



South Coast
AQMD

Proposed Amended Rule 1134 Public Workshop & CEQA Scoping

December 18, 2018

Background

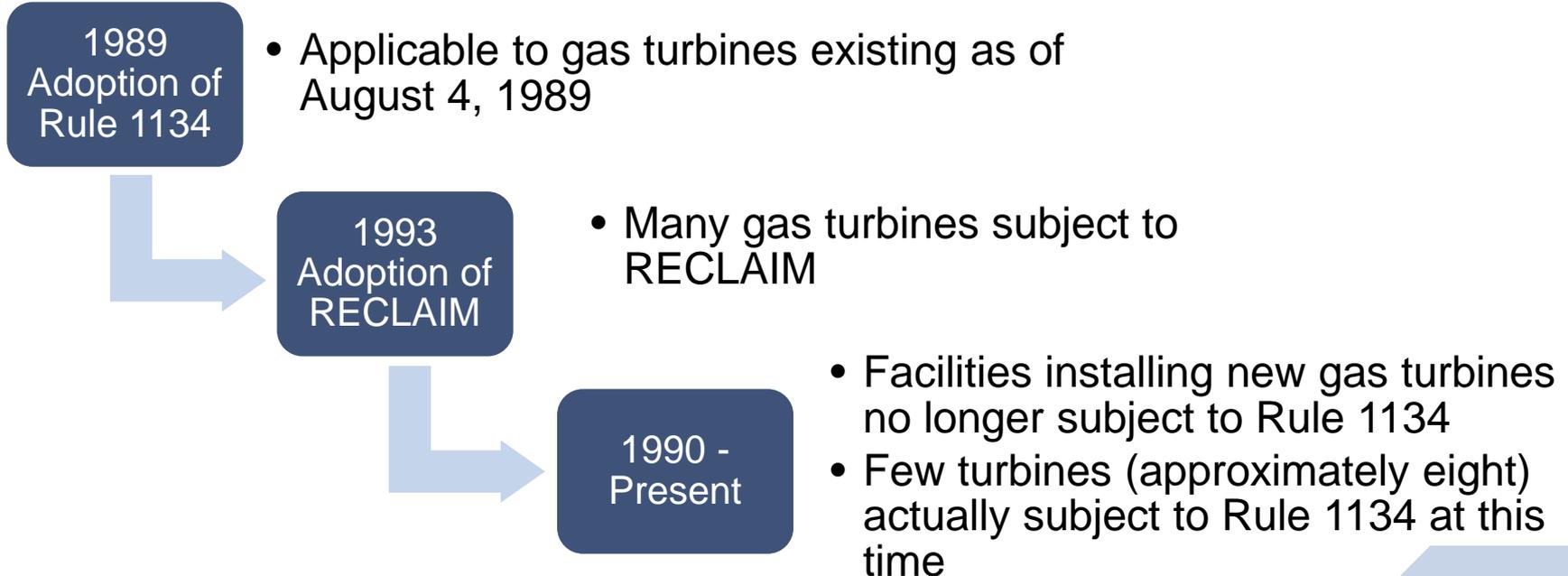
Public Process

- Four Working Group Meetings
 - ▷ February 22, 2018
 - ▷ April 26, 2018
 - ▷ June 13, 2018
 - ▷ August 10, 2018
- Eight site visits
- Seven individual meetings

Background

- 2016 Air Quality Management Plan
 - ▷ Control Measure CMB-05 called for further NO_x reductions from an assessment of the RECLAIM program, including:
 - ▷ A 5 ton per day NO_x reduction to be achieved no later than 2025; and
 - ▷ Sunsetting the RECLAIM program and transitioning to a command-and-control regulatory structure that requires Best Available Retrofit Control Technology (BARCT) level controls
- AB 617 (2017)
 - ▷ Expedited schedule for implementation of BARCT for facilities in the greenhouse gas cap-and-trade program
 - ▷ Implementation schedule to be developed by 1/1/2019
 - ▷ Full BARCT implementation by 12/31/2023

Regulatory Timeline for Stationary Gas Turbines



Proposed Rule Language

Overview

- Rule language based on rule concepts with input from stakeholders
- Limits provided in rule from BARCT assessment
 - Special consideration for low-use and units close to proposed NOx limit
- Presentation will highlight key provisions of proposed rule language

Purpose – Subdivision (a)

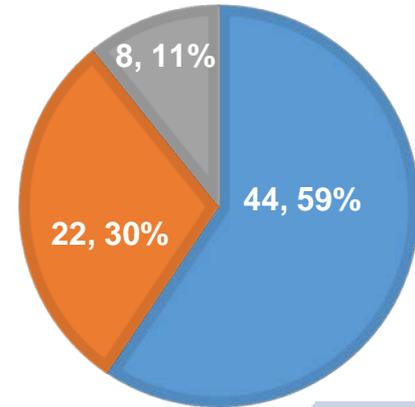
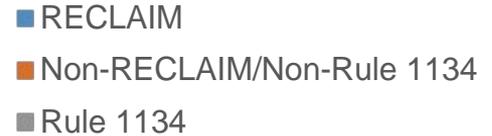
- The purpose of the rule is to reduce oxides of nitrogen (NO_x) from stationary gas turbines



Applicability – Subdivision (b)

- Applies to turbines, regardless of installation date
- Retain size threshold of ≥ 0.3 MW output
- Does not apply to turbines subject to:
 - ▷ Electricity Generating Facilities (Rule 1135)
 - ▷ Landfills (Proposed Rule 1150.3)
 - ▷ Petroleum Refineries (NAICS 324110/ Proposed Rule 1109.1)
 - ▷ Publicly Owned Treatment Works (Proposed Rule 1179.1)

NUMBER OF PAR 1134 TURBINES



Key Definitions – Subdivision (c)

- Annual Capacity Factor – Ratio between measured heat input from fuel consumption and potential heat input if operated continuously over a year
- Start-Up – Start-Up ends when the turbine generates electricity for sale or for use including on-site use
 - ▶ Consistent with U.S. EPA definition of Start-Up for gas turbines

Key Definitions – Subdivision (c) *(continued)*

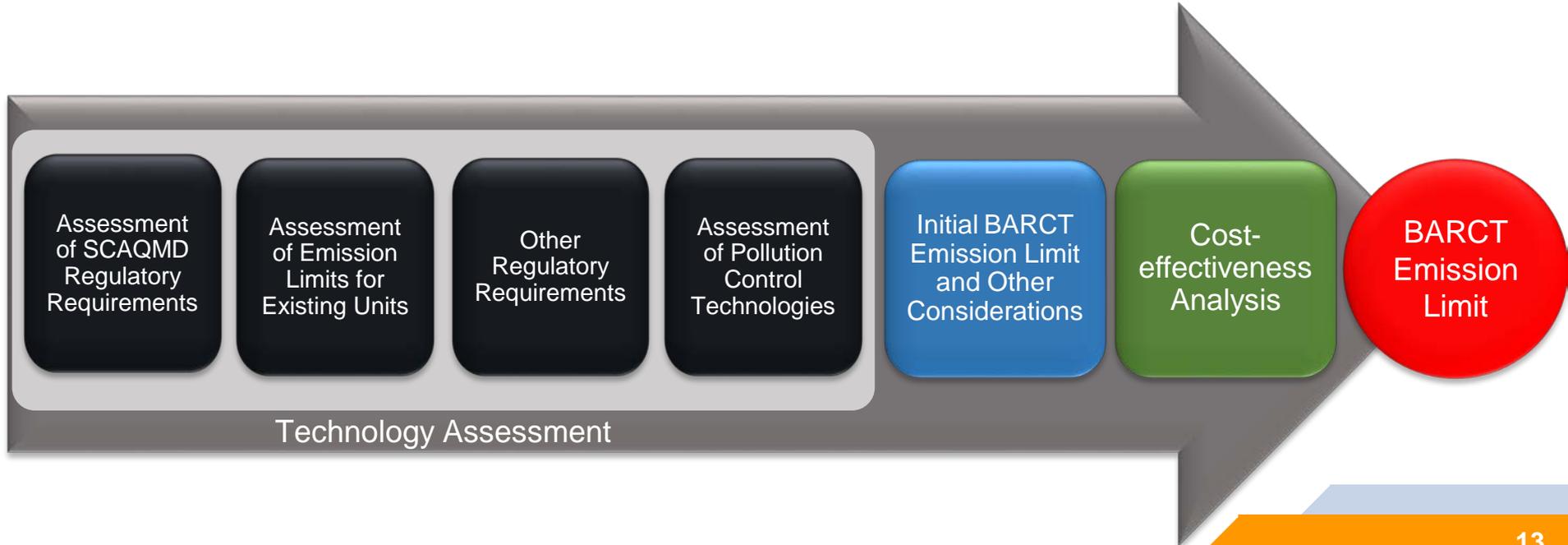
- Landfill – Solid waste disposal facility (SCAQMD Rule 1150.1)
- Natural Gas – Pipeline quality gas (SCAQMD Rule 2000)
- Produced Gas – Gas associated with the production, gathering, separation, or processing of crude oil (SCAQMD Rule 1148.1)
- Publicly Owned Treatment Works – Wastewater treatment or reclamation plants (SCAQMD Rule 1179)

Existing Requirements – Paragraphs (d)(1) and (d)(2)

- Current emission limits retained during interim for existing turbines until emission concentration limits in paragraph (d)(3) are met or become effective
- Current emission limits do not apply to:
 - ▷ Turbines exiting RECLAIM
 - ▷ Turbines in operation after August 1989
 - ▷ Applying current limits would add costs and slow progress to meet BARCT limits
- Retains notice of applicability of Regulation XIII if CO emissions increase when NOx controls installed
 - ▷ Informational statement that Regulation XIII applies if there are emission increases on other pollutants
 - ▷ No CO emission limits in PAR 1134

BARCT Assessment

BARCT analysis is conducted for each equipment category and fuel type



Emission Limits – Paragraph (d)(3)

Table I: Emissions Limits for Stationary Gas Turbines

Fuel Type	NOx (ppmv @ 15% O2)	Ammonia (ppmv @ 15% O2)
Liquid – Outer Continental Shelf	30	5
Natural Gas – Combined Cycle	2	5
Natural Gas – Pipeline Gas Turbine	8	5
Natural Gas – Simple Cycle	2.5	5
Produced Gas	5	5
Produced Gas – Outer Continental Shelf	15	5
Other	12.5	5

- Effective Date: January 1, 2024
 - ▷ Analyzing effective date for facilities with multiple equipment

Start-Up, Shutdown, and Tuning Requirements – Paragraph (d)(4)

- Emission limits in Table I not applicable during Start-Up, Shutdown, and Tuning
- SCAQMD permits establish provisions for start-up, shutdown, and tunings
 - Specifies duration, mass emissions, frequency for start-up and shutdown
 - Permit may contain additional conditions for tunings



Averaging Time – Paragraph (d)(5)

- Units installed or retrofitted after rule amendment shall average emission limits over a 60 minute rolling average
 - ▶ 60 minute rolling average requires software modification
 - ▶ Permits will contain similar requirement
- Units installed prior to rule that comply with proposed limits shall retain current averaging time requirements specified in the permit
 - ▶ Existing averaging times vary widely

Prohibition of Liquid Fuel – Paragraph (d)(6)

- Prohibits use of liquid fuel except for gas turbines located on Outer Continental Shelf
 - Liquid fuel needed when produced gas is insufficient; no access to pipeline natural gas
- Fuel must be 10% or greater liquid content by volume to qualify for higher limit



Photo by Beta Offshore www.betaoffshore.com

Permit Reconciliation – Paragraph (d)(7)

- Permits for stationary gas turbines shall submit an application by July 2022 to reconcile permit with changes to Rule 1134
 - ▶ Removes RECLAIM requirements and includes new Rule 1134 provisions

Overview of Monitoring, Reporting, and Recordkeeping (MRR) – Subdivision (e)

- SCAQMD is current working on adopting Rule 113 – Monitoring, Reporting, and Recordkeeping (MRR) Requirements for NO_x and SO_x Sources
- Once Rule 113 is adopted, all Rule 1134 facilities will transition to Rule 113 for MRR
- In the interim, the intention of the PAR 1134 MRR is to maintain current MRR for all facilities

Monitoring, Reporting, and Recordkeeping – Subdivision (e)

Facility Type	Rule Paragraph	MRR Requirement
Non-RECLAIM	(e)(1)	Comply with SCAQMD Rule 218
RECLAIM	(e)(3)	Comply with SCAQMD Rule 2012
Former RECLAIM	(e)(4)	Comply with SCAQMD Rule 2012 excluding reporting requirements

Source Testing – Paragraph (e)(2) and Test Methods – Subdivision (f)

- Require source testing for turbines rated ≤ 2.9 MW
 - ▷ Adding SCAQMD Test Method 207.1 for ammonia – Paragraph (f)(1)
- Retain annual source test for NO_x and ammonia for turbines emitting 25 tons or more of NO_x per calendar year
- Source testing every three calendar years otherwise
 - ▷ Previously was every 8,400 hours
 - ▷ New requirement provides consistency and predictability
- Includes SCAQMD Test Method 207.1 for ammonia

Recordkeeping - Paragraph (g)(3)

- Require data acquisition system to record compliance with emission concentration limits in rule
 - ▷ Monthly emission summary removed
 - ▷ Provides needed information to determine compliance without requiring extensive reporting

Exemptions – Paragraphs (h)(1) through (h)(5), excluding (h)(4)

- Removed exemptions for equipment no longer in SCAQMD jurisdiction or no longer existing – paragraphs (h)(1) and (h)(2)
- Exempt existing combined cycle turbines from Table 1 limits that are already permitted at 2.5 ppmv NO_x or less at 15% oxygen
 - ▶ Found not to be cost-effective
- Turbines that do not use SCR are not required to conduct ammonia concentration testing

Low-Use Turbines – Paragraph (h)(4)

- Some turbines are operated sporadically
 - ▷ Low-use units are not cost-effective to install additional control equipment
- NOx concentration not applicable for turbines that:
 - ▷ Operate less than 25% of annual capacity factor in one year;
 - ▷ Operate less than 10% averaged over three years;
 - ▷ Retain NOx and NH3 limits, averaging times, and start-up, shutdown, and tuning requirements in current permit; and
 - ▷ Apply for permit condition limiting annual capacity factor by July 2022

Exceedance of Low-Use Provision – Clause (h)(4)(D)

Ensures that low-use threshold is maintained and provides instructions if exceedance

- Demonstrate each March that turbine remains below annual capacity factor threshold
- If exceedance:
 - ▷ Submit permit application within six months from reported date
 - ▷ Submit CEMS Plan within six months
 - ▷ Operate in compliance with limits in Table I by two years from date of reported exceedance

Cost-Effectiveness and Emission Reductions

Cost-Effectiveness

- AQMP has a threshold is \$50,000/ton NOx reduced – provides guidance on threshold for BARCT rules
- Calculated using Discounted Cash Flow Method
 - ▷ Cost Effectiveness = Present Value / Emissions Reduction Over Equipment Life
 - ▷ Present Value = Capital Cost + (Annual Operating Costs * Present Value Formula)
 - ▷ Present Value Formula incorporates nominal interest rate

Estimated Emissions Inventory and Reductions

- **Baseline Emissions**
 - ▶ Determined by using reported fuel consumption and permit emission limit
- **PAR 1134 Emissions**
 - ▶ Determined by using reported fuel consumption and proposed emission limit
- **Emission Reductions = Baseline Emissions - PAR 1134 Emissions**

Cost Estimates

- Retrofit costs determined using U.S. EPA's Air Pollution Control Cost Estimation Spreadsheet for Selective Catalytic Reduction¹
 - ▷ Methodology based on U.S. EPA Clean Air Markets Division Integrated Planning Model
 - ▷ Size and costs of SCR based on size, fuel burned, NOx removal efficiency, reagent consumption rate, and catalyst costs
 - ▷ Capital costs annualized over 25 years at 4% interest rate
 - ▷ Annual MW output based on 2015 annual reported emissions
 - ▷ Values reported in 2015 dollars
- Stakeholders are welcome to provide staff with their own costs and cost effectiveness calculations

¹https://www.epa.gov/sites/production/files/2017-12/documents/scrcostmanualchapter7thedition_2016revisions2017.pdf

Summary of Cost-Effectiveness

Combined Cycle Turbines and Duct Burners

- 7 of 17 (41%) already meet proposed BARCT or at 2.5 ppmv
- Remaining 10 have average cost-effectiveness of \$5,900/ton NOx reduced

Simple Cycle Turbines

- 2 of 27 (7%) already meet proposed BARCT limit; 11 low-use units
- Remaining 14 have average cost-effectiveness of \$6,100/ton NOx reduced

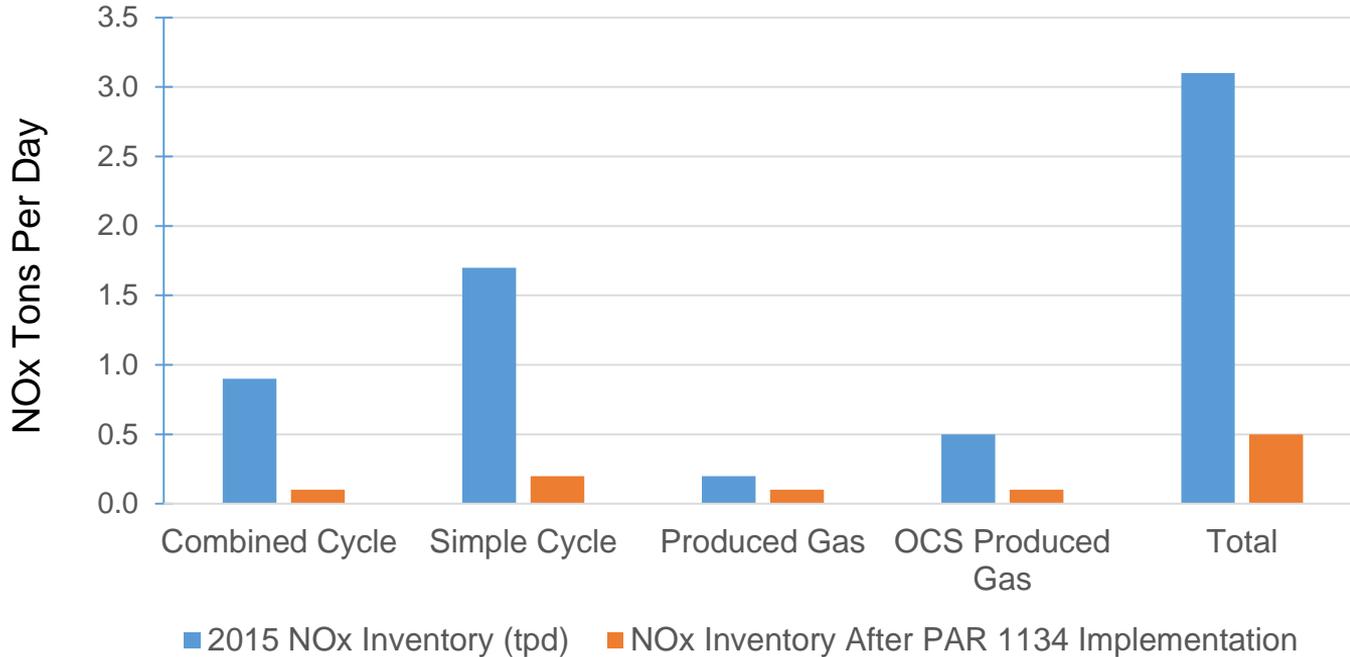
Produced Gas Turbines

- 1 of 5 (20%) already meet proposed BARCT limit
- Remaining four have average cost-effectiveness of \$43,600/ton NOx reduced

Outer Continental Shelf Produced Gas Turbines

- None currently meet proposed BARCT limit
- Average cost-effectiveness is approximately \$3,600/ton NOx reduced

Emission Inventory and Reductions



- 2015 Inventory is 3.1 tons per day
- After implementation, PAR 1134 will reduce 2.6 tons per day of NOx

California Environmental Quality Act (CEQA)

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- California State Law adopted 1970
- Purpose [CEQA Guidelines Section 15002(a)]
 - ▷ Inform governmental decision-makers and public about potential significant effects of projects
 - ▷ Identify ways to avoid or reduce adverse impacts
 - ▷ Require feasible alternatives and mitigation measures to prevent significant environmental damage
 - ▷ Disclose to the public why a project was approved
- Applies to projects undertaken by a Public Agency such as SCAQMD adoption of rules [CEQA Guidelines Section 15002(b)]
 - ▷ Required to comply with CEQA when approving a project [CEQA Guidelines Section 15002(d)]
 - ▷ Required for discretionary approvals [CEQA Guidelines Section 15002(i)]
- Lead Agency = SCAQMD
 - ▷ Oversight and legal responsibility for appropriate CEQA document preparation, circulation, response to comments, and approval/certification

California Environmental Quality Act (CEQA)

- PAR 1134 is a project subject to CEQA
- PAR 1134 contains changes that are revisions to the March 2017 Final Program Environmental Impact Report (EIR) for the 2016 Air Quality Management Plan (AQMP)
 - ▷ New potentially significant adverse impacts to the topics of air quality and hazards and hazardous materials are expected that were not analyzed in the March 2017 Program EIR
 - ▷ CEQA Guidelines Section 15162(b) allows preparation of a SEA based on project changes or new information available after adoption of a previous EIR
- Decision to prepare 45-day Draft Subsequent Environmental Assessment (SEA) to the March 2017 Final Program EIR for the 2016 AQMP
- Due to potentially significant adverse impacts, a CEQA scoping meeting is required pursuant to Public Resources Code Section 21083.9(a)(2)

California Environmental Quality Act (CEQA)

- Draft SEA will:
 - ▾ Analyze alternatives and mitigation measures
 - ▾ Focus on potentially significant adverse impacts to the topics of air quality and hazards and hazardous materials
 - ▾ Include comment letters received at CEQA scoping meeting and responses
 - ▾ Be released for 45-day public review and comment period, upon completion
- Final SEA will:
 - ▾ Include comment letters submitted relative to draft SEA and responses
 - ▾ Additional modifications to reflect any changes to the project since the release of the draft SEA
 - ▾ Be presented to the governing board for consideration and certification, if the project is approved

Scope of Socioeconomic Impact Assessment

Legal Requirements California Health & Safety Code Sections 40440.8(a) and (b)

- Socioeconomic Impact Assessment considers:
 - ▷ Type of affected industries, including small businesses
 - ▷ Impact on employment and the regional economy
 - ▷ Range of probable costs, including costs to industry or business
 - ▷ Availability and cost effectiveness of alternatives
 - ▷ Socioeconomic impacts of CEQA Alternatives
- Governing Board shall:
 - ▷ Actively consider socioeconomic impacts
 - ▷ Make a good faith effort to minimize adverse socioeconomic impacts

Cost Considerations

- One-time compliance costs
 - ▷ Capital cost of new equipment
 - ▷ SCR retrofit
 - ▷ Turbine replacement
 - ▷ Permitting
- Recurring costs
 - ▷ Source testing
 - ▷ Increased ammonia usage
- Opportunity costs for facilities exiting RECLAIM
 - ▷ Lost revenues for facilities with excess RTC holdings
 - ▷ Cost savings for facilities with insufficient RTC holdings

Key Assumptions

- Analysis horizon: 2020 to 2045
- Equipment life: 25 years
- Discount rate: 1% & 4%
- Cost-effectiveness threshold: \$50,000/ton

Schedule

Current Tentative Schedule

- Stationary Source Committee February 15, 2019
- Set Hearing March 1, 2019
- Public Hearing April 5, 2019

Contacts

PAR 1134 Development

Michael Morris, mmorris@aqmd.gov, (909) 396-3282

Uyen-Uyen Vo, uvo@aqmd.gov, (909) 396-2238

CEQA Questions

Ryan Banuelos, rbanuelos@aqmd.gov, (909) 396-3479

Socioeconomic Questions

Ryan Finseth, rfinseth@aqmd.gov, (909) 396-3575

RECLAIM Questions

Gary Quinn, P.E., gquinn@aqmd.gov, (909) 396-3121

Kevin Orellana, korellana@aqmd.gov, (909) 396-3492

General Questions

Susan Nakamura, snakamura@aqmd.gov, (909) 396-3105