South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765
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STATIONARY SOURCE COMMITTEE

Committee Members
Mayor Ben Benoit, Chair
Dr. Joseph Lyou, Vice Chair
Mayor Pro Tem Judith Mitchell
Supervisor Shawn Nelson
Supervisor Janice Rutherford
Supervisor Hilda L. Solis

August 17, 2018 ♦ 10:30 a.m. ♦ CC8
21865 Copley Dr., Diamond Bar, CA 91765

TELECONFERENCE LOCATIONS

8575 Haven Ave
Suite 110
Rancho Cucamonga CA

Wildomar City Hall
City Council Chambers
23873 Clinton Keith Road
Wildomar, CA 92595

Hall of Administration
Planning Commission Room
333 West Santa Ana Blvd.
Santa Ana, CA 92701

Rolling Hills Estates
City Hall
4045 Palos Verdes Drive North
Rolling Hills Estates, CA 90274

(The public may attend at any location listed above.)

Call-in for listening purposes only is available by dialing:
Toll Free: 866-244-8528
Listen Only Passcode: 5821432
In addition, a webcast is available for viewing and listening at:
http://www.aqmd.gov/home/library/webcasts

AGENDA

CALL TO ORDER

INFORMATIONAL ITEMS – Items 1-3

1. **Summary of Proposed Amended Rule (PAR) 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities** **(15 mins.)** Michael Morris, Manager
   (No Motion Required)
   PAR 1135 is being amended to update emission limits to reflect current Best Available Retrofit Control Technology (BARCT), establish provisions for monitoring, reporting, and recordkeeping, and provide implementation timeframes to facilitate the transition of NOx RECLAIM facilities to a command-and-control regulatory structure. Staff will provide a summary of PAR 1135 and any key issues.
   (Written Material Attached)

2. **Status Report on Reg. XIII – New Source Review** **(10 mins.)** William Thompson, Manager
   (No Motion Required)
   This report presents the federal Final Determination of Equivalency for January 2016 through December 2016. As such, it provides information regarding the status of Regulation XIII – New Source Review, in meeting federal NSR requirements and shows that SCAQMD's NSR program is in final compliance with applicable federal requirements from January 2016 through December 2016.
   (Written Material Attached)

3. **Update on 2016 AQMP Control Measures for Underfired Charbroilers and Commercial Cooking Equipment** ***(No Motion Required)*** **(20 mins.)** Tracy Goss, Manager
   Staff will provide an update on recent research efforts for underfired charbroilers and other commercial cooking equipment.
   (Written Material Attached)

OTHER MATTERS

4. **Other Business**
   Any member of the Committee, or its staff, on his or her own initiative or in response to questions posed by the public, may ask a question for clarification, may make a brief announcement or report on his or her own activities, provide a reference to staff regarding factual information, request staff to report back at a subsequent meeting concerning any matter, or may take action to direct staff to place a matter of business on a future agenda. (Gov't. Code Section 54954.2)

5. **Public Comment Period**

Members of the public may address this body concerning any agenda item before or during consideration of that item (Gov't. Code Section 54954.3(a)). All agendas for regular meetings are posted at District Headquarters, 21865 Copley Drive, Diamond Bar, California, at least 72 hours in advance of a regular meeting. At the end of the regular meeting agenda, an opportunity is also provided for the public to speak on any subject within the Committee's authority. Speakers may be limited to three (3) minutes each.

6. **Next Meeting Date: September 21, 2018**

ADJOURNMENT

Americans with Disabilities Act
The agenda and documents in the agenda packet will be made available, upon request, in appropriate alternative formats to assist persons with a disability (Gov't. Code Section 54954.2(a)). Disability-related accommodations will also be made available to allow participation in the Stationary Source Committee meeting. Any accommodations must be requested as soon as practicable. Requests will be accommodated to the extent feasible. Please contact Evangelina Barrera at 909.396-2583 from 7:30 a.m. to 6:00 p.m., Tuesday through Friday, or send the request to ebarrera@aqmd.gov.

Document Availability
All documents (i) constituting non-exempt public records, (ii) relating to an item on an agenda for a regular meeting, and (iii) having been distributed to at least a majority of the Committee after the agenda is posted, are available prior to the meeting for public review at the South Coast Air Quality Management District, Public Information Center, 21865 Copley Drive, Diamond Bar, CA 91765.

Proposed Amended Rule 1135

Emissions of Oxides of Nitrogen from Electricity Generating Facilities

Stationary Source Committee

August 17, 2018

Regulatory Background for Electricity Generating Facilities (EGFs)

- Rule 1135 was adopted in 1989 – applies to electric power generating systems
- Most EGFs entered RECLAIM in 1993
- Rule 2009 – Compliance Plan for Power Producing Facilities adopted in 2001
  - Required installation of Best Available Retrofit Control Technology (BARCT) through compliance plans for EGFs in RECLAIM

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Rule 2009

- Adopted in response to California's energy issues which significantly increased power production impacting the supply and price of RECLAIM Trading Credits
- Required submittal of compliance plans demonstrating how all RECLAIM NOx emitting equipment will achieve BARCT
- Case-by-case technical and cost-effectiveness BARCT evaluation
  - Majority of equipment under Rule 2009 ranges from 5 to 9 ppmv NOx
- EGFs in RECLAIM have installed BARCT controls, retired equipment, or repowered equipment with more efficient equipment
  - Catalina Island electric power generating equipment not included because total output (~ 9 MW) is less than Rule 2009 threshold (50 MW)

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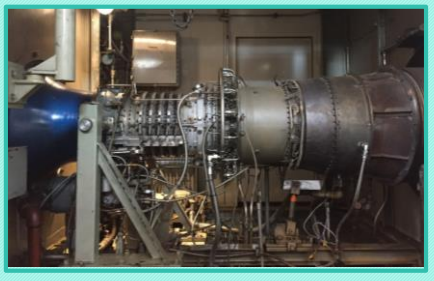
Proposed Amended Rule (PAR) 1135 Applicability

- Applies to 34 electricity generating facilities that are owned or operated by:
  - Market participants of California Independent System Operator Corporation
  - Municipal or public electric utility
  - Electric utility on Catalina Island
  - All but five are RECLAIM facilities
- Industry-specific rule, includes
  - Boilers
  - Combined cycle gas turbines
  - Simple cycle gas turbines
  - Internal combustion engines



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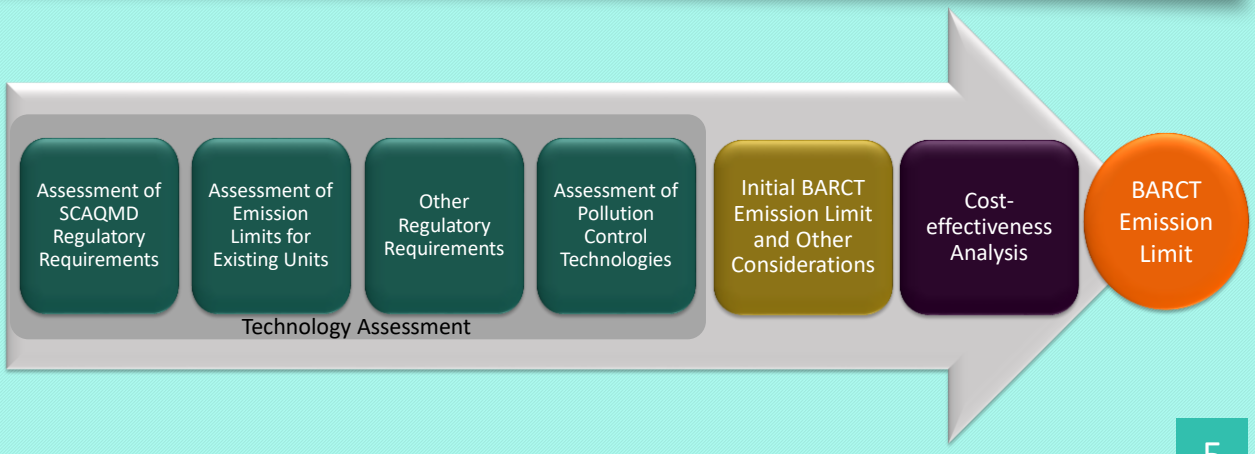
Best Available Retrofit Control Technology (BARCT) Assessment



BARCT analysis is conducted for each equipment category and fuel type

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Proposed NOx Emission Limits

Boilers	5.0 ppmv @ 3% O_2
Turbines – Combined Cycle and Duct Burners	2.0 ppmv @ 15% O_2
Turbines – Simple Cycle	2.5 ppmv @ 15% O_2
Internal Combustion Engines (Diesel)	45 ppmv @ 15% O_2 (Catalina Island only)

- Emission limit of 5.0 ppmv for ammonia slip when using selective catalytic reduction
- For internal combustion engines – incorporate VOC, CO, and PM emission limits
- Effective date: January 1, 2024 (excluding diesel engines and once-through-cooling boilers and turbines)

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Implementation Approach for Diesel Engines at Catalina Island

- Catalina Island has 6 diesel engines that are 1,500 to 3,900 brake horsepower
  - Catalina Island currently emits approximately 69 tons/year
  - 10% of PAR 1135 NOx inventory; for <0.1% of PAR 1135 power output
- PAR 1135 establishes a NOx emission limit of 45 ppmv @ 15% O_2 for diesel engines
  - Compliance with PAR 1135 would reduce emissions to approximately 39 tons/year
- PAR 1135 provides three compliance options to incentivize cleaner technologies:
  - Option 1: Replace or retrofit diesel engines by 2024 – reduce emissions to 39 tons/year
  - Option 2: Reduce emissions to 26 tons/year by 2025 (33% additional reduction)
  - Option 3: Reduce emissions to 13 tons/year by 2026 (67% additional reduction)
- Rule 2009 compliance plans allowed EGFs less than 3 years to achieve BARCT
- PAR 1135 allows Catalina Island 5 to 7 years to achieve BARCT

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Special Considerations for BARCT Analysis

- Exempt units from NOx emission limit if close to BARCT emission limit
  - Cost-effectiveness >> $50,000/ton
  - Combined cycle gas turbines at 2.5 ppmv @ 15% O_2 (PAR 1135 limit is 2.0 ppmv @ 15% O_2)
  - Boilers at 7.0 ppmv @ 3% O_2 (PAR 1135 limit is 5.0 ppmv @ 3% O_2)
- Exempt low-use units from NOx emission limit
  - Cost-effectiveness >> $50,000/ton
  - Must remain below 25% annual capacity averaged over a calendar year and 10% annual capacity averaged over three consecutive calendar years
  - Must incorporate low-use condition in permit

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Cost-Effectiveness

Boilers	• 21 of 24 (88%) already shutting down mainly due to once-through-cooling • Remaining 3 have average cost-effectiveness ~ $50,000/ton NOx reduced
Turbines – Combined Cycle and Duct Burners	• 19 of 28 (68%) already meet proposed BARCT limit; 3 units at 2.5 ppmv • Remaining are low-use and exempt from proposed BARCT limit
Turbines – Simple Cycle	• 45 of 75 (60%) already meet proposed BARCT limit • Remaining are low-use and exempt from proposed BARCT limit
Internal Combustion Engine (Diesel)	• Unique to Catalina Island • Average cost-effectiveness is approximately $27,000/ton NOx reduced

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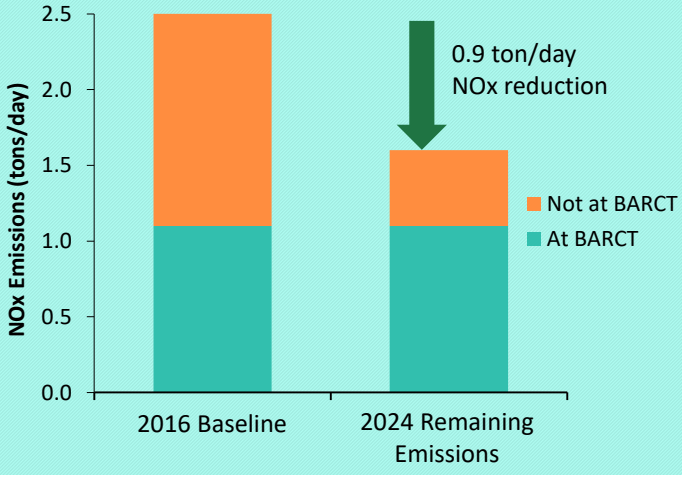
Emission Reductions



- Initial inventory in 1986 was 25.6 tons per day of NOx
- NOx inventory just under 10 tons per day after Rule 2009 implementation
- EGFs emitted 2.5 tons per day of NOx in 2016*
  - 1.1 tons per day from equipment already at BARCT
- PAR 1135 will reduce about 1.4 tons per day
  - 0.8 tons per day from boilers
  - 0.1 tons per day from internal combustion engines

* Based on 2016 fuel usage and permit limits

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Key Issue – Catalina Island Power Generating Equipment

Comment:

- Request for additional flexibility and longer implementation period to replace engines or use other non-diesel technology
  - SCE's July 2018 Proposal
    - Implementation time by 2029 to replace engines (10 years); or
    - Alternative technology (renewable energy and storage) by 2030
  - SCE's August 2018 Proposal
    - Extend implementation time by 2026 to replace engines (7 years); or
    - Potentially install undersea cable by 2028 instead of replacing engines
    - Determined 100% renewable energy and storage not cost-effective

Response:

- PAR 1135 includes three compliance options in order to incentivize cleaner technology
- Implementation timeframe is two to four years longer than timeframe under Rule 2009

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Key Issue – BARCT Analysis

Comment:

- BARCT must be established for each class and category of equipment and may not apply to other equipment or industry groups within the category of equipment
- BARCT assessments should include both emission limits and effective dates

Response:

- BARCT analysis for PAR 1135 and other landing rules is evaluating each category of equipment to account for unique applications
- While data was provided showing cost by device, BARCT is being established for each equipment category
- Implementation schedule for PAR 1135 is January 2024

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Schedule

- October 5, 2018 Set Hearing
- November 2, 2018 Public Hearing

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Status Report on Regulation XIII – New Source Review

Stationary Source Committee
August 17, 2018

NSR Status Report Overview

Purpose:

Demonstrate SCAQMD's NSR program meets federal NSR offset requirements for Major Sources, as required by EPA, for sources that are exempt from offsets under SCAQMD's NSR rule

NSR Status Report History

- SCAQMD has produced Annual NSR Status Reports since 1990
- Around 2002-2004 EPA requested SCAQMD adopt a rule to memorialize equivalency demonstrations
- SCAQMD adopted Rule 1315 - Federal NSR Tracking System in 2006/2007 and adopted a revised Rule 1315 in February 2011
- EPA approved Rule 1315 into the SIP and it became effective on June 25, 2012

Rule 1315 Federal NSR Tracking System

- Rule 1315 established procedures to demonstrate equivalency with federal NSR offset requirements
  - Tracks debits from and credits to SCAQMD's federal internal offset account for each pollutant
  - Annual Preliminary Determination of Equivalency (PDE), Final Determination of Equivalency (FDE) and Projections
  - Balances in SCAQMD's federal offset account must remain positive
  - Cumulative Net Emission Increases must remain below Rule 1315(g) thresholds

SCAQMD's Federal NSR Offset Accounts Final Determination of Equivalency (FDE) (CY 2016)

DESCRIPTION	VOC	NOx	SOx	CO	PM10
2015 Final Ending Balance (tons/day)	**101.20**	**24.82**	**4.10**	**15.75**	**14.96**
2016 Total Credits (tons/day)	4.72	0.7	0.22	15.19	1.22
2016 Total Debits (tons/day)	-0.16	-0.09	0	-0.02	-0.03
2016 Total Discount of Credits for Surplus Adjustment (tons/day)	0.00	-2.73	0.00	0.00	0.00
2016 Final Ending Balance (tons/day)	**105.76**	**22.70**	**4.32**	**30.92**	**16.15**

Cumulative Net Emission Increase February 4, 2011 – December 31, 2016

DESCRIPTION	VOC	NOx	SOx	CO	PM10
2015 Net Emission Increase (tons/day)	-13.97	-2.30	-0.61	N/A	-0.15
2016 Increases in Potential to Emit (tons/day)	1.85	0.59	0.01	N/A	0.37
2016 Decreases in Potential to Emit (tons/day)	-5.90	-0.87	-0.27	N/A	-1.52
Cumulative Net Emission Increase (tons/day)	**-18.02**	**-2.58**	**-0.87**	**N/A**	**-1.30**
Rule 1315(g) Table B Threshold (tons/day)	**7.58**	**0.61**	**0.18**	**N/A**	**1.09**

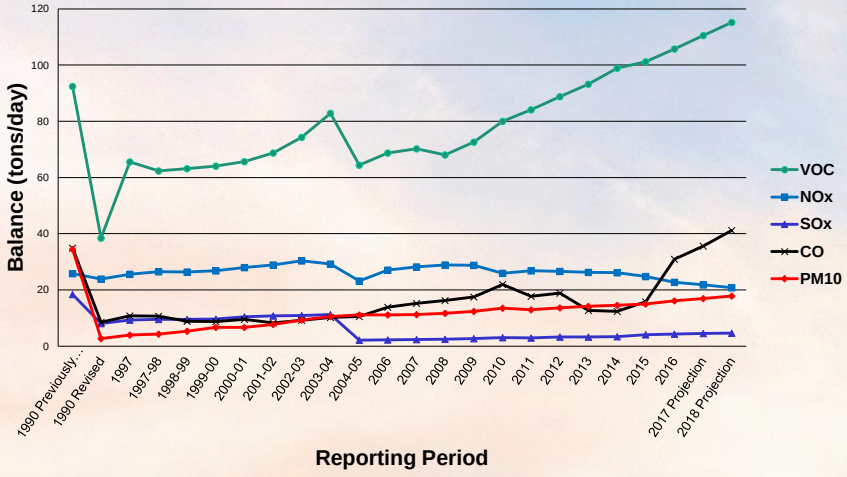
SCAQMD's Projected Federal NSR Offset Accounts CY 2017

DESCRIPTION	VOC	NOx	SOx	CO	PM10
2016 Final Ending Balance (tons/day)	**105.76**	**22.70**	**4.32**	**30.92**	**16.15**
CY 2017 Total Projected Credits (tons/day)	5.19	0.88	0.19	7.03	0.82
CY 2017 Total Projected Debits (tons/day)	-0.35	-0.20	0.00	-2.09	-0.02
CY 2017 Total Projected Discount of Credits for Surplus Adjustment (tons/day)	-0.12	-1.58	0.00	-0.22	0.00
CY 2017 Projected Ending Balance (tons/day)	**110.48**	**21.80**	**4.51**	**35.64**	**16.95**

SCAQMD's Projected Federal NSR Offset Accounts CY 2018

DESCRIPTION	VOC	NOx	SOx	CO	PM10
CY 2017 Projected Ending Balance (tons/day)	**110.48**	**21.80**	**4.51**	**35.64**	**16.95**
CY 2018 Total Projected Credits (tons/day)	5.16	0.83	0.16	8.07	0.85
CY 2018 Total Projected Debits (tons/day)	-0.39	-0.14	0.00	-2.50	-0.02
CY 2018 Total Projected Discount of Credits for Surplus Adjustment (tons/day)	-0.03	-1.68	0.00	-0.05	0.00
CY 2018 Projected Ending Balance (tons/day)	**115.22**	**20.81**	**4.67**	**41.16**	**17.78**

SCAQMD's Federal Offset Account Balances (1990 – 2016, and 2017-2018 Projections)



Conclusions

- The Final Determination of Equivalency for CY 2016 shows SCAQMD's NSR program continued to be at least equivalent to the federal NSR offset requirements
- For CYs 2017 and 2018 it is also projected that SCAQMD's NSR program will continue to be at least equivalent to the federal NSR offset requirements
- The Cumulative Net Emission Increases for CY 2016 remained below the thresholds identified in Table B of Rule 1315(g)(4)
- Next Preliminary Determination of Equivalency for CY 2017 will be presented to the Governing Board in February 2019

Item #3

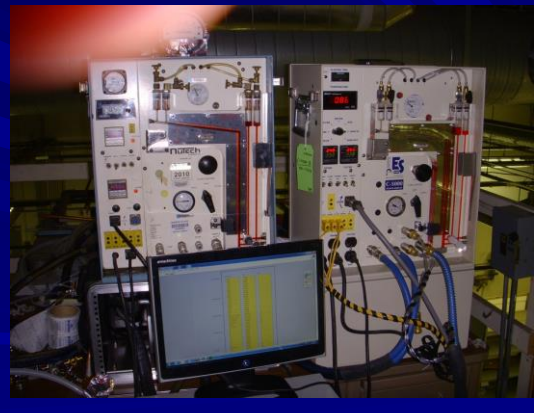
Back to Agenda

Update on the 2016 AQMP Control Measures BCM-01 (PM) & CMB-04 (NOx) for Underfired Charbroilers and Commercial Cooking Equipment

Stationary Source Committee

August 17, 2018

Charbroiling Equipment (PM)



Background

Early studies

- Survey indicated more than 13,000 restaurants in Basin
  - Many are small businesses
- Conducted characterization of various restaurant equipment
- Emission factor development for various meats cooked on under-fired charbroilers
- Majority of direct PM emissions from underfired charbroilers cooking beef
- Rule 1138 adopted in 1997 for chain-driven charbroilers

Cost-effective and affordable control approaches were not available for underfired charbroilers

Other Regulatory Efforts

BAAQMD and SJVUAPCD adopted same chain-driven equipment requirements as SCAQMD Rule 1138

- Underfired charbroiler requirements not adopted due to costs and impacts on restaurant profit margins

BAAQMD later adopted requirements for filterable emissions from larger underfired charbroilers, with exemptions (2007)

SJVUAPCD adopted registration and reporting requirements for underfired charbroilers (June 2018)

- On-site demonstrations of controls inconclusive at this time

Early Efforts

Began rulemaking for underfired charbroilers in 2009

Cost-effective reductions remained elusive (scrubber system costs >$50,000)

Decision to conduct more research

- Issued Program Opportunity Notice in 2012 to evaluate available or newer control technologies
  - Contract with CE-CERT to evaluate various control options
- Sub-contract with UCLA for health study
- Additional tests co-funded by BAAQMD and USEPA

CE-CERT Testing

Various control configurations tested consisting of:

- Electrostatic Precipitators (ESPs)
- Ceramic/microwave regeneration
- Centrifugal Separator
- Diesel PM-style filters
- Multi-stage filters
- In-hood options
- Under grate technologies
- Combination of technologies

Test Results

- ~95% of emissions are less than 1 micron
- Emission control levels can range from 18% to 85%
- Preliminary capital costs range from $5,000 to $50,000 depending on configuration
- Retrofit options limited due to cost considerations and lack of in-field demonstration
- New facility options more feasible

Key Cost Considerations

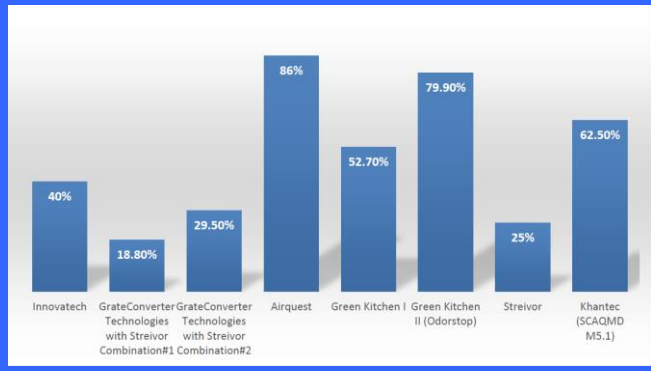
Main benefits would derive from retrofits of existing underfired charbroilers

Cost issues

- Physical ability to retrofit an existing charbroiler control
- Hood size and ducting, as well as control location
- Capital costs to operators due to low-profit margins (mom-and-pop operations)
- Operation and Maintenance costs

Preliminary Findings

Staff Assessment:
There may be an opportunity to balance lower cost options with less control efficiency that combine technologies (i.e., under-grate and in-hood technologies)



Health Impacts Characterization
(UCR & UCLA)

Evaluated particle size and further emissions characterization

Conclusions

- Emissions dominated by organic and elemental carbon
- Contains toxics (PAHs and nitrate-PAHs)
- Controls can significantly reduce:
  - PM emissions
  - Exposure to gaseous toxics (such as carbonyls)
  - Particle- and gas-phase PAHs

Other Commercial Equipment (NOx)

Commercial Cooking

2016 AQMP Control Measure CMB-04:

- Applies to retail and quick service restaurants
- Promotes and incentivizes the use & installation of low-NOx burner technologies
- May consider developing a manufacturer based rule to establish emission limits
- Will seek co-benefit reductions through existing or enhanced energy efficiency programs being implemented by other entities

Issued RFP to conduct NOx emissions characterization for various types of commercial equipment

- Develop test methods for measuring emissions from several types of equipment
- Perform tests on selected equipment to develop baseline NOx and CO emission rates

Scope of Work

Protocol development performed by :	• The Gas Company (Sempra Energy) • SCAQMD
Emission testing performed by :	• The Gas Company (Sempra Energy) • Frontier Energy, Inc. DBA Fisher – Nickel, Inc. contracted by SCAQMD (Jan 26, 2017 – June 30, 2018)
The units for testing:	• Boilers, fryers, griddles, and ovens (convection, combination, range, deck, conveyor, and rack) • Total of 48 units, 27 assigned to the Gas Company and 21 assigned to Frontier Energy for testing • Will investigate residential applications

Status of Test Protocol Development

Nine final draft test protocols developed for determining NOx emissions from:

Deep fat fryer	Griddle	Underfired broiler	Convection oven	Rack oven	Combination oven	Conveyor oven	Deck oven	Range oven

Status of Emission Testing

- Testing completed for 27 units by the Gas Company and for 13 units by Frontier Energy as below
- The contract with Frontier Energy ended on June 30, 2018

Equipment Type	the Gas Company		Frontier Energy	
	Standard	Efficient	Standard	Efficient
Boiler	4			
Fryer			3	5
Griddle			3	2
Oven – Combination	1	5		
Oven – Convection	2	4		
Oven – Conveyor	2	1		
Oven – Rack	1	1		
Oven – Deck	3			
Oven – Range	3			

- **Results under review**

Next Steps

Analyze testing results and approve final report → Determine if additional testing should be performed → Seek further collaboration with the food service industry and other entities for CMB-04