(7).

Paragraph (d)(5) – Compliance by Decommissioning the Unit

Paragraph (d)(5) provides the option for an owner or operator of a unit subject to PAR 1153.1 to decommission the unit instead of reducing emissions to comply with the applicable emission limits in PAR 1153.1 Table 1. The provision establishes requirements for decommissioning a unit to comply with Phase I or Phase II Emission Limits. To decommission a unit, the owner or operator must inactivate the permit, and disconnect and blind the fuel lines going to the unit pursuant to schedule in subparagraph (e)(5) for Phase I Emission Limits, or pursuant to the schedule in subparagraph (e)(2)(A) for Phase II Emission Limits.

Paragraph (d)(6) – Combustion System Maintenance

Paragraph (d)(6) requires a unit subject to the combustion-based emission limits to conduct combustion system maintenance in accordance with manufacturers schedule and specifications. The owner or operator is also subject to recordkeeping requirement which was originally included in this paragraph in Rule 1153.1. The recordkeeping requirements has been moved to subdivision (i) in PAR 1153.1

Paragraph (d)(7) – Compliance with Pounds Per Million Btu Requirement Prior to Compliance Demonstration

Paragraph (d)(7) requires an owner or operator of a unit electing to comply with the emission rate limits in paragraph (d)(2) expressed as pounds per million Btu to install and maintain a non-resettable totalizing fuel meter pursuant to subparagraph (j)(7) prior to conducting a source test in accordance with subdivision (g).

Paragraph (d)(8) – Compliance with Pounds Per Million Btu for Fuel and Time Meter Requirement

Paragraph (d)(8) requires an owner or operator of a unit that operates at only one firing rate that elects to comply with paragraph (d)(2) expressed as pounds per million Btu to install and maintain a non-resettable totalizing time or fuel meter pursuant to subparagraph (j)(7).

Paragraph (d)(9) – Compliance with another South Coast AQMD Regulation for Exempt Units

Paragraph (d)(9) informs the owner or operator of a unit that is subject to the Phase II Emission Limits pursuant to Rule 1153.1 that the unit may be required to obtain a permit to comply with another South Coast AQMD regulation. For example, some units may also be subject to the permitting requirements for volatile organic compound limits in Rule 1153 – Commercial Bakery Ovens.

Rule 1153.1 Compliance Schedule [Subdivision(e)]

Subdivision (e) provides the compliance schedule for the units subject to the emission limits in subdivision (d).

Paragraph (e)(1) – Compliance Schedule for a Unit that is required to meet the Phase I Emission Limits

Paragraph (e)(1) provides the compliance schedule for units that are required to meet the NOx and CO Phase I Emission Limit in PAR 1153.1 Table 1. Units subject to the Phase I Emission Limits need to submit a permit application to demonstrate compliance with the applicable Phase I Emission Limits in PAR 1153.1 Table 1 when the burner age reaches 7 years of age pursuant to paragraph (f)(1) or when the burners are replaced after rule adoption. There are three scenarios for replacing burners to meet the Phase I Emission Limits:

(1) When a burner is replaced on or after date of rule adoption, it must meet the Phase I Emission Limits in PAR 1153.1 Table 1.

(2) When the burner(s) becomes 7 years of age on or after date of rule adoption, the owner or operator shall submit a permit application by July 1, 2024.

(3) If a burner is not 7 years of age at the time of rule adoption, the owner or operator must submit an application on or before July 1st of the calendar year when the burner age becomes 7 years of age.

Paragraph (e)(1) also establishes dates when the unit shall be in compliance with the Phase I Emission Limits in PAR 1153.1 Table 1. The dates established are dependent on the burners age at time of rule adoption. If the burner is 7 years of age or older, the unit shall be in compliance 12 months after the permit to construct is issued or applicable extension date. If the burner age is 7 years or less, the unit shall be in compliance 12 months after a permit to construct is issued, or the the date included in a permit extension, approved in writing, pursuant to Rule 205 – Expiration of Permits to Construct, or when the burner age reaches 10 years, whichever is sooner. Below is an example for units that are not currently complying with a Phase I limit.

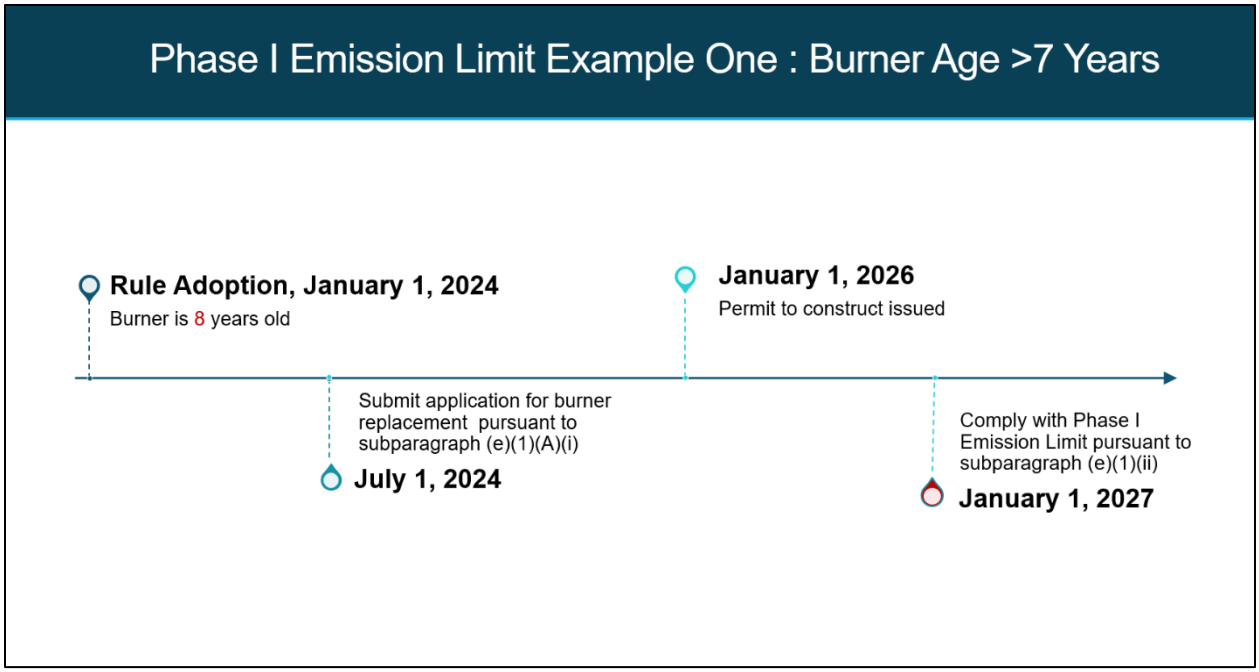

Figure 3-2. Phase I Emission Limit Example One: Burner Age >7 Years

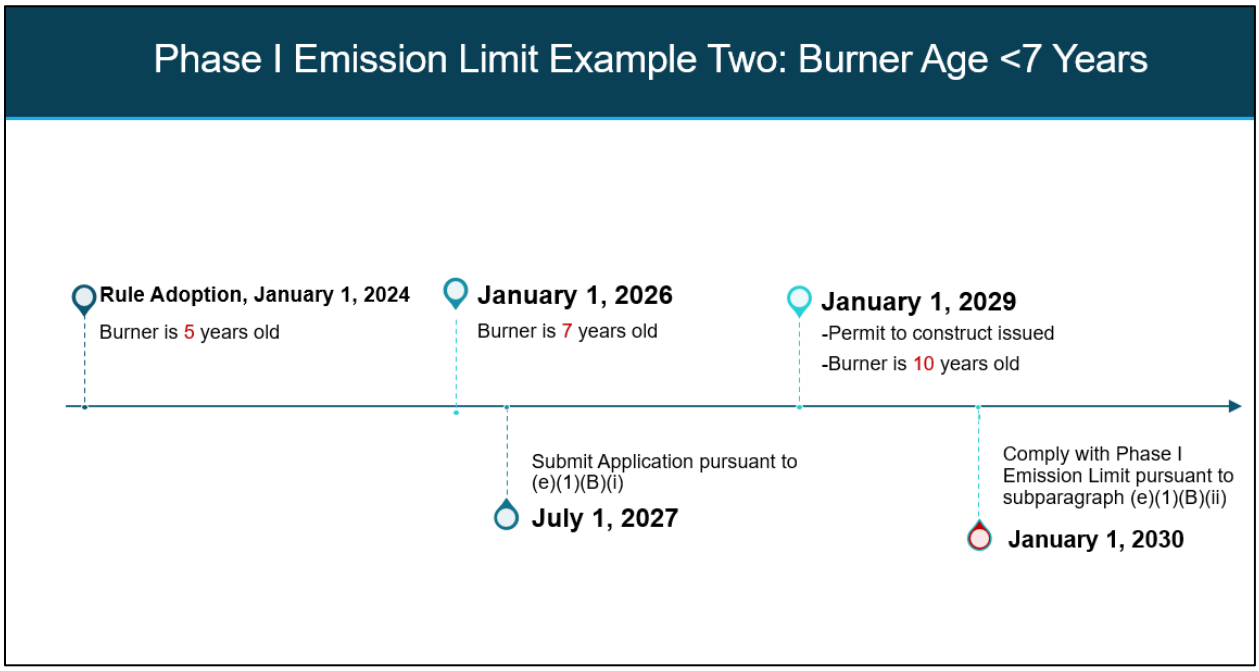

Figure 3-3. Phase I Emission Limit Example Two: Burner Age <7 Years

Paragraph (e)(2) – Compliance Schedule for a Unit that is required to meet the NOx Phase II Emission Limits

Paragraph (e)(2) provides the compliance schedule for units that are required to meet the NOx Phase II Emission Limit in PAR 1153.1 Table 1. Phase II Emission Limits are zero-emission limits

for applicable units. Units subject to the requirement must meet the Phase II Emission Limit once the unit becomes 25 years of age as determined pursuant to paragraph (f)(2) and when the burner becomes 10 years of age determined pursuant to paragraph (f)(1). The owner or operator has two options to meet the Phase II Emission Limit and can either elect to replace the unit with a new zero-emission unit or modify the unit to meet the Phase II Emission Limit. In either case, the owner or operator will need to submit a form to inactivate the permit for the combustion unit or decommission the combustion unit pursuant to paragraph (d)(5) based on the following below:

- For any unit that is 25 years of age or older, and the burner is 10 years of age or older as of January 1, 2027, the owner or operator must decommission the unit or submit a form to inactivate the permit on or before January 1, 2027.
- For any unit that is less than 25 years of age or the burner is less than 10 years of age as of January 1, 2027, the owner or operator must decommission the unit or submit a form to inactivate the permit on or before January 1 after the end of the calendar year when the unit becomes 25 years of age or older. However, if the unit becomes 25 years of age as of January 1, 2033, the owner or operator is required to decommission the unit or submit a form to inactivate the permit regardless of burner age.

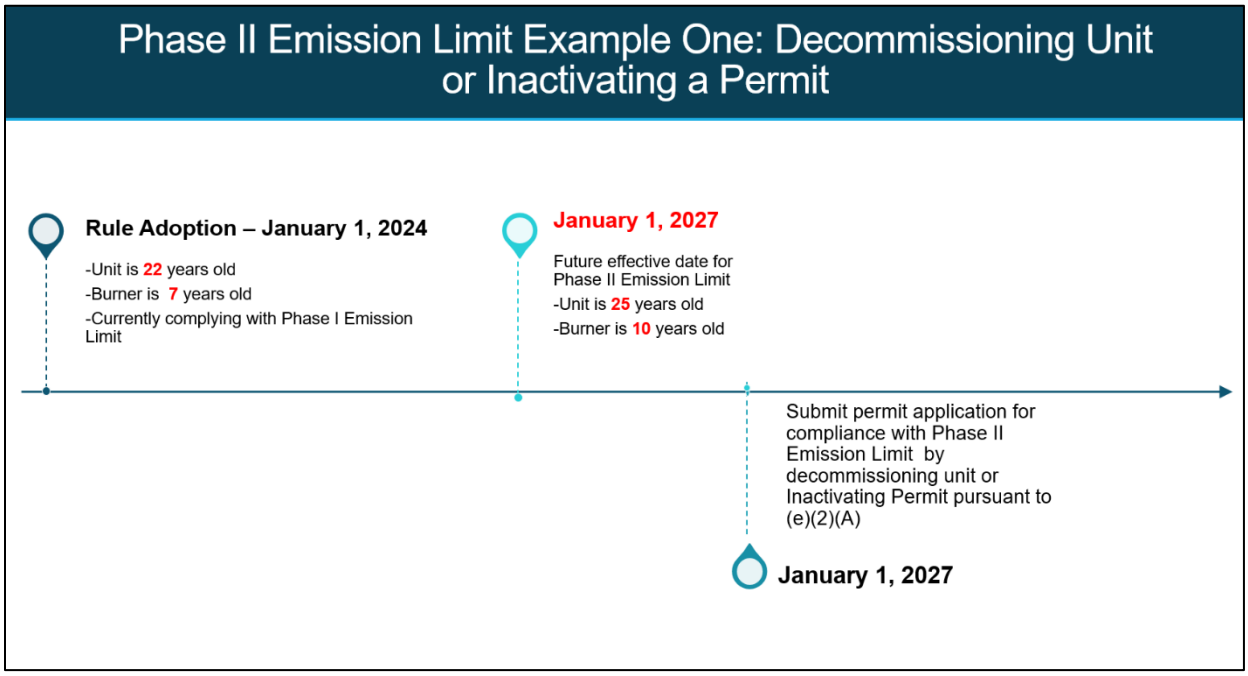

Figure 3-4. Phase II Emission Limit Example: Unit Age is 25 Years of Age and Burner Age is 10 years of Age by January 1, 2027

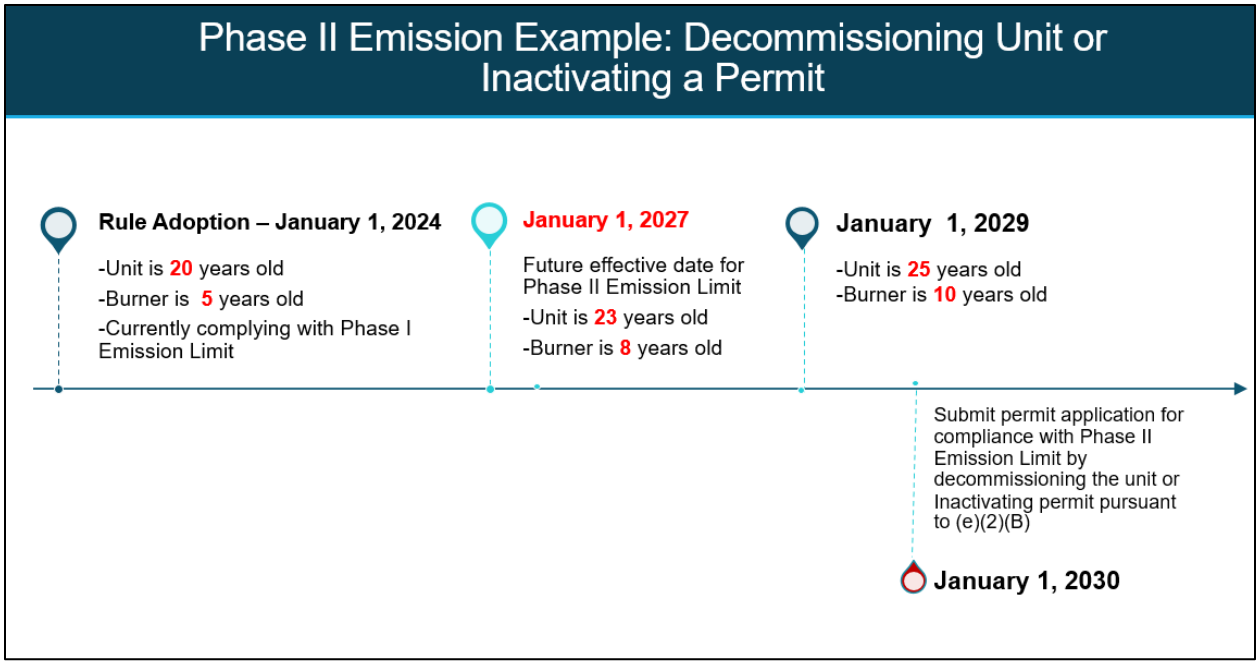

Figure 3-5. Phase II Emission Limit Example: Unit Age is Not 25 Years of Age and Burner Age is Not 10 years of Age by January 1, 2027

*Paragraph (*e)(3) – Alternative Compliance Schedule for Units with a Phase II Emission Limit

Paragraph (e)(3) provides an alternative compliance schedule for the owner or operator of a unit subject to the Phase II Emission Limits where the utility provider cannot provide the necessary power to facility for the unit according to the compliance schedule specified in paragraph (e)(2). The owner or operator must submit an Alternative Compliance Schedule Plan pursuant to the requirements in subdivision (k) to the Executive Officer. Planning staff will review the submitted Alternative Compliance Schedule Plans for completeness and notify the facility regarding any deficiencies. The Executive Officer will notify the facility in writing whether the Alternative Compliance Plan is approved or disapproved.

Paragraph (e)(4) – Compliance Schedule for Units That Fail to Demonstrate Compliance with One Pound or less of NOx per day

Paragraph (e)(4) provides the compliance schedule for owner or operator of units that elects to comply with the limit of one pound or less of NOx per day and fails to demonstrate compliance in accordance with subdivision (i). The owner or operator is required to submit a permit application for the applicable limit in PAR 1153.1 Table 1 within 180 days of the date of the failure and demonstrate compliance with the applicable PAR 1153.1 Table 1 limit within 12 months after the date the permit is issued or the extended date of the issued permit.

Paragraph (e)(5) – Compliance Schedule for Decommissioning of the Unit

Paragraph (e)(5) establishes the compliance schedule for the owner or operator of a unit electing to decommission a unit instead of complying with the applicable emission limits in PAR 1153.1 Table 1. The owner or operator must decommission the unit within 30 months following the permit application submittal deadline pursuant to subdivision (e).

Paragraph (e)(6) – Failure to Meet the Compliance by Manufacturer Certification Requirements

Paragraph (e)(6) outlines that if an owner or operator fails to meet the manufacturer's certification requirements for a unit pursuant to subparagraph (h)(1), the owner or operator must demonstrate compliance with the applicable emission limits through source test pursuant to subdivision (g) and it establishes a schedule to submit and conduct the source test protocol and any subsequent source test.

Paragraph (e)(7) – Failure to Operate Unit as Specified in Manufacturer Certification

Paragraph (e)(7) outlines that if an owner or operator fails to operate a unit as specified in the manufacturer's emission certification or if the certification expires and the manufacturer does not re-certify the unit in accordance with manufacturers certification, the owner or operator must demonstrate compliance with the applicable emission limits through source test pursuant to subdivision (g) and it establishes a schedule to submit and conduct the source test protocol and any subsequent source test.

Equipment Age [Subdivision(f)]

Subdivision (f) provides guidance to determine the original burner age and the age of applicable equipment. Paragraph (f)(1) provides options for determining original burner's age and Paragraph (f)(2) provides options for determining a unit's age. Owners or operators of unit(s) subject to PAR 1153.1 may choose any of the available options listed in paragraph (f)(1) and (f)(2) to determine original burner age and unit age, including the invoice related to the installation from equipment manufacturer, original manufacturer's identification plate, information submitted to the South Cast AQMD with permit applications, or any other method of determining burner age or unit age that can be substantiated through sufficient written information as approved by the Executive Officer. Burners without the information outlined in subparagraphs (f)(1)(A) and (f)(1)(B) will be deemed 7 years old as of January 1, 2024. Similarly, Unit's without the information outlined in subparagraph (f)(2)(A) and (f)(2)(B) will be deemed 25 years old as of January 1, 2024.

Source Test Requirements for Units Subject to Combustion Based Emission Limits [Subdivision(g)]

Paragraph (g)(1) – Source Test Provisions

Units subject to the Combustion Based NOx and CO emission limits of PAR 1153.1 or South Coast AQMD permit concentration limit must conduct simultaneous source tests for NOx and CO to demonstrate compliance with the applicable emission limits. Paragraph (g)(1) also specifies that a source test must be conducted every five calendar years, but no earlier than 48 calendar months after the previous source test.

Paragraph (g)(2) – Initial Source Test Requirements

Units subject to the NOx and CO emission limits of PAR 1153.1 shall conduct a source test no later than 24 months after rule adoption or 24 months after a facility becomes a former RECLAIM facility, whichever is later. This initial source test will set the schedule for the subsequent source testing. For new units installed after date of rule adoption, a source test must be conducted according to the conditions established in the permit to construct which will establish the subsequent source testing schedule. The source test must be representative of the current operation of the equipment, or a new source test protocol will be required.

Paragraph (g)(3) – Source Test Protocol Submission for Approval

The owner or operator of units subject to the NOx and CO emission limits of PAR 1153.1 shall submit a source test protocol for approval 60 days prior to conducting the source test and must conduct the source test 90 days after a written approval. Source test protocols for subsequent testing would not need to be re-evaluated provided that the burner or combustion system tested was not altered to require a new permit.

Paragraph (g)(4) – Source Test Protocol Re-Submittal

Paragraph (g)(4) specifies when the owner or operator must resubmit a source test protocol after the approval of the initial protocol.

Paragraph (g)(5) – Source Test Procedure and Methods to Demonstrate Compliance

Paragraph (g)(5) specifies the procedure how a source test shall be conducted to demonstrate compliance with the limits in PAR 1153.1 and lists the approved methods for conducting a source test. Paragraph (g)(5) specifies the operating parameters a unit must operate at when conducting a source test. A unit's compliance determination source test shall be conducted using two source tests: (1) source test where the unit is operated at the maximum rated heat input the unit normally operates at, and (2) second source test at less than 35% of the rated heat input of the unit.

Paragraph (g)(6) – Pounds Per Million Btu per hour of Heat Input Compliance

Paragraph (g)(6) specifies the procedure and test methods for an owner or operator electing to comply with the Table 1 NOx emission limit in pounds per million Btu.

Paragraph (g)(7) – Source Test Compliance for Multiple Unit in Series

Paragraph (g)(7) outlines a method for determining compliance for multiple units in series. Some commercial food ovens subjected to PAR 1153.1 are equipped with afterburners, thermal oxidizers, or vapor incinerators downstream of the unit which are subject to Rule 1147. The provision was expanded to include those downstream units and provide an option for demonstrating compliance since the emission limits for units subject to Rule 1147 have a different emission limit from units from units subject to PAR 1153.1.

Paragraph (g)(8) – Emissions determined to Exceed an Emission Limit

Paragraph (g)(8) states that any unit that is determined to exceed an established emission limit through the use of specified test methods constitutes a violation of the rule.

Compliance by Certification for Units Subject to Phase I Emission Limits [Subdivision(h)]

Subdivision (h) outlines the procedure and requirements that an owner or operator of a unit subject to the Phase I Emission Limits with a rated heat input capacity of 2MMBtu/hr or less must follow to demonstrate compliance with an applicable emission limit through the burner manufacturer's emission certification in lieu of conducting a source test pursuant to subdivision (g).

Paragraph (h)(1) – Demonstrate Compliance with Manufacturer Certification

Paragraph (h)(1) establishes the requirements and procedure to obtain a manufacturer's emission certification for a unit in lieu of compliance demonstration through source testing pursuant to subdivision (g). The emissions certification must be signed by the burner manufacturer or distributor's responsible official that guarantees the compliance of the burner(s), fuel and

combustion air system, and combustion control system identified in the submitted South Coast AQMD application with the applicable NOx emission limit in PAR 1153.1 Table 1. The following submissions are required when an owner or operator is electing to comply with subdivision (h):

(1) A guarantee showing that it complies with the applicable NOx emission limit in PAR 1153.1 Table 1 when used for the specified process, operating conditions, and within a specified temperature range.
(2) A separate signed and dated emission certification addressing owner or operator of the unit and the designee at the facility.
(3) Supporting documentation which must include emission test reports of at least five South Coast AQMD approved emission tests using South Coast AQMD approved test protocol and methods for five different units operating the same process, burner, fuel and combustion air system, combustion control system, and temperature range.
(4) Approved emissions test results (Number 3) by South Coast AQMD prior to submittal of a permit application or application to renew a burner emission certification.
(5) A contract or purchase order, signed, and dated by the responsible official of the owner or operator of the unit as identified in the permit application and signed, and the dated letter or bid from burner manufacturer to the owner or operator of the unit.

Paragraph (h)(2) – Notification of Manufacturer's Emission Certification Approval

Paragraph (h)(2) establishes that the Executive Officer will notify the owner or operator of a Unit in writing whether the manufacturer's emission certification has been approved. The certification will be valid for five years from the date of the written notification of approval and thereafter will expire.

Paragraph (h)(3) – Manufacturer's Emission Certification Expiration

Paragraph (h)(3) establishes the timeline to renew the manufacturer's emission certification. No later than 60 days prior to the date the manufacturer's emission certification expires, the owner or operator of a Unit shall do one of two following options:

(1) Submit a new application for a burner manufacturer's emission certification to be reviewed by the Executive Officer and include all the information required in paragraph (h)(1).
(2) Submit a source test protocol and demonstrate compliance by conducting a source test according to the requirements in subdivision (g) and establish the date of that source test as the basis for subsequent source testing frequency, unless an extension of time has been approved in writing by the Executive Officer.

Paragraph (h)(4) – Failure to Demonstrate Manufacturer Certification Requirements

Paragraph (h)(4) establishes that any compliance determination conducted by the South Coast AQMD on a unit complying with subdivision (h) that is in excess of those in the rule shall be considered a violation.

Demonstration of Alternative Emission Limit of One Pound or Less Per Day [Subdivision(i)]

Subdivision (i) establishes demonstration methods in which an owner or operator can demonstrate meeting NOx emissions limit of one pound per day pursuant to paragraph (d)(4). The demonstration methods require the owner or operator to install and maintain a unit specific non-resettable totalizing time meter for hourly limit, or a unit specific non-resettable totalizing fuel meter for fuel or therm limit and maintain records pursuant to paragraph (j)(8).

Paragraph (i)(1) – One Pound Per Day Demonstration Averaged Over a Calendar Month

Facilities electing to comply with the one pound of NOx per day averaged over a calendar month shall demonstrate compliance in accordance with paragraph (i)(1) and can either demonstrate compliance with the maximum monthly operating limits specified in PAR 1153.1 Table 2 (Table 3-2 of staff report). The maximum monthly operating hours in PAR 1153.1 Table 2 are based on the operating hours specified in PAR 1153.1 Table 3 (Table 3-3 of staff report) which is the daily operating hours and calculated assuming a five day per week operation multiplied by four weeks. The provision is to provide operating flexibility for some units.

Table 33-2. PAR 1153.1 – Less than One Pound per Day Monthly Operating Limits

Unit Rated Heat Input (Btu/hr)	Monthly Operating Limit (Hours)
≤ 400,000	320
>400,000 to ≤ 800,000	160
> 800,000 to ≤ 1,200,000	100

Facilities may also choose to monitor emissions either by calculating monthly operating hours with a unit specific factor in lb NOx/MMscf of natural gas in accordance with equation 1 or calculate monthly fuel usage expressed in therms with a unit specific emission factor in lb NOx/MMscf natural gas in accordance with equation 2.

Equation #1	**Equation #2**
Monthly Operating Hours=D ÷ [R x (EF ÷ HHV)] Where, D= Number of Days in Calendar Month R= Rated Heat Input (MMBtu/hr), EF= Emission Factor for the Units (lbs NOx MMScf natural gas), HHV= Higher Heating Value of Natural Gas (1,050 MMBtu/MMScf)	Monthly Therms of Fuel = (D ÷ EF) x HHV x 10 Where, D= Number of Days in Calendar Month EF= Emission Factor for the Units (lbs NOx MMScf natural gas), HHV= Higher Heating Value of Natural Gas (1,050 MMBtu/MMScf) 10= Conversion to/from MMBtu to Therms

Figure 3-3. PAR 1153.1 Equation 1 and Equation 2

An owner or operator of a unit electing to comply with the one pound or less of NOx per day through calculating monthly maximum usage with equation 1 or 2 in PAR 1153.1 shall determine the emission factor using a South Coast AQMD approved method (e.g., source test) or use the default unit emission factor of 130 lb/MMscf of natural gas.

Paragraph (i)(2) –One Pound Per Day or Less Daily Demonstration

Facilities electing to comply with the one pound or less of NOx per day using daily averages shall demonstrate compliance in accordance with paragraph (i)(2) and can either demonstrate compliance through one of the two following ways:

(1) Maintain a permit condition limiting the operating hour based on rated heat input in Btu/hr pursuant to PAR 1153.1 Table 3.

Table 33-3. PAR 1153.1– Less than One Pound per Day Daily Operating Limits

Unit Rated Heat Input (Btu/hr)	Monthly Operating Limit (Hours)
≤ 400,000	16
>400,000 to ≤ 800,000	8
> 800,000 to ≤ 1,200,000	5

(2) Maintain a permit condition limiting the daily natural gas usage to 7,692 cubic feet per day or less.

The owner or operator of the unit will be required to install and monitor the unit with a unit specific non-resettable totalizing time meter or unit specific non-resettable totalizing fuel meter depending on the chosen approach.

Monitoring, Recordkeeping, and Reporting Requirements [Subdivision(j)]

Subdivision (j) outlines the monitoring, reporting, and recordkeeping requirements including source tests, maintenance, and records for determination of compliance with applicable Rule 1153.1 emission limit. Records must be kept for a minimum of five years and made available to the Executive Office upon request.

Paragraph (j)(1) – Compliance by Manufacturer Certification Recordkeeping

Paragraph (j)(1) requires an owner or operator that elects to comply with compliance by manufacturer's certification to maintain records and documentation for the unit. Also Requires the owner or operator to conduct tests to ensure compliance with PAR 1153.1. If the owner or operator fails to conduct testing of the certified unit, any compliance test that has to be conducted by South Coast AQMD shall be considered a violation.

Paragraph (j)(2) – Phase II Emission Limit Reporting Requirements Prior to Effective Date

Paragraph (j)(2) requires an owner or operator with units subject to the Phase II Emission Limits to report to the Executive Officer the age of the unit and anticipated date of replacement. Furthermore, the provision also requires the owner or operator to reach out to the utility provider when the unit's age reaches 17 years of age pursuant to paragraph (f)(2) and submit a document with an explanation of the service upgrades and timeframe to complete the service upgrades. This is to ensure that there are no delays and to prevent any issues with complying with the Phase II Emission Limits. The documents submitted to the Executive Office must also be maintained on site for at least five years which will ensure the information is available due to potential staff turnover at the facility.

Paragraph (j)(3) – Rated Heat Input Capacity Labeling and Documentation Requirements

Paragraph (j)(3) outlines documentation requirements of the units rated heat input capacity.

Paragraph (j)(4) and (j)(5) – Labeling Requirements

Paragraph (j)(4), and (j)(5) outlines unit labeling requirements including units that have been modified from the original burner configuration or specifications.

Paragraph (j)(6) – Recordkeeping Requirements for Maintenance and Source Test

Paragraph (j)(6) outlines the recordkeeping requirements of maintenance and source test for the unit.

Paragraph (j)(7) – Non-Resettable Totalizing Fuel Meter Requirements and Non-Resettable Totalizing Time Meter

Paragraph (j)(7) specifies the requirements that an owner or operator must comply with when required to install and operate a non-resettable totalizing fuel meter and non-resettable totalizing time meter.

Paragraph (j)(8)) – Non-Resettable Totalizing Time Meter and Non-Resettable Totalizing Fuel Meter Recordkeeping Requirements for Demonstration of One Pound or Less of NOx Per Day

Paragraph j(8) specifies the recordkeeping requirements for an owner or operator electing to comply with one pound or less of NOx per day requirements or compliance by certification requirements which requires non-resettable totalizing meters.

Paragraph (j)(9) – RECLAIM Facility Reporting Requirements

Paragraph (j)(9) specifies that a RECLAIM facility must continue to comply with the reporting requirements until the facility officially exits the RECLAIM program

Paragraph (j)(10) – Source Test and Records Recordkeeping Requirements

Paragraph (j)(10) specifies the recordkeeping requirements that an owner or operator must comply with for source tests and records required.

Alternative Compliance Schedule Plan Requirements [Subdivision(k)]

Subdivision (k) outlines and specifies the requirements, submittal date, review process, approval process, plan modification process, and plan fees for an owner or operator that qualifies for an Alternative Compliance Schedule Plan.

Paragraph (k)(1) – Alternative Compliance Schedule Plan Requirements

Paragraph (k)(1) specifies the timeframe that an owner or operator with a Unit(s) subject to Phase II Emission Limits must refer to for submittal of an Alternative Compliance Schedule Plan. The provision also specifies the required documents and information that must be submitted as part of submittal.

Paragraph (k)(2) – Alternative Compliance Schedule Plan Review and Approval Process

Paragraph (k)(2) specifies the Alternative Compliance Schedule Plan review and approval process and the criteria that must be met in order for the plan to be approved by the Executive Officer.

Paragraph (k)(3) – Upon Receiving Approval

Paragraph (k)(3) specifies the actions that an owner or operator must take once an Alternative Compliance Schedule Plan is approved as well as the schedule for decommissioning of the unit(s).

Paragraph (k)(4) – Alternative Compliance Schedule Plan Disapproval

Paragraph (k)(4) specifies the timeframe for an owner or operator to correct deficiencies to the plan once a written notification of disapproval from the Executive Officer is received.

Paragraph (k)(5)– Alternative Compliance Schedule Plan Second Disapproval

Paragraph (k)(5) specifies the schedule and actions that an owner or operator of a Unit(s) must take when a second plan disapproval is received. The facility must decommission the unit pursuant to the compliance schedule in paragraph (e)(2) or submit permit application for the Phase II Emission Limit within 60 days of receiving the disapproval.

Paragraph (k)(6) – Modifications to an Approved Alternative Compliance Schedule Plan

Paragraph (k)(6) specifies the requirements that are necessary for an owner or operator that is requesting to modify an approved Alternative Compliance Schedule Plan.

Paragraph (k)(7) – Modifications to an Approved Alternative Compliance Schedule Plan Review

Paragraph (k)(7) specifies that the Executive Officer will review any modifications to an approved Alternative Compliance Schedule Plan in accordance to paragraph (k)(2).

Paragraph (k)(8) – Alternative Compliance Schedule Plan Progress Updates Submittal

Paragraph (k)(8) specifies the requirements that an owner or operator must mee to verify the progress of Alternative Compliance Schedule Plan.

Paragraph (k)(9) – Notification of Pending Approval of an Alternative Compliance Schedule Plan

Paragraph (k)(9) specifies the availability of Alternative Compliance Schedule Plans to the public and any update on status as the Executive Office deems it approved or disapproved.

Paragraph (k)(10) – Plan Fees

Paragraph (k)(10) states that an owner or operator of a facility that submits an Alternative Compliance Schedule Plan or requests to modify an approved Alternative Compliance Schedule Plan will be subject to applicable plan fees pursuant to Rule 306 – Plan Fees.

Exemptions [Subdivision(l)]

Paragraph (l)(1) – Exemptions

Paragraph (l)(1) has been updated to include equipment regulated under Rule 1147 - NOx Reductions from Miscellaneous Sources and units with a rated heat input capacity less than 325,000 Btu/hr. The definition of afterburner was expanded to include thermal oxidizers, and vapor incinerators as defined by Rule 1147.

The exemption of not requiring units heated solely with infrared burners to demonstrate compliance with PAR 1153.1 Table 1 limits by an approved Source Test protocol was removed.

The demonstration of one pound or less of NOx per day was moved to subdivision(i) as a separate subdivision.

CHAPTER 4 : IMPACT ASSESSMENT

INTRODUCTION

Proposed Amended Rule 1153.1 (PAR 1153.1) is expected to impact 202 units located at approximately 97 facilities. Of the estimated 97 facilities, 6 facilities are identified as participants in the RECLAIM program. Rule 1153.1 was initially adopted on November 7, 2014, and established NOx emission limits for commercial food oven located at non-RECLAIM facilities. It is expected that most of the equipment subject to PAR 1153.1 at non-RECLAIM facilities is already in compliance with emission limits of PAR 1153.1. Approximately 131 units that are currently subject to the existing limits currently have a limit of 30 ppmv, so it is expected that approximately 93 units will be subject to the requirement to submit permit applications once the burner age reaches 25 years and comply with the lower limits when the burner reaches 10 years of age, which staff has identified as the end of the burner's useful life.

EMISSIONS INVENTORY

The total NOx inventory for the RECLAIM and non-RECLAIM units affected by PAR 1153.1 is estimated to be 0.2 tpd based on the South Coast AQMD annual emissions report (AER) inventory database for compliance year 2019 for permitted units or audited RECLAIM reported emission data. The South Coast AQMD AER program was developed to track emissions of air contaminants from permitted facilities. Facilities with annual emissions exceeding 4 or more tons per year of NOx, sulfur oxides, volatile organic compounds, specific organics, particulate matter, or emissions of 100 tons per year or more of CO are required to submit an annual emissions report. Facilities could also be required to submit AER if the facility receives a notification from South Coast AQMD or is subject to the AB2588 Program for reporting quadrennial updates to its toxics inventory. For each piece of RECLAIM equipment, the annual activity is estimated using the facility's reported emissions for the compliance year of 2019 and fuel usage is calculated using an emission factor represented by the permit limit specific for each unit.

PAR 1153.1 will impact 97 facilities with commercial food ovens and staff will use 2019 NOx emissions as the baseline. Six facilities are currently subject to RECLAIM and 91 facilities are non-RECLAIM facilities. The emissions from the six RECLAIM facilities emissions are measured and reported to AER – the emissions are 0.028 tpd. For the 91 non-RECLAIM facilities, only 9 facilities submitted AER NOx emissions which totaled 0.047 tpd. Only 9 facilities have the criteria pollutants potential to emit (PTE) greater than the AER thresholds of 4 tons per year. In addition, most the non-RECLAIM facilities have small roasters that qualify for the exemption and emit less than one pound per day of NOx emissions. To estimate emissions for the other 82 facilities, staff evaluated the following information:

- Equipment types and number of food ovens located at facility
- Operational days per week
- Burner size or rated heat input capacity

Staff compared the information to similar equipment categories in the information survey that was sent out to facilities. Staff averaged the emissions information for similar equipment to estimate pounds per day of NOx emissions. Facilities baseline emission estimates were presented in Working Group Meeting #3, as listed in the following table.

Table 44-1. Facility 2019 Baseline Emission Estimates

Equipment	Burner Size (MMBtu / hr)	Number of Facilities *	Operational Days per Week	NOx Emissions Assumption Per Unit (lbs/day)	NOx Emissions for Category (tons/year)	NOx Emissions Estimate (tons/day)
Roasters	3 or less	38	5	0.9	4.4	0.017
Dryers	3.2 or less	5	7	4.5	4.1	0.011
Smokehouses/ Drying Ovens	5 or less	4	7	4.5	3.3	0.015
Baking & Cooking Ovens	7.2 or less	33	7	5.2	31.2	0.085
Tortilla Ovens	9.8 or less	6	7	2.9	21.9	0.06
Non-RECLAIM with AER	9 Facilities					0.047
				RECLAIM		0.028
				Rule Total		0.26

*Two smokehouse ovens were not included in the emission estimates - one of these ovens is electric, and the other is electric and steam heated

After the table was presented in Working Group Meeting#3, staff identified several more units at the non-RECLAIM facilities with a total estimated NOx emissions of 0.008 tpd and as a result, the baseline NOx emissions increased from 0.192 to 0.26 tpd. The change in the estimated baseline NOx emissions was reflected in Working Group Meeting#8 discussions. Emission reductions were calculated by first summing the total 2019 baseline NOx emissions for all units subject to the rule. Then using the existing concentration limit in ppmv or the emission factor (converted to ppmv) found in equipment permits, the difference between existing permit limits and the proposed concentration limits in PAR 1153.1 was calculated. This difference was then applied to the total 2019 baseline emissions for all units.

COST-EFFECTIVENESS

California Health and Safety Code Section 40920.6 requires a cost-effectiveness analysis when establishing BARCT requirements. The cost-effectiveness of a control technology is measured in terms of the control cost in dollars per ton of air pollutant reduced for each class and category of equipment. The costs for the control technology include purchasing, installation, operating, and maintaining the control technology.

South Coast AQMD typically relies on the Discounted Cash Flow (DCF) method which converts all costs, including initial capital investments and costs expected to be incurred in the present and all future years of equipment life, to a present value. Conceptually, it is as if calculating the amount of funds that would be needed at the beginning of the initial year to finance the initial capital investments but also funds to be set aside to pay off the annual costs as they occur in the future. The fund that is set aside is assumed to be invested and generate a rate of return at the chosen

discount rate. The final cost-effectiveness measure is derived by dividing the present value of total costs by the total emissions reduced over the equipment life of 25 years.

Table 44-2. Cost-Effectiveness

Equipment Categories		Cost-Effectiveness at 30 ppmv	Cost-Effectiveness at 0 ppmv
Bakery Ovens	**(≤3 MMBtu/hr)**	$93,000	$290,000
	(>3 MMBtu/hr)		$400,000
Indirect-Fired Bakery Ovens		$0 (Currently achieving)	--
Griddle Ovens		$94,000	$514,000
Tortilla Ovens	**(IR burners only)**	$29,000	$400,000
	Ribbon& IR Burners)		
Cooking Ovens	**(≤3 MMBtu/hr)**	$0 (Currently achieving)	$190,000
	(>3 MMBtu/hr)		$560,000
Drying Ovens		$22,000	$350,000
Dryers		$18,000	--
Smokehouses		$43,000	$60,000
Roasters		$85,000	$820,000

The cost-effectiveness for four equipment categories (bakery ovens ≤3 MMBtu/hr, Indirect-Fired Bakery Ovens, Cooking ovens ≤3 MMBtu/hr, and Smokehouses) showed to be below the $325,000 ($349,000 adjusted to 2022-dollar year) cost-effectiveness threshold established in the 2022 AQMP.

INCREMENTAL COST-EFFECTIVENESS

Health and Safety Code Section 40920.6 requires an incremental cost-effectiveness analysis for BARCT rules or emission reduction strategies when there is more than one control option which would achieve the emission reduction objective of the proposed amendments relative to ozone, carbon monoxide, sulfur oxides, oxides of nitrogen, and their precursors. Incremental cost-effectiveness is the difference in the dollar costs divided by the difference in the emission reduction potentials between each progressively more stringent potential control option as compared to the next less expensive control option. Incremental cost-effectiveness was calculated for the transition from 30 ppm NOx control technology to zero-emission technology for four categories of

commercial food ovens where staff determined zero-emission technology is technically feasible. Below is a table summarizing the incremental cost-effectiveness for each category considered in the BARCT Assessment.

Table 44-3. Incremental Cost-Effectiveness

Equipment Categories		Incremental Cost-Effectiveness (30 ppmv to 0 ppmv)
Bakery Ovens	**(≤3 MMBtu/hr)**	$291,000
	(>3 MMBtu/hr)	$763,000
Indirect-Fired Bakery Ovens		N/A
Griddle Ovens		N/A
Tortilla Ovens		$626,000
Cooking Ovens	**(≤3 MMBtu/hr)**	$173,000
	(>3 MMBtu/hr)	$542,000
Drying Ovens		$288,000
Dryers		N/A
Smokehouses		$65,000
Roasters		$745,000

EMISSION REDUCTIONS

The following table summarizes the estimated emission reductions for PAR 1153.1 by category. The estimated emission reductions are 0.11 tpd at full implementation and will be achieved through burner or unit replacement at the end of useful life.

Table 44-4. Emission Reductions by Commercial Food Oven Category

Equipment Categories		NOx Emission Reductions at 30 ppmv (tpd)	NOx Emission Reductions at 0 ppmv (tpd)	NOx Emission Reduction at Full Implementation
Bakery Ovens	**(≤ 3 MMBtu/hr)**	0.004	0.06	0.06
	(> 3 MMBtu/hr)	0.0043	N/A	0.0043
Griddle Ovens		0.001	N/A	0.001
Tortilla Ovens	**IR burners**	N/A	N/A	N/A
	Ribbon/IR	0.015		0.015
Cooking Ovens	**(≤3 MMBtu/hr)**	Currently achieving	0.019	0.019
	(>3 MMBtu/hr)		N/A	N/A
Drying Ovens		0.001	N/A	0.001
Dryers		0.006	N/A	0.006
Smokehouses		0.001	0.006	0.006
Roasters		0.0002	N/A	0.0002
Total				**0.11**

ANTICIPATED SCHEDULE FOR EMISSION REDUCTIONS

Phase I emission limits become effective upon rule adoption and will be required at the end of burner useful life with emission reductions of approximately 0.03 tpd. Phase II limits becomes effective January 1, 2027 and will be required at the end of equipment useful life. Staff evaluated facility permits to estimate equipment age for units subject to the Phase II emission limits to estimate the timeline for compliance, emission reductions, and impact on the electrical grid. The following charts summarize the age distribution of equipment subject to the Phase II emission limits and the anticipated timeframe for transition to zero-emission equipment. PAR 1153.1 will achieve ~82% of the emission reductions by 2036 and the remaining 18% will occur by 2043. The remaining 18% of units are five years old or less and were installed or retrofit to comply with the 2014 rule adoption. The compliance schedule allows for those units to reach the end of their useful life to address stranded assets. Emissions reductions at full implementation is approximately 0.11 tpd.

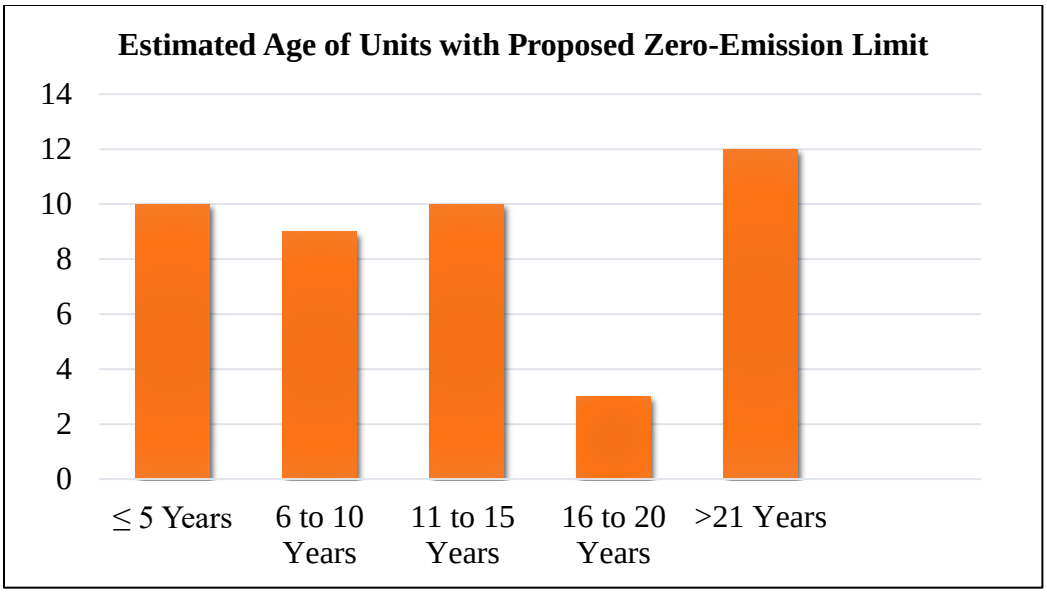

Figure 4-1. Estimated Age of Units Subject Phase II

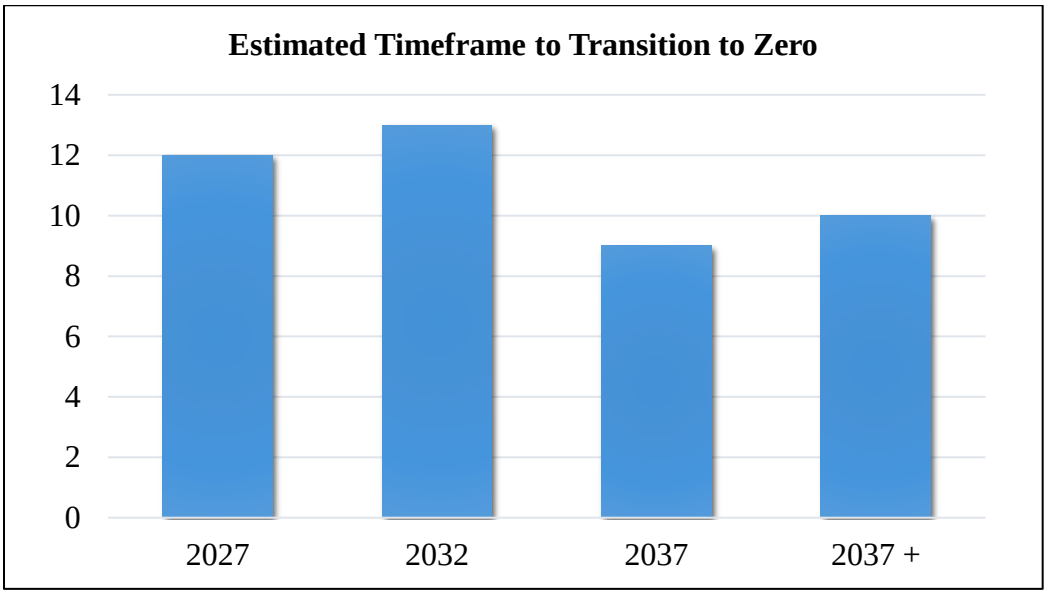

Figure 4-2. Estimated Timeframe Zero-Emission Transition

SOCIOECONOMIC IMPACT ASSESSMENT

The Draft Socioeconomic Impact Assessment for PAR 1153.1 will be released no later than July 5, 2023, for a 30-day public review period.

CALIFORNIA ENVIRONMENTAL QUALITY ACT ANALYSIS

Pursuant to the California Environmental Quality Act (CEQA) and the South Coast AQMD's certified regulatory program (Public Resources Code Section 21080.5, CEQA Guidelines Section 15251(l) and South Coast AQMD Rule 110, South Coast AQMD, as the lead agency, is reviewing

the proposed project (PAR 1153.1) to determine if it will result in any potential adverse environmental impacts. Appropriate CEQA documentation will be prepared based on the analysis.

DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY CODE SECTION 40727

Requirements to Make Findings

California Health and Safety Code Section 40727 requires that prior to adopting, amending, or repealing a rule or regulation, the South Coast AQMD Governing Board shall make findings of necessity, authority, clarity, consistency, non-duplication, and reference based on relevant information presented at the public hearing, and in the staff report.

Necessity

Proposed Amended Rule 1153.1 is needed to establish BARCT requirements for facilities that will be transitioning from RECLAIM to a command-and-control regulatory structure and to partially implement the 2022 AQMP by establishing zero-emission NOx limits where feasible.

Authority

The South Coast AQMD Governing Board has authority to adopt amendments to Rule 1153.1 pursuant to the California Health and Safety Code Sections 39002, 40000, 40001, 40440, 40702, 40725 through 40728, and 41508.

Clarity

Proposed Amended Rule 1153.1 is written or displayed so that its meaning can be easily understood by the persons directly affected by it.

Consistency

Proposed Amended Rule 1153.1 is in harmony with and not in conflict with or contradictory to, existing statutes, court decisions, or state or federal regulations.

Non-Duplication

Proposed Amended Rule 1153.1 will not impose the same requirements as any existing state or federal regulations. The proposed amended rule is necessary and proper to execute the powers and duties granted to, and imposed upon, the South Coast AQMD.

REFERENCE

In drafting Proposed Amended Rule 1153.1, the following statutes which South Coast AQMD hereby implements, interprets or makes specific are referenced: Health and Safety Code Sections 39002, 40000, 40001, 40702, 40440(a), 40440(b), 40440(c), 40725 through 40728.5, and 41508.

COMPARATIVE ANALYSIS

Under Health and Safety Code Section 40727.2, South Coast AQMD is required to perform a comparative analysis when adopting, amending, or repealing a rule or regulation. The comparative analysis is relative to existing federal requirements, existing or proposed South Coast AQMD rules and air pollution control requirements and guidelines which are applicable to combustion equipment subject to PAR 1153.1. The comparative analysis for PAR 1153.1 can be found in the following table below.

Staff is not aware of any state or federal requirements regulating air pollution that are applicable to the new or in-use equipment subject to PAR 1153.1.

Table 44-5. Comparative Analysis for PR 1153.1 with South Coast AQMD Rules

Rule Element	PAR 1153.1	RECLAIM	Rule 1147
Applicability	Commercial food ovens including, but not limited to, bakery ovens, griddle ovens, tortilla ovens, drying ovens, smokehouses, dryers, and roasters with NOx emissions that are used to prepare food or products for making beverages for human consumption.	Facilities regulated under the NOx RECLAIM program (SCAQMD Reg. XX)	Ovens, dryers, dehydrators, heaters, kilns, calciners, furnaces, crematories, incinerators, heated pots, cookers, roasters, fryers, closed and open heated tanks and evaporators, distillation units, afterburners, degassing units, vapor incinerators, catalytic or thermal oxidizers, soil and water remediation units and other combustion equipment with nitrogen oxide emissions that require a District permit and are not specifically required to comply with a nitrogen oxide emission limit by other District Regulation XI rules

Requirements	**Phase I**
	• Directly Fired Bakery Ovens
	  ○ ≤3 MMBTU – 30 ppm
	  ○ >3 MMBTU – 30 ppm
	• Indirectly-Fired Bakery Ovens – 30 ppm
	• Griddle Ovens – 30 ppm
	• Tortilla Ovens
	• Heated solely by IR burners – 15 ppm
	• All other Tortilla ovens – 30 ppm
	• Cooking Ovens
	  ○ ≤3 MMBTU – 30 ppm
	  ○ >3 MMBTU – 30 ppm
	• Drying Ovens – 30 ppm
	• Smokehouses – 30 ppm
	• Dryers – 30 ppm
	• Roasters – 30 ppm
	Phase II
	• Directly Fired Bakery Ovens ≤3 MMBTU – 0 ppm
	• Indirectly Fired Bakery Ovens – 0 ppm
	• Cooking Ovens ≤3 MMBTU – 0 ppm
	• Smokehouses – 0 ppm
		RECLAIM 2005:
		• Boilers and Heaters <20 MMBtu/hr:12 ppmv
		• Boilers and Heaters ≥20–<40 MMBtu/hr: 9 ppmv
		• Boilers and Heaters ≥40–≤110 MMBtu/hr: 25 ppmv
		• Boilers and Heaters >110 MMBtu/hr: 5 ppmv
		• Petroleum Refining, Calciner: 30 ppmv
		• Petroleum Refining, FCCU: 85% reduction for FCCU and CO Boiler
		
		RECLAIM 2015:
		• Boilers and Heaters ≥40 MMBtu/hr: 2 ppmv @ 3% O_2
		• Petroleum Refining, Calciner: 10 ppmv
		• Petroleum Refining, FCCU: 2 ppmv @ 3% O_2, dry
		• Refinery Gas Turbines: 2 ppmv @ 15% O2, dry
		• Sulfur Recovery Units/Tail Gas Incinerator: 2 ppmv NOx @ 3% O2, dry
			• Calciner and Kiln (≥1200°F): 60 ppmv at 3% O2 or 0.073 lb/MMBtu
			• Incinerator, Afterburner, Remediation Unit, and Thermal Oxidizer: 60 ppmv or 0.073 lb/MMBTU

Rule Element	PAR 1153.1	RECLAIM	Rule 1147
Reporting	• Owner and operator with units subject to Phase II emission limits must report the age of unit and anticipated date of replacement before Phase II emission limits effective date • RECLAIM Facilities must continue to comply with reporting requirements pursuant to Reg XX until facility becomes former RECLAIM Facility	•Daily electronic reporting for major sources •Monthly to quarterly reporting for large sources and process units • Quarterly Certification of Emissions Report and Annual Permit Emissions Program for all units	None
Monitoring	• Install and maintain in service non-resettable, totalizing, fuel meters for each unit's fuel(s) for a unit complying with applicable limit using pounds per million BTU • Owners or operators of units shall determine compliance with the applicable emission limit using a District approved test protocol	• A continuous in-stack NOx monitor for major sources • Source testing once every 3 years for large sources • Source testing once every 5 years for process units	• Owners or operators of units shall determine compliance with the applicable emission limit using a District approved test protocol • Install and maintain in service non-resettable, totalizing, fuel meters for each unit's fuel(s) for a unit complying with applicable limit using pounds per million BTU
Record Keeping	• Maintain Source Test and Phase II Emission Limits documentation on site for five years and made available to South Coast AQMD upon request	• Quarterly log for process units • < 15-min. data = min. 48 hours; ≥ 15-min. data = 3 years (5 years if Title V) • Maintenance & emission records, source test reports, RATA reports, audit reports and fuel meter calibration records for Annual Permit Emissions Program = 3 years (5 years if Title V)	• Records of source tests shall be maintained for ten years and made available to District personnel upon request • Maintain on site at the facility where the unit is being operated a copy of the manufacturer's, distributor's, installer's or maintenance company's written maintenance schedule and instructions and retain a record of the maintenance activity for a period of not less than three years • Maintain on site a copy of all documents identifying the unit's rated heat input capacity for as long as the unit is retained on-site

APPENDIX A: COMMENTS AND RESPONSES

PUBLIC WORKSHOP COMMENTS

Staff held a Public Workshop on March 30, 2023, to provide a summary of PAR 1153.1. The following is a summary of the verbal comments received on PAR 1153.1 and staff's responses.

Commenter #1: John Furlong – Yorke Engineering

John Furlong expressed concern regarding potential confusion if the planned technology assessments are not explicitly included in the proposed rule language.

Staff Response to Commentor #1:

Staff responded by explaining that the technology assessments are generally included in the South Coast AQMD resolution and not directly in the rule language. South Coast AQMD resolutions are legally binding documents.

Commenter #2: Scott Weaver – Ramboll

Scott Weaver expressed concern about the speed of the Phase II and Phase III compliance schedule and the commercial availability of zero-emission equipment for various categories. Commenter also expressed concern regarding the cost-effectiveness values presented by staff and additional direct and indirect costs that were not included.

Staff Response to Commentor #2:

Staff responded by pointing out that an Alternate Compliance Schedule Plan is considered in the proposed rule language to address instances where facilities would need more time to comply with Phase II and Phase III emission limits due to electrical upgrade timelines of the public utility. Staff also explained that more time has been given to larger units that would require larger electrical upgrade due to higher electrical demand. Staff did conduct further research into the costs associated with electrification and updated the cost-effectiveness analysis.

Commenter #3: Joseph Steirer – Yorke Engineering

Joseph Steirer expressed concern about whether the rule would be applicable to the units subject to South Coast AQMD Rule 222, the speed of Rule 1153.1 amendment process, and inclusion of the technology assessment in the rule language.

Staff Response to Commentor #3:

Staff clarified that in the current rule proposal, the units subject to Rule 222 would not be subject to the PAR 1153.1 requirements, but those units would be potentially considered to be subject to the proposed rule in the future. Staff amended the rule to clarify that these units would remain exempt in PAR 1153.1 and added the technology assessment requirement to the rule language to address this comment.

Commenter #4: Evan Gillespie – Industrious Labs

Evan Gillespie expressed concern regarding any further delays in the rule amendment especially with the tight deadlines to meet our air quality goals. He also expressed disagreement with some of the accommodations made to industry stakeholders, including the extended compliance schedules.

Staff Response to Commentor #4:

Staff appreciates the comment and initially worked toward maintaining the June Public Hearing date but ultimately, it was delayed to August. The proposed compliance schedule was developed to accommodate the time needed for the zero-emission technology to emerge and for the facilities to adjust their operations. Staff understands the concerns that proposed compliance schedule could lead to further delays and added several hard dates as backstops provisions to trigger unit replacement.

Commenter #5: Jed Holtzman – RMI

Commenter #5 expressed concern regarding potential emission impacts as a result of delayed compliance or transition to zero-emission equipment due to strategically timed replacement of burners.

Staff Response to Commentor #5:

Staff's proposal to allow additional time to for a facility to transition to zero-emission ovens when they replace a burner is to address the issue of a stranded asset. PAR 1153.1 relies on technology forcing limits, meaning the zero-emission technology does not exist today. A facility may not have the option to transition to zero-emission technology before a future effective date. In that case, staff is proposing to allow the burner to reach a ten-year useful life before requiring the oven's replacement. Staff added backstop date of January 2, 2036, to prevent a facility from changing burners to continually delay transitioning to zero-emission technology.

Commenter #6: Mark Abromowitz – CES

Mark Abromowitz expressed concern regarding the delayed implementation timelines due to delayed infrastructure upgrades and requested the inclusion of alternate electricity sources, such as fuel cells, in the assessment to expedite the transition to zero-emission equipment. Commenter expressed additional concern regarding the Alternative Compliance Schedule Plan to be perceived as utility-centric and not technology-neutral, and allowing for an alternative compliance schedule would result in delayed emission reductions that would otherwise be met if the plan was more technologically inclusive.

Staff Response to Commentor #6:

Staff evaluated photovoltaic solar and fuel cell technologies as potential options to offset electricity cost to address Mr. Abromowitz's concern. The costs considerations included capital, installation, annual service contracts, and O&M costs. Upon assessment of solar technologies, staff concluded that the average photovoltaic solar square foot coverage for a commercial application would only provide approximately five to fifteen percent of the electricity needed to run an average sized electric oven, and therefore, it would not significantly offset the fuel-switching costs. Despite the applicability of the 2022 AQMD cost-effectiveness threshold of $325,000 ($349,000 adjusted to 2022-dollar year) per ton of NOx reduced, fuel cell would increase costs considerably above the cost-effectiveness threshold for a very small amount of NOx emission reductions. The installation of solar panels did reduce costs for the smaller units; however, they lead to higher costs estimates for the larger units due to high upfront costs. The assessment of using fuel cell technologies as a potential option to offset electricity costs had the highest impact on the increased cost-effectiveness. The significant increase was a result of additional capital and annual recurring fuel cost necessary to operate the systems. Staff's assessment is provided in Chapter 2 of this Staff Report.

COMMENT LETTERS

COMMENT LETTER #1

Yorke ENGINEERING, LLC
www.YorkeEngr.com

April 5, 2023

Mr. Sarady Ka
Program Manager
South Coast Air Quality Management District (SCAQMD)
21865 Copley Drive
Diamond Bar, CA 91765
Phone: 909) 396-2331
E-mail: SKa@aqmd.gov

Subject: Comments on SCAQMD Proposed Amended Rule 1153.1

Dear Mr. Ka:

On behalf of Bimbo Bakeries USA, Inc (BBU), Yorke Engineering, LLC (Yorke) has prepared this letter to provide comments on the proposed amendments to South Coast Air Quality Management District (SCAQMD) Rule 1153.1: Emissions of Oxides of Nitrogen (NO_x) from Commercial Food Ovens. This letter also addresses the SCAQMD questions submitted to BBU on 3/21/2023 and 3/28/2023.

We appreciate SCAQMD staff incorporating some of our feedback from the previous working group meeting. However, there are still several comments and points that we would like to provide in this letter. We are also disappointed that the food industry has been singled out for the first ever Zero Emission regulation. The baking sector provides nutritious and low-cost products to our consumers. The related NO_x emissions from baking industry are a fraction of the SCAQMD overall NO_x emissions when compared to other industry's stationary sources and mobiles sources.

Comment 1-1

BBU BACKGROUND

BBU operates two facilities in the SCAQMD with five direct-fired bakery food ovens that would be impacted by Proposed Amended Rule (PAR) 1153.1. One facility, located in Montebello (SCAQMD Facility ID 132068), is a current NO_x Regional Emission Clean Air Incentives Market (RECLAIM) facility, while the other facility, located in Placentia (Facility ID 176788), is a minor source facility. A summary of these five units is provided in Tables 1 and 2.

Table 1: BBU SCAQMD Food Oven Information and PAR 1153.1 Deadlines – Placentia

Equipment Name	Heat Input Rating (MMBtu/hr)	Current NO_x Limit (3% O_2)	Burner Age	Unit Age[1]	Phase I Deadline (30 ppm NO_x)	Phase II Deadline (0 ppm NO_x)[2]
Muffin Line #1	1.95	60 ppm	2017	2000	7/1/2039	7/1/2027
Muffin Line #2	1.95	60 ppm	2017	2000	7/1/2039	7/1/2027

Comment 1-2

[1] All ovens were estimated to be built in the year 2000 or older except Oven #5 at Montebello.
[2] There is an additional Phase III Compliance Deadline but it does not apply to Placentia facilities, as it only applies to bakery ovens with Heat Input Rating over 3 MMBtu/hr.

LOS ANGELES/ORANGE COUNTY/RIVERSIDE/VENTURA/SAN DIEGO/FRESNO/BERKELEY/BAKERSFIELD
31726 Rancho Viejo Road, Suite 218 ▼ San Juan Capistrano, CA 92675 ▼ Tel: (949) 248-8490 ▼ Fax: (949) 248-8499

Table 2: BBU SCAQMD Food Oven Information and PAR 1153.1 Deadlines – Montebello

Equipment Name	Heat Input Rating (MMBtu/hr)	Current NO_x Limit (3% O_2)	Burner Age	Unit Age[1]	Phase I Deadline (30 ppm NO_x)	Phase III Deadline (0 ppm NO_x)[3]
Oven #1[4]	6.5	30 ppm	2023	2000	Compliant	7/1/2033
Oven #3	6.075	51.4 ppm	2000[5]	2000	7/1/2024	7/1/2034[6]
Oven #5 (Bun Roll Line)	12.32	30 ppm	2019	2019	Compliant	7/1/2044

BBU CORPORATE BACKGROUND

BBU is a leader in the baking industry, known for its category-leading brands, innovative products, freshness and quality. Our team of 20,000 U.S. associates operates 60 manufacturing locations in the United States. Over 11,000 distribution routes deliver our leading brands such as Arnold®, Artesano®, Ball Park®, Bimbo®, Boboli®, and Brownberry®. Entenmann's®, Little Bites®, Marinela®, Mrs Baird's®, Oroweat®, Sara Lee®, Stroehmann®, and Thomas'®. Bimbo Bakeries USA is part of Mexico's Grupo Bimbo, S.A.B de C.V., the world's largest baking company with operations in 34 countries.

BBU is regarded as one of the leaders in Sustainability for the Food & Beverage Industry.

- Earned USEPA Energy Star Partner of the Year Award for the 6th Year in Row for its company wide commitment to energy management strategy and leadership.
- Earned USEPA ENERGY STAR certification for superior energy efficiency at 18 BBU facilities across the country, sustaining the record for the highest number of certifications in the baking industry.
- Won the USEPA ENERGY STAR Challenge for Industry at two bakeries, Atlanta, GA and Kent, WA. The Atlanta bakery reduced its energy intensity by 11 percent, and the Kent bakery by 18 percent, within three years. This is the Atlanta bakery's third time meeting this goal.
- Received a 2022 USEPA Green Power Leadership Award from the U.S. Environmental Protection Agency (EPA) for outstanding clean energy initiatives and impact on the green power market.
- In 2021, BBU took a step forward in its sustainability efforts by expanding its existing solar and battery storage systems. The company signed an Environmental Services Agreement (ESA) with GreenStruxure to deploy microgrids at all 6 of its California

Comment 1-2 cont.

[3] The Phase II deadline will not apply to any Montebello facilities, since all three units will have burners that are less than 10 years old up to the Phase III deadline. If the Phase II deadline would apply, it would require hybrid ovens for all three units as of July 1, 2017.

[4] Oven #1 currently has a permit limit of 51.4 ppm NO_x at 3% O_2 and is rated at 4.672 MMBtu/hr but is expected to complete a burner modification to be compliant with 30 ppm NO_x by March 31, 2024.

[5] The burner of Oven #3 is assumed to have been last replaced in the year 2000 or earlier.

[6] The Phase III deadline for Oven #3 assumes that the burners will be modified with new low NO_x burners by the Phase I compliance deadline, which is July 1, 2024.

bakeries. The microgrids, comprised of solar and battery storage systems, will be installed at the Montebello, Placentia, South San Francisco, Sacramento, Oxnard, and San Luis Obispo locations. Together with the existing 1 Megawatt (MW) solar array in Escondido, these microgrids will generate more than 7 MWs of renewable energy. Based on EPA estimates, this is equivalent to removing approximately 14,000 metric tons of CO_2e and about 45 metric tons of NO_x emissions from a natural gas power plant per year.

- Additionally, BBU was awarded a $1.1 million grant by the California Energy Commission to replace oversized and outdated legacy boilers at its California bakeries with high-efficiency low NO_x boilers. The boiler replacements, which are scheduled for completion in 2023, will not only reduce natural gas usage by 15%, but also significantly decrease NO_x emissions.

Comment 1-2 cont.

BBU USA Oven Operation General Information

BBU operates 139 food ovens in the United States. The oldest active operating oven has been in operation since 1948 (over 70 years), and the most recent oven was installed in 2021. The average current active life of the ovens is over 40 years (1991), with the median age of BBU's ovens currently being 32 years. Aside from the building structure, the oven represents that largest financial asset at a commercial bakery. These ovens cost multi-millions of US dollars. Therefore, there are comprehensive preventative maintenance programs in place at our bakeries to ensure these ovens provide baked products for decades. As provided in Tables 1 and 2, four of the five current food ovens have been operating for over 22 years. Based on the lifespan of the BBU ovens, a 30- or 40-year lifespan might be a better basis for determining the unit life for the ovens for PAR 1153.1 compliance.

BBU ELECTRIC OVEN CHALLENGES

Placentia Muffin Lines

Although the units at Placentia have a lower heat input rating, they have significantly higher operating temperatures, between 550-900°F, depending on which of the three burner zones the muffins are entering on the conveyor cooking process. BBU has a proprietary protected process on the manufacturing of Thomas English Muffins. This includes the direct fired oven design, which is proprietary. Competitors cannot replicate it, which makes it unique/iconic. Most english muffin baking involves ring bake, meaning the dough piece is placed in a pocket/pan shaped in a ring. Thomas muffins are free flowing and baked directly on the steel griddle. Therefore, these ovens require higher temperatures than the other ovens in BBU's fleet and other english muffins lines. Assuming all the other barriers are overcome, such as infrastructure upgrades, utility power supply, increased safety risks, tech availability, etc., the oven's original equipment manufacturer (OEM) and BBU's baking technology personnel are extremely concerned with not being able to replicate this product via current available electric oven technology. The current electric technology would simply not be able to provide the needed British thermal units per pound (BTU/lb) of dough mass for proper baking.

Comment 1-3

Montebello Oven Lines

The Montebello direct fired ovens have their own barriers to overcome. Although they operate at lower oven temperatures, typically between 400-500°F, the flexibility of the ovens to manufacture more than 40 different products at varying temperatures, ingredients, and yeast concentrations required BBU technical staff years to perfect those product recipes. Replicating those recipes on electric ovens is a difficult challenge. There is more to baking than just the baking temperature. Heat Transfer is also critical with radiant, conductive, and convection all being important. Time is also an extremely important aspect of baking. Electric ovens create different heated air currents than natural gas ovens, making it difficult and time consuming to modify those recipes for use with different technologies. The Montebello operation utilizes tunnel ovens for bread and a conveyorized oven for buns. BBU is not aware of electric versions being available today that can meet the needed BTU/lb of dough mass and heat transfer at the run rates of these ovens.

Comment 1-3 cont.

SCAQMD RULE 1153.1 PERMIT HISTORY

SCAQMD Rule 1153.1 was initially adopted on September 4, 2014. Food ovens were previously required to comply with the emission limit requirements of Rule 1147 (adopted in 2011). Rule 1147 established standard emission limits for all miscellaneous combustion equipment outside of boilers, engines, and turbines. However, the NO_x limits for food ovens under Rule 1147 were not feasible for food ovens, so the SCAQMD adopted Rule 1153.1 to allow in-use ovens to meet emission limits of 40 parts per million (ppm) NO_x corrected to 3% oxygen (O_2) for food ovens operating 500°F or less and 60 ppm NO_x at 3% O_2 for food ovens operating over 500°F. These limits are the current operating limits for BBU ovens at the Placentia facility.

The Montebello facility was not required to meet these limits, since the Montebello facility is in the RECLAIM program. Facilities in RECLAIM are exempt from many SCAQMD NO_x emission limit rules because emission reductions for these facilities are obtained through a credit trading program. The Montebello facility's air permit still has NO_x emission limits for all permitted combustion equipment, but some limits may be higher than the SCAQMD rule limit that would otherwise apply to the equipment.

Comment 1-4

In October 2016, as part of the SCAQMD 2016 Air Quality Management Plan (AQMP) control measure CMB-05, and accelerated by Assembly Bill (AB) 617, SCAQMD pushed to end RECLAIM emissions trading program, with impacted facilities beginning a transition for RECLAIM facilities to meeting the same requirements as non-RECLAIM facilities. Consequently, the SCAQMD has been modifying all of its NO_x emissions rules over the last 5 years and creating a few new rules to adopt the same emissions standards for all SCAQMD permitted equipment (previously only required for non-RECLAIM facilities). Many of these rules have already been updated, including the rules for boilers (Rules 1146, 1146.1, and 1146.2) and catalytic oxidizers and fryers (Rule 1147).

In July 2021, the SCAQMD held their first working group meeting for proposed amendments for Rule 1153.1. Over the next 15 months, the SCAQMD held five working group meetings and one public workshop, and they proposed draft rule language during the workshop on October 6, 2022. The draft rule language at that time proposed that the new NO_x emission limit for food ovens would be 30 ppm NO_x at 3% O_2 with up to 22 years after the start of new ovens to meet this lower emission limit.

In addition to these meetings and workshops, Yorke and BBU staff hosted two SCAQMD site visits, provided cost effectiveness data to SCAQMD staff, and had multiple meetings to discuss the state of technology for food ovens and emphasize BBU's push to be more environmentally sustainable through its entire process.

PAR 1153.1 was initially scheduled to go to the Hearing Board with these revisions in December 2022. However, sometime in November, the December PAR 1153.1 meeting was removed from the calendar without notice. On February 2, 2023, the SCAQMD held its sixth working group meeting on PAR 1153.1 and released a draft presentation a few days earlier on January 27th. In the presentation and as discussed during that working group meeting, the SCAQMD changed the previous proposed limit of 30 ppm NO_x at 3% O_2 for bakery, cooking, drying, and smokehouse ovens and proposed a new Best Available Retrofit Control Technology (BARCT) limit of 0 ppm NO_x. This limit would prohibit NO_x emissions from new and existing ovens, which the SCAQMD deemed to be feasible for this equipment with electric ovens. Yorke and BBU staff shared uneasiness with this new limit during the working group meeting on February 2, 2023.

Yorke and BBU staff held a Zoom meeting on March 6, 2023, to address initial issues with the proposed BARCT requirements in PAR 1153.1 with SCAQMD staff.

The following working group meeting was held on March 8, 2023, and included a presentation by Babbco on the feasibility for implementing electric ovens, as well as several comments with regards to the feasibility for implementing electric ovens, the quick timeline to address limitations with the proposed language is presented to the hearing board on June 2nd, the infrastructure issues and unique challenges with compliance in the food manufacturing industry, and other concerns.

Comment 1-4 cont.

An updated draft staff report and revised PAR 1153.1 rule language was released on Friday, March 17th, addressing some, but not all of the items discussed in the March 8th working group meeting. We understand that if there are no changes to the schedule, the following will be the timeline for PAR 1153.1 approval:

- March 30, 2023: Public Workshop;
- April 21, 2023: Stationary Source Committee Meeting;
- May 5, 2023: Final PAR 1153.1 Staff Report and Rule Language; and
- June 2, 2023: Board Meeting for PAR 1153.1 Approval.

With all the major changes proposed since the February 2nd working group meeting, and considering there was 18 months to review revisions to the rule before the changes posed during the February 2nd working group meeting, we suggest that the SCAQMD provide an additional 3 to 6 months to collect more information and provide more impacted entities an opportunity to voice their troubles with the proposed rule language so that unforeseen and unintended consequences from PAR 1153.1 can be mitigated and minimized.

COMMENTS AND CONCERNS WITH PAR 1153.1

We appreciate the efforts of the SCAQMD to incorporate comments and feedback with the revisions to PAR 1153.1. However, we still have several comments and perturbances regarding the current PAR 1153.1.

NO_x Cost Effectiveness Analysis

There are several potential issues with the posted NO_x cost effectiveness analysis. First, it would be helpful to see the detailed analysis affected facilities could understand the basis of the costs and emission calculations that went into the analysis. We understand that capital costs were determined based on a 25-year estimated life for an oven, but we are concerned that several costing considerations may have been underestimated or not included. Some of those considerations include:

- Cost for a facility to conduct electrical upgrades to a plant;
- Required increase in power demand, especially during peak demand times;
- Increase in electricity cost for electricity provider to upgrade substations and lines, bringing power to the plant;
- Larger cables required for the additional electric load required for the electric ovens;
- Building infrastructure upgrades required to support larger electric load at the facility while managing the rolling brown outs Southern California has been facing;
- Safety considerations for the electric load; and
- NO_x emissions associated with electricity production on-site or by electricity provider.

In addition, the uniqueness of the ovens operated by BBU makes it difficult to determine the availability and functionality of electric ovens replacing the ribbon burners used currently for baking products at the BBU facilities. BBU would like to be able to provide its own cost effectiveness analysis, but needs additional information from the SCAQMD to accurately conduct such an analysis in line with the cost effectiveness calculations conducted by the SCAQMD.

Comment 1-5

Electric Oven Availability

BBU has had several conversations with its bakery oven vendors over the last several months, and most of their vendors agree that electric oven availability for their unique products is several years away. Even when that technology is available, it will take BBU's team a couple of years to test and determine what changes are needed to the electric ovens to replicate the quality of the products currently made by their natural gas-fired ovens. It should also be noted that there are space constraints at both Placentia and Montebello. We would anticipate either having to install multiple electric ovens or oversized ovens to be able to meet our run rate. This would pose a challenge due to the limited floor space at both facilities. The entire electric infrastructure would need to be changed with increased sizing of the components due to the electric power demands.

Comment 1-6

Product Quality and Employee Safety

As mentioned during the March 8th working group meeting, the conversion from natural gas to electric ovens will require significantly higher electric loads than what is currently operated at the facility, including significant higher amperage to provide the necessary power to heat the food at

Comment 1-7

cooking temperature for both ovens. This poses significant safety concerns and would require significant safety protocols and training to avoid accidents from electrical mishaps from the high amperage equipment.

Baking is a very delicate process; there are several factors besides baking temperature, ingredients, and yeast content that go into baking high-quality food products. The airflow around the food product, the quality of the heat elements, and the different reactions that take place between gas and electric baking all impact food quality and taste. It is not simple to determine the impact of these parameters, and significant testing will likely be required to convert operation from natural gas baking to electric baking.

Electric is not as responsive as natural gas. Electric ovens will reduce the volume of product that we can produce in the same facility due to a negative impact to the volume/run rates, extended start-up times, extended changeover/cleaning, reduced product mix, and the inability to make up this lost time in our shifts (there's only 24 hours in a day).

The moisture content is very important to the baking process. Natural Gas has a high moisture content, while electric is a dry heat. This could significantly jeopardize the quality, food safety, and shelf life of the baked product.

Comment 1-8

Electricity Upgrades and Electric Load Availability

We understand that SCAQMD staff has recently spoken to Southern California Edison (SCE) with regards to upgrading the electric infrastructure to support the additional power demand required for food manufacturing facilities to convert from natural gas-fired to electric-fired ovens. Just last year, during peak demand, the State of California allowed diesel generators to run to provide emergency power to the grid. As power demand increases from increased electrical devices and massive conversion of vehicle fleets from fossil to electric fuels, there will likely be more emergency events in the future, requiring the operation of heavily polluting diesel generators in the SCAQMD, which will increase criteria pollutant emissions, including NO_x. With the SCAQMD now also pushing stationary sources to move to electricity usage, there is significant potential of increasing NO_x emissions with an increase of emergency power generation during peak demand. As mentioned in previous meetings, the electric load required for a single large electric oven would be significantly larger than the current electricity demand for the entire facility.

It is important to continue to work toward lower criteria emissions, but relying solely on grid electricity does not equal zero emissions (since most electricity is still generated by natural gas combustion, especially during peak operating times) and makes the SCAQMD more susceptible to high criteria and toxic emissions pollution. We are aware that SCE is working toward addressing these issues. It is likely that San Diego Gas and Electric (SDG&E), which covers southern Orange County, is also addressing these issues. It is much less clear if Los Angeles Department of Water and Power (LADWP) or the smaller SCAQMD-based power entities (Anaheim, Azusa, Banning, Burbank, Colton, Corona, Glendale, Pasadena, Riverside, and Vernon) are addressing power demand issues, which will need to be addressed by all utilities for there to be enough electricity to substitute all commercial food production with electric ovens.

Comment 1-9

Timeline for Regulatory Review

The SCAQMD has been working on PAR 1153.1 for almost 18 months, with an initial expectation after much discussion with stakeholders of a NO_x limit of 30 ppm for most food ovens. The

Comment 1-10

SCAQMD is now giving stakeholders less than 5 months to address the radical changes that now require electric food ovens to utilize BARCT in the future. This is a massive change, and there are many factors involved in converting to all electric equipment that will take time to consider. The public has not seen the detailed NO_x cost effectiveness analysis to address concerns that all the information used in this analysis is accurate. Based on missteps from rushed rulemaking in the past, we suggest that more working group meetings, consultations with stakeholders, and more feedback from all power entities be incorporated into the final rulemaking process. It is more important to get a clear, well-written, achievable PAR 1153.1 than to rush to pass changes that will need to be rewritten again in a few years for items that were not addressed during this current rulemaking cycle.

Comment 1-10 cont.

Emission Leakage

With an accelerated timeline for implementing electric ovens without the proper feasibility analysis and considerations for the natural complications with food manufacturing, some facilities may consider it more cost effective to relocate their operations outside the SCAQMD instead of meeting the strict electric oven deadlines currently proposed.

Comment 1-11

SUGGESTED ACTIONS

The following actions are suggested or proposed revisions for PAR 1153.1:

- Consider going back to the original plan that was discussed throughout 2022, which was NOx limits of 30 ppm. Staff could revisit the Zero NOx provision when technology warranted if the SCAQMD still wants to proceed with Zero NOx provisions;
- Hold additional stakeholder meetings, provide notification to all impacted facilities so they have an opportunity to comment on the rule, and push the Hearing Board meeting to approve the revised rule language to fourth quarter 2023;
- Include technology assessment language directly in the rule so stakeholders, inspectors, and permitting staff are all aware that technology may not be currently available and extending compliance deadlines accordingly;
- Suggest that bakery ovens operating over 500°F have the same compliance deadline as bakery ovens over 3 MMBtu/hr (July 1, 2030);[7]
- Increase the unit life or remove entirely the proposed rules provision for existing food ovens as they last much longer than the proposed rule, which states 22 and 25 years;
- Speak with additional electricity providers to see if they are working toward upgrading grid load and capacity to handle electricity demand from electric ovens, as well as for statewide requirements for transition from fossil fuel to electric vehicle fleets (which impacts overall electric demand from the grid); and
- Provide additional detail on all the data used for the NO_x cost effectiveness analysis and give guidance so stakeholders can also conduct their own cost effectiveness analysis.

Comment 1-12

[7] There was a reason why higher temperature ovens currently have a higher NO_x emissions limit (60 ppm instead of 40 ppm) under Rule 1153.1, as high temperatures also complicate the baking process, just as high heat input ratings.

Mr. Sarady Ka
April 5, 2023
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CONCLUSION

This letter summarizes the proposed impact of PAR 1153.1 on BBU's two SCAQMD facilities, comments and concerns on the current regulation, and suggested actions for rulemaking on PAR 1153.1 going forward. Should you have any questions or concerns, please contact me at (949) 248-8490.

Sincerely,

Joseph J. Steirer

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Staff Response to Comment Letter #1:

Response to Comment 1-1:
Staff appreciates Bimbo Bakeries, USA (BBU) and York Engineering taking the time to meet with staff to discuss their concerns and for submitting the comment letter. Zero-emission regulations are being promulgated in many cities, states, and air districts throughout the country; therefore, the food industry is not being singled out for the first ever zero-emission regulation. In order to demonstrate attainment with the 2015 8-hour ozone National Ambient Air Quality Standards (NAAQS) for the South Coast Air Basin by 2037, the 2022 Air Quality Management Plan (AQMP) was adopted on December 2, 2022, by the South Coast AQMD Governing Board. The 2022 AQMP is a zero-emission focused plan that emphasized zero-emission technologies to meet the control measure goals. Implementation of zero-emission technologies is required **across all industrial sectors wherever feasible** to meet the stringent NAAQS set forth by EPA. The 2022 AQMP focuses on all sectors and not just the food industry, and as a result, staff re-assessed Best Available Retrofit Control Technology (BARCT) to include zero-emission technology for commercial food oven categories as part of the on-going rule development. Furthermore, all future rulemaking will evaluate zero-emission technology for all sectors, not just the food industry.

Response to Comment 1-2:
Staff appreciates Bimbo Bakeries, USA's (BBU) efforts and leadership in achieving sustainability goals for the Food & Beverage Industry. Staff is aware of the awards and progress BBU has made at its facilities across the world and commends BBU for their leadership. Staff understands that the bakery ovens represent a significant investment and are the largest financial assets at a commercial bakery, which is why staff revised the proposal for Phase II to include burner age and oven age as the two criteria triggering oven replacement with zero-emission technology. Staff understands that as part of the maintenance programs at a facility, the burners are often replaced to ensure the ovens are operating effectively and efficiently to achieve lower NOx emissions. Staff revised the proposal to include the additional burner useful life of 10 years to address the potential stranded assets but will retain the 25-year useful life of the ovens.

Staff would also like to point out that the date presented in "Phase I Deadline" in Table 1 of the comment letter for the Placentia facility is not correct and does not align with staff's proposal. The date specified in Table 1 is 7/1/2039 for compliance with the 30 ppm NOx limit in Phase I. The 30 ppm NOx is effective upon rule adoption and all units will have to meet this limit, regardless of operating temperature, unless a future emission limit takes effect before a unit is required to comply with the Phase I limit. The units in Table 1 had new burners installed in 2017 and according to the current proposal, that unit will have to meet 30 ppm once the burners have been in operation for 10 years, e.g., by 2027. However, effective January 1, 2027, Phase II emission limits apply. That unit will not be required to retrofit to 30 ppm but will be required to submit a permit to retrofit to meet zero-emission level by January 1, 2027, unless additional burner replacements are needed before 2027.

Response to Comment 1-3:
Staff understands and is aware of the uniqueness of the oven located at the Placentia facility and the challenges of the ovens located at the Montebello facility. PAR 1153.1 includes a technology assessment prior to the effective dates of the zero-emission standards. The technology assessment will ensure the technology and electrical infrastructure are on schedule to meet the implementation

deadlines with minimal impacts on recipe or product quality. If necessary, staff will amend the rule to adjust the limits or the compliance schedule.

Response to Comment 1-4:
Other industry stakeholders have raised similar concerns about the rule schedule. Staff has proposed to delay the Public Hearing for PAR 1153.1 from June 2023 to August 2023 to provide additional time for stakeholders to provide feedback.

Response to Comment 1-5:
Staff acknowledges that the cost and installation of a new oven are significant investments for the facility. Staff attempts to estimate cost based on real world information from both manufacturers and facilities, where costs are available. Cost assumption information and the cost-effectiveness analysis was presented at Working Group Meeting #6 held on January 27, 2023, was further updated and presented in the Public Workshop, and is detailed under "Summary of Cost Assumptions" in Chapter 2 of this staff report. Staff outlined the cost data used to estimate total installed cost for electrical ovens and a cost-curve was generated to estimate cost for other ovens based on the oven type. Total installed cost included capital equipment cost, installation costs, electrical upgrades, some utility-side upgrades that facilities may be required to pay, and the difference between the cost to operate on electricity versus natural gas. Staff's assumption for electrical upgrades is approximately 10 percent of the estimated capital equipment cost and in some instances was nearly $1.2 million, in line with some cost estimates that facilities have mentioned. Throughout the rulemaking process, staff has always welcomed facility-provided cost information since this cost is representative of the actual cost incurred.

Response to Comment 1-6:
Staff's zero-emission proposal includes technology-forcing NOx concentration limits. BARCT emission levels can be technology-forcing, meaning the limits can be based on an emerging technology, provided the NOx limit is achievable by the future effective compliance date established in the rule. Emerging technology is a technology that can achieve emission reductions but is not widely available at the time the NOx limit is established and the rule is adopted. When South Coast AQMD adopts rules with technology-forcing emission limits, the limits are given a future implementation date to allow time for the technology to develop. BARCT limits evolve over time as the technology improves or new pollution control technologies emerge; setting future effective emission limits is an approach that has been used and upheld in other rules. For example, South Coast AQMD adopted volatile organic compound (VOC) limits in Rule 1113 – Architectural Coatings in 2002 with a future effective date of July 1, 2006, based on emerging technology (e.g., reformulated coatings). The technology to meet the lower VOC limits was commercially available at the time of rule development but had performance issues that had yet to be overcome. The American Coatings Association sued the South Coast AQMD for adopting technology-forcing BARCT limits, but the South Coast AQMD prevailed in the Supreme Court of California, which upheld the ability to adopt technology-forcing BARCT limits. Furthermore, staff has incorporated a technology assessment that will be conducted prior to the zero-emission effective dates in the rule. The technology assessment will consider the status and availability of zero-emission technology at the time of conducting the assessment as well as the impacts on product quality when transitioning from natural gas-fired ovens to electric ovens. Staff will also be reaching out to the facility to understand the space constraint challenges at each of the facilities.

Response to Comment 1-7:
Staff appreciates the fact that BBU is concerned with the safety and wellbeing of its employees; safety should be the core value at most industrial production facilities due to the inherent hazards associated. Staff acknowledges that the use of electric ovens will result in higher electric loads than what is currently being operated at the facility, but every employee should be trained on the proper safety protocols regardless of the type of equipment being used. Combustion units using natural gas are not free of hazards, the natural gas used can potentially pose a significant safety hazard that can result in explosions and injury if proper procedures and practices are not followed. As with any new equipment being used at the facility, every employee should be properly trained on the correct safety protocols and procedures of operation.

Response to Comment 1-8:
Staff acknowledges the current different baking conditions when using electric equipment compared to gas-fired equipment and has proposed to conduct a future technology status update/technology check-in to evaluate the commercial availability of zero-emission equipment and its product applicability. Staff included the proposed future effective dates to allow time for facilities to adjust recipes for the new equipment, if necessary, to ensure product quality standards upon technology transition. Staff has identified several electric test kitchens that facilities can utilize to experiment with recipes during the time that zero-emission technologies take to fully mature. Staff invited BABBCO to present information to stakeholders about the company's electric equipment and demonstration facility during Working Group Meeting #7. Staff acknowledges that the use of electric ovens can reduce moisture in the combustion chamber. This is due to the lack of combustion in the cooking chamber; one of the by-products of combustion is moisture. The absence of moisture can potentially affect product quality, but there are options for adding moisture into the cooking environment. One option an electric oven manufacturer mentioned was using a steam injection system to minimize impacts on recipe or product quality. The steam used is a method of introducing moisture into the cooking environment. Steam injections in bakery oven operations is already a common practice for combustion-based bakery ovens.

Response to Comment 1-9:
Staff consulted with Southern California Edison (SCE) to understand the potential impacts of electrification and SCE's ability to meet the additional power demand from food manufacturing facilities. Based on their feedback, supplying the additional power is not the limiting factor but rather the ability to bring the power in to a specific location, which may require additional time. The additional power that will be required for PAR 1153.1 will be minimal, as only smaller units will be required to transition to zero-emission technologies, and phased-in over time, as the zero-emission limits will be required upon unit replacement. Regarding the potential increase in NOx emissions from energy generating facilities, South Coast AQMD has regulations that limit NOx emissions from energy generating facilities to address those emissions (Rule 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities).

While it is true that the Governor issued a proclamation suspending certain permitting requirements to allow for greater energy production with the use of back-up power generation during critical times (e.g. extreme heat events, interruption of transmission lines, or other events) that threaten energy supply, the proclamation also provides for mitigation to offset impacts from any additional emissions generated as a result (Newsom, 2021). SCE is aware of the potential

increase in future demand and is currently working to minimize these emergency events. Furthermore, diesel generators are not the only source of emergency power supply, so the assumption that all additional power will be generated from highly polluting diesel generators is not factual.

Staff understands the power demand from a single large electric oven will be significant for the facility. However, technology is continuing to progress, and efficiency gains of zero-emission technologies will lower electricity demand. As stated, the current proposed compliance schedule is based on when a unit reaches the end of their useful life, so the impacts on the grid will be staggered since not all units are the same age or will be replaced at the same time. Staff also revised the proposal for zero-emission from all categories to only four categories which will lessen the impact on the overall grid. In addition, the proposed rule includes an Alternative Compliance Schedule Plan for facilities that may require more time for their electricity provider to make any infrastructure upgrades to accommodate energy needs. Those facilities with approved Alternative Compliance Schedule Plans will have additional time to comply with the zero-emission limits allowing time for utility companies to complete the necessary service upgrades.

Response to Comment 1-10:

Staff appreciates stakeholder concerns regarding the rule schedule and has delayed the Public Hearing until August 2023 and held additional stakeholder and working group meetings to further discuss the rule concepts. Further, staff has included additional details regarding the NOx cost-effectiveness calculations in this staff report and presented the results in a working group presentation. Staff has been clear that zero-emission limits are needed to meet the South Coast AQMD's air quality goals. The 2022 AQMP, which was developed over three years and adopted in December 2022, states that the only way to achieve the required NOx reductions is through extensive use of zero-emission technologies across all stationary and mobile sources. While staff originally proposed a 30-ppm combustion limit, staff also discussed the emerging zero-emission technology being developed and implemented. Upon adoption of the 2022 AQMP, staff pivoted to proposing technology-forcing limits that leverage the zero-emission technology previously discussed with stakeholders.

Response to Comment 1-11:

It is never the staff's intent to drive businesses out of our jurisdiction. We value our local industry and business and want to work together to improve air quality for all people who live and work within the South Coast AQMD. Staff strives to propose rule requirements that are fair for all stakeholders and that allow businesses to continue to operate in South Coast AQMD.

Response to Comment 1-12:

Staff's responses to the suggested action items are listed below:

- *Suggested Action 1:* Consider returning to original proposal of 30 ppm NOx emission limit and revisit zero-emission limits when technology matures.
- *Staff Response:* Staff is following the direction of the 2022 AQMP to propose zero-emission limits wherever feasible; however, in the most recent version, staff revised the proposed emission limits to address the additional costs for operating units on electricity.

That reassessment resulted in some units reverting to the 30 ppmv limit while maintaining the zero-emission limit where it was deemed to be technically feasible and cost-effective. Further, as part of the technology assessment, staff will revisit the feasibility and cost-effectiveness for the categories where zero-emission limits were not established at this time.

- *Suggested Action 2:* Hold additional stakeholder meetings, provide notification to all impacted facilities, and push the Hearing Board meeting to fourth quarter 2023.
- *Staff Response:* Staff agrees that additional working group meetings are needed and held one additional working group meeting and several individual stakeholder meetings since receipt of this comment letter. Staff also discussed the revised proposal and reached out to impacted facilities regarding the latest proposal to the rule amendment. In addition, the Public Hearing was postponed until August 2023, the date is subject to change.

- *Suggested Action #3:* Include technology assessment language direction in the rule.
- *Staff Response:* The status update/technology check-in will be included in the resolution, which is the standard practice for most South Coast AQMD rule development.

- *Suggested Action #4:* Bakery ovens operating over 500 degrees Fahrenheit should have the same compliance deadline as bakery ovens rated over 3 MMBtu/hr.
- *Staff Response:* Based on staff's research, electric ovens have higher operating temperatures, including pizza ovens capable of achieving 900-degree operating temperatures. Staff does not intend to propose emission limits nor compliance deadlines based on operating temperature.

- *Suggested Action #5:* Increase unit life or remove rule provisions for the existing food ovens.
- *Staff Response:* Staff has proposed a useful unit life of 25 years with the potential for an additional 10 years to account for new burner installations. The South Coast AQMD has to meet the 70 parts per billion (ppb) ozone standard by 2037, and all possible emission reductions are needed to meet that goal. Further delaying emission reductions by extending timelines to comply with future emission limits would adversely impact air quality and the risk of South Coast AQMD remaining in nonattainment with respect to the federal ozone standard.

- *Suggested Action #6:* Speak with additional electricity providers to see if they are working toward upgrading grid load and capacity to handle electricity demand from electric ovens, as well as for statewide requirements for transition from fossil fuel to electric vehicle fleets.
- *Staff Response:* The revised proposal is not anticipated to have a significant impact on the grid as it will only require smaller units to electrify and the transition to zero-emission will be gradual. Staff has worked with SCE, who is the major utility provider in the South Coast AQMD and has also reached out to the CEC and smaller municipal electricity providers. Staff will continue to engage and discuss with the utility providers in the future.

- *Suggested Action #7:* Provide additional detail on all the data used for the NOx cost-effectiveness analysis and provide guidance to stakeholders so that they may conduct their own cost-effectiveness analysis.
- *Staff Responses:* Staff has provided additional details regarding the cost-effectiveness analysis and cost assumption under "Summary of Cost Assumptions" in Chapter 2 of the Draft Staff Report as well as during the public meetings.

Comment Letter #2

April 13, 2023

Via e-mail at: mkrause@aqmd.gov

Michael Krause
Assistant Deputy Executive Officer
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

Re: SCAQMD Use of New Health Benefit-Based Cost-Effectiveness Threshold for PAR 1153.1 - Emissions of Oxides of Nitrogen from Commercial Food Ovens

Dear Mr. Krause,

We are contacting you on behalf of BizFed, the Los Angeles County Business Federation. We are an alliance of over 200 business organizations who represent over 400,000 employers in Los Angeles County, including large and small businesses from a wide range of industries throughout the South Coast Air Basin (SCAB). We are writing to comment on the use of the health benefit-based cost-effectiveness threshold in rule development. Many of the businesses we represent have or will be writing their own individual comment letters that specifically address the impacts to their industries. Our comments address the impacts to the business community as a whole and include overarching concerns of our diverse membership.

SCAQMD is in rule development for Proposed Amended Rule 1153.1 (PAR 1153.1), which appears to be the first rulemaking where SCAQMD is applying the new health benefit-based cost-effectiveness threshold established in the SCAQMD 2022 Air Quality Management Plan (AQMP).[1] BizFed offers the following comments on the use of this threshold.

1. **SCAQMD has not established a methodology for conducting cost effectiveness determinations with the cost effectiveness threshold established under the 2022 AQMP. Such a methodology needs to be developed in consultation with stakeholders before using this cost effectiveness threshold for rulemaking purposes.** 2-1

Under the 2022 Air Quality Management Plan (AQMP), SCAQMD established a new health benefit-based cost-effectiveness threshold of $325,000/ton. This threshold is significantly different from the 2016 AQMP thresholds (i.e., $30,000 per ton of VOC reduced, $50,000 per ton of NOx reduced)[2] in both its value and its economic basis.

The 2016 AQMP cost effectiveness thresholds were strictly tied to facility-level costs (e.g., capital costs, installation costs, operation and maintenance (O&M) costs) divided by facility-level emission reductions.[3] The 2022 AQMP health benefit-based cost-effectiveness threshold is different in that it considers projected regional-level public health benefits which might occur from projected improvements to regional air quality. The informational basis presented to AQMP stakeholders suggested that these benefits would include reduced societal costs from reduced hospitalizations, reduced premature mortality, and other improved public health outcomes. Because this cost-effectiveness threshold is based on regional benefits, a number

[1] SCAQMD 2022 AQMP. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022-aqmp.pdf?sfvrsn=16.
[2] SCAQMD 2016 AQMP. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15.
[3] Ibid.

Los Angeles County Business Federation / 6055 E. Washington Blvd. #1005, Commerce, California 90040 / T:323.889.4348 / www.bizfed.org 1

of AQMP stakeholders noted that SCAQMD would need to establish a new methodology to ensure that control measure (or rule) costs are also evaluated on a regional basis.[4] No such methodology was presented in the 2022 AQMP. Cont'd 2-1

With PR1153.1, SCAQMD is now applying the new threshold but has yet to provide stakeholders with a methodology. Rather, it appears that SCAQMD is simply using the old method with the new cost effectiveness threshold. This would be a flawed approach because it mismatches a regional benefit without considering the full costs of the proposed rule.

2. Determining the regional costs for PR1153.1 requires SCAQMD to conduct a socioeconomic analysis as detailed in the USEPA Guidelines for Preparing Economic Analyses. SCAQMD has not conducted such an analysis for the rule. 2-2

A social cost/benefit analysis would require a full socioeconomic analysis. USEPA published Guidelines for Preparing Economic Analyses (Guidelines) to establish a scientific framework for performing economic analyses of environmental regulations and policies.[5] The Guidelines establish methodology for a benefit-cost analysis (BCA) and state that in conducting a BCA, the correct measure to use is the social cost, where:

> *Social cost represents the total burden that a regulation will impose on the economy. It is defined as the sum of all opportunity costs incurred as a result of a regulation where an opportunity cost is the value lost to society of any goods and services that will not be produced and consumed as a result of a regulation.*

Per the guidelines, a Partial Equilibrium Analysis (PEA) is appropriate for estimation of societal cost when a regulation is limited to a single sector or a small number of sectors. SCAQMD typically does not conduct a full socioeconomic analysis, such as that required by a PEA, for a single rulemaking. However, in order to match the societal cost with societal benefit, a PEA must be performed.

Per the Guidelines, costs include:[6]

- Explicit and implicit costs, where explicit costs are those for which an explicit monetary payment is made, and an implicit cost is a cost for which a monetary value does not exist, such as the value of current output lost or reduced flexibility of response to changes in market conditions.
- Direct and indirect costs, where direct costs are those costs that fall directly on the regulated entity, and indirect costs are costs incurred in related markets or experienced by consumers or government agencies not under the scope of the regulation. For example, a change in the price of a good this could impact the rest of the economy, causing prices to rise or fall in other sectors and ultimately affect consumers income.
- Private sector and public sector costs, where private sector costs include the cost borne by households and facilities, and public sector costs are those borne by government entities.

The Guidelines provide additional detail on types of costs, as follows:

[4] SCAQMD Mobile Source Committee Meeting, September 16, 2022. Available at: http://www.aqmd.gov/home/news-events/webcast/live-webcast?ms=zSMKn4miXuk
[5] US EPA Guidelines for Preparing Economic Analyses. Available at: https://www.epa.gov/environmental-economics/guidelines-preparing-economic-analyses.
[6] Ibid.

- Incremental costs, determined by subtracting the total cost of environmental regulations and policies already in place from the total cost after a new regulation or policy has been imposed.
- Capital costs, which include cost of installation or retrofit of structures or equipment and include the primary equipment, installation, and startup
- Operation and maintenance (O&M) costs, which are annual expenditures on salaries and wages, energy inputs, materials and supplies, purchased services, and maintenance of equipment associated with pollutant abatement.
- Industry costs, which include the effects of actual or expected market reactions, including plant closures, reduced industry output, or the passing on of costs directly to consumers.
- Transaction costs, which are those incurred in making an economic exchange beyond the cost of production of a good or service.
- Government Regulatory Costs, such as those borne by government entities in the course of researching, enacting, and enforcing a policy
- Transitional costs, which may include cost of training workers in the use of new air pollution control equipment.
- Distributional costs, which relate to how certain entities or societal groups are impacted by the imposition of a policy or regulation.

Cont'd 2-2

SCAQMD is obligated to include all social costs in evaluation of the cost of a rule, including the traditional costs typically used to establish control cost (i.e. capital, O&M, and additional utility usage), as well as other, not previously evaluated costs (i.e. industry costs, transaction costs, and distributional cost, among others). Without this evaluation, the true cost of the rulemaking is unknown. The costs captured in the US EPA Guidelines acknowledge that the imposition of an environmental regulation could have significant effects in markets beyond those that are directly subject to the regulation. SCAQMD is obligated to substantiate that there are no broader market effects. However, even without market effects, SCAQMD needs to include all societal costs, as delineated in the Guidelines.

3. Besides failing to consider societal costs, the cost analysis presented for PR1153.1 fails to account for the full range of facility-level costs. 2-3

SCAQMD is currently in the rule development process for PAR 1153.1. This is the first rulemaking in which Staff is referencing the new health benefit-based cost-effectiveness threshold established in the 2022 AQMP. SCAQMD has suggested that the Health and Safety Code only requires staff to evaluate the cost of the potential control option, and thus have only included direct facility costs, such as cost for equipment (capital and installation), O&M costs, and electrical upgrades and infrastructure at the facility).[7] In estimating the cost-effectiveness of the control options, SCAQMD must follow the US EPA Guidelines. BizFed expects these costs would reasonably include:

- Direct Costs:
  - Capital cost of proposed equipment
  - Installation cost
  - O&M cost
  - Cost of stranded assets resulting from early retirement of equipment
  - Training Cost

[7] PAR1153.1 WGM #7. Available at: http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1153-1/par-1153-wgm7-presentation.pdf?sfvrsn=18.

Cont'd 2-3

  - Electrical upgrades and infrastructure at the facility
  - Electrical utility service upgrades directly related to the requirement for installation of control, including:
    - Meter upgrades
    - Distribution infrastructure upgrades including transformers and substations
- Indirect costs:
  - Potential cost of plant closures and resultant job loss
  - Cost of reduced industry output
  - Cost of rule development, and associated adoption and EPA approval
  - Other regional grid upgrades that may be needed to support electrification

It should be noted that the costs for the electrical utility service upgrades described above are typically directly borne by the facility requiring the infrastructure upgrades to meet its increase electrical demand.[8]

The EPA Guidelines delineate the challenges in estimation of costs, including estimation of cost over time, and difficulties in developing numeric values for social cost. The EPA Guidelines note:[9]

> *"Most regulations cause permanent changes in production and consumption activities, leading to permanent (ongoing) social costs."*

Districts must therefore carefully consider the time horizon for calculating the producer and consumer adjustments from a new regulation. For example, SCAQMD has proposed a phased-in approach for implementation of Rule 1153.1 based on age of equipment. When questioned during a recent working group meeting, Staff stated that they have not evaluated the current age of equipment in the universe being impacted by PAR1153.1 (reported as 202 units in total). By not completing such an evaluation, SCAQMD risks causing a potentially large number of units with identical and/or near-term compliance deadlines. This has impacts both for equipment availability, infrastructure readiness, and availability of energy. It appears that none of these factors has been considered under PAR1153.1.

The US EPA Guidelines also note that for social cost analysis, it is difficult to represent:[10]

- Irreversible environmental impacts
- Substantial changes in economic opportunities for segments of the population
- Social costs that span very long time horizons
- Socioeconomic effects on populations, and
- Effects on large-scale ecosystems.

The US EPA Guidelines also note the uncertainties that can be introduced by economic models, and state that these uncertainties should be carefully evaluated and reported. All of these items must be taken into account when developing a rule that relies on a social health benefit-based cost-effectiveness threshold.

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[8] California electric utility tariff rules. Example: Southern California Edison Rule 16 (Service Extensions), Section E (Allowances and Payments by Applicant).
[9] US EPA Guidelines for Preparing Economic Analyses. Available at: https://www.epa.gov/environmental-economics/guidelines-preparing-economic-analyses.
[10] Ibid.

In order to align with the BCA, SCAQMD should be considering all costs associated with implementation of the proposed rule (e.g., PR1153.1) and the broader context in which the rule will be applied. SCAQMD's 2022 AQMP and the California Air Resources Board's (CARB) State Implementation Plan[11] plot a transition towards zero emission technologies across a variety of sectors spanning both stationary and mobile sources. These actions will clearly have a cumulative impact on the state's electric grid infrastructure that needs to be taken into consideration for the benefit-cost analysis of proposed regulations. Cont'd 2-3

The immediate impacts and challenges of broad-based electrification policies are only now beginning to be understood. At a recent CARB infrastructure-focused workgroup, electric utilities and fleet operators operating in the SCAB ~~South Coast Air Basin~~ discussed potential timelines and costs for grid infrastructure upgrades necessitated by another electrification mandate.[12] The timelines discussed at that meeting ranged from 2-3 years for small system upgrades (e.g., increases in cable or conductor size) up to 7 or more years for larger projects (e.g., projects needing new or upgraded substations).[13] In one presented example, a fleet operator needing 10 megawatts (MW) of new charging capacity faced electric utility infrastructure costs ranging from a minimum of $300,000 for a 10 MW connection (assuming availability at the local substation) to as much as $25 million for full dual 66 KV lines, transformers, and a dedicated substation.[14] So the direct costs of an technology electrification mandate can be significant. Furthermore, the piecemealing of electrification mandates across a variety of rules can cause an understatement of the costs to be borne by individual facilities. This would be economically inefficient and could result in higher facility expenses for the combined control measures. 2-4

The SCAB ~~South Coast Air Basin~~ is home to a significant number of facilities that will be competing for limited grid (i.e., transmission and distribution) capacity as this transition gets underway. A capacity analysis from the California Energy Commission's (CEC's) EDGE model recently demonstrated that a majority of the electric grid in the SCAB ~~South Coast Air Basin~~ is presently unable to accommodate additional load without any thermal or voltage violations. According to CEC, significant upgrades will be necessary to meet rising electrical demand.[15]

SCAQMD recently presented the impacts of the potential increase in energy demand from PAR 1153.1. SCAQMD presented a 90 MW increase in power demand as a result of PR1153.1. Assuming a conservative 50% capacity factor, that would translate to roughly 400 GWh of new energy demand just for PR1153.1. Given the number of control measures in the 2022 AQMP that rely on equipment electrification, there will be significant impacts to the grid.

In their benefit-cost analysis, SCAQMD must consider not only the costs associated with the transition to zero emission technology under the proposed regulation, but also the costs for grid infrastructure upgrades that will be borne by businesses, ratepayers, and public entities alike as conflicting demands for limited electric capacity increase under CARB's and SCAQMD's proposed suite of regulations.

The District has made significant strides in air reductions during the past 30 years, despite a significant population increase, and it should be proud of its accomplishments. Those reductions were accomplished in collaboration with many stakeholders, in particular the 2-5

[11] 2022 State Implementation Plan. CARB. 2022. Available at: https://ww2.arb.ca.gov/sites/default/files/2022-08/2022_State_SIP_Strategy.pdf
[12] CARB Transit Infrastructure Work Group Meeting, January 31, 2023. Available at: https://ww2.arb.ca.gov/sites/default/files/2023-02/transitinfrastructure_wkgmtg_1.31.23_full%20presentation.pdf.
[13] Ibid.
[14] Ibid.
[15] Final Environmental Analysis for the Advanced Clean Cars II Regulation. CARB. 2022. Available at: https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/accii/acciifinalea.docx

business community. We respect that SCAQMD is placed in a uniquely challenging situation to demonstrate attainment of the 2015 ozone NAAQS, and the business community stands ready to help the District achieve all practicable reductions as soon as possible. Cont'd 2-5

We look forward to continuing our work with the District to see progress made in a way that is equitable and lasting.

Thank you for your consideration of our letter. If you have any questions, please contact BizFed's Director of Policy and Advocacy Sarah Wiltfong at sarah.wiltfong@bizfed.org.

Sincerely,

John Musella	David Fleming	Tracy Hernandez	David Englin
BizFed Chair	BizFed Founding Chair	BizFed Founding CEO	BizFed President

Cc: Wayne Nastri, SCAQMD
Sarah Rees, SCAQMD
Healther Farr, SCAQMD
Sarady Ka, SCAQMD
Chris Bradley, SCAQMD

BizFed Association Members

7-11 Franchise Owners Association for SoCal
Action Apartment Association
Alhambra Chamber
American Beverage Association
Antelope Valley Chamber formerly Lancaster Chamber of Commerce
Apartment Association of Greater Los Angeles
Apartment Association, CA Southern Cities, Inc .
Arcadia Association of Realtors
AREAA North Los Angeles SFV SCV
Armenian Trade & Labor Association
Arts District Los Angeles
Associated Builders & Contractors SoCal (ABC SoCal)
Association of Club Executives
Association of Independent Commercial Producers
AV Edge California
Azusa Chamber
Beverly Hills Bar Association
Beverly Hills Chamber
BioCom
Black Business Association
BNI4SUCCESS
Bowling Centers of SoCal
Boyle Heights Chamber of Commerce
Building Industry Association - LA/Ventura Counties
Building Industry Association of Southern California
Building Industry Association- Baldyview
Building Owners & Managers Association of Greater Los Angeles
Burbank Association of Realtors
Burbank Chamber of Commerce
Business and Industry Council for Emergency Planning and Preparedness
Business Resource Group
CABIA California Business and Industrial Alliance
Calabasas Chamber of Commerce
CalAsian Chamber
CalChamber
California Apartment Association- Los Angeles
California Asphalt Pavement Association
California Bankers Association
California Business Properties
California Business Roundtable
California Cannabis Industry Association
California Cleaners Association
California Contract Cities Association
California Fashion Association
California Gaming Association
California Grocers Association
California Hispanic Chamber
California Hotel & Lodging Association
California Independent Oil Marketers Association (CIOMA)
California Independent Petroleum Association
California Life Sciences Association
California Manufacturers & Technology Association
California Metals Coalition
California Natural Gas Producers Association
California Restaurant Association
California Retailers Association
California Self Storage Association
California Small Business Alliance
California Society of CPAs - Los Angeles Chapter
California Trucking Association+
Carson Chamber of Commerce
Carson Dominguez Employers Alliance
Central City Association
Century City Chamber of Commerce
Cerritos Regional Chamber of Commerce
Chatsworth Porter Ranch Chamber of Commerce
Citrus Valley Association of Realtors
Claremont Chamber of Commerce
Commercial Industrial Council/Chamber of Commerce
Compton Chamber of Commerce
Construction Industry Air Quality Coalition
Construction Industry Coalition on Water Quality
Council on Infil Builders
Crenshaw Chamber of Commerce
Culver City Chamber of Commerce
Downey Association of REALTORS
Downey Chamber of Commerce
Downtown Alhambra Business Association
Downtown Center Business Improvement District
Downtown Long Beach Alliance
El Monte/South El Monte Chamber
El Segundo Chamber of Commerce
Employers Group
Encino Chamber of Commerce
Energy Independence Now EIN
Engineering Contractor's Association
FastLink DTLA
Filipino American Chamber of Commerce
Friends of Hollywood Central Park
FuturePorts
Gardena Valley Chamber
Gateway to LA
Glendale Association of Realtors
Glendale Chamber
Glendora Chamber
Greater Antelope Valley AOR
Greater Bakersfield Chamber of Commerce
Greater Lakewood Chamber of Commerce
Greater Leimert Park Crenshaw Corridor BID
Greater Los Angeles African American Chamber
Greater Los Angeles Association of Realtors
Greater Los Angeles New Car Dealers Association
Greater San Fernando Valley Chamber
Harbor Association of Industry and Commerce
Harbor Trucking Association
Historic Core BID of Downtown Los Angeles
Hollywood Chamber
Hong Kong Trade Development Council
Hospital Association of Southern California
Hotel Association of Los Angeles
Huntington Park Area Chamber of Commerce
ICBWA- International Cannabis Women Business Association
Independent Cities Association
Industrial Environmental Association
Industry Business Council
Inglewood Board of Real Estate
Inland Empire Economic Partnership
International Franchise Association
Irwindale Chamber of Commerce
Kombucha Brewers International
La Cañada Flintridge Chamber
LA Coalition
LA Fashion District BID
LA South Chamber of Commerce
Larchmont Boulevard Association
Latin Business Association
Latino Food Industry Association
Latino Restaurant Association
LAX Coastal Area Chamber
League of California Cities
Long Beach Area Chamber
Long Beach Economic Partnership
Los Angeles Area Chamber
Los Angeles Economic Development Center
Los Angeles Gateway Chamber of Commerce
Los Angeles Latino Chamber
Los Angeles LGBTQ Chamber of Commerce
Los Angeles Parking Association
Los Angeles World Affairs Council/Town Hall Los Angeles
MADIA
Malibu Chamber of Commerce
Manhattan Beach Chamber of Commerce
Marketplace Industry Association
Monrovia Chamber
Motion Picture Association of America, Inc.
MoveLA
MultiCultural Business Alliance
NAIOP Southern California Chapter
NAREIT
National Association of Minority Contractors
National Association of Tobacco Outlets
National Association of Women Business Owners
National Association of Women Business Owners - LA
National Association of Women Business Owners- California
National Federation of Independent Business Owners California
National Hookah
National Latina Business Women's Association
Orange County Business Council
Orange County Hispanic Chamber of Commerce
Pacific Merchant Shipping Association
Panorama City Chamber of Commerce
Paramount Chamber of Commerce
Pasadena Chamber
Pasadena Foothills Association of Realtors
PGA
PhRMA
Pico Rivera Chamber of Commerce
Planned Parenthood Affiliates of California
Pomona Chamber
Rancho Southeast REALTORS
ReadyNation California
Recording Industry Association of America
Regional CAL Black Chamber, SVF
Regional Hispanic Chambers
San Dimas Chamber of Commerce
San Gabriel Chamber of Commerce
San Gabriel Valley Economic Partnership
San Pedro Peninsula Chamber
Santa Clarita Valley Chamber
Santa Clarita Valley Economic Development Corp.
Santa Monica Chamber of Commerce
Sherman Oaks Chamber
South Bay Association of Chambers
South Bay Association of Realtors
South Gate Chamber of Commerce
South Pasadena Chamber of Commerce
Southern California Contractors Association
Southern California Golf Association
Southern California Grantmakers
Southern California Leadership Council
Southern California Minority Suppliers Development Council Inc.
Southern California Water Coalition
Southland Regional Association of Realtors
Sportfishing Association of California
Structural Engineers Association of Southern California
Sunland/Tujunga Chamber
Sunset Strip Business Improvement District
Torrance Area Chamber
Tri-Counties Association of Realtors
United Cannabis Business Association
United Chambers – San Fernando Valley & Region
United States-Mexico Chamber
Unmanned Autonomous Vehicle Systems Association
US Green Building Council
US Resiliency Council
Valley Economic Alliance, The
Valley Industry & Commerce Association
Venice Chamber of Commerce
Vermont Slauson Economic Development Corporation
Veterans in Business
Vietnamese American Chamber
Warner Center Association
West Hollywood Chamber
West Hollywood Design District
West Los Angeles Chamber
West San Gabriel Valley Association of Realtors
West Valley/Warner Center Chamber
Western Electrical Contractors Association
Western Manufactured Housing Association
Western States Petroleum Association
Westside Council of Chambers
Whittier Chamber of Commerce
Wilmington Chamber
Women's Business Enterprise Council
World Trade Center

Staff Response to Comment Letter #2:

Response to Comment 2-1:

The 2022 AQMP introduced a Public Health Benefit Cost-Effectiveness Threshold approach that takes into consideration the health impacts and overall benefit to society resulting from improved air quality. Staff used principles of Benefit Cost Analysis to compare monetized benefits to costs and proceed if the benefits outweigh the costs. The approach borrowed some, but not all, of the principles in the U.S. EPA Guidelines for Preparing Economic Analyses (Guidelines), which includes monetized health impacts, such as premature deaths, lost school and workdays, hospital admissions, and respiratory and cardiovascular symptoms, when evaluating the costs associated with regulatory programs. This approach is aligned with the methodologies employed by U.S EPA and CARB in evaluating the costs associated with compliance with regulatory programs. By incorporating health considerations and assessing the societal advantages, this approach ensures a comprehensive evaluation of the costs and benefits associated with air quality improvements. The established screening threshold of $325,000 ($349,000 adjusted to 2022-dollar year) is equivalent to the monetized benefits associated with a ton of NOx. This screening threshold is used as a guideline to conduct a comprehensive cost-effectiveness analysis when establishing BARCT standards during rulemaking. The U.S. EPA Guidelines does not apply to a BARCT cost-effectiveness assessment. That cost assessment is based on the California Health and Safety Codes section 40920.6 which states:

(a) Prior to adopting rules or regulations to meet the requirement for best available retrofit control technology pursuant to Sections 40918, 40919, 40920, and 40920.5, or for a feasible measure pursuant to Section 40914, districts shall, in addition to other requirements of this division, do all of the following:

(1) Identify one or more potential control options which achieves the emission reduction objectives for the regulation.

(2) **Review the information developed to assess the cost-effectiveness of the potential control option. For purposes of this paragraph, "cost-effectiveness" means the cost, in dollars, of the potential control option divided by emission reduction potential, in tons, of the potential control option.**

Staff's cost assessment includes direct and indirect costs that facilities will incur to install NOx controls used to comply with the regulation but does not consider the regional-level monetized health impacts. Staff provided additional in-depth details to stakeholders regarding the methodologies used to determine cost-effectiveness during multiple Working Group Meetings (WGM), including WGM#8. This approach is consistent with the 2022 AQMP which states (page 4-83) [emphasis added]:

> Based on these analyses, Option 2 would use a screening threshold of $325,000 per ton (2021 dollars) when evaluating the cost-effectiveness of proposed rules ($325,00 [sic] is the mid-point between the estimates from the 2016 AQMP and Table 4-17). **Cost-effectiveness would continue to be evaluated as the cost of controls divided by the tons of NOx reduced.**

Staff's cost-effectiveness assessment is consistent with the direction provided in the 2022 AQMP as approved by the Governing Board.

Further cost impacts can be found in a socioeconomic analysis conducted by the South Coast AQMD Socioeconomic team, which will be available to the public no later than July 5, 2023. That document provides a more in-depth analysis than the BARCT cost-effectiveness assessment and includes an examination of regional job losses and price increases.

Response to Comment 2-2:

A full socioeconomic analysis has been conducted by the socioeconomic team and is being made available to the public no later than July 5, 2023. Staff has also conducted a socioeconomic analysis as part of this staff report which included direct and indirect costs that will be incurred to meet the proposed emission limits including capital costs, installation cost, fuel switching costs, costs for electrical panel upgrades, and costs that the utility companies might charge to the facility to make upgrades to the electrical circuit in the region where the facility is located. Many of the social costs cited in the comment 2-2 are speculative; therefore, staff would not be able to set a monetary value to them with any certainty. It is standard practice not to monetize highly uncertain and/or speculative costs *or* benefits.

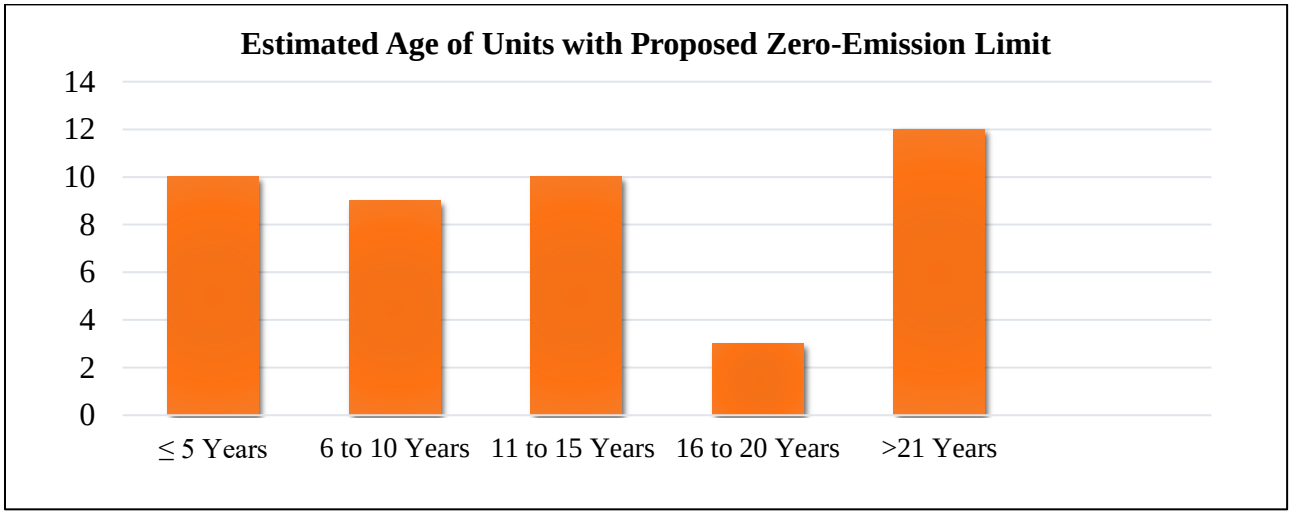
South Coast AQMD has a well-established methodology that has been used since the adoption of a cost threshold as part of the 2012 AQMP. As required by the Health and Safety Code, staff takes into consideration the cost of the control option which includes both direct and indirect costs the facility will incur to meet the proposed NOx limits. That analysis does not include regional costs as detailed in the U.S. EPA Guidelines for Preparing Economic Analyses (Guidelines) even though some of that methodology was borrowed to support the policy decision to establish the 2022 AQMP screening threshold.

The original 2012 cost threshold was established with the purpose of guiding rule development in response to costly control measures necessary to fulfill State Implementation Program obligations and establishing BARCT emission standards. As with the current cost screening threshold, it was not considered as an absolute cap; any BARCT emission standard with a cost exceeding the threshold would trigger an additional public process. The 2012 cost threshold was established at $22,500 per ton of NOx reduction. With the adoption of the 2016 AQMP, the threshold was increased to $50,000 per ton of NOx reduced, which was based on inflation and costs for control measures. For the 2022 AQMP, staff initially proposed to conduct a similar approach to increase the threshold to account for inflation; however, several Board Members were concerned that the threshold was too low to achieve the NOx emission reductions necessary in the South Coast AQMD and the high cost of health impacts from air pollution. Based on that direction, staff developed an alternative proposal that considered public health benefits based on nationwide U.S. EPA studies and the 2016 AQMP. Staff provided an in-depth analysis of the cost-effectiveness threshold which included concepts from the U.S. EPA Guidelines. The U.S. EPA Guidelines are designed to assist analysts in the economic analysis of environmental policies, but they are not required to be used for South Coast AQMD rule cost-effectiveness analyses, nor do they provide a rigid methodology for all policy assessments. While staff used the U.S. EPA Guidelines to establish the new screening cost-effectiveness threshold, the California Health and Safety Code is more appropriate to estimate the cost-effectiveness of BARCT emission limits.

Response to Comment 2-3:

Staff revised the cost-effectiveness to account for the full range of facility-level costs to implement the rule requirements, which includes the costs of capital equipment, facility-level electrical upgrades, utility-side electrical upgrades, and infrastructure related to the requirement of zero-emission equipment. In addition, staff revised the cost-effectiveness analysis to include fuel switching costs associated with the transition from natural gas to electricity. To address the issue of stranded assets, staff incorporated a requirement for unit age and burner age and is based upon unit replacement into the compliance schedule for Phase II. A unit will need to be 25 years of age and the burner will need to be 10 years of age before it is required to meet the Phase II requirements. This requirement, which is based on equipment life, addresses the concerns a facility may have regarding stranded assets due to recently replacing or upgrading burners to meet the limits of the 2014 rule amendments.

Staff has conducted an analysis regarding the age of the units, impacts of the rule, and infrastructure readiness, which is summarized in Chapter 4 of this staff report. The chart below is from Chapter 4 and demonstrates that the transition to zero-emissions, which will be based on unit age, will be gradual.



Please see response to comment 2-2 regarding use of the U.S. EPA Guidelines.

Response to Comment 2-4:

Staff acknowledges the time required for electrical grid upgrades to meet the potential increased demand for zero-emission equipment. The amount of energy required will not impose a significant change to demand on the grid. The updated rule proposal does not require all categories to meet the zero-emission requirement and only establishes zero-emission limits for the smaller units. Assuming the 50 percent capacity factor per year for operations as assumed in the comment letter, the electricity demand is calculated to be 75 MWh and not 400 MWh as mentioned due to the staff's revised proposal. Staff's revised proposal will only require four categories to comply with zero-emission requirement, which represents 0.06% of the overall estimated power usage in South Cost AQMD region. Furthermore, staff's proposed compliance schedule is based on the equipment age and unit replacement date; this will allow for a gradual phased-in approached alleviating potential significant impacts on the grid. Staff also acknowledges that utility-side upgrades may be beyond the facility's control; therefore, staff has also included an Alternate Compliance Schedule Plan for facilities where the utility provider cannot provide the necessary upgrades in a timely manner.

The California Energy Commission (CEC) conducts assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery and distribution, demand, and prices. The assessment and findings are presented in the CEC Integrated Energy Policy Report (IEPR) which is adopted every two years and updated every other year. The latest CEC Integrated Energy Policy Report was released in 2022. One of the area the report evaluates is the energy demand forecast which considers the economic and energy impacts from zero-emission regulations that are expected to be adopted at the local, regional, and statewide level. IEPR forecast considers multiple parameters including factors such as: population growth, climate impacts, electrification standards, EV adoption, battery storage, and renewable energy. IEPR estimates energy demand in California is expected to grow at a rate of 1.8% annually from 290,000 GWh to approximately 360,000 GWh by 2035. In summary, the state is aware of the increase the demand and is planning accordingly to meet the projected demands.

Response to Comment 2-5:

Staff appreciates the feedback and values the participation of all stakeholders in the rule amendment process. Staff will continue to include all interested parties in the process.

Comment Letter #3

AMERICAN BAKERS ASSOCIATION

April 13, 2023

By Electronic Submission: SKa@aqmd.gov

Mr. Sarady Ka
Program Manager
South Coast Air Quality Management District (SCAQMD)
21865 Copley Drive
Diamond Bar, CA 91765

Subject: Comments on SCAQMD Proposed Amended Rule 1153.1

Dear Mr. Ka,

The American Bakers Association (ABA) appreciates the opportunity to comment on the proposed amendments to South Coast Air Quality Management District (SCAQMD) Rule 1153.1: *Emissions of Oxides of Nitrogen (NOx) from Commercial Food Ovens*.

ABA is the voice of the baking industry. The baking sector provides nutritious and low-cost products to consumers while also helping to support national feeding programs. Serving its members from global wholesale baking companies and suppliers to baking industry entrepreneurs, ABA is the only bakery-specific national and state trade association, delivering results on priorities affecting the companies that feed the world. Since 1897, ABA has worked to build the talent pool of skilled workers with specialized training programs, and forge industry alignment by establishing a more receptive environment to grow the baking industry. ABA's membership has grown to represent more than 300 companies with a combined 1000+ facilities. The commercial baking sector provides over 86,000 jobs in the state of California along with $4.46 billion in wages and $5.53 billion in tax revenues.

ABA is concerned that the food industry has been prematurely singled out for the first ever sector-based Zero-Emissions regulation in California, yet there is no zero-emissions baking oven technology currently available. The baking sector's NOx emissions footprint represents a small fraction of NOx emissions when compared to other industrial stationary sources and mobile sources in the SCAQMD. ABA's member commercial bakeries are open to adopting electric oven technology when it is truly available, but the transition should be mandated only when feasible and in a stepwise manner from natural gas to hybrid ovens to full electric ovens, as California has done with electric vehicles. We understand that SCAQMD has continued an open dialogue with impacted stakeholders and we appreciate the ongoing dialogue with the regulated community. Our concerns are discussed below. 3-1

BACKGROUND 3-2

Commercial Baking Sector Ovens

Commercial baking operations in California include facilities that produce 1200 buns per minute and 200 bread loaves per minute. These are not small bakeries with "kitchen" style ovens. Ovens are a significant capital investment for a baking company and with proper maintenance can

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operate for 30-40 years. PAR 1153.1 would require commercial bakery ovens older than 22 years to be scrapped and switched to net-zero NOx technology (i.e., electric ovens) in 2027. According to the SCAQMD's March 30th presentation, there appear to be some discussions for a phased-in approach based on the type of oven. However, SQAMD should ensure a thorough step-by-step regulatory transition for commercial ovens from natural gas to hybrid and then to electric, where feasible. Where electric oven technology continues to be infeasible, the agency should provide clear regulatory language on how implementation will be phased in, what criteria will be considered, and who will determine when the rule becomes effective. ABA believes these considerations should be in place prior to the amendments being finalized, rather than considering additional modifications once the rule is updated. The regulated community needs certainty. Cont'd 3-2

Infrastructure Needs and Impacts 3-3

As recently as this winter, California has had to work through the challenges of increased stress on its electric grid, which typically occur during the summer and fall months. ABA understands that SCAQMD has had conversations with electric utilities regarding necessary upgrades to electric transmission and distribution infrastructure to support the dramatically higher power loads for food manufacturing facilities to convert from natural gas-fired to electric-fired ovens.

The added electric load for each commercial-scale electric oven could be larger than the present electricity demand for the entire baking facility. In some cases, it is estimated that each bakery will need 5x times more electricity to continue its operations. Each baking facility itself will need significant infrastructure upgrades, including switching from a low voltage to a high voltage facility, which raises worker safety and training concerns. The details of the transition to zero NOx technology needs to be thought through in a step-by-step manner before any rule amendment is adopted. ABA endorses working towards lowering emissions, but we are skeptical that the California electric grid can handle this transition presently, given the electric reliability and availability challenges that the state is experiencing.

TECHNICAL COMMENTS 3-4

ABA respectfully provides the following comments on SCAQMD's PAR 1153.1 based on the Working Group Meeting #7 (Mar. 8, 2023) slide presentation.

A. The Public Participation Process Must Start from SCAQMD's New Zero-Emissions Proposal

First, ABA requests that SCAQMD provide the usual opportunity for public comment and participation for this proposed rule, which was not done here due to the re-writing of the proposed rule in early 2023. It is our understanding that PAR 1153.1 was originally proposed as a rule to limit NOx emissions from existing natural-gas fired ovens to 30 ppm NOx, which would have required low-NOx burners or hybrid gas-electric oven technology (which is in its infancy but beginning to be available commercially). This proposal was discussed with stakeholders for some 18 months. However, only in January 2023 did SCAQMD re-write the proposal to require zero NOx emissions, which as a practical matter is the equivalent of mandating early retirement of natural gas ovens and capital investment in new electric ovens. Stakeholders have not had an opportunity to recalibrate to this entirely different rule proposal. Accordingly, ABA suggests that SCAQMD convene a stakeholder workshop to discuss the possibility of transitioning to electric ovens. The workshop should include representatives from the baking industry (ABA and others),

owners of baking facilities in the South Coast and California, oven equipment manufacturers, technical experts from the baking industry such as AIB International, and technical experts from the relevant electric utilities, as well as staff and leadership from key agencies such as CARB, CEC and CPUC. Cont'd 3-4

B. Commercial-Scale Electric Ovens Are Not Currently Available and Zero-Emissions Is Not Achievable 3-5

The central requirement of emissions standards is that they be "achievable." Cal. Health & Safety Code (HSC) § 40406 defines "best available retrofit control technology [BARCT]" as "an emission limitation that is based on the maximum degree of reduction ***achievable***, taking into account environmental, energy, and economic impacts by each class or category of source." SCAQMD's Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning, at G-2, May 6, 2005, describes BARCT as "[a]n air emission limitation that applies to existing sources and is based on the maximum degree of reduction ***achievable***, taking into account environmental, energy, and economic impacts by each class or category of source." Similarly, HSC § 40405 defines "best available control technology" as "an emission limitation that will ***achieve*** the lowest achievable emission rate for the source to which it is applied" including "(1) The most stringent emission limitation that is contained in the state implementation plan for the particular class or category of source, unless the owner or operator of the source demonstrates that the limitation is ***not achievable***." An emission standard is not achievable if emissions control technology is not available.[1] In addition, under HSC § 40440.11, in situations where SCAQMD is going beyond federal Clean Air Act standards, it is doubtful that SCAQMD could require baking facilities to switch to an entirely new and unproven technology such as electric ovens, as opposed to adding emissions controls to existing gas-fired oven technology.[2]

The rulemaking record for PAR 1156.1 shows that electric ovens are not available technology at this time and thus zero emissions are not achievable. Although the baking sector has embraced sustainability and has invested millions in new technology such as low-NOx burners in ovens; low-NOx boilers for steam and electricity, hybrid gas-electric ovens; and solar/storage microgrids; the reality is that electric oven technology at the scale of commercial baking ovens is only in pilot stages and will not be available for 3-5 years. As SCAQMD knows, the sole equipment vendor that it spoke with does not manufacture ovens for all commercial-scale bakeries, but rather

[1] *See, e.g.*, HSC 40440.11(c)(2) (SCAQMD must "[d]etermine that the proposed emission limitation has been met by production equipment, control equipment, or a process that is commercially available for sale, and has achieved the best available control technology in practice on a comparable commercial operation for at least one year, or a period longer than one year if a longer period is reasonably necessary to demonstrate the operating and maintenance reliability, and costs, for an operating cycle of the production or control equipment or process"); *Sierra Club v. EPA*, 479 F.3d 875, 883 (D.C. Cir. 2007) (it is "not feasible" to set an emission standard when "the application of measurement methodology to a particular class of sources is not practicable due to technological and economic limitations") (citing Clean Air Act § 112).

[2] HSC § 40440.11 ("Best available control technology; establishment or revision; district considerations and duties; frequency of change (a) In establishing the best available control technology that is more stringent than the lowest achievable emission rate pursuant to federal law for a proposed new or modified source, the south coast district shall consider only ***control options or emission limits to be applied to the basic production or process equipment existing*** in that source category or a similar source category.").

is a niche supplier of specialty ovens which would not work for commercial scale and throughput. SCAQMD must realize that commercial bakeries do not all use the same ovens or vendors and that a "one size fits all" approach is not possible. Different baking facilities have different product lines, each with specific oven types and performance parameters necessary to meet its operational needs. Bakers are willing to adopt electric ovens when that technology is technically and economically available; however, it is indisputable that the electric oven technology is not currently available at commercial scale. Cont'd 3-5

ABA encourages SCAQMD to consider the comments submitted by Yorke Engineering LLC, dated April 5, 2023, on behalf of our member Bimbo USA Group which detail the experience of bakers in California, including two major facilities in the South Coast region. These comments emphasize the following critical points, which the SCAQMD must consider in its rulemaking:

1. There are currently no proven, commercial-scale electric ovens available in the baking industry. The only significant manufacturer of electric ovens has indicated that its equipment cannot replace large commercial scale ovens;
2. In some applications, such as english muffin baking, electric oven technology will likely not be able to replicate the baking profile needed for the products even if the technology is scaled;
3. Electric ovens have no track record of performance;
4. Bakers will have to go through an extensive "retooling" period in which scores of baking recipes are tested and adapted to electric ovens. This research and development period might take up to 2-3 years.

Moreover, as discussed above, the electrical infrastructure needed to install electric ovens does not currently exist.

C. The PAR 1153.1 Electric Oven Mandate Can Be Phased In As Technology Becomes Available 3-6

In light of the barriers to adoption evident in the rulemaking record, SCAQMD cannot at this time legally require electric ovens at any facility in California. However, the baking industry wishes to facilitate the transition to lower emissions technology as soon as possible. Accordingly, ABA does not object to SCAQMD promulgating a version of PAR 1156.1 at this time -- provided that zero emissions limits do not become effective at particular facilities until the legally required prerequisites are demonstrated. ABA suggests that the PAR include the following language making effectiveness of the proposed emissions limits contingent on authoritative demonstrations of achievability, as follows:

[PAR 1153.1 proposed text]

"The emissions limits in Rule 1153.1 shall be effective for a facility 24 months after:

(1) a determination by SCAQMD and AIB International, Inc. (or other independent body with technical expertise in the baking industry) that zero-NOx emissions oven equipment with comparable heat input, comparable radiant, conductive, and convection heating properties, and comparable throughput capacity as equipment currently installed at such facility, is commercially available in the U.S. market;

(2) a determination by the [California Energy Commission] that the electric transmission and distribution grid serving such facility is adequate and ready to serve the electric load required by such facility after conversion to zero-NOx emissions technology;

(3) a determination by SCAQMD that such zero-NOx emissions oven equipment is available at reasonable cost, consistent with the cost-benefit analysis supporting Rule 1153.1; and

(4) a determination by SCAQMD and the California Air Resources Board that, based on cradle-to-grave lifecycle analysis (including supply of electricity on a lifecycle basis), NOx and greenhouse gas emissions from zero-NOx equipment mandated to be installed at such facility will be less than emissions from equipment currently in use at such facility.

Cont'd 3-6

D. SCAQMD Must Provide its Technical Analysis for Public Review

3-7

As flagged in the Yorke Engineering letter, SCAQMD has not yet made its NOx Cost Effectiveness Analysis available for public review and comment. ABA concurs in Yorke Engineering's request that the baking industry should have an opportunity to see SCAQMD's inputs and assumptions and to conduct an independent analysis using actual industry data prior to the rulemaking advancing any further. SCAQMD is required by law to provide this analysis and underlying assumptions and data. Pursuant to Cal. HSC § 40727.2(d), SCAQMD "shall prepare a written analysis" which includes evaluation of "(1) Averaging provisions, units, and any other pertinent provisions associated with emission limits. (2) Operating parameters and work practice requirements. (3) Monitoring, reporting, and recordkeeping requirements, including test methods, format, content, and frequency. (4) Any other element that the district determines warrants review." Subsection (f) requires that "The analysis required by this section shall be provided to the public upon request." Accordingly, there cannot be proper stakeholder engagement until SCAQMD provides copies of its analysis and underlying data.

ABA is also concerned that SCAQMD's economic analysis omits several critical considerations that are legally required under California law (including CEQA), such as the following:

3-8

1. the economic and environmental costs of forcing the retirement of currently installed ovens which are still within their useful life (which as noted in the Yorke Engineering comments is likely 30-40 years rather than SCAQMD's unsupported assumption of 22 years), including the emissions (and carbon) footprint of retiring in-service equipment, scrapping electrical wiring and components, and the indirect (Scope 3) emissions from the manufacture, materials (including extractive/mining impacts associated with steel and copper components) and shipping of new equipment;
2. the anticipated levels of food waste that would result from testing and trialing baking recipes in order to transition to electric ovens;
3. the effect of PAR 1153.1 on food prices, availability and nutrition (particularly for disadvantaged communities, vulnerable persons and children) due to reduction of production output from California baking facilities affected by the rule;
4. the environmental impacts of leakage of baked goods production to areas outside of California requiring greater transport emissions;
5. the comparative lifecycle emissions profile of electricity used by electric ovens in the applicable electric service area compared to in-use natural gas-fired ovens, considering

emissions from electric generation, including the use of diesel generators during peak demand and the NOx penalty from electric generation, transmission and conversion losses; Cont'd 3-8

6. electric grid availability, reliability and readiness, including availability of backup power during power curtailments;
7. the economic and environmental costs of diverting renewable electricity for use in electric ovens, including environmental justice implications of denying availability of renewable electricity to rural and disadvantaged communities due to higher costs and demand and the health and environmental impacts on host communities of electric generation facilities whose output will increase as a result of the use of zero-NOx technology at baking facilities.

In short, SCAQMD has not completed its evaluation of the proposed rule, which should be done through a fulsome stakeholder and regulatory agency engagement process. In particular, SCAQMD seems to be making some unfounded assumptions, including in relation to (1) availability of oven technology, (2) the assumption that renewable energy would be used to power electric ovens, and (3) that grid infrastructure is adequate to handle the increased load/demand from electric ovens. SCAQMD should open these issues to more thorough public stakeholder engagement.

E. The NOx Cost Effectiveness Analysis in Incomplete

ABA is unable to locate details regarding the NOx cost effectiveness analysis that is required to be done by SCAQMD. First, ABA is unable to determine the basis of the costs and emission calculations that went into the analysis. We understand that capital costs were determined based on a 25-year estimated life for a commercial bakery oven, but we believe that several costing considerations have been excluded or underestimated. These include: 3-9

1. cost for a facility to conduct electrical upgrades to a bakery;
2. required increase in power demand, especially during peak demand times;
3. increase in electricity cost for electricity provider to upgrade substations and lines, bringing power to the plant;
4. cost of larger cables required for the additional electric load required for the electric ovens;
5. building infrastructure upgrades required to support larger electric load at the facility while managing the rolling brown outs Southern California has been facing;
6. worker safety considerations for the electric load; and
7. NOx emissions associated with electricity production on-site or by the electricity provider.

CONCLUSION

The American Bakers Association appreciates the opportunity to provide our comments as the SCAQMD works on Proposed Amended Rule 1153.1. We remain concerned that the pace and details of these proposed changes may not have been thoroughly vetted, particularly with regard to infrastructure needs and the ability to transition to electric ovens. Accordingly, ABA 3-10

recommends a stepwise transition from natural gas to hybrid ovens, and finally to electric ovens when the technology is available. If you have additional questions, please contact Rasma Zvaners. Cont'd 3-10

Sincerely,

Rasma Zvaners
Vice President Regulatory & Technical Services

Staff Response to Comment Letter #3:

Response to Comment 3-1:
Staff's intent is not to single out any one industry. We are seeking to implement zero-emission regulation for every industry where it can be demonstrated to be technically feasible and cost-effective. In order to demonstrate attainment with the 2015 8-hour ozone National Ambient Air Quality Standards (NAAQS) for the South Coast Air Basin by 2037, the 2022 AQMP was adopted on December 2, 2022, by the South Coast AQMD Governing Board. The 2022 AQMP is a zero-emission focused plan and emphasizes the use of zero-emission technologies to achieve the emission reductions needed to meet federal air quality standards. The 2022 AQMP focuses on all sectors and not just the food industry, and as a result, staff re-assessed BARCT to include zero-emission technology for commercial food oven categories as part of the on-going rule development process. Furthermore, all future rulemaking will evaluate zero-emission technology for all sectors not just the food industry.

Response to Comment 3-2:
Staff understands that the universe of ovens regulated by Rule 1153.1 are commercial-sized units and not small kitchen-sized units. However, there are opportunities for technologies to be scaled up from smaller units to larger commercial units as well as opportunities for technology transfer for zero-emission ovens used in other sectors.

With regard to hybrid ovens, staff evaluated hybrid oven technology as a potential step towards zero-emission technology for the larger bakery oven category; however, there were considerably high operating costs for the large units. Staff also considered if including an interim emerging technology, such as a hybrid oven, could ultimately delay the development of emerging zero-emission technology. As a result, staff removed the hybrid requirement from the rule.

Regarding the compliance schedule, the proposed emission limits apply at the end of the unit's useful life, which staff estimated as 25 years, and includes a provision for new burners to also reach the end of a 10-year useful life. The 25-years useful life assumption is based on facility input. Not all commercial food ovens are in service for 30 – 40 years; some companies upgrade or replace their ovens in 15 - 20 years as part of their maintenance schedules. Some facilities see an economic value in replacing rather than maintaining older ovens. This compliance schedule will allow the technology to transition to zero-emission in a phased-in schedule. Further, the proposed rule includes a requirement for staff to conduct a technology assessment to address the possibility that the technology development is slower than anticipated, in which case, the rule may be amended to adjust emission limits or the compliance schedule.

Response to Comment 3-3:
Please see comments 1-7 and 1-9.

Response to Comment 3-4:
The South Coast AQMD's rule development process includes a rigorous public process, including working group meetings, stakeholder presentations, stakeholder meetings, public workshop, and an official public comment period. The rule development did pivot to include zero-emission limits upon the adoption of the 2022 AQMP which raised concerns from the regulated industry. To address stakeholder's concerns, the public hearing was delayed from June until August and staff held two public Working Group Meetings and a Public Workshop with all of the interested parties to seek comments on the proposed rule amendment. In addition, staff meet separately with key

industrial and environmental stakeholders to understand their concerns and met with oven manufacturers to discuss status of zero-emission technology. Stakeholders may provide their comments and reach out to staff at any time throughout that public process.

Response to Comment 3-5:
Staff acknowledges that the zero-emission NOx limits are technology-forcing emission limits. For a discussion on South Coast AQMD's ability to adopt technology-forcing limits, please see response to comment 1-6.

Response to Comment 3-6:
It is unclear precisely what the commenter is referring to when it states "SCAQMD cannot at this time legally require electric ovens at any facility in California." To the extent the commenter means South Coast AQMD cannot require electric ovens be installed immediately ("at this time"), the rule does not require immediate implementation of zero-emission technologies. If the commenter is referring to the South Coast AQMD's authorization to adopt technology-forcing regulations, please see response to comment 1-6. Staff is proposing emission limits that include technology-forcing zero-emission limits, which will be considered and voted on by the South Coast AQMD Governing Board. The requirements to conduct a BARCT analysis are set forth in the California Health and Safety Code. Our rule development includes a rigorous public process where staff consider comments by the regulated industry, trade groups, other regulatory agencies, and community and environmental groups. While we appreciate the suggested language, the South Coast Governing Board, will determine what emission limits will be established and when those emission limits take effect. The proposed rule language includes a future technology assessment where staff will re-assess the progress of the technology development. That process will also include a public process where stakeholders can provide comments. Staff will present their findings and make recommendations to the Stationary Source Committee, which will provide staff direction on future emission limits and the compliance schedule.

The commenter also suggested a cradle-to-grave lifecycle analysis, which would analyze whether NOx and greenhouse gas emissions from zero-NOx equipment would be less than emissions from combustion-based equipment fueled by natural gas currently used at that facility. A cradle-to-grave lifecycle analysis is not a required element of a BARCT assessment; thus, it will not be included as part of this assessment.

Response to Comment 3-7:
Staff outlined the cost data used to estimate total installed cost for electrical ovens and a cost-curve was generated to estimate the cost for other ovens based on the oven type. Total installed cost included capital cost of equipment, installation costs, and electrical upgrades. Staff's assumption for electrical upgrades is approximately 10 percent of the estimated capital cost of equipment, which in some instances was nearly $1.2 million and is in line with some cost estimates that facilities mentioned. Throughout the rulemaking process, staff has always welcomed facility-provided cost information since this is the most accurate representation of the actual cost incurred. In addition, staff revised some cost assumptions and added costs relative to utility-side upgrades that may be passed on to the facilities, as well as fuel-switching costs that account for the difference between prices of natural gas and electricity. This information is included in Chapter 2 of the staff report, and past and updated cost assumptions were presented during working group meetings.

South Coast AQMD is required to perform a comparative analysis pursuant to Health and Safety Code Section 40727.2 when adopting, amending, or repealing a rule or regulation. The comparative analysis can be found in Chapter 4 of this staff report.

Response to Comment 3-8:

Staff has prepared and released for public review the socioeconomic assessment and California Environmental Quality Act assessment for the proposed rule amendment. Those assessments do not include estimates of food waste for testing new ovens as staff does not agree that ovens installed to meet PAR 1153.1 NOx limits will result in additional food waste. The compliance schedule is based on unit replacement; installation of any new technology, regardless of whether if it is electric or combustion-based, will necessitate product testing that could result in product waste. Similarly, staff does not agree that the NOx limits will result in food price increases or loss of available nutritional food products for vulnerable populations and has been provided no evidence to support this assertion. The socioeconomic analysis addressed the impacts of PAR1153.1 on delivered price in the Food Manufacturing sector. Based on the REMI model, for the Food Manufacturing sector as a whole, the average cost of production in the sector will increase by 0.069 percent in the South Coast region in 2027 when the biggest impact will happen. Accordingly, the relative delivered price in Food Manufacturing will increase by 0.0448 percent in 2027, which is not significant in economic terms.

The activities to implement the proposed project involve the replacement of equipment or burners at the end of its useful life between years 2023 and 2047. Regarding the comment's disagreement about what equipment age should be used to determine the end of its useful life as described in Point 1, if the equipment is viable and functional, there is nothing in PAR 1153.1 that would prevent the equipment from being sold and relocated for use outside of South Coast AQMD's jurisdiction, rather than being scrapped. If the equipment is no longer functioning, then equipment replacement and electrical wiring would be necessary irrespective of PAR 1153.1. Of course, the type of equipment that would be allowed for replacement would need to comply with the emission limits in PAR 1153.1. Any metal-containing construction debris, especially if comprised of copper and steel, is valuable and can be sent for recycling, rather than disposal.

In addition, Point 1 seeks to attribute the environmental impacts of manufacturing new commercial food ovens to complying with PAR 1153.1. PAR 1153.1 emission limits are based on the end of unit's useful life; therefore, that equipment would already need to be replaced. While there is a disagreement on the definition of useful life, staff's proposal of a 25-year unit life, with the potential of extending that if new burners were installed, aligns staff's assumptions with stakeholder comments. As such, staff does not agree that there will be increased environmental impacts associated with early replacement of equipment still within its useful life.

Relative to the comment about transportation impacts to haul away removed equipment and burners and deliver new equipment and burners, as stated above, those units would be replaced at the end of the Unit's useful life and therefore there would be no additional impact from the emission limits in PAR 1153.1. In addition, the number of units that may be affected by PAR 1153.1 is around 200, and the equipment replacement would be expected to occur over an extended period of 25 years. Thus, on a peak daily basis, the number of trips associated with these activities and the associated emissions would be minimal.

Further, for the same reasons, and due to the wide variations in equipment/burner age, the replacement activities are not expected to overlap in a manner that would cause a significant

adverse effect on the environment. In addition, the replacement of equipment and burners can be accomplished via minimal construction equipment.

Regarding Point 2, bakeries that test out new product lines or test products in newly installed ovens will result in some food waste regardless of whether the new oven is electric or combustion-based. A transition to new electric equipment or new gas-burning equipment would still require product testing and could generate food waste.

Regarding Points 3 and 4, staff was not provided the evidence that there will be a reduction in baked goods output for the region causing other bakeries outside the area to step up their production. Baked goods currently come from within our region, within California, and from other bakeries throughout the U.S. Staff does not anticipate changes to this scenario as a direct result of PAR 1153.1.

Regarding Points 5, 6 and 7, the 2022 AQMP Program Environmental Impact Report (EIR) analyzes the potential increase in demand for natural gas primarily associated with production of electricity in the short term that may result from control measures in the AQMP. Projected increases in renewable energy in the state's overall energy portfolio were also analyzed and taken into consideration in the Program EIR. The CEC and CPUC have also forecasted and anticipate subsequent increases in electricity demand, and utility providers acknowledge the electrical grid infrastructure projects that will be needed to accommodate such an increase in demand.

Further, no direct or indirect physical changes resulting from economic or social effects have been identified. Pursuant to CEQA Guidelines Section 15131(a), "[e]conomic or social effects of a project shall not be treated as significant effects on the environment." CEQA Guidelines Section 15131(b) states further, "[e]conomic or social effects of a project may be used to determine the significance of physical changes caused by the project." Thus, it can be seen with certainty that implementing PAR 1153.1 would not cause a significant adverse effect on the environment, and therefore, it is exempt from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) – Common Sense Exemption.

Any potential for the closing or curtailing of affected businesses as a result of PAR 1153.1 is evaluated in the Socioeconomic Impact Assessment.

Response to Comment 3-9:

Staff detailed the cost assumption, the cost-effective methodology, and the results of the cost-effectiveness assessment in working group meetings as well as in the staff report. In addition, staff updated the assessment based on comments received which are included in this staff report and were presented during Working Group Meeting #8. Further information will be provided in the Socioeconomic Analysis. However, staff did not consider emissions generated at electrical generating facilities as those facilities are regulated under different South Coast AQMD regulations. Staff also does not evaluate the energy requirements and emission caused by extracting, refining, and delivering natural gas to facilities including the energy requirements and emissions causes by both fugitive leaks and catastrophic incidents, such as the massive natural gas leak that occurred in 2015 at the Porter Ranch Aliso Canyon Oil Field, as a BARCT assessment does not require a lifecycle analysis. For a discussion on emissions generated from electricity generating facilities, please refer to response to comment 1-9.

Response to Comment 3-10:

Staff acknowledges and understands the stakeholder's concern regarding the pace of the rule development and has extended the rule process by several months. In addition, staff appreciates and has considered the suggestion to include a hybrid option; however, there are more electric oven models available at this time than hybrid models. Including a hybrid requirement might cause unanticipated delays as oven manufactures would have to shift resources from emerging electric ovens to develop hybrid options that are currently unavailable for most commercial food oven.

Comment Letter #4

April 14, 2023

Michael Krause
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Heather Farr
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Chris Bradley
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Re: Comments on Proposed Amended Rule 1153.1 – Emissions of Oxides of Nitrogen from Commercial Food Ovens

Dear Mr. Krause, Ms. Farr, and Mr. Bradley,

RMI submits this letter responding to the Air District's call for comments on the Proposed Amendments to Rule 1153.1. RMI is an independent, non-partisan, nonprofit organization of experts across disciplines working to accelerate the clean energy transition and improve lives.

The Air District should be commended for expeditiously applying the 2022 Air Quality Management Plan's zero-emission paradigm to the proposed amendments to Rule 1153.1, and staff have taken vital steps to revise the Best Available Retrofit Control Technology (BARCT) for this sector. The proposed zero-NO_x emission limits in Phases II and III of the rule amendments will deliver important air quality and health benefits to the region, and the Air District should adopt them with the following modification.[1] 4-1

In order to ensure the rule will effectively reduce emissions and not delay achievement of zero-emission BARCT under Phases II/III, the Phase I burner replacement(s) provision will require additional amendment. Specifically, staff should take into consideration any net increase in emissions arising from Phase I-mediated delays in Phase II/III compliance, and the rule's compliance framework should be optimized around minimizing the total remaining lifetime emissions curve from the sector. As the rule amendments are currently composed, installation of zero- NO_x units can easily be pushed back by up to 8-10 years from the installation of a single low-NO_x burner. Examples of these expected negative consequences are illustrated in slides 29 and 32 of the Public Workshop presentation. 4-2

[1] RMI has also signed onto the comment letter supporting the rule submitted by Earthjustice and other nonprofits. Please see that letter for additional analysis in support of the rule and suggested revisions to further strengthen the rule.

A minimum burner age of 10 years was added to the proposed Phase II/III compliance schedules in the weeks between Working Group #7 and the Public Workshop, in response to industry concerns that full unit replacement/decommissioning under Phases II/III could be required shortly after low-NO_x burner replacement is required under Phase I. While manufacturers are understandably concerned about avoiding expenditures that will be made obsolete before businesses are able to recoup their full benefits, this issue needs a different solution to avoid undermining the speed of the proposed rule's emission reductions. As currently proposed, the Phase I requirements may perversely result in greater lifetime emissions than would otherwise be achieved without the inclusion of a low-NO_x requirement. In addition, burner replacement could be employed by a regulated entity as an active means of delaying Phase II/III unit replacement.

Cont'd 4-2

Phase I burner replacement would reduce maximum burner emissions by 25-50% from current emission limits in almost all cases[2] (i.e., 40 ppm to 30 ppm, or 60 ppm to 30 ppm, depending on process temperature). Phase II/III unit replacement, on the other hand, would reduce maximum burner emissions by 100% from current emission limits, with that impact multiplied by the number of burners per unit. Given this analysis, **the Air District should calculate the emissions tradeoffs inherent in Phase I changeouts and concomitant delays in Phase II/III compliance, and the rule's compliance framework should be optimized around minimizing the total remaining lifetime emissions curve from the sector.**

If the agency is uncomfortable requiring a single fossil fuel burner to be upgraded without allowing it to be fired for a full 10 years – *along with many other fossil fuel burners in that unit* – and if the emissions reductions from timely unit replacement under the proposed Phase II/III timelines surpass the net emissions benefits from Phase I (i.e., upgrading N burners to low-NO_x, while delaying Phase II/III unit replacement by Y years as a result), then Phase I requirements should be eliminated from the rule amendments. Setting up a regime that curtails emissions a bit for a few years at the expense of eliminating those emissions entirely will result in greater NO_x emissions from the sector than is necessary and feasible. Given the District's incredibly serious air quality challenges, BARCT must be applied as soon as is feasible, and given the primary and secondary health consequences from these ovens' pollution, the region deserves a rule that minimizes total remaining lifetime emissions from the sector.

4-3

We appreciate your consideration of these comments, and we look forward to working with you toward successful adoption of effective and timely zero-emission BARCT for commercial ovens in the region.

Sincerely,
Jed Holtzman
Senior Associate
RMI

jholtzman@rmi.org

[2] The only exception would be tortilla ovens heated solely by infrared burners, which will have a Phase I emissions limit of 15 ppm instead.

Staff Response to Comment Letter #4:

Response to Comment 4-1:
Staff appreciates all stakeholder feedback and participation in the rule amendment process. While staff had to revise some of the proposed Phase II zero-emission limits and removed the proposed Phase III zero-emission limits due to technical feasibility concerns and high costs, staff is encouraged that the proposed amended rule includes the first zero-emission limits for commercial units in the nation. Further, staff intends to use the status update/technology check-in to revisit the zero-emission technology, the energy efficiency of new electric ovens, and the cost of operating those units with the intent of continuing to pursue zero-emission limits.

Response to Comment 4-2:
Staff appreciates the comment and did include a back-stop date of January 2, 2036, to prevent burner replacement being used as a tool to circumvention future effective emission limits. Stranded assets are a concern when developing rule concepts and evaluating the cost-effectiveness of the rule. If the rule does not allow the equipment to reach the end of useful life, the cost of the stranded assets should be included in the cost-effectiveness assessment. Staff conducted an analysis including the cost of the burners in the cost-effectiveness assessment of the zero-emissions limits to determine whether it would be cost-effective if burners were not allowed to reach a 10-year useful. However, especially due to the impacts of the cost of fuel switching, staff is unable to include the cost of potential stranded assets and the proposal will retain the allowance for the burners to reach a 10-year useful life. It is not anticipated for all facilities to install new burners to delay complying with the emission limits, but the rule will allow ovens to reach a 25-year useful life and burners to reach a 10-year useful or January 2, 2036, whichever is sooner.

Regarding the Phase I emission limits and timeframes to comply, the proposed rule was changed to shorten that timeline from 25-years to 10-years which will result in achieving some emission reductions sooner.

Response to Comment 4-3:
The Phase I combustion-based emission limits were not the main driver for allowing a 10-year burner life allowance in Phase II zero-emission limits. The zero-emission limits are technology-forcing. If a facility needs to replace a burner before the future effective date, e.g., before the zero-emission technology is technically feasible, the facility will likely need to rely on a burner technology. Staff wanted to address those burner installations. The Phase I emission limits will result in some early emission reductions which staff would like to retain.

Comment Letter #5

RAMBOLL

ENVIRONMENT
& HEALTH

Mr. Michael Krause
Assistant Deputy Executive Officer
South Coast Air Quality Management District
21865 Copley Dr.
Diamond Bar, CA 91765

SCAQMD PROPOSED RULE 1153.1
EMISSIONS OF OXIDES OF NITROGEN FROM COMMERCIAL FOOD OVENS
COMMENTS ON PROPOSED RULE

April 14, 2023

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Dear Mr. Krause:

Ramboll appreciates the opportunity to participate in the Working Group Meetings (WGMs) for South Coast Air Quality Management District (SCAQMD or District) Proposed Amended Rule 1153.1 (PAR 1153.1), Emissions of Oxides of Nitrogen from Commercial Food Ovens. This rulemaking is being undertaken to (1) transition facilities in the REgional CLean Air Incentives Market (RECLAIM) program for NOx emissions to a command-and-control structure requiring Best Available Retrofit Control Technology (BARCT) level controls as soon as practicable, as required by Control Measure CMB-05 of the 2016 Air Quality Management Plan[1] (AQMP), and (2) reduce NOx emissions from existing food ovens at non-RECLAIM facilities. On March 17, 2023, SCAQMD released preliminary draft rule language and a preliminary draft staff report (PDSR) for PAR 1153.1. On behalf of our clients who are directly impacted by PAR 1153.1, Ramboll offers the following comments the PAR 1153.1 rulemaking and the District Staff's associated analysis.[2,3]

1. **Ramboll strongly recommends that Governing Board consideration of PAR 1153.1 needs to be delayed to allow District staff sufficient time to complete the required technical analyses and provide stakeholders sufficient time to evaluate the proposed rule. While the PAR 1153.1 rulemaking has been in process since 2021, a significant change in the control strategy was only introduced in February 2023. The required District technical analyses for this significant change are still evolving and incomplete. Stakeholders must be given adequate time to understand the District's proposed ZE technology mandate, the supporting technical rationale, and to provide appropriate comments.**

5-1

[1] SCAQMD Final 2016 Air Quality Management Plan, March 2017. Available at: https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15.

[2] SCAQMD PAR 1153.1 Preliminary Draft Rule Language. Available at: http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1153-1/preliminary-draft-par-1153-1---march-2023.pdf?sfvrsn=6.

[3] SCAQMD PAR1153.1 Preliminary Draft Staff Report. Available at: http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1153-1/preliminary-draft-staff-report-par-1153-1---march-2023.pdf?sfvrsn=6.

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SCAQMD held Working Group Meetings (WGMs) between July 2021 and September 2022 to allow stakeholders the opportunity to discuss and provide feedback on PAR 1153.1 prior to a public workshop held on October 6, 2022.[4] At the October 2022 public workshop Staff presented proposed NOx emission limits of 30 ppm for all equipment categories with the exception of tortilla ovens heated solely by infrared burners, which would be subject to a 15 ppm limit.[5] In the February and March 2023 WGMs, SCAQMD presented an abrupt change in the BARCT approach which would mandate replacement of commercial food ovens for several categories of equipment, by proposing that bakery ovens, cooking ovens, drying ovens, and smokehouse ovens should meet a BARCT limit of 0 ppm using ZE technologies (i.e., electric ovens).[6,7] Only after the last working group meeting was held in March 2023 did Staff release preliminary draft rule language which added tortilla ovens and roasters to that list, proposing a 0 ppm endpoint. Cont'd 5-1

Obviously, the most recent preliminary draft rule language is **dramatically different** from the proposal presented to stakeholders in 2022. The new proposal presents electrification mandates for all categories of equipment, including categories for which District staff openly acknowledge **there is no commercially available product**.

In Ramboll's experience, it is highly unusual for the District to release draft rule language with no opportunity for stakeholder discussion or comment. In this case, there have been significant changes impacting operators of tortilla ovens and roasters with no opportunity for the impacted stakeholders to review the technical assessment or make comments. Additionally, the District failed to present cost-effectiveness results for tortilla ovens or roasters in the PDSR. Staff offered cost-effectiveness values for the first time at the Public Workshop held on March 30, 2023, but has not provided stakeholders any information to support those values.

Given these facts, Ramboll strongly recommends that SCAQMD return to the PAR 1153.1 Working Group to allow stakeholders the opportunity to review and comment on the District's proposal.

2. **SCAQMD has not completed the technical analyses required under the California Health & Safety Code (H&SC) for establishing new BARCT limitations. Specifically, the District have failed to demonstrate that the proposed control measures are technically feasible and/or cost effective for each class and category of equipment covered by the rule. SCAQMD must complete the BARCT assessments for each class and category of equipment and revisit the proposed compliance timelines as they directly impact the technical feasibility and cost effectiveness conclusions.** 5-2

The California Health & Safety Code (H&SC) defines BARCT as "an emission limitation that is based on the maximum degree of reduction achievable, taking into account environmental, energy, and

[4] SCAQMD PAR 1153.1 Rulemaking Schedule and Documents. Available at: http://www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules/rule-1153-1.

[5] SCAQMD PAR 1153.1 Public Workshop, October 6, 2022. Available at: http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1153-1/par-1153-1-public-workshop-presentation.pdf?sfvrsn=7.

[6] PAR 1153.1 WGM #6. Available at: http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1153-1/par-1153-1-wgm-6.pdf?sfvrsn=6.

[7] SCAQMD PAR 1153.1 WGM #7. Available at: http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1153-1/par-1153-wgm7-presentation.pdf?sfvrsn=18.

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economic impacts by each class or category of source."[8,9] The H&SC defines cost-effectiveness as "the cost, in dollars, or the potential control option divided by the emission reduction potential, in tons, of the potential control option."[10] If the cost per ton of emissions reduced is less than the established cost-effectiveness threshold, then the control method can be considered to be cost-effective. Cost-effectiveness evaluations need to consider both capital costs (e.g., equipment procurement, shipping, engineering, construction and installation) and operating costs (e.g., utilities, labor, and replacement).

Cont'd 5-2

There are significant direct costs related to Phase II and Phase III implementation that Staff have failed to consider over all categories. Additionally, for tortilla ovens and roasters, the zero emission endpoints proposed by PAR 1153.1 would require facilities to comply with emission limits that **the District has not demonstrated to be technically feasible or cost-effective**.

Staff acknowledged the following in WGM 6:[11]

> *"Staff did not identify any zero-emission/electric tortilla ovens suitable for commercial production…*
>
> ***Burner replacement to achieve 15 and 30 ppm is the only feasible option** identified at this time" [Emphasis added]*
>
> and
>
> *"Staff did not identify any large zero-emission commercial roaster for industrial operations…*
>
> ***Burner replacement to achieve 30 ppm is currently only feasible control option** for category" [Emphasis added]*

SCAQMD has also stated:[12]

> *"The Phase II and Phase III Emission Limits are technology forcing limits, meaning the limits are **based on technology that is not widely available at the time of rule adoption.**" [Emphasis added]*

There are currently no known commercially available tortilla ovens or roasters on the market. The compliance schedule presented in the current version of the draft rule could subject certain facilities to Phase III electrification mandates as soon as 2030. That schedule would require R&D, and commercialization of the required technology within less than 6 years' time.

[8] California Health & Safety Code §40440. Available at: https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=HSC&division=26.&title=&part=3.&chapter=5.5.&article=4.

[9] California Health & Safety Code §40406. Available at: https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=40406.&lawCode=HSC#:~:text=40406.,class%20or%20category%20of%20source.

[10] California Health & Safety Code §40920.6. Available at: https://codes.findlaw.com/ca/health-and-safety-code/hsc-sect-40920-6.html.

[11] SCAQMD PAR 1153.1 WGM #6. Available at: http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1153-1/par-1153-1-wgm-6.pdf?sfvrsn=6.

[12] SCAQMD PDSR. Available at: http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1153-1/preliminary-draft-staff-report-par-1153-1---march-2023.pdf?sfvrsn=6.

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Ramboll is also concerned that the proposed compliance schedule would not provide sufficient time for other activities necessary to deliver such equipment into a facility. These would include: Cont'd 5-2

- Project planning, engineering and construction.
- Procurement of additional electrical capacity from the electric utility.
- Electric utility engineering, permitting and construction of any needed electric distribution infrastructure, engineering.
- Permitting and construction of necessary electric systems on the facility's side of the utility meter.

The current draft of PAR 1153.1 contains very prescriptive deadlines for decommissioning of existing (gas-fired) equipment based on oven and burner age and does not provide alternatives for situations where the desired ZE technologies do not become available fast enough to meet the implementation timelines specified under the rule.

Regarding technical feasibility SCAQMD has stated:

> *"Follow up discussions with commercial food oven manufacturers and industry stakeholders identified that certain types of ovens may potentially have challenges when attempting to electrify due to the oven format, size, design, and construction.* ***Staff is continuing to evaluate the technical feasibility for these types of ovens.***" [Emphasis added]

Implementation of these ZE technical BARCT endpoints (i.e., Phase II and Phase III) would therefore violate SCAQMD's obligations under the H&SC to identify technologies that are technically feasible and cost-effective.

3. **In addition to these problems with the technical feasibility demonstration, Staff have failed to consider significant direct costs related to PAR 1153.1 for most oven categories. SCAQMD is applying the health benefit-based cost-effectiveness threshold established in the 2022 AQMP. That threshold attempts to account regional public health benefits in determining cost effectiveness. In that event, the District must use a cost methodology that considers regional costs as generally outlined in the USEPA Guidelines for Preparing Economic Analyses. The cost-effectiveness analysis should be updated to consider all regional costs, as well as costs borne by the facility for replacement of natural gas fired ovens with electric ovens.** 5-3

With PAR 1153.1, the District is attempting to apply a new health benefit-based cost-effectiveness threshold of $325,000 per ton of NOx emissions reduced for BARCT rules, as established in the 2022 AQMP.[13] The health benefit-based cost effectiveness threshold considers projected regional level public health benefits resulting from regional air quality improvements; therefore, costs should also be evaluated on a regional basis. However, SCAQMD has not established an appropriate methodology for calculating regional costs. The USEPA Guidelines for Preparing Economic Analyses (Guidelines) establishes a framework for performing economic analyses of environmental regulations

[13] SCAQMD 2022 AQMP. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022-aqmp.pdf?sfvrsn=16.

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and policies.[14] The costs to be included in such analyses include explicit and implicit costs, direct and indirect costs, and private sector and public sector costs. Cont'd 5-3

The cost analysis presented by the District for PAR 1153.1 fails to account for most of these costs, and even fails to include all of the direct costs which would be borne by a facility complying with PAR 1153.1. For example, the District has made no attempt to consider electric utility service upgrades that would be necessary to support the mandated replacement of existing natural gas-fueled ovens with new electric ovens. These costs must be considered when assessing the cost-effectiveness for each category, otherwise the cost-effectiveness analysis is defective.

4. **Many of the existing ovens will need to be retrofit with new burners to meet Phase I emission limits. SCAQMD has stated that the cost-effectiveness analysis for burner replacement uses a 25-year useful life. But under Staff's current proposal, equipment with newly replaced burners would only be allowed to operate a maximum of 10 years before being forced to comply with Phase II or Phase III limits. Therefore, the District's cost-effectiveness analysis for Phase I limits must be revised to assume a 10-year useful life.** 5-4

   SCAQMD performed a technology assessment on equipment subject to Rule 1153.1, stating:[15]

   > *"Further review of additional permit information, facility survey data, and source test data confirmed that approximately 131 out of the 202 food ovens were already performing below the 30 ppmv level..."*

   This indicates that 35% of the existing units may need to be retrofit with low NOx burners to meet the proposed Phase I limits. The BARCT cost-effectiveness analysis presented in the preliminary draft staff report states:[16]

   > *"The useful for the burner control equipment was assumed to be 25 years"*

   The compliance deadlines presented in Section (e) of the proposed rule require facilities to submit permit applications to meet Phase II and Phase III emission limits when the burners reach 10 years of age. It is therefore inappropriate to do the cost-effectiveness analysis for burner replacement for all equipment based on a 25-year lifetime. Staff must therefore identify which units would need to be replaced within 10 years of burner replacement and redo the Phase I cost-effectiveness analysis for those units based on a 10-year lifetime.

5. **SCAQMD must reevaluate their cost-effectiveness analysis to incorporate the significant operational and infrastructure energy costs that would be borne by facilities under Phase II and III. The SCAQMD cost-effectiveness calculations fail to include direct costs related to energy usage in the transition from natural gas fired ovens to electric ovens. Ramboll calculated a revised cost-effectiveness that incorporates the net increase in energy costs, which suggests that none of the categories is considered cost-effective when these costs are considered.** 5-5

   As discussed above, there are significant additional infrastructure and utility costs associated with replacement of existing units with electric ovens. Such costs should include electrical upgrades and

[14] US EPA Guidelines for Preparing Economic Analyses. Available at: https://www.epa.gov/environmental-economics/guidelines-preparing-economic-analyses.

[15] SCAQMD Preliminary Draft Staff Report. Available at: http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1153-1/preliminary-draft-staff-report-par-1153-1---march-2023.pdf?sfvrsn=6.

[16] Ibid.

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Cont'd 5-5

infrastructure at the facility, and electrical utility service upgrades directly related to the requirement for installation of electric equipment. The District must also include increased costs for electricity.

In order to understand how the increased cost of electricity would impact the cost-effectiveness analysis, Ramboll performed a high-level analysis using District cost effectiveness data and publicly available utility cost information using the following methodology:

1. Current SCAQMD-calculated Costs: Ramboll back-calculated the present worth value (PWV) for each PAR 1153.1 category based on the emission reductions and cost effectiveness presented in the Preliminary Draft Staff Report and Public Workshop presentation.
2. Ramboll-calculated power demand and corrected energy usage: Ramboll calculated the additional power demand required for electric oven replacements based on the estimated maximum power demand presented in WGM 7. Due to differences in equipment counts, WGM 7 power demand was scaled based on the equipment counts presented in the Public Workshop presentation relative to counts presented in WGM 7. In cases where an estimated power demand was not presented in WGM 7, Ramboll calculated the power demand based on the equipment ratings presented in WGM 6,[17] the number of units presented in the Public Workshop presentation, and the power demand formula presented in WGM 6, Slide 35. The total PAR 1153.1 power demand was then used to calculate an annual PAR 1153.1 energy usage assuming units operate 50% of the year.
3. Electricity Costs: The rule-wide electricity costs were calculated based on the corrected energy usage in combination with the California – Industrial electricity costs reported by the U.S. Energy Information Administration (EIA).[18]
4. Natural Gas Cost Savings: Cost savings (i.e., offsets) for eliminated natural gas usage were calculated based on the average natural gas costs from 2018–2022 as reported by Southern California Gas Company.[19] Estimated power demand was used to calculate the equivalent heat rating using the formula presented in WGM 6, Slide 35 and annualized assuming units operate 50% of the year.
5. Revised Cost-Effectiveness Calculation: Based on the additional costs related to the increased electricity usage and cost reductions associated with the elimination of natural gas, Ramboll added the additional operational costs using SCAQMD's discounted cash flow method. The revised cost-effectiveness was calculated based on the revised cost (including existing capital and O&M costs calculated by SCAQMD, electricity costs, and natural gas cost reductions), and the estimated emission reductions associated with the 0 ppm endpoint.

[17] The spray dryer category did not have a power rating presented in WGM 6. Thus, for the purposes of this calculation, Ramboll has assumed that a spray dryer unit operates at 3 MMBTU/hr to quantify energy demand costs.

[18] U.S. EIA 2021 Total Electric Industry- Average Retail Price (cents/kWh). Available at: https://www.eia.gov/electricity/sales_revenue_price/pdf/table4.pdf.

[19] SoCalGas Gas Procurement Prices Monthly Price. Available at: https://www.socalgas.com/for-your-business/energy-market-services/gas-prices.

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Results of the analysis are presented in Table 1:

Table 1: Updated Cost-Effectiveness Considering Differences in Utility Costs.

PAR 1153.1 Category	Energy Costs (Electricity Costs – Natural Gas Costs) ($ PWV)	NOx Reductions (tpy)	Existing SCAQMD Capital & O&M Cost ($ PWV)	Revised Cost-Effectiveness ($/ton NOx removed)
Bakery Ovens	$720,000,000	49.3	$109,000,000	**$672,000**
Tortilla Ovens	$176,000,000	5.8	$13,100,000	**$1,290,000**
Cooking Ovens	$250,000,000	7.3	$6,940,000	**$1,410,000**
Drying Ovens	$93,900,000	3.3	$3,290,000	**$1,180,000**
Smokehouse Ovens	$51,500,000	4.0	$903,000	**$522,000**
Spray Dryers1	$221,000,000	2.2	N/A – No SCAQMD Cost-Effectiveness Presented	**$4,030,000**
Roasters	$452,000,000	4.4	$20,700,000	**$4,310,000**

[1] The revised cost-effectiveness presented for the spray dryer category is based solely on the estimated energy costs, as a SCAQMD cost-effectiveness was not reported for this category.

As shown in Table 1, **none of the categories are below the cost-effectiveness thresholds for Phase II/III** when utility usage costs are included in the calculation. Note that these results only include the cost differences for energy, and do not include infrastructure upgrade costs, such as upgrades to substations, transformers, meters, and switch gear, among other needed upgrades.

Infrastructure upgrades will be substantial. In a recent CARB workgroup meeting, the infrastructure cost for 10 MW of new capacity ranged from $300,000 (which assumes availability at the local substation) to $25 million for a new substation, transmission lines, and transformers.[20] Such costs for infrastructure upgrades would generally be borne directly by the facility and must be taken into account when estimating cost-effectiveness of the proposed technology.

SCAQMD must therefore reevaluate cost-effectiveness for these equipment categories to include the substantial additional energy and infrastructure costs.

Cont'd 5-5

6. **Staff must ensure the decommissioning timelines include allowances to continue operating existing natural gas fueled equipment when permitted to use an alternative compliance schedule.**

5-6

The electrification mandates in PAR 1153.1 will require significant upgrades both to the utility and facility electrical infrastructure. At a recent CARB meeting, a utility noted that anyone requesting projects over 2 MW would have an extended wait period of 5-7 years.[21] SCAQMD has included the option an Alternative Compliance Schedule Plan to address additional time that might be needed for a utility to provide the necessary energy to the facility to power the electric ovens. However, the rule is very prescriptive on when existing natural gas fueled ovens must be decommissioned based on unit and burner ages. The rule does not include provisions for situations where electrical

[20] CARB Transit Infrastructure Work Group Meeting, January 31, 2023. Available at: https://ww2.arb.ca.gov/sites/default/files/2023-02/transitinfrastructure_wkgmtg_1.31.23_full%20presentation.pdf..

[21] CARB Advanced Clean Fleets (ACF) Infrastructure and Zero-Emission Vehicle (ZEV) Availability Provisions. January 13, 2023.

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infrastructure may not yet be available, but equipment has aged beyond the decommissioning compliance timelines.

In order to ensure that facilities can still operate within SCAQMD, Staff must ensure these decommissioning timelines include allowances to continue operating existing equipment when permitted to use an alternative compliance schedule.

Cont'd 5-6

7. **Ramboll recommends that all categories of equipment that have Table 1 limits be defined in Section (c) of the rule. PAR 1153.1 preliminary draft rule language contains Table 1 NOx and CO emission limits for cooking ovens; however, "Cooking Ovens" is not defined in the rule.**

5-7

8. **PAR 1153.1 preliminary draft rule language contains Table 1 NOx and CO emission limits for tortilla ovens. Ramboll believes that the numbers presented contain an error and requests that the rule language be updated to reflect the intent of the District for this category.**

5-8

PAR 1153.1 preliminary draft rule language contains Table 1 NOx and CO emission limits for tortilla ovens as follows:

Equipment Categories		Phase I (ppmv)		Phase II (ppmv)		Phase III (ppmv)	
		NOx	CO	NOx	CO	NOx	CO
Tortilla Ovens	Heated Solely by IR Burners	30	800	N/A	N/A	0	0
	All Other Tortilla Ovens	15	800	N/A	N/A	0	0

All PAR 1153.1 WGM presented Phase I proposed NOx emission limits for tortilla ovens heated solely by infrared (IR) burners and all other tortilla ovens of 15 ppmv and 30 ppmv respectively. Ramboll believes the numbers presented in Table 1 of the preliminary draft rule language to be in error and requests that the numbers be updated in the next version of draft rule language

9. **The PAR 1153.1 proposed rule language would require a facility complying with Phase III requirements to decommission a unit when the unit and burner reach a certain age, which could result in a requirement for a facility to replace equipment when the burners are less than 10 years of age. Ramboll's understanding from the District is that this is not the intent. Therefore, rule language should be updated as recommended below.**

5-9

PAR 1153.1 Section (e) sets forth the compliance and decommissioning schedules for implementation of the three phases of NOx emission limits. For Phases I and II, SCAQMD proposes that facilities decommission each unit with an emission level that exceeds the applicable limits on or before July 1st that follows the end of the calendar year when the unit *or* burner reaches a certain age. This would allow a facility to operate a unit beyond a certain age if burners were recently replaced. However, for Phase III, SCAQMD is proposing that facilities decommission each unit with an emission level that exceeds the applicable limits on or before July 1st that follows the end of the calendar year when the unit *and* burner reach a certain age. This could result in a requirement for a facility to replace equipment when the burners are less than 10 years old. Our understanding from

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discussion with SCAQMD is that this was an error in the rule language and not the intent of the District.[22] Ramboll recommends that rule language be updated as follows: Cont'd 5-9

(e)(3)(C)(ii): For existing Units that will be replaced to meet Phase III Emission Limits, Decommission each Unit with an emission level that exceeds the Phase III Emission Limit pursuant to paragraph (d)(6):

(i) On or before July 1, 2030, if:

(A) The Unit is 25 years or older by January 1, 2030, as determined pursuant to paragraph (f)(2); and

(B) The burner is 10 years or older by January 1, 2030, as determined pursuant to paragraph (f)(1); and

(ii) On or before the July 1st that follows the end of the calendar year when:

(A) The Unit reaches 25 years of age, as determined pursuant to paragraph (f)(2); ~~or~~ and

(B) The burner reaches 10 years of age, as determined pursuant to paragraph (f)(1); and

Ramboll appreciates the opportunity to provide these comments related to PAR 1153.1. As outlined above, there are multiple items requiring further analysis and thorough discussion prior to rule adoption. The District and stakeholders need more time to ensure the necessary changes are incorporated into the rule. Ramboll recommends delay of the rule adoption until these items can be addressed.

We look forward to continued discussion of this important rulemaking. If you have questions regarding these comments, please contact me at (213) 943-6360 or via email at msweaver@ramboll.com.

Regards,

M. Scott Weaver, QEP
Principal & Practice Area Leader, Air and Climate Services

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SW:gw

[22] Personal communication between Y. Stutz, Ramboll, and S. Ka, SCAQMD, on April 4, 2023.

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Staff Response to Comment Letter #5:

Response to Comment 5-1:
Staff understands the concern regarding the timeline and speed of the rule amendment process. The Public Hearing has been delayed until August 2023 and staff has continued to hold meetings with stakeholders and additional working group meetings.

Regarding staff's release of rule language and stakeholder's ability to comment, staff released two version of proposed rule language since the pivot to zero-emission limits and held three public meetings to solicit stakeholder's feedback.

Response to Comment 5-2:
Staff acknowledges that some of the zero-emission limits are based on technology-forcing limits. In the case of tortilla ovens and roasters, staff relied on smaller zero-emission units that could be scaled up to the sizes regulated by this rule over time. Staff has conducted a cost-effectiveness assessment, which was updated based on stakeholders' feedback. At this time, staff has determined that zero-emission limits are not cost-effective for roaster or tortilla ovens but will reassess its applicability in 2025 during the technology assessment for commercial food ovens.

Response to Comment 5-3:
Please see staff's response to comment letter #2 regarding the $325,000 ($349,000 adjusted to 2022-dollar year) cost-effectiveness threshold adopted with the 2022 AQMP and the BARCT cost-effectiveness assessment.

Response to Comment 5-4:
Staff appreciates the comment and agrees with the comment and revised the draft rule language to reflect a 10-year useful burner life for Phase I emission limits, which is consistent with the future phase allowance of a 10-year burner life. The revised proposal also aligns with recent feedback from burner manufacturers regarding the expected life of burners that are used in commercial bakery ovens..

Response to Comment 5-5:
Staff appreciates the feedback and acknowledges that there will be increased costs associated with switching from operating ovens on natural gas versus electricity. Therefore, staff re-evaluated the cost-effectiveness for each established category to include fuel switching costs. Staff does not agree with Ramboll's cost estimates. Electricity costs run approximately three times higher than natural gas cost; however, electric heating is more efficient than using natural gas. The assumption from Ramboll indicate that electricity cost run five times higher than natural gas. While staff disagrees with some of the details of Ramboll's analysis, staff does agree that costs are higher than the original estimates and amended the proposed emission limits to reflect the new cost-effectiveness assessment.

Response to Comment 5-6:
Staff updated the rule language to make it clear that the future effective zero-emission limits and the schedule to decommission existing combustion units, will not be required if the facility has an approved Alternative Compliance Schedule Plan.

Response to Comment 5-7
Staff agreed with the comment and included a definition for Cooking Ovens.

Response to Comment 5-8:
Staff appreciates the stakeholder pointing out this discrepancy and has corrected the proposed rule language.

Response to Comment 5-9:
Staff made correction to the original intend that the future effective limits would be required once the unit and burner reach the end of useful life. In addition, the proposed draft includes back stop dates to ensure the emission reductions will be achieved by January 2, 2036.

Comment Letter #6

April 14, 2023

Michael Krause
Assistant DEO
South Coast AQMD
mkrause@aqmd.gov

Heather Farr
Planning and Rules Manager
South Coast AQMD
hfarr@aqmd.gov

Re: Proposed Rule 1153.1 Comments

Dear Mr. Krause and Ms. Farr:

On behalf of the undersigned organizations, we submit comments on the proposed amendments to Rule 1153.1. On March 2, 2023, eleven organizations submitted comments, and we incorporate those comments by reference here. First off, we appreciate the workshop that took place this month on this important rule. We encourage swift adoption of this first measure that will apply zero-emission Best Available Retrofit Control Technology (BARCT) standards for stationary sources.

I. Great Urgency Exists to Adopt this Rule.

6-1

During the workshop, some speakers requested delays. While some industry stakeholders may not have urgency to achieve emissions reductions, we want to reiterate the need to reduce pollution in the most polluted region of the country. Thus, there is great urgency to move

forward with this rule no later than the June Governing Board meeting. We are on the precipice of failing to attain the 1997 8-hour ozone standard. In addition, we have the need for additional emissions reductions to achieve the annual PM2.5 standard. Rules like this are critical to achieving emission reductions, in addition to allowing staff to move onto other life-saving rules. Cont'd 6-1

Also importantly, this rule is critical to wrapping up the transition away from the harmful RECLAIM program. As implementation of the 2016 AQMP continues, we really appreciate the Governing Board's wise decision to shift the Nitrogen Oxide (NOx) and Sulfur Oxide (SOx) RECLAIM program to a command-and-control system. Ensuring the largest stationary sources in the South Coast Air Basin actually install state-of-the-art and life-saving pollution controls is critical to providing cleaner air to millions of breathers in the region. With only two landing rules left, we are very close to wrapping up this transition.

And wrapping up is critical because we have consistently been critical of the RECLAIM program over the years. Indeed, our concerns have been substantiated as the evidence shows facilities in the RECLAIM program pollute our air more than they would if a command-and-control system was in place. In fact, the South Coast AQMD staff's review of the permit database determined that "well over half of the equipment at RECLAIM facilities is currently **not at BARCT**."[1] AQMD Staff's analysis shows that approximately 60% of the equipment in the RECLAIM program does not meet the Best Available Retrofit Control Technology (BARCT) standard. This means the most ozone-polluted basin in the country operates a pollution control system where more than half of the equipment does not even meet standards that staff has determined are achievable when taking into account costs and technological feasibility. Moving forward quickly to complete the RECLAIM transition – including adoption of this rule – is therefore very important.

II. Commercial cooking is a prime place for electrification. 6-2

This is a perfect category to start advancing zero-emission technologies in the stationary source arena. We particularly appreciate reevaluating BARCT quickly. We encourage future rulemakings in the large combustion and commercial combustion categories to proceed with this speed in the coming years. We also appreciate places where South Coast AQMD identifies that electric technologies are actually cheaper than methane-burning technologies (e.g., smokehouse ovens). Finally, we applaud the inclusion of a zero-emission standard in Phase III for Tortilla Ovens.

III. Baking Facilities are Already Heavily Electrified. 6-3

One of the interesting things about this working group and some of the naysayers of zero-emission technologies is the failure to recognize that these operations are already heavily electrified. The following chart from the 2012 White Paper *called Energy Efficiency Improvement*

[1] SCAQMD, RECLAIM Transition Plan Version 1.0, at p. vi (March 2018), *available at* http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/regxx/draft-transition-plan-version1-final.pdf?sfvrsn=6 (emphasis added).

and Cost Saving Opportunities for the Baking Industry An ENERGY STAR® Guide for Plant and Energy Managers by Eric Masanet, Peter Therkelsen, and Ernst Worrell provides the following chart outlining baking system components for a range of products.[2]

Cont'd 6-3

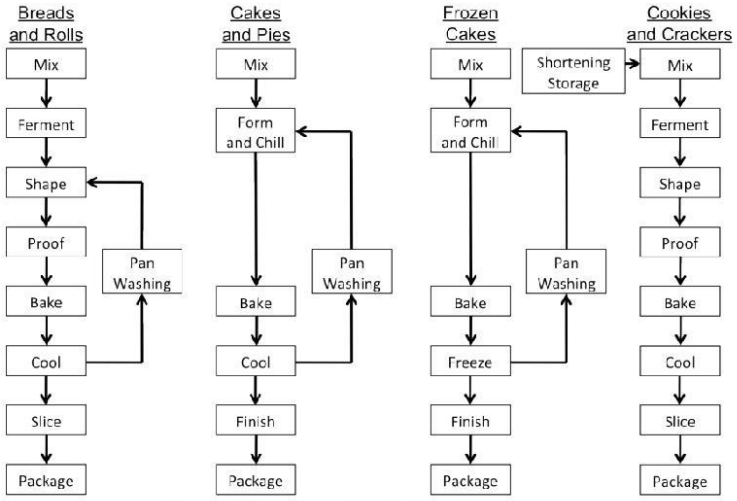


Figure 1. Bakery product production processes

The report recognizes that for "non-frozen products, baking is the largest energy consumer ranging between 26 and 78% of total energy." Thus, even for energy intensive products like cookies and crackers, there are still electrical components all along the system. Moreover, for frozen products, electrical equipment makes up more than half of the energy use. The following chart[3] demonstrates just how intensive making frozen cakes, pies and other pastries is:

Table 5. Frozen cakes, pies, and other pastries (311813) energy requirement per pound of product

BTU/pound of product	Steam	Fuel	Refrigeration	Other Electricity	Percent of Total
Mix	0.0	0.0	0.0	114.5	5%
Form and Chill	108.0	0.0	0.0	0.0	5%
Bake	0.0	555.6	0.0	19.1	26%
Freeze	0.0	0.0	722.1	0.0	32%
Pan Washing	422.0	0.0	0.0	80.2	22%
Finish	0.0	0.0	0.0	114.5	5%
Package	0.0	0.0	0.0	114.5	5%
Total	530.0	555.6	722.1	442.8	1750.5

Source: Adapted from (Sikirica et al. 2003)

This already heavy electric use at these facilities means that rational actors are already looking to ways to reduce energy use. For example, Bimbo bakeries announced in 2022 its plans for an onsite renewable energy microgrid at many facilities, including the Montebello facility in the

[2] Full paper is available at the following url: https://www.osti.gov/servlets/purl/1172002.
[3] Eric Masanet, Peter Therkelsen, and Ernst Worrell *Energy Efficiency Improvement and Cost Saving Opportunities for the Baking Industry An ENERGY STAR® Guide for Plant and Energy Managers*, at p. 7.

South Coast Air Basin.[4] While some of the lobbyists for industry may be myopically looking at this rule as simply switching out methane burning equipment for electric equipment, the rule provides a golden opportunity to couple this shift with energy efficiency and use of clean energy resources like microgrids. Cont'd 6-3

IV. While grid capacity is an important topic, the small number of pieces of equipment at issue in this rule makes it an inappropriate place for broader discussions about grid capacity. 6-4

The 2022 AQMP process began in October 2019.[5] After three years of work, the Governing Board adopted the plan in December 2022. After myriad meetings, workshops, and Governing Board discussions, the Board landed on a direction that we must pursue zero emissions. The process even included a robust infrastructure working group. Importantly, the final approval happened in a bipartisan and overwhelming fashion. Nine Board Members voted for the plan, and two Board Members voted against the plan. Two Board Members were absent. Some of the discussion during the February working group meeting seemed to be a re-litigation of this plan, which is not a good use of time.

As a reminder on the grid capacity issue, Michael Carroll from Latham and Watkins, on behalf of the Western States Petroleum Association, proposed a resolution about the concept of grid capacity and having an annual report back to the Mobile Source Committee on this topic. Even though Mr. Carroll ultimately withdrew his resolution request, the Board Chair[6] stated that the agency would follow through on this desire to discuss grid capacity for zero-emission technologies at the Mobile Source Committee.

We encourage staff to follow the sage advice of then Chair Benoit and have these broader discussions at the Mobile Source Committee. It is not appropriate (and in fact inefficient) to have the broader discussion in each and every rule that is undergoing rulemaking. We agree that understanding additional power needs, infrastructure, and other considerations for this universe of equipment is needed for this rule. But, we do not need meandering debates about the entire grid for the complete conversion of the region to zero emissions during this rulemaking, which covers only a small and discrete universe of equipment. We also note that the analysis staff completed on slide 7 of its Working Group 7 presentation pasted below represents a "worst case" scenario.

[4] Bimbo Bakeries, *Bimbo Bakeries USA Announces Multi-Site Energy Conservation Plan Through Partnership With Greenstruxture* (March 22, 2022) *available at* **https://www.bimbobakeriesusa.com/press/2022-03-28/bimbo-bakeries-usa-announces-multi-site-energy-conservation-plan-through.**

[5] SCAQMD, Final 2022 AQMP, at 9-4.

[6] SCAQMD, Agenda Item No. 2, January 6, 2023 Governing Board Meeting, *available at* http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2023/2023-jan6-002.pdf?sfvrsn=4.

Potential Increased Energy Demand from PAR 1153.1

Cont'd 6-4

	2021 Power Usage Gigawatt hours (GWh)
California	277,764*
South Coast AQMD	124,994^
PAR 1153.1	0.09•
Percent Impact	0.00007%

Thus, even with a worst-case scenario analysis, this paltry energy use impact does not merit concerns that this will harm our grid.

V. Future effective date.

6-5

We suggest that the future effective date not be drawn too far out into the future for zero-emission standards. Given that the rule will require the installation of zero-emission technologies at the end of equipment life, we suggest that a pace that could allow complete conversion before the attainment deadline for the 2008 8-hour ozone standard would be an appropriate end date. We remain concerned that some of the dates in the rule will happen way out into the future – even beyond the attainment date for the 2015 ozone standard.

Moreover, we suggest an even swifter conversion schedule for smokehouse ovens, given the cost savings of electric technologies compared to gas.

VI. Alternative Compliance Plans

6-6

Alternative Compliance Plan (ACP) applications should be published on the AQMD website in a clearly disclosed place. In addition, acceptance or rejections of the ACPs should be posted in the same place on the website.

VII. Interim Emissions Limits.

6-7

We support interim emissions limit provisions for RECLAIM facilities.

5

VIII. One pound or less exemption.

While we do not oppose the 1 lb or less exemption in this rule, we would like to understand the path to get this smaller equipment to zero emissions. Based on an initial analysis, we believe the universe of commercial ovens less than 1 lb may be substantial in the South Coast Air Basin. Given that this equipment could move to zero emissions quickly, it would be good to articulate where these ovens get covered in control measure(s) in the 2022 AQMP. 6-8

IX. Technology check-in.

We support the technology check-in approach outlined in the presentation. We do suggest adding a presentation on tortilla oven technology in 2025, as opposed to just 2028 given that there could be advances in this technology in the next couple of years. 6-9

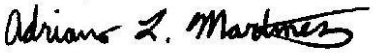
X. Incentive Program.

Given that Phase I compliance may mean some entities replace their gas burners with newer burners before 2027, we suggest that the Air District develop a $5-10 million incentive program to encourage shifts to zero-emission technologies sooner by covering the incremental cost difference between gas technologies and electric technologies. This program should be limited to encourage near-term actors to receive funds, while not allowing incentives for those who wait to install zero-emission equipment. 6-10

XI. Conclusion.

We appreciate your consideration of these comments. We look forward to the passage of this first regulation that sets a zero-emission stationary source standard in the country.

Sincerely,



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West Long Beach Association

Staff Response to Comment Letter #6:

Response to Comment 6-1:
Staff appreciates the support, feedback, and participation of all stakeholders in the rule amendment process.

Response to Comment 6-2:
Staff is working to adopt PAR 1153.1 in a timely manner that also allows time for stakeholders to provide necessary feedback. Staff is striving to develop a rule which facilities can comply with and also reduces emissions in South Coast AQMD so the District can meet its air quality standards and protect the health of those who work and live in this region. The Public Hearing has been delayed until August 2023, but staff is working to prevent further delays. This has been a long rule amendment process, which was purposely delayed after the adoption of the 2022 AQMP so staff could seek zero-emission limits for as many categories of commercial food ovens that can be demonstrated to be technically feasible and cost-effective. Staff tries to maintain a reasonable rule development schedules but sometimes deadlines are extended as new information is obtained or targets are changed.

Staff understands the urgency to sunset the RECLAIM program to meet the air quality standards and is working diligently to amend the last two remaining landing rules, Rule 1153.1 and Rule 1159.1, that must be in place before the RECLAIM program can sunset. The original rule schedule was to amend both Rules 1153.1 and 1159.1 no later than December 2022 so the RECLAIM program could sunset. As mentioned in the previous paragraph, this schedule was delayed to allow time for staff to seek more zero-emission technologies. At this time, the RECLAIM program sunset is not being delayed due to PARs 1153.1 and 1159.1 not being amended, yet because staff is working to address some New Source Review concerns.

Regarding the RECLAIM units not meeting BARCT, staff agrees that was the case for many of the units at facilities participating in the RECLAIM program. For the Rule 1153.1 universe, only 5 out of the 97 facilities are participating in the RECLAIM program and only 5 out of 6 units at those facilities are not meeting the proposed 30 ppmv BARCT limit.

Response to Comment 6-3:
Staff agrees that there are opportunities to seek zero-emission limits for the commercial cooking sector. Some commercial cooking equipment can feasibly transition from natural gas fired equipment to electric equipment with zero-emission. However, based on staff's reassessment of cost associated with operating electric units, especially large units like tortilla ovens, some of the zero-emission limits have been removed for now. Staff intends to use the required technology assessment, proposed to be conducted by January 1, 2026, to reassess the state of the technology, potential efficiency enhancements that could diminish the electric operating costs, and re-evaluate fuel switching costs based on changes in natural gas and electricity rates. If any new zero-emission technologies are identified that are technically feasible and cost-effective, staff will recommend amending the rule to include additional zero-emission limits.

Response to Comment 6-4:

Staff agrees with the comment that the electrical grid can support the increased demand from PAR 1153.1; grid capacity should not be a barrier to the industry's transition to zero-emission equipment. Further, investing in energy efficiency and on-site renewable energy options, such as renewable microgrids and rooftop photovoltaic, at the facilities will lessen the impact on the grid and the cost impacts to the facility. As part of the revised cost-effectiveness assessment, staff included a scenario where some of the electricity costs were offset by onsite electricity generation. That scenario demonstrates that cost saving can be achieved when facilities invest in on-site power generation. Staff understands that each facility will have different layouts and ability to install on-site energy generation.

Response to Comment 6-5:
Staff agrees with the comment that discussions of overall grid capacity does not need to be address in this rule amendment but must be part of a broader discussion.

Response to Comment 6-6:
Staff acknowledges stakeholder concerns regarding the compliance timeline. Staff is working to propose a compliance timeline that is fair for all parties involved and also technically feasible. Staff included a backstop deadline of January 2, 2036, to ensure the emission reductions will be achieved before the 2037 deadline for the 8-hour average ozone standard.

Response to Comment 6-7:
Staff agreed with the suggestion and included a rule requirement to post the Alternative Compliance Schedule Plans 30 days prior to pending approval of the plan and update the website to indicate if the plan was approved or disapproved.

Response to Comment 6-8:
Staff appreciates the comment.

Response to Comment 6-9:
Staff appreciates the comment and agrees that units with small emission, such as those currently meeting the one pound or less exemption, could in the aggregate be a large emission source. Staff intends to compile emission data for units exempt from permits under Rule 219, specifically those registering under Rule 222, to estimate the emissions from these smaller units. Smaller units are good candidates for electrification and should be a focus of future emission reductions efforts. While these units were not a specific focus of the 2022 AQMP, control measure MCS-01: Application of all Feasible Measures directs staff to seek all feasible emission reductions. The control measures states that South Coast AQMD will consider adopting and implementing new retrofit technology control standards that are feasible and cost-effective, based on research and development and other information. Staff intends to look at all equipment categories, including those subject to Rule 222, during the anticipated technology assessment.

Response to Comment 6-10:
A technology assessment will be included in the resolution and will be conducted two years prior to the future effective date of January 1,2027. The results will be reported to the Stationary Source Committee by January 1, 2026, which aligns with the commenters suggestion of conducting the assessment in 2025. Staff will revisit potential zero-emission tortilla oven technology at that time as well as the cost-effectiveness of requiring zero-emission limits.

Response to Comment 6-11:

Staff appreciates the suggestion and is considering if an incentive program can be a useful tool to expedite the transition to zero-emissions in the commercial food cooking sector. However, based on staff's current understanding, the largest barrier may not be the capital costs of the ovens themselves but the ongoing electricity cost to operate the ovens. South Coast AQMD is currently looking to focus the incentive funding on the residential sector to expedite the transition to zero-emission water and space heating with a focus on environmental justice communities.

Comment Letter #7

April 20, 2023

Michael Krause
Assistant Deputy Executive Officer
South Coast Air Quality Management District
21865 Copley Dr.
Diamond Bar, CA 91765

Re: Snak-King Comments on SCAQMD Proposed Amended Rule 1153.1 (Emissions of Oxides of Nitrogen from Commercial Food Ovens)

Dear Mr. Krause:

Snak-King LLC manufactures a portfolio of both private label and branded snack food products from our corporate headquarters in City of Industry, CA. The City of Industry manufacturing facility operates under a South Coast Quality Management District (SCAQMD or District) permit to operate (ID# 119596) and we operate a number commercial food ovens which would impacted by Proposed Amended Rule (PAR) 1153.1.[1]

At the City of Industry facility, Snak-King employs 405 team members and produces over 900 different SKUs which are distributed to consumers across southern California and beyond. Our team not only produces and invents snack products based in the latest consumer trends, but we also actively explore ways to leverage manufacturing technology including new offerings for manufacturing equipment. Snak-King is very concerned that the District's latest proposal for PAR 1153.1 has been rushed along and does not reflect the current market condition for commercial food ovens. 7-1

All-electric tortilla (chip) ovens are not commercially available at this time. As Snak-King previously communicated to District staff, tortilla chip manufacturing requires an oven to produce certain unique product features (e.g., texture, crisp, etc.) which at this time have not been demonstrated to be achievable with an all-electric design. Snak King has active relationships with the original equipment manufacturers (OEMs) for this category of commercial food oven and we are unaware of any proprietary research that would suggest an all-electric tortilla chip oven will be commercially available in the reasonably foreseeable term. If an OEM were to engage in development of an electric tortilla chip oven design, Snak-King expects that reaching commercialization would require a minimum of two years after completion of the R&D stage. Given that reality, and the additional time we would need to engineer, permit and construct such a project, we cannot see a scenario where an electric tortilla chip oven product could be available and operational on the timetable presented in the current draft rule (i.e., as soon as 2030).

Snak-King also believes that the District has misunderstood the infrastructure and energy requirements of an all-electric oven mandate. Our current electricity demand for the entire facility totals about 1 megawatt (MW). Our engineering team estimates that electrification of our tortilla chip ovens alone (which as noted, is not technically feasible at this time) would increase 7-2

[1] SCAQMD PAR 1153.1 Rulemaking Schedule and Documents. Available at: http://www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules/rule-1153-1.

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the raw power demand to about 5 MW; a 400% increase. Such an increase in electricity demand would necessitate significant changes to our physical infrastructure within the facility, including: Cont'd 7-2

- New and expanded transformers;
- New and expanded switch gear;
- New implementation of peak shaving or regenerative power capabilities;
- Adding a significant amount of new equipment cooling capacity to service the new switch gear; and
- Hiring additional top-tier electricians to our employment base.

The amount of investment and time to deliver this supportive infrastructure would be significant and does not appear to have been considered by the District. Our initial cost estimate for these items is (roughly) $7 million on top of the costs for the electric oven equipment (which are unknown at this time) and production line reconfigurations.

Snak-King also has concerns with regards to the existing electric utility transmission and distribution lines (T&D) serving the City of Industry facility and their capacity to support a 400% demand increase. We are presently unable to get preliminary utility cost estimates for T&D infrastructure since we lack project-specific engineering design details and lack a commercially available project on which to base such a design. But any reasonable guess would suggest the additional direct costs for a demand increase of that scale will total in the millions of dollars. Snak-King would be required to cover much or all of such costs under electric utility rules.[2] 7-3

Snak-King understands that the District is required to demonstrate that a Best Available Retrofit Control Technology (BARCT) proposal is both technically feasible and cost effective.[3,4] Snak-King has examined the evaluation presented in the Draft Staff Report for PAR 1153.1.[5] Based on our review, **no such evaluation of cost effectiveness** was presented for Phase III endpoints for the tortilla oven category. 7-4

Based on calculations by our technical consultant, we do not believe that the Phase II/III mandates are anywhere near cost effective. Ramboll analyzed Phase II/III cost effectiveness for the Snak-King ovens subject to PAR 1153.1 using cost information from our engineering team in combination with cost information presented in the Draft Staff Report.

1. Cost Estimates for Electric Ovens: Snak-King does not have actual purchase cost data for replacement of its existing commercial food ovens with all-electric ovens. As noted above, there are no commercially available all-electric products for tortilla chips, so this is the best estimate available for such equipment at this time. For this reason, Ramboll derived estimates based on the cost model presented in the Draft Staff Report.

2. Costs for Facility-Owned Electric Infrastructure Upgrades: As noted above, Snak-King estimates that infrastructure upgrades (within our facility) to support a 400% increase in

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[2] See SCE Rule 16 (Service Extensions), Section E (Allowances and Payments by Applicant)
[3] California Health & Safety Code §40440. Available at: https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=HSC&division=26.&title=&part=3.&chapter=5.5.&article=4.
[4] California Health & Safety Code §40406. Available at: https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=40406.&lawCode=HSC#:~:text=40406.,class%20or%20category%20of%20source.
[5] SCAQMD PDSR. Available at: http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1153-1/preliminary-draft-staff-report-par-1153-1---march-2023.pdf?sfvrsn=6.

electric power demand would cost on the order of $7 million. Ramboll applied these costs to the food ovens on a pro rata basis using nameplate rating. Cont'd 7-4

3. Power Demand and Energy Usage: Snak-King estimated power demand and energy usage associated with all-electric ovens (if such a product were commercially available).

4. Electricity Costs: Snak-King provided Ramboll an estimate of annual electricity costs for the increased energy usage associated with Phase II/III. These were based on the average electricity rate paid by Snak-King and were not adjusted for future inflation.

5. Natural Gas Cost Savings: Cost savings (i.e., offsets) for eliminated natural gas usage were also provided by Snak-King based on actual baseline natural gas consumption and average natural gas prices. Similar to electricity, this pricing was not adjusted for future inflation.

6. Utility Infrastructure Costs: As noted, Snak-King does not have an estimate of these costs. Ramboll did not include a figure for these, even though we expect them to be considerable (i.e., millions of dollars) given the scale of the demand increase.

Ramboll next estimated the cost effectiveness for the Phase II/III endpoints using SCAQMD's discounted cash flow method. Results of that analysis are presented in Table 1: 7-5

Table 1: Cost-Effectiveness Results

PAR 1153.1 Category	Costs at 0 ppm Endpoint (PWV $)	Emissions Reduction (tpy)	Cost-Effectiveness ($/ton NOx removed)
Tortilla Ovens	$58,400,000	2.2	$1,079,000
Drying Oven	$3,600,000	0.2	$696,000

Converting our tortilla chip ovens from direct-fired gas to electric heat would be a very capital-intensive endeavor with relatively marginal air quality benefits. And as shown here, it is not cost-effective even with an incomplete cost assessment.

If the March version of PAR 1153.1 were to be adopted by your Governing Board, it will result in significant product price increases that will negatively impact our ability to compete with companies not subject to this mandate. Ultimately, consumers will experience accelerated inflation. 7-6

The District has not demonstrated that the current PAR 1153.1 proposal is technically feasible and/or cost effective for each class and category which is the California Health & Safety Code requirement. For this reason, Snak-King respectfully requests that District staff return this matter to the working group and complete the additional study to resolve these informational and technical gaps. Snak-King appreciates the District's consideration of these comments. 7-7

Please call Mark Schieldge at (626) 363-7706 if you have questions.

Very truly yours,

Mark Schieldge
Chief Operating Officer

cc: Scott Weaver, Ramboll US Consulting, Inc.
Yasmine Stutz, Ramboll US Consulting, Inc.

Staff Response to Comment Letter #7:

Response to Comment 7-1:
Staff acknowledges that the zero-emission NOx limits are technology-forcing emission limits. For a discussion on South Coast AQMD's ability to adopt technology-forcing limits, please see response to comment 1-6. Staff has identified restaurant sized electric tortilla ovens and is confident that this technology can be scaled up. There has not been a lot of development of electric commercial food ovens, because there has not been a regulatory push toward zero emissions. Setting future-effective zero-emission limits will provide such regulatory push. The revised proposal has eliminated the future-effective zero-emission limits due to the high cost-effectiveness. This does not mean that staff will not continue to pursue zero-emission limits for tortilla ovens. When the technology assessment is conducted in 2025, staff will revisit tortilla ovens to determine if technologies have emerged that can be demonstrated as cost-effective.

Response to Comment 7-2:
Staff included estimated costs for electrical infrastructure upgrades at the facilities. For large units, those costs were estimated between $30,000 and $460,000. Staff appreciates the power and cost estimates and will use those figures in the revised cost-effectiveness assessment.

Response to Comment 7-3:
Staff has been working with the utilities to estimate the cost that facilities would be charged for the upgrades required on the grid to meet the facility's needs. The cost varies facility-by-facility and depends on a number of variables including the load on the local circuit, if transformer and trenching would be required to run new lines. Staff has estimated those costs between $2000-$50,000 and applied the cost to all units greater than 1 MW; the utilities indicated that units under 1 MW would not have a significant impact on the grid.

Response to Comment 7-4:
Staff included costs to address each of the six mentioned potential cost impacts to the facility. Most of those cost had been included in the prior cost-effectiveness except for the difference between operating the units on electricity versus natural gas. Based on staff's revised cost-effectiveness assessment, it is not cost-effective for tortilla ovens to transition to zero-emission at this time. Staff will continue to monitor technology advancements, particularly efficiency improvements, to continue to push for zero-emission technologies.

Response to Comment 7-5:

While staff agrees that the cost-effectiveness of converting to zero-emission tortilla ovens is above the $325,000 ($349,000 adjusted to 2022-dollar year) per ton of NOx reduced, staff does not agree with the cost estimates provided by Ramboll. Staff also understands that Ramboll was also using assumptions based on the available data provided in the working group meetings and was not conducting the assessment with a complete dataset, so some assumptions were necessary. However, staff does agree that fuel transition cost should be considered since it is an additional recurring cost the facility will incur annually. Staff revised the cost-effectiveness analysis with consideration of fuel switching costs. The following tables summarizes the cost estimates from staff's analysis compared to Ramboll assessment.

Table 1: Summary of Staff's Cost-Effectiveness with Fuel Switching Costs

Revised Cost-Effectiveness Summary 41

	Number of Units	Number of Units to Zero	Baseline NOx (tpd)	Phase I Limits (ppmv)	Phase I C/E (10-year life)	Phase II Limits (ppmv)	C/E to Zero (Average)	NOx Red (tpd)
Bakery Ovens								
≤3 MMBtu/hr	30	30	0.05	30	$93,000	0	$290,000	0.06
>3 MMBtu/hr	32	0	0.06	30		-	$400,000	0.0043
Griddle Ovens	2	0	0.002	30		-	$498,000	0.001
Indirect-Fired Ovens	5	5	0	30	Currently Achieving	0	--	--
Tortilla Oven								
IR Burners Only	13	0	0.03	15	$29,000	--	$400,000	--
Ribbon and IR Burners	15	0	0.04	30		-	--	0.015
Cooking Ovens								
≤3 MMBtu/hr	13	13	0.04	30	Currently Achieving	0	$190,000	0.019
>3 MMBtu/hr	10	0		30		--	$560,000	--
Drying Ovens	8	0	0.009	30	$22,000	--	$350,000	0.001
Smokehouses	9	9	0.006		$43,000	0	$60,000	0.006
Dryers	25	0	0.009	30	$18,000	--	-	0.006
Roasters	56	0	0.017	30	$85,000	--	$820,000	0.0002
Total	218	57	0.26					0.11

Table 2: Ramboll's Cost-Effectiveness Assessment

PAR 1153.1 Category	Costs at 0 ppm Endpoint (PWV $)	Emissions Reduction (tpy)	Cost-Effectiveness ($/ton NOx removed)
Tortilla Ovens	$58,400,000	2.2	$1,079,000
Drying Oven	$3,600,000	0.2	$696,000

Staff's revised cost-effectiveness is lower than Ramboll's estimates due to the use of a larger timeframe to calculate the average natural gas rate; this resulted in a lower natural gas rate and a larger difference in fuel switching costs. Since this difference in cost is an annual recurring cost, the overall cost-effectiveness value was much higher. Staff used data from the previous two years whereas Ramboll used data from the previous four years. Based on conversations with Southern California Edison and electric oven manufacturers, electric ovens are more efficient. Electric units will typically

require a higher energy demand during start-up which will steadily decline as the oven reaches operating temperature. Furthermore, since there is no combustion taking place, flue gas extraction is significantly reduced resulting in less heat energy loss. Staff considered efficiency gains with electric ovens when compared to natural gas ovens – electric units are approximately 20% more efficient. Ramboll did not consider the efficiency gains of electric units with the transition from natural gas to electricity which also contributed to the large difference in cost-effectiveness for the categories.

Response to Comment 7-6:

The Public Hearing for PAR 1153.1 was delayed until August 2023 (subject to change) and staff has continued holding individual and working group meetings. Staff appreciates the feedback and engagement in the public process.

Comment Letter #8

May 31, 2023

Mr. Sarady Ka
Program Manager
South Coast Air Quality Management District (SCAQMD)
21865 Copley Drive
Diamond Bar, CA 91765

Subject: Comments on SCAQMD Proposed Amended Rule (PAR) 1153.1

Dear Mr. Ka:

On behalf of United States Bakery Company (USB), I would like to share our concerns regarding the proposed amendment to South Coast Air Quality Management District (SCAQMD) Rule 1153.1: Emissions of Oxides of Nitrogen (NOx) from Commercial Food Ovens.

USB has operated a bakery in Southern California since 2017, providing livable wages, with secure jobs, and baked goods to the community, in the Southern California LA area. Since the inception of the bakery, we have added a donut line that was fully vetted for air quality standards. We have been complying with the 2014 requirements.

SCAQMD Rule 1153.1 was initially adopted on September 4, 2014. Food ovens were previously required to comply with the emission limit requirements of Rule 1147 (adopted in 2011). Rule 1147 established standard emission limits for all miscellaneous combustion equipment outside of boilers, engines, and turbines. However, the NOx limits for food ovens under Rule 1147 were not feasible for food ovens, so the SCAQMD adopted Rule 1153.1 to allow in-use ovens to meet emission limits of 40 parts per million (ppm) NOx corrected to 3% oxygen (O2) for food ovens operating 500°F or less and 60 ppm NOx at 3% O2 for food ovens operating over 500°F.

Our concerns are:

1. Current viable options for replacement and testing have not been available to meet the proposed rule 1153.1, nor has this been vetted to show consistent quality in products served in the community.
2. The ability to continue to provide baked goods and jobs for the community at this location in the event of removing and adding a new oven. This location has 1 oven and would require a significant amount of time to remove and replace, causing employee hardships.

8-1

If you have any questions or concerns, please contact me at (503) 232-2191 x 4232.

Thank you for your consideration,

Mark Park
Corporate Compliance Manager
United States Bakery

340 NE 11th Avenue Portland, OR 97232

Staff Response to Comment Letter #8:

Response to Comment 8-1:

Staff understands the concerns of industry stakeholders regarding the commercial availability of the technology needed to comply with the proposed emission limits. Staff has identified both burner technology and zero-emission oven technology that is commercially available and would allow facilities to comply with the proposed emission limits. Staff has also identified several electric test kitchens that facilities can utilize to experiment with product recipes during the time that zero-emission technologies take to fully mature. Staff invited BABBCO to present information to stakeholders about the company's electric equipment and demonstration facility during one of the working group meetings. Staff acknowledges that significant cooking chamber moisture differences can affect the product quality and has identified other feasible non-combustion mechanisms of adding moisture in a cooking environment. Staff has proposed future effective dates that would allow facilities enough time to replace and/or retrofit equipment units.

With regard to the timing of replacement, based on the comment letter, the referenced facility is a new facility that presumably has a newly installed oven as of 2017. PAR 1153.1 takes stranded assets into consideration, especially since there were recent emission reductions required in Rule 1153.1. The oven at the facility is rated at 10 MMBtu/hr and therefore would not be subject to Phase II emission limits. The oven at the facility will only be required to comply with the Phase I NOx emission limit under the current proposal and will be required to submit a permit application for the 30 ppm NOx limit when the current burner reaches seven years of age in 2024. The proposed limit of 30 ppm can be achieved with commercially available burner technology and several manufacturers are willing to provide a performance guarantee of 30 ppm.

With regard to the potential job losses that could result from PAR 1153.1, the socio-economic assessment will include an analysis on potential job impacts.

Comment Letter #9

CALIORNIA SAFE SCHOOLS
COALITION FOR CLEAN AIR
COALITION FOR A SAFE ENVIRONMENT
COMMUNITIES FOR A BETTER ENVIORNMENT
COMMUNITY DREAMS
INDUSTRIOUS LABS
EARTHJUSTICE
EAST YARD COMMUNITIES FOR ENVIRONMENTAL JUSTICE
ROCKY MOUNTAIN INSTITUTE
SAN PEDRO & PENINSULA HOMEOWNERS COALITION
SIERRA CLUB
WEST LONG BEACH ASSOCIATION

VIA: ELECTRONIC MAIL ONLY

June 1, 2023

Chair Vanessa Delgado &
Members of the Board of Directors
Governing Board Chair
South Coast Air Quality Management District (South Coast AQMD)
21865 Copley Drive
Diamond Bar, CA 91765
Email: cob@aqmd.gov

RE: Support - Agenda Item 2a: Set Hearing for Proposed Amended Rule 1153.1 (Commercial Ovens)

Dear Chair Delgado and Members of the Board:

On behalf of the undersigned organizations, we write regarding the set hearing for Proposed Rule 1153.1. This rule is critical for implementing the 2022 Air Quality Management Plan (AQMP) and the 2016 AQMP, in addition to fulfilling the commitments to transition the RECLAIM program. We support moving forward quickly to adoption of this rule by the August Governing Board meeting at the latest. Advancing zero-emissions in the stationary source space is critical to tackling harmful air pollution. 9-1

I. Commercial ovens are a prime place for electrification.

This is a perfect category to start advancing zero-emission technologies in the stationary source arena. We particularly appreciate reevaluating BARCT based on the new imperative articuled in the 2022 AQMP. We encourage future rulemakings in the large combustion and commercial combustion categories to proceed with this speed in the coming years. We also appreciate places 9-2

where South Coast AQMD staff identifies that electric technologies are actually cheaper than methane-burning technologies (e.g., smokehouse ovens). 9-2 Cont.

II. Finalizing this rule is critical to transitioning away from RECLAIM.

As implementation of the 2016 AQMP continues, we really appreciate the Governing Board's wise decision to shift the Nitrogen Oxide (NOx) and Sulfur Oxide (SOx) RECLAIM program to a command-and-control system. Ensuring the largest stationary sources in the South Coast Air Basin actually install state-of-the-art and life-saving pollution controls is critical to providing cleaner air to millions of breathers in the region. With only two landing rules left, the South Coast AQMD is very close to wrapping up this transition.

And wrapping up is crucial. Indeed, the evidence shows facilities in the RECLAIM program pollute our air more than they would if a command-and-control system was in place. In fact, the South Coast AQMD staff's review of the permit database determined that "well over half of the equipment at RECLAIM facilities is currently **not at BARCT**."[1] AQMD Staff's analysis shows that approximately 60% of the equipment in the RECLAIM program does not meet the Best Available Retrofit Control Technology (BARCT) standard. This means the most ozone-polluted basin in the country operates a pollution control system where more than half of the equipment does not even meet standards that staff has determined are achievable when taking into account costs and technological feasibility. Moving forward quickly to complete the RECLAIM transition work is therefore very important. 9-3

We look forward to working together to fully transition the agency away from RECLAIM and implementing the AQMP through rules like Proposed Amended Rule 1153.1.

Sincerely,

Adrian Martinez
Fernando Gaytan
Earthjustice

Robina Suwol
California Safe Schools

Chris Chavez
Coalition for Clean Air

Jesse Marquez
Coalition for a Safe Environment

[1] SCAQMD, RECLAIM Transition Plan Version 1.0, at p. vi (March 2018), *available at* http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/regxx/draft-transition-plan-version1-final.pdf?sfvrsn=6 (emphasis added).

Bahram Fazeli
Communities for a Better Environment

Ricardo Pulido
Community Dreams

Taylor Thomas
East Yard Communities for Environmental Justice

Evan Gillespie
Industrious Labs

Jed Holtzman
Rocky Mountain Institute

Peter Warren
San Pedro & Peninsula Homeowners Association

Monica Embrey
Sierra Club

Theral Golden
West Long Beach Association

CC: Wayne Nastri, Executive Officer (Email: wnastri@aqmd.gov)
Michael Krause, Assistant Deputy Executive Officer (Email: mkrause@aqmd.gov)

Staff Response to Comment Letter #9

Response to Comment 9-1:
Staff appreciates the comment and is working to bring the first South Coast AQMD zero-emission rule to the Governing Board for consideration by August 2023.

Response to Comment 9-2:
Staff appreciates the support and participation of all stakeholders in the rule development process. While this rulemaking process found several of the larger commercial food ovens not to be technically feasible to transition to zero-emission level, staff is positive about its applicability to the categories where zero-emission technology was found to be technically feasible. Staff intends to continue to evaluate zero-emission technology wherever feasible, across all industry sectors, and in the BARCT assessment stages of future rule proposals, as required by the 2022 AQMP.

Response to Comment 9-3:
Please see staff's response to comment 6-1 regarding the RECLAIM program. Staff understands the urgency to sunset the RECLAIM program to meet air quality standards and is working diligently to amend the last two remaining landing rules, Rule 1153.1 and Rule 1159.1, that must be in place before the RECLAIM program can sunset. The original rule schedule was to amend both Rules 1153.1 and 1159.1 no later than December 2022 so the RECLAIM program could sunset. As mentioned in response to comment 6-2, that schedule was delayed to allow time for staff to seek more zero-emission technologies. Staff will work expeditionary to get the last two landing rules adopted.

Comment Letter #10

June 14, 2023

Submitted via email at: mkrause@aqmd.gov

Michael Krause
Assistant Deputy Executive Officer
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

RE: SCAQMD Proposed Amended Rule 1153.1 – Emissions of Oxides of Nitrogen from Commercial Food Ovens

Dear Mr. Krause and Members of the SCAQMD Stationary Source Committee:

The California Manufacturers & Technology Association (CMTA) and the organizations listed appreciate the opportunity to comment on the consideration of SCAQMD's proposed amendments to Rule 1153.1 – Emissions of Oxides of Nitrogen from Commercial Food Ovens. We appreciate the continued engagement and dialogue with SCAQMD staff throughout the eight working group meetings and public workshops. As the regulated parties to these air quality considerations and others, California industry continues our endeavor to implement air quality improvement technologies, accelerate deployment of air emission controls, and the education of staff on the challenges facing our collective hard-to-electrify industries.

Concerning Proposed Amended Rule 1153.1 (PAR 1153.1), implementation will be challenging. The challenges that exist are not limited to industry but are also beyond our ability to control. The staff presentation correctly identifies several key issues that will continue to define California's challenges of a zero-emission or fully electrified economy.

These issues include:

- The commercial availability and cost-effectiveness of zero-emission technologies.
- Local, regional, and statewide electrical grid impacts from increased energy demands.

Comment 10-1

The zero-emission or fully electrified option is often presented as the panacea to mitigating the impacts of climate change. This transition is often lauded and compared to California's efforts to scale zero-emission energy development and advance zero-emission transportation. However, the benefits of what California is witnessing in these technologies have followed nearly two decades of research, development, and an influx of federal and state funds to support. As such,

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industry-wide electrification pathways have been largely ignored, underfunded, and slow to develop.

To inform an appropriate pathway, California law requires that Best Available Retrofit Control Technology (BARCT) rules, like PAR 1153.1, be technically feasible **AND** cost-effective. The most recent version of the proposed regulation is a fair balance that advances the SCAQMD Board's long-term objectives within these obligations. As currently drafted, the technical assessment fairly acknowledges that for some regulated entities operating the commercial food oven categories, no zero-emission option exists in the market. Further, the revised staff analysis also better reflects the costs incurred for electrifying these categories.

Comment 10-1 cont.

Ultimately, the proposal is fair and equitable, given the current state of technology and cost considerations. SCAQMD staff are also proposing a technology assessment to occur in 2026, which would inform further adjustments to the regulation. Evaluating technological feasibility and availability is an appropriate approach that we support.

We appreciate the opportunity to provide these comments for consideration and look forward to continued collaboration on this rulemaking and others that may be considered in the future.

Respectfully,

Robert Spiegel
Senior Policy Director, Government Relations

On behalf of:

California Business Roundtable
California Chamber of Commerce
California League of Food Producers
California Restaurant Association
Industrial Environmental Association

Cc: Catherine Rodriguez, SCAQMD – crodriguez@aqmd.gov

Staff Response to Comment Letter #10

Response to Comment 10-1:

Staff appreciates the comment and support for the most recent proposal. Staff's intention is to collaboratively work together with all stakeholders involved to improve air quality for everyone living within the region. Stakeholder feedback is valuable and helps staff develop fair and balanced rule requirements that will help meeting NAAQS attainment requirements set forth by the federal government. Staff conducts extensive research on the current state of commercial scale technology to understand the existing limitations. However, staff is also cognizant that technology is always advancing and moving forward, especially as it gets adopted. As a result, staff believes a status update that includes a technology evaluation at a future date is warranted. When the status update and check-in is conducted in 2025, staff will assess the commercial availability and cost-effectiveness of zero-emission technologies for all established equipment categories and will assess local, regional and statewide grid impacts from the increased electricity demand.

Comment Letter #11

VIA: ELECTRONIC MAIL

June 15, 2023

Chair McCallon &
Members of the Stationary Source Committee
South Coast Air Quality Management District (South Coast AQMD)
21865 Copley Dr.
Diamond Bar, CA 91765
crodriguez@aqmd.gov

Re: Agenda Item No. 3 - Proposed Amended Rule 1153.1

Dear Chair McCallon and Members of the Stationary Source Committee:

The undersigned organizations are grateful for the opportunity to provide comments on Proposed Amended Rule 1153.1. This is the first major regulation targeting Nitrogen Oxide (NOx) emissions after the adoption of the 2022 Air Quality Management Plan (AQMP). As such, it is a critical regulatory proceeding that could set the template for future action. Overall, we are pleased that the South Coast AQMD staff will adopt the nation's first zero-emission standard for a small subset of stationary source categories covered under this rule. Given this is the first of many rules that will include zero-emission standards for stationary sources, it is critical to ensure it sets a good precedent for future rulemakings. For that reason, the points below provide feedback on the most recent iteration of the rule.

I. The Cost-Effectiveness Threshold Must Be Inflated Per the Clear Direction of the Final 2022 AQMP This Board Adopted. 11-1

The 2022 AQMP is abundantly clear in describing how the cost-effectiveness threshold would be applied: "This benefits-based screening threshold would be inflated through time to the dollar year used in a control measure-specific socioeconomic analysis."[1] The socioeconomic analysis for this rulemaking uses 2023 dollars, yet the staff presentation still references the

[1] *See* 2022 Final AQMP, at 4-83, *available at* http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022-aqmp.pdf?sfvrsn=16.

"$325,000 threshold established in 2022 AQMP," which was established using 2021 dollars.[2] We want to make sure stakeholders do not get misled that $325,000 is a fixed benchmark for rules done under this AQMP, no matter the year. Cont'd 11-1

The Stationary Source Committee will recall that the 2022 AQMP was a compromise. Several organizations advocated to get rid of the cost-effectiveness threshold because it is not required by California law, unduly restricts measures that the South Coast AQMD could consider, and fails to reflect cumulative benefits of technologies in communities overburdened by pollution, amongst other arguments. Some in regulated industry asked that the cost-effectiveness approach from prior air plans remain intact. We do not seek to re-litigate the ultimate compromise that South Coast AQMD staff struck between industrial stakeholders who wanted to keep the old approach to using cost-effectiveness and our effort to let health be the driver of regulations. But, we need regulations to incorporate the compromise struck in the 2022 AQMP.

Adjusting the health-based cost-effectiveness threshold for inflation was included in the AQMP because the value of a dollar goes down every year. If the $325,000 per ton threshold were frozen in time, the health benefits it represents would decrease every year, because a dollar in 2021 is worth less in 2023 and will become even less in 2024 and beyond. Juxtaposed with the economic data that staff uses for the Best Available Retrofit Control Technology (BARCT) assessment for this rulemaking, which includes data and forecasting well beyond 2021, it is clear this simple recalculation must be done expeditiously.

While it is unclear if this correction would impact BARCT recommendations for these source types, it is undoubtedly important to clarify and reaffirm the approach outlined in the 2022 AQMP for rulemakings moving forward.[3]

Recommendation:

Ensure rulemakings properly comply with the promises made in the Final 2022 AQMP to adjust cost-effectiveness thresholds through time.

II. The Current Approach of Assuming Natural Gas Will Be Abundant and Cheap for Decades Does Not Comport with Reality. 11-2

On December 1, 2022, the California Public Utilities Commission (CPUC) "adopted a new framework to comprehensively review utility natural gas infrastructure investments in order to help the state transition away from natural gas-fueled technologies and avoid stranded assets

[2] Stationary Source Committee Meeting 6-16-2023, Agenda Item No. 3, at Slide 8.

[3] Moreover, this issue is not just related to this rule. In agenda item 5, which looks at Proposed Rule 1173, the staff presentation uses a $36,000 cost effectiveness threshold despite clear direction from the 2022 AQMP that the VOC threshold "would be inflated by the consumer price index annually." Final 2022 AQMP, at 4-83.

in the gas system."[4] There is a cognitive dissonance between air quality planning and these proceedings happening at the state level. The current BARCT assessment assumes electricity prices will go up over the next two decades, but natural gas prices are predicted to go down.

Cont'd 11-2

These assumptions arise from South Coast AQMD's use of the gas and electricity rate projections included in the California Energy Commission's (CEC) California Energy Demand Update 2022-2035[5] – which assumes gas demand will remain steady through time despite California's many policies to reduce fossil fuel use and corresponding greenhouse gas emissions.[6]

The economic assumptions underpinning the analysis that fossil methane will be cheap and abundant ignore many factors. For example, as more and more people and entities leave the gas system, this means fewer and fewer users will have to pay for the fixed infrastructure costs of the gas system. It is not clear why gas prices in the South Coast Air Basin would defy the tenets of economics and remain abundantly cheap for decades to come.

The same year CEC published the document staff is using, the agency published another report, "The Challenge of Retail Gas in California's Low-Carbon Future," which does takes

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[4] CPUC Creates New Framework to Advance California's Transition Away from Natural Gas, Press Release, (December 1, 2022), *available at* https://www.cpuc.ca.gov/news-and-updates/all-news/cpuc-creates-new-framework-to-advance-california-transition-away-from-natural-gas.

[5] California Energy Demand Update *available at* https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2022-integrated-energy-policy-report-update-2.

[6] The Environmental Defense Fund (EDF) filed significant comments on the gas assumptions portion of the Integrated Energy Policy Report (IEPR). In particular, EDF pointed out "Currently, the IEPR preliminary model projects stable future gas demand…

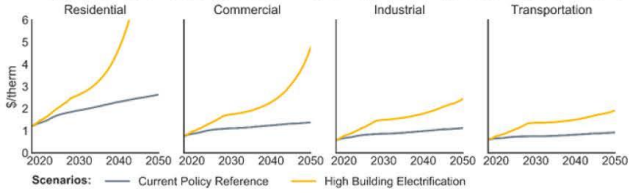
> EDF highlights two concerns around these projections. First, stable gas demand is at odds with California's climate policies aimed at reducing fossil fuel use—including natural gas demand. These state policies include the Senate Bill 32 targets of reducing California's greenhouse gas emissions by 40% below 1990 levels by 2030, the Assembly Bill 1279 target of reaching net zero by 2045, the California Air Resources Board (CARB) 2022 Scoping plan targets of reducing total fossil fuel consumption by 86% below 2022 levels by 2045, the California Public Utilities Commission (CPUC) decision to eliminate gas extension subsidies, and various local ordinances on gas appliances…
>
> Second, EDF contends that it is unreasonable to assume constant demand beyond a future point in time simply because no existing projections are available. It is true that no future projection can be made with 100% confidence and accuracy; and that confidence will decline further out into the future the projection is made. However, the entire IEPR process has uncertainty of projections baked in, and holding this one element constant is not worthy of the IEPR process. To project *no change* and assume constant future gas demand beyond a certain point, however, would be to overlook existing market trends of electrification and various state policies."

EDF Comments on Gas Demand Forecasts in IEPR, (May 2, 2023).

Cont'd
11-2

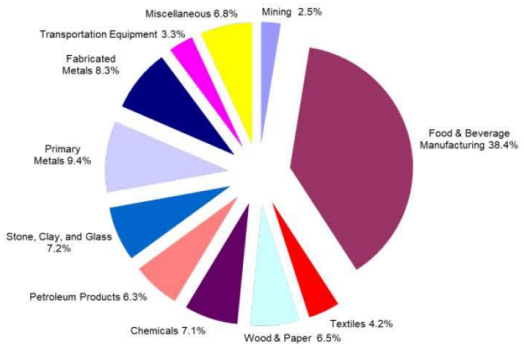
future demand and future customer base into account, and that work finds that gas rates will increase steadily over time especially as California implements its programs to curb air and climate pollution.[7] For example, the chart below shows that building electrification at a high level will result in increased rates for industrial facilities.

Figure 25: Gas Rates by Sector in the High Building Electrification Scenario



The context for the assumptions staff uses in the BARCT analysis is important as well. While the South Coast AQMD's primary regulatory concern is reducing traditional criteria pollutants, there is overwhelming consensus that we must dramatically drive down the use of methane to stave off the worst consequences of climate change. The sector being discussed today – food and beverage manufacturing – is far and away the largest methane-burning non-refining industrial sector in SoCal Gas territory. The chart below[8] shows that food and beverage manufacturing burns close to 4 times the methane as the next largest sector.

FIGURE 19 INDUSTRIAL GAS DEMAND BY BUSINESS TYPE COMPOSITION OF INDUSTRY (2021)–



[7] CEC, *The Challenge of Retail Gas in California's Low Carbon Future, available at* https://www.energy.ca.gov/sites/default/files/2021-06/CEC-500-2019-055-F.pdf.
[8] California Gas & Electric Utilities, 2022 California Gas Report, at 126.

As such, this industry will be a priority target for addressing greenhouse gas emissions moving forward. Moreover, we are disappointed in the regulated industry's approach to this rulemaking, which appears to note the facilities covered under this rule can be wed to a climate destructive fuel in methane to power their baking operations for decades to come. For example, the American Baking Association recently wrote in commercialbaking.com that "[w]ith proper maintenance, commercial bakery ovens can operate for up to 30-40 years."[9] Since the last compliance date for this rule is in 2036, the factual predicate of the ABA's arguments here is that some commercial ovens in the South Coast Air Basin could be run by burning methane as far out as when the United States celebrates its tricentennial – or 2076.[10] This makes no sense given many of the companies regulated here have significant climate pledges that require deep cuts to their greenhouse gas emissions well before 53 years from today. Cont'd 11-2

While the lobbyists and lawyers in industry try to center the debate on the electrical grid in the transition to zero-emissions, we encourage the Governing Board to have more information on the perils of remaining a combustion-centric air basin for our stationary and area sources, including the affordability impacts of being the last remaining users of the gas system once it becomes a stranded asset.

Recommendation

Direct staff to provide more frequent updates through this rule & other rulemakings about the work to transition away from gas and the impacts on cost-effectiveness projections.

III. The Technology Assessment Is Unduly Narrow and Should Be Expanded. 11-3

The technology assessment scheduled for one year prior to compliance needs to be a more robust and well-rounded exercise. While the regulated industry would like to focus solely on equipment availability, this unduly myopic approach will not equip future board members to put this rule in context. In particular, staff should add the following topics to this review: 1) an update on health studies articulating impacts to those with prolonged close exposure to burning gas (e.g., bakery workers); 2) an updated analysis of the revised health impacts and associated dollar values attached to those impacts (e.g., a new health benefits cost-effectiveness threshold, represented in 2026 dollars); 3) an update on the gas transition work and a review of the forecasted gas rates moving forward; and 4) an update on additional technologies that could help defray any costs associated with transitioning to electric technologies (e.g. industrial heat pumps).

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[9] Joanie Spencer, *Proposed oven ruling: Sustainability solution or operational setback?*, *available at* https://commercialbaking.com/proposed-oven-ruling-sustainability-solution-or-operational-setback/.

[10] The end date for the rule is 2036, so all equipment must be replaced with the methane burning equipment that meets the standards by that date. The outer projection for the American Baking Association is potentially 40 years for an oven. So, facilities that wait to the end date, could be operating their methane burning equipment until 2076.

Recommendation

Direct staff to expand the technology assessment to include impacts on health of workers, impacts of health from air pollution more broadly, an update on the gas transition work that is proceeding in California, and additional technologies that could help defray any costs associated with transitioning to electric technologies.

Cont'd 11-3

IV. Technology Investments.

11-4

On June 2, 2023, South Coast AQMD staff presented a new version of this proposed rule that changed the prior version of the regulation dramatically. Instead of having zero-emission standards across all categories – even if not for several years – the new rule language only preserves zero-emission standards for four categories, about 25% of the equipment, cutting the proposed emission reductions in half. Zero-emission options for categories like tortilla ovens and larger batch ovens are not being presented to you because the cost-effectiveness exceeded the threshold as presented – even in cases where projected costs were based on very rough and contingent long-term forecasts and/or where projected costs came in very close to the threshold. Given that the proposed rule does not provide a zero-emission market signal for technology development for large categories of equipment, the AQMD should work to find federal and/or state funds to develop a $15 million program to encourage the development of zero-emission commercial ovens. These monies could come from state or federal funds, such as the Food Production Investment Program at the California Energy Commission.

There is a clean air, public health, and climate imperative to develop better incentive programs to push this industry to zero-emission operations. Where the Air District will not pursue life-saving regulations to eliminate combustion, it must work with relevant agencies like the California Energy Commission, the Department of Energy, and other agencies that have identified the food and beverage manufacturing space as a key sector to advance decarbonization and stave off the worst impacts of climate change.

Recommendation

Direct staff to develop a food and beverage zero-emission technology fund by seeking state and federal funds.

We appreciate your consideration of these comments, and we look forward to adoption of this rule to get one step closer to wrapping up the environmental justice nightmare that has been the RECLAIM program.

Sincerely,

Adrian L. Martinez

Adrian Martinez
Earthjustice

[*Additional Signatories Continued on Next Page*]

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Communities for a Better Environment

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Jed Holtzman
Rocky Mountain Institute (RMI)

Peter Warren
San Pedro & Peninsula Homeowners Coalition

Monica Embrey
Sierra Club

Staff Response to Comment Letter #11:

Response to Comment 11-1:
Staff agrees that the cost-effectiveness screening threshold must be adjusted for inflation each year, as directed by the 2022 AQMP. Please refer to Chapter 2 in the Staff Report for more information regarding cost-effectiveness being adjusted to the appropriate dollar year.

Response to Comment 11-2:
Staff acknowledges and understands the difficulty in forecasting future natural gas prices and will continue to evaluate forecasts and utility data as they continue to be updated. However, Staff does not agree with the forecasted cost numbers provided in the comment letter. Based on energy rate data evaluated by staff, forecasting energy prices involves a level of uncertainty and the actual rates will differ from the forecasted rates in any given year due to various factors. Staff acknowledges this uncertainty and notes that the methodology used in the analysis for PAR 1153.1 is not precedential. Staff will update the forecasts and cost assumption methodologies for energy rates in future rulemakings, based on the best practices and the latest energy price forecasts including but not limited to the California IEPR.

Response to Comment 11-3:
Staff agrees that the status update/technology check-in should be expanded to include an analysis of natural gas price forecasts and additional technologies that may reduce fuel-switching costs.

Response to Comment 11-4:
Staff appreciates the recommendation and will continue to evaluate, monitor, and reach out to the California Energy Commission for any potential funding opportunities