Concepts to Reduce Emissions from Locomotives and Railyards
Meeting Agenda

- Introductions
- Background
- CARB Concepts
- South Coast Concepts
- Questions
What do we need to minimize the community health impacts from locomotives?

- Engaged community partners
- Industry leadership
- Coordinated state and local government actions
- Multi-year incentive funding
- More stringent national standards
Railyard Emissions Sources

- Locomotives
- Cargo Handling Equipment
- Forklifts
- Truck Fleets
- Drayage Trucks
- TRUs
Line Haul Locomotives

- Large, high horsepower
- Travel throughout country
- Difficult to incentivize
Switchers

- Small, lower horsepower
- Typically older
- Generally stay local
- State incentives available
CARB Background on Rail

1998 South Coast Agreement (sunset 2030)
• Average Tier 2 NOx emissions standard
• Railroads report activity
• Credits provided for early technology adoption

2005 Statewide Railyard Agreement (sunset 2015)
• Idle reduction, repair and reporting effort
• Use of cleaner diesel fuel
• 17 railyard health risk assessments
South Coast AQMD – Rail Activities

• 2017
  South Coast AQMD Board directed staff to develop a draft Indirect Source regulation on railyards, and explore voluntary approaches

• 2018/2019
  Staff collected emission inventory information from UP/ BNSF

• 2019
  All three year-1 AB617 communities identified railyards as a top priority (Commerce/E. LA, Wilmington/West Long Beach/Carson, San Bernardino)
State of Locomotive Technology

- Tier 4 (2015)
- Locomotive Petition to U.S. EPA
- Currently Demonstrating Batteries on Locomotives

### Emission Standards

<table>
<thead>
<tr>
<th>Tier</th>
<th>NOx</th>
<th>PM</th>
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<tbody>
<tr>
<td>Tier 3</td>
<td>9</td>
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<td>Tier 4</td>
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<td>Tier 5</td>
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Petitioned Emission Standards

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[Reference](https://www.epa.gov/)

[California Environmental Protection Agency](https://www.epa.gov/)
Locomotive Emissions in the South Coast

Tier 4 in 2018: 4.1%

Cleanest
- Tier 4
- Tier 3/ULEL

Dirtiest
- Tier 2/2+
- Tier 1/1+
- Tier 0+ and Older
## Who Can do What?

<table>
<thead>
<tr>
<th>Federal: U.S. Environmental Protection Agency</th>
<th>State: California Air Resources Board (CARB)</th>
<th>Local: Air Quality Management Districts (SCAQMD)</th>
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<tbody>
<tr>
<td>• Regulate locomotive emissions standards</td>
<td>• Regulate locomotive activity</td>
<td>• Regulate railyard emissions</td>
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<tr>
<td>• Stationary and Mobile Source Authority</td>
<td>• Primarily Mobile Source Authority</td>
<td>• Primarily Stationary and Indirect Source Authority</td>
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[Image of United States map highlighting California and a railyard with trains]
CARB Statewide Concepts

1. Establish a Locomotive Emissions Reduction Spending Account
2. In-Use Locomotive Remanufacture Limit
3. Adopt U.S. EPA 30 Minute Idling Limit
4. Genset Repurposing
1. Establish a Locomotive Emissions Reduction Spending Account

2. Charges held in the individual Railroads’ trust, with annual public reporting of locomotive usage and funds deposited.

3. Railroad uses accumulated charges for cleaner locomotives, with reporting.

Assess charge to Railroads for locomotives based on emissions level and amount of work performed in CA.

Tier 0 $$$$$
Tier 1 $$$
Tier 2 $$
Tier 3 $
Tier 4
2. In-Use Locomotive Remanufacture Limit

- Railroads currently have no limit how many times they can remanufacture
  - Remanufacture only needs to be as-built or “plus” standard
  - When implemented, any locomotive already remanufactured more than once would be banned from California
- Alternative: remanufacture to Tier 4 and continue California operation
3. Adopt U.S. EPA 30 Minute Idling Limit

- Incorporates Federal requirements in California SIP
- Makes the rule CARB enforceable
- Enforcement by Air Districts possible through enforcement MOU
4. Genset Repurposing

- Tier 3 generator sets not fit for Class 1 use
- Class 3 operating much older, lower use locomotives
- Potential Class 3 use?
- Class 1 acquire new Tier 4?

Class 1
Tier 3

becomes a

Class 3
Tier 3

Class 3
Pre Tier 0
South Coast AQMD Concepts

1. Indirect Source Rule (ISR) to Reduce Exposures from Locomotive Maintenance Emissions
2. ISR to Require Engineering Plans for Zero Emissions Operations
3. New Incentive Program Focused on Cleanest Locomotive Use
4. Evaluate New Monitoring Approaches for In-Use Locomotives
1. Reduce Exposures from Locomotive Maintenance Emissions

- Community has placed high priority on reducing exposure from locomotive maintenance
- Some railyards have >10,000 maintenance events per year
- Load testing and idling can have high emissions

Proposed ISR Requirements

→ Minimum distances to sensitive receptors (buffer)
→ Install/Use emission control equipment
→ Schedule maintenance activities to reduce impacts
2. Engineering Plans for Zero Emissions Operations

- Community priority on zero emission on-site equipment
- For transition to Zero Emissions operations, significant infrastructure upgrades are needed
  - Land, electrical equipment, site-specific engineering, etc.
- Coordination with local utilities is critical

Proposed ISR Requirements

→ Railroads prepare site-specific Zero Emissions Plans
→ South Coast AQMD and CARB would evaluate plans to identify next steps (regulations, incentives, etc.)
3. New Incentive Program Focused on Cleanest Locomotive Use

- Current incentive programs have limited effectiveness in accelerating the widespread use of the cleanest locomotives (Tier 4)
- Programs require in-state use and replacement
- Railroads have shown that preferential routing is possible with 1998 MOU Tier 2 requirement
- Attract cleanest existing locomotives now
  - Faster possible emission reductions than regulations
- Potentially funded by Railroads through proposed CARB spending account

Potential Approach:

- Develop new local program that provides incentives tied to clean locomotive use, not replacement
- Increased incentives in disadvantaged communities

South Coast AQMD funded 19 freight locomotives since 2016 (~$37 million total)
4. Evaluate New Monitoring Approaches for In-Use Locomotives

- South Coast AQMD continues to receive air quality complaints about smoking locomotives
- We pass along the complaint to the railroads
- EPA sets emissions standards, but only requires in-use testing for up to five locomotives per railroad per year
- Better data on local air quality impacts of smoking locomotives can lead to follow-up actions/priorities

Potential Approach

→ Evaluate new monitoring technologies to document air quality impacts
→ Use data to support follow-up regulatory or enforcement actions to reduce emissions
Path Forward on Freight

- Coordinated SCAQMD ISR and CARB regulatory efforts
- Complementary multi-agency approach
- Near-term and long-term solutions
- Coordinate & expand incentives for freight transition to zero emissions operations

Protect communities near freight facilities
Next Steps

• Hold second joint workshop in South Coast
• Continue to reach out to stakeholders to develop South Coast AQMD concepts
• Continue South Coast AQMD partnership with CARB as they develop their concepts
• CARB to hold additional workshops statewide
Stakeholder Feedback

• CARB Freight Team
  (916) 322-8382, Freight@arb.ca.gov
  www.arb.ca.gov/rail_concepts

• South Coast AQMD: Ian MacMillan
  (909) 396-3244, imacmillan@aqmd.gov
  www.aqmd.gov/fbmsm