



Development of Amendments to the In-Use Off-Road Diesel-Fueled Fleets Regulation

South Coast AQMP Mobile Source Working Group
June 15, 2021

Agenda

Background

Air Quality Goals

Off-Road Emissions Contribution

Current Regulation Status

Goals for the Off-Road Diesel Strategy

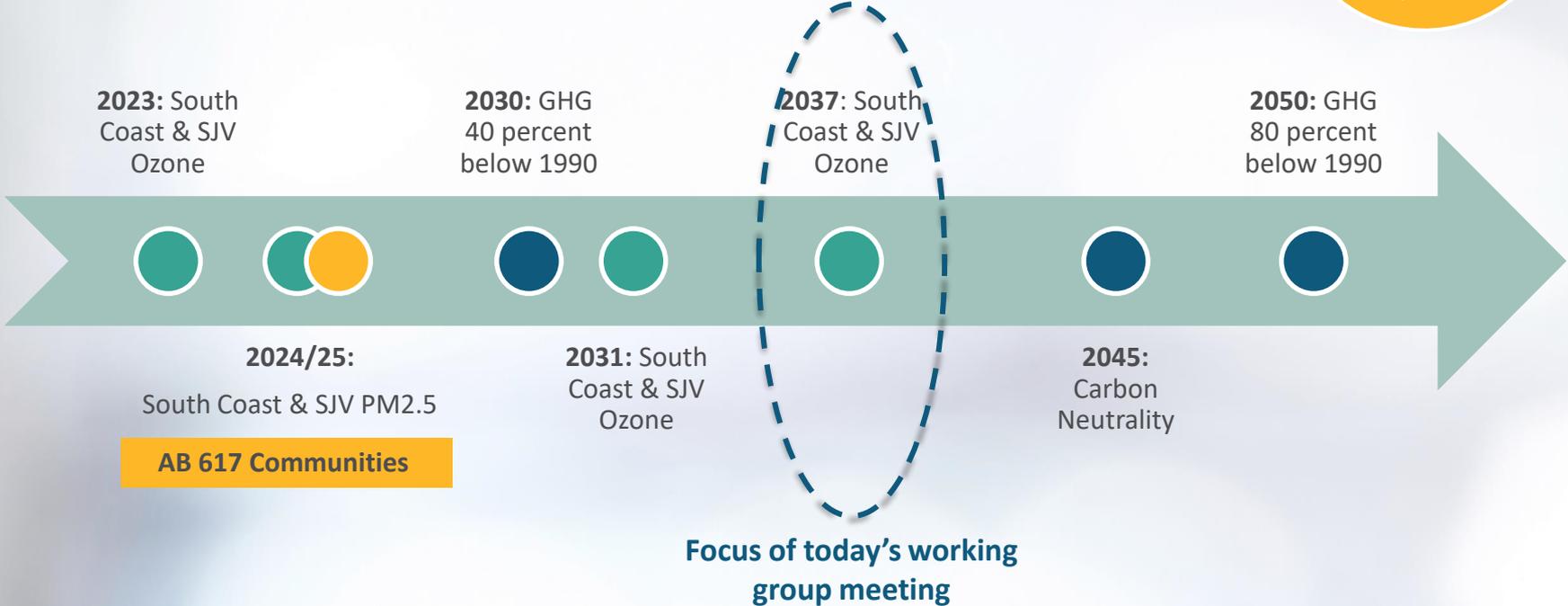
Off-Road Diesel Strategy

Potential Amendment Concept

Potential Future Strategies

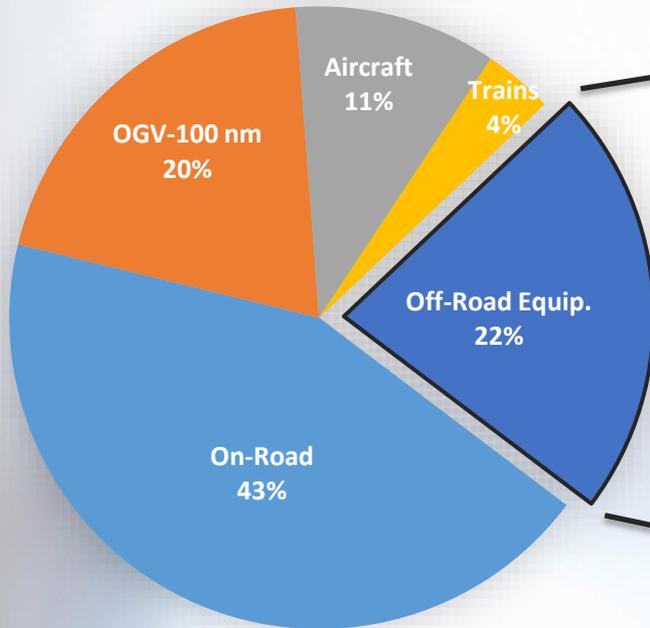
Next Steps

California's Air Quality and Climate Goals

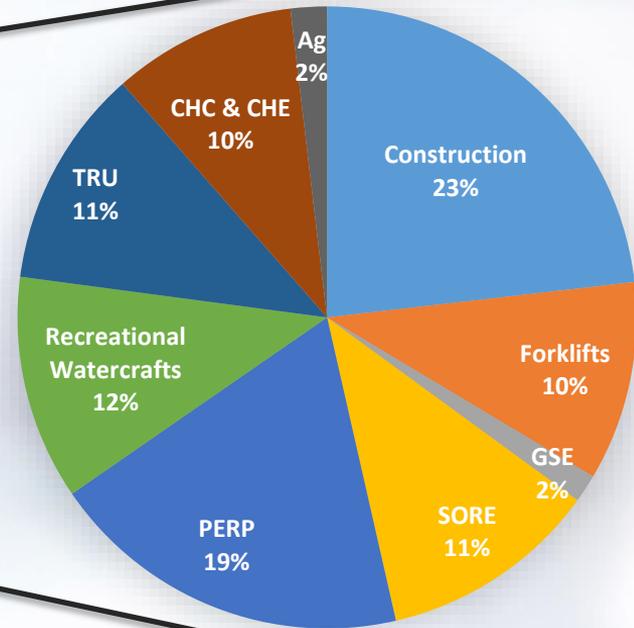


Off-Road NOx Emission Contribution

Mobile Source NOx emissions in SC in 2037

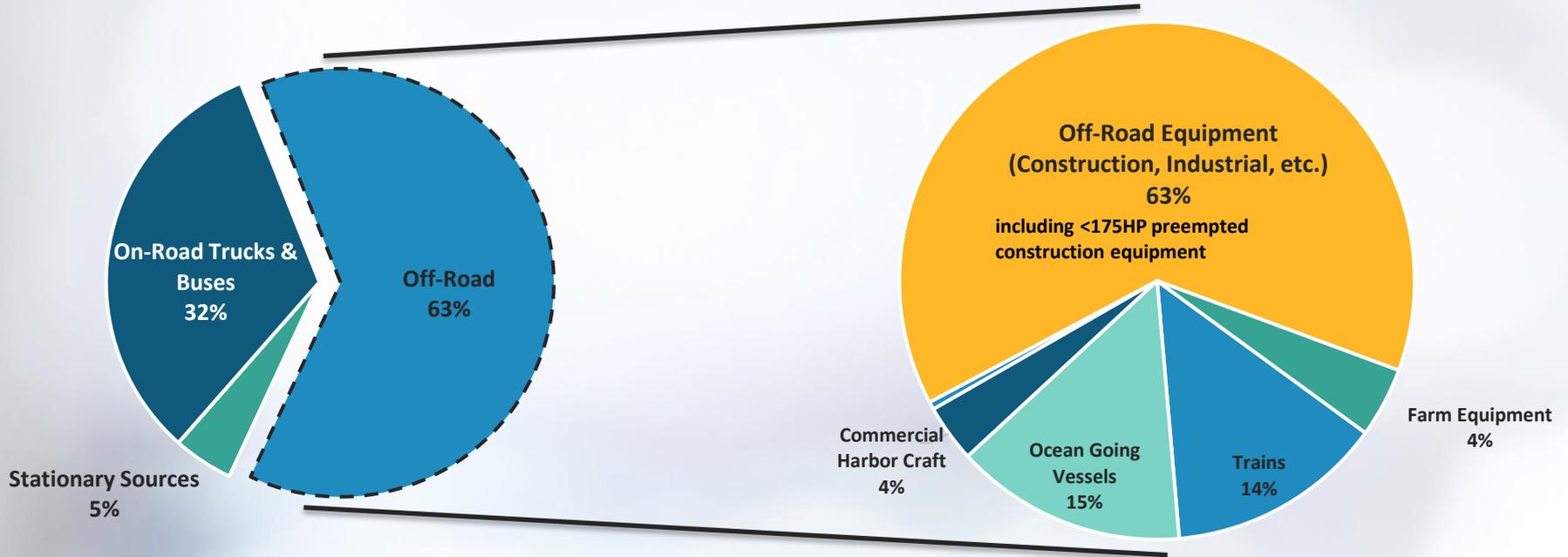


Off-Road Equipment NOx emissions in SC in 2037



Off-Road Diesel PM Emission Contribution

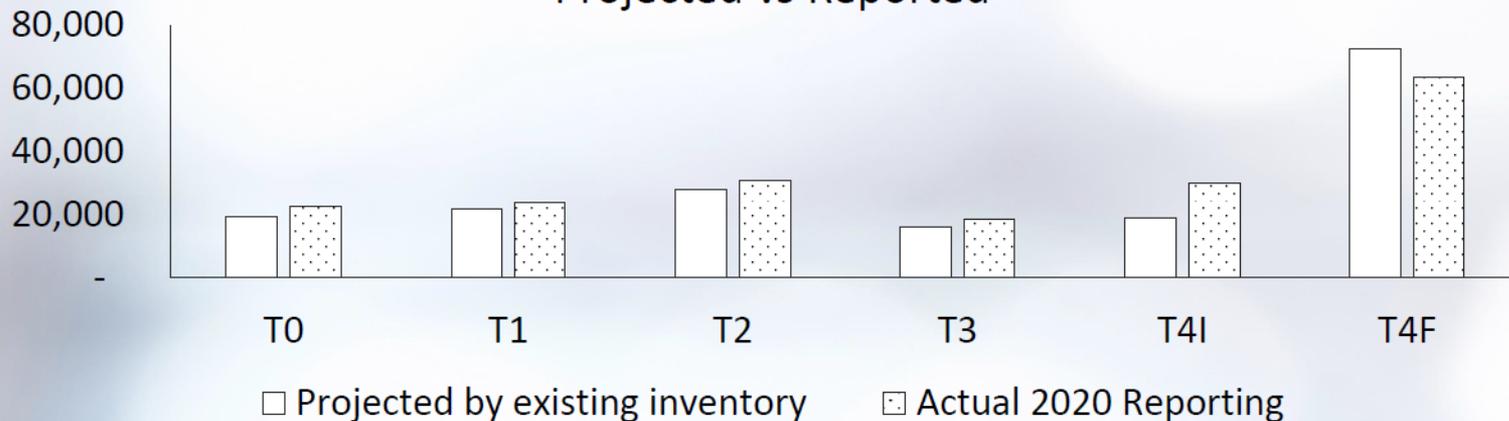
Diesel PM emissions in SC in 2020



Draft 2021 In-Use Emission Inventory

- New inventory in progress, aiming for completion in summer 2021
- Initial distribution shows slightly more Tier 0 to Tier 2 than projected by the 2011 inventory

Statewide In-Use Equip. Population in 2020 by Tier:
Projected vs Reported



Current Off-Road Diesel Overview

Applicability

- Vehicles with diesel-fueled off-road compression-ignition engines with maximum horsepower of 25 or greater

Reporting

- Report to CARB
- Vehicle labeling is also required

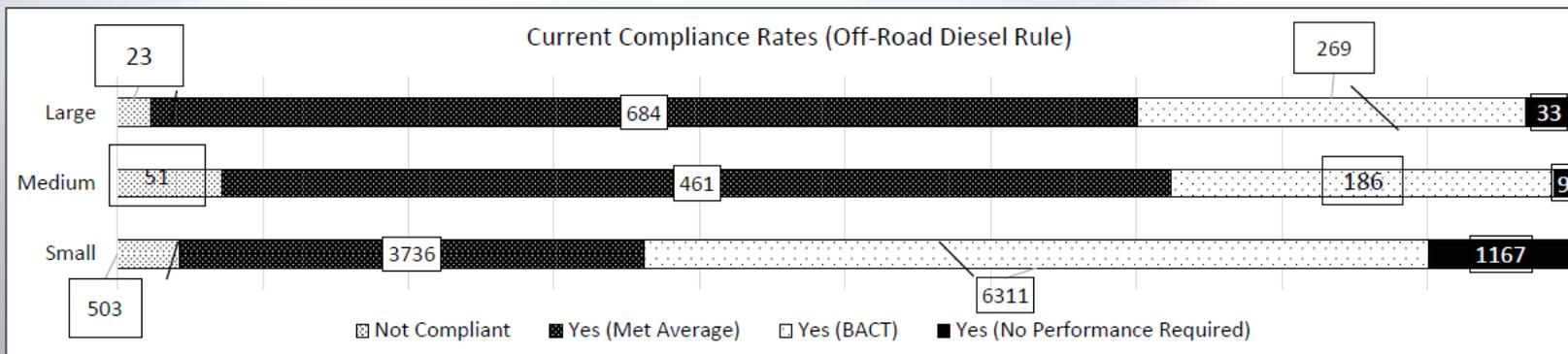
Performance

- Meet declining fleet average target
- Gradually reduce fleet emissions through turnover, repower, or retrofits

Current Off-Road Diesel Structure

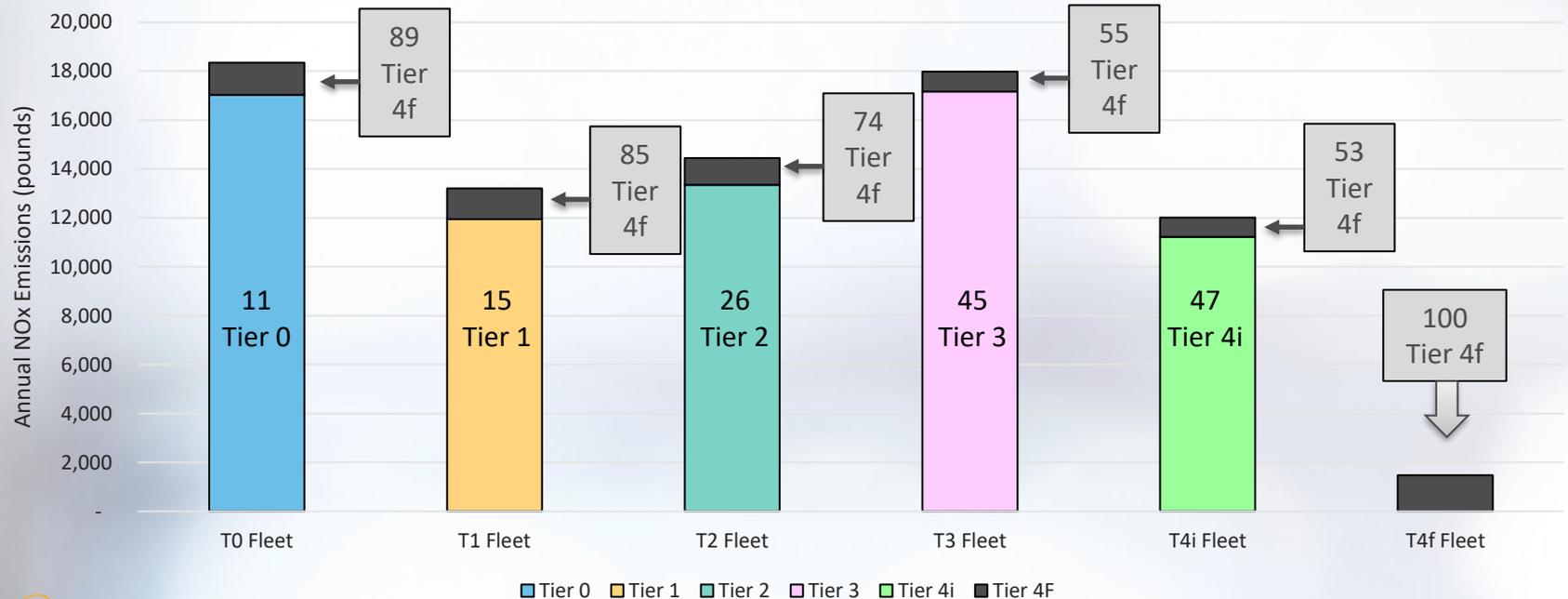
Fleet Size	Total Max Horsepower	Fleet Average Target or BACT Dates*
Large	L>5000	2014 - 2023
Medium	2500<M≤5000	2017 - 2023
Small	S≤2500	2019 - 2028

*A fleet using BACT to comply may have requirements beyond these dates if the fleet average target is not achieved.



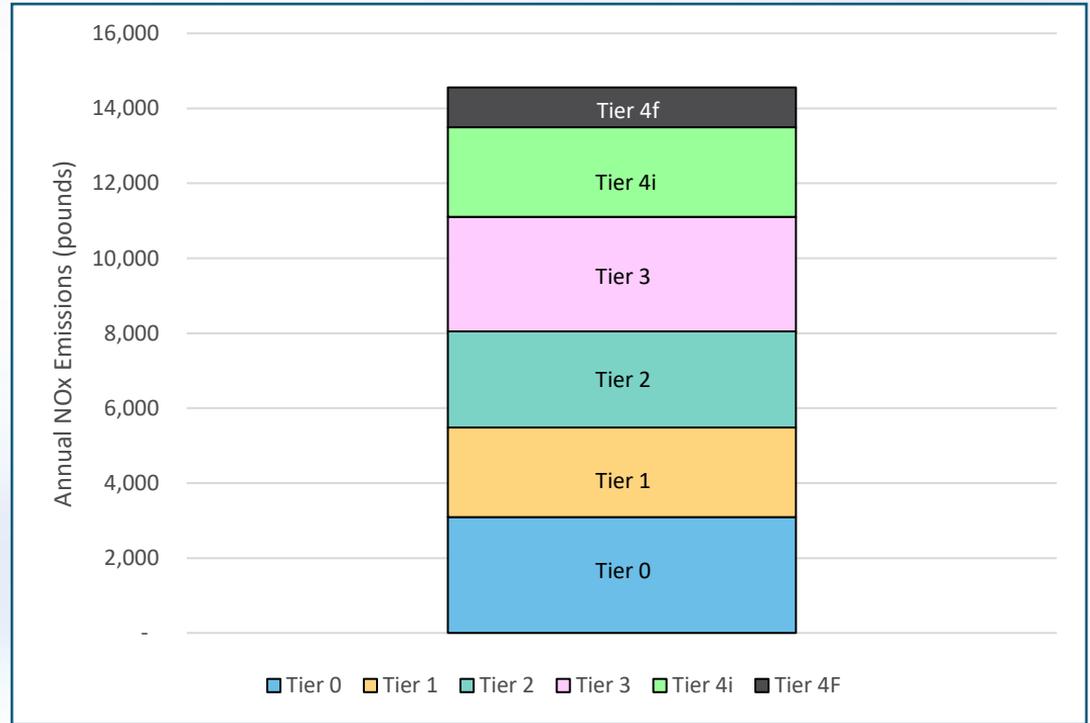
Hypothetical Compliant Fleets

- Each fleet has 100 vehicles and is compliant with the 2023 final fleet average target
- Assumes all vehicles are in the 100-175 horsepower bin and have equal activity



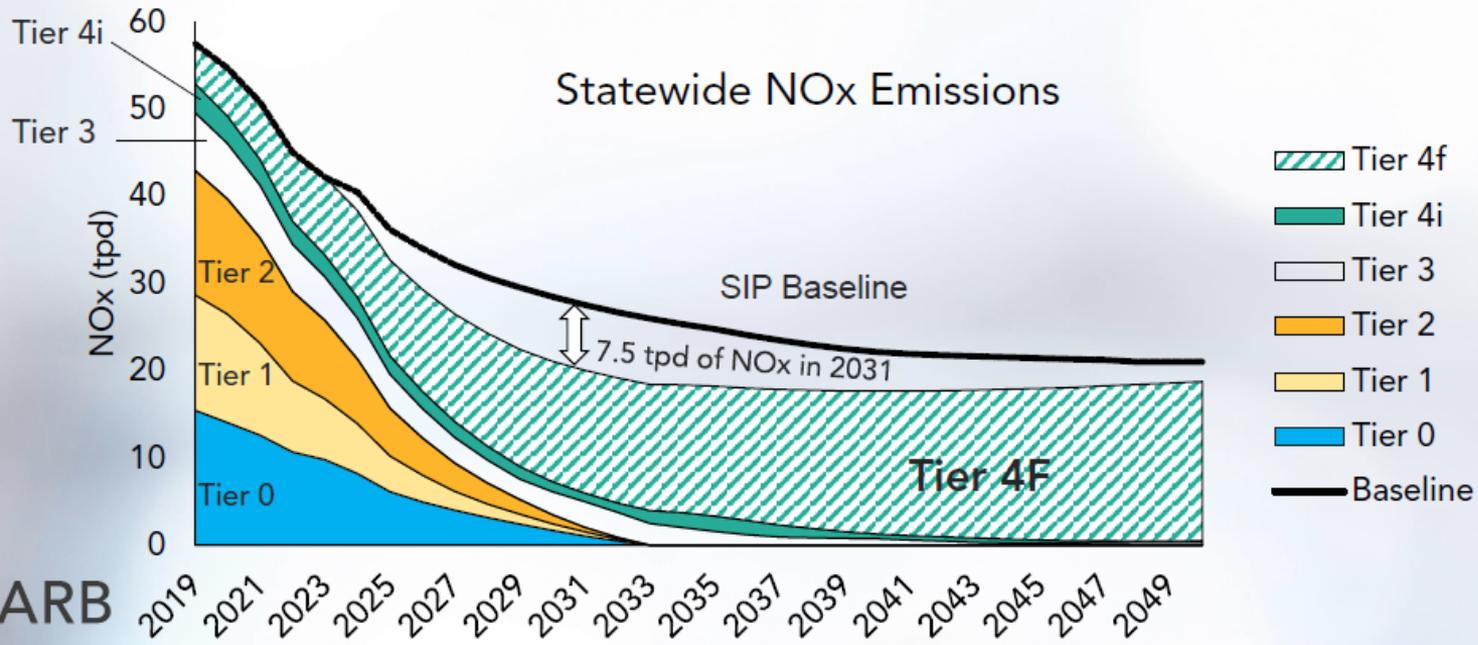
Example Mixed Fleet Meeting Compliance

Engine Tier	Population
Tier 0	2
Tier 1	3
Tier 2	5
Tier 3	8
Tier 4i	10
Tier 4f	72



Construction, Industrial, Mining Sector Goals

- **Current regulation** allows continued use of Tier 0 to Tier 2 indefinitely if meeting Fleet Average requirements
- **MSS Scenario:** Implement full turnover of Tier 0/1/2 equipment by 2033



Goals for Off-Road Diesel Strategy

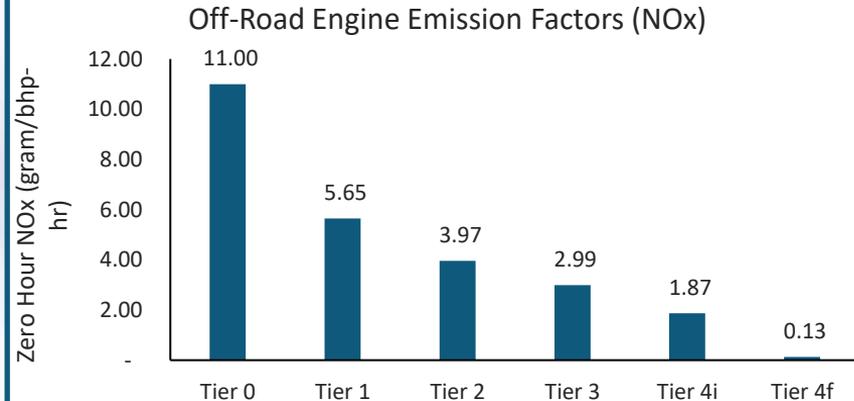
Emission Reductions

- Equivalent to removal of Tier 0-2 equipment by 2033

Simplify

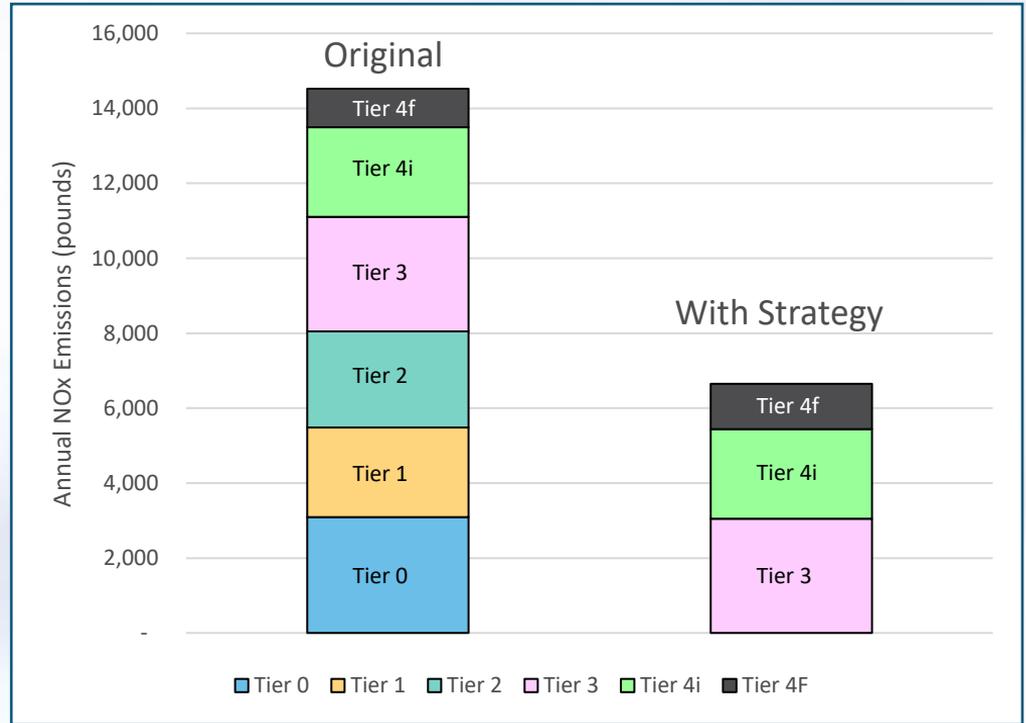
- Easier for fleets to understand
- Streamline what is required of fleets

A single Tier 0 off-road engine in the 100-175 horsepower bin has 80 times higher NO_x emissions than a Tier 4 Final off-road engine.



Example Mixed Fleet Meeting Compliance: Fully Implemented Strategy

Engine Tier	Original Population	Strategy Population
Tier 0	2	0
Tier 1	3	0
Tier 2	5	0
Tier 3	8	8
Tier 4i	10	10
Tier 4f	72	82



Potential Amendment Concept

Actions
Operational Backstop on Old Equipment
Extension of Adding Vehicles Provision
Simplify the Low-Use Exemption
Other Potential Changes

Operational Backstop on Old Equipment

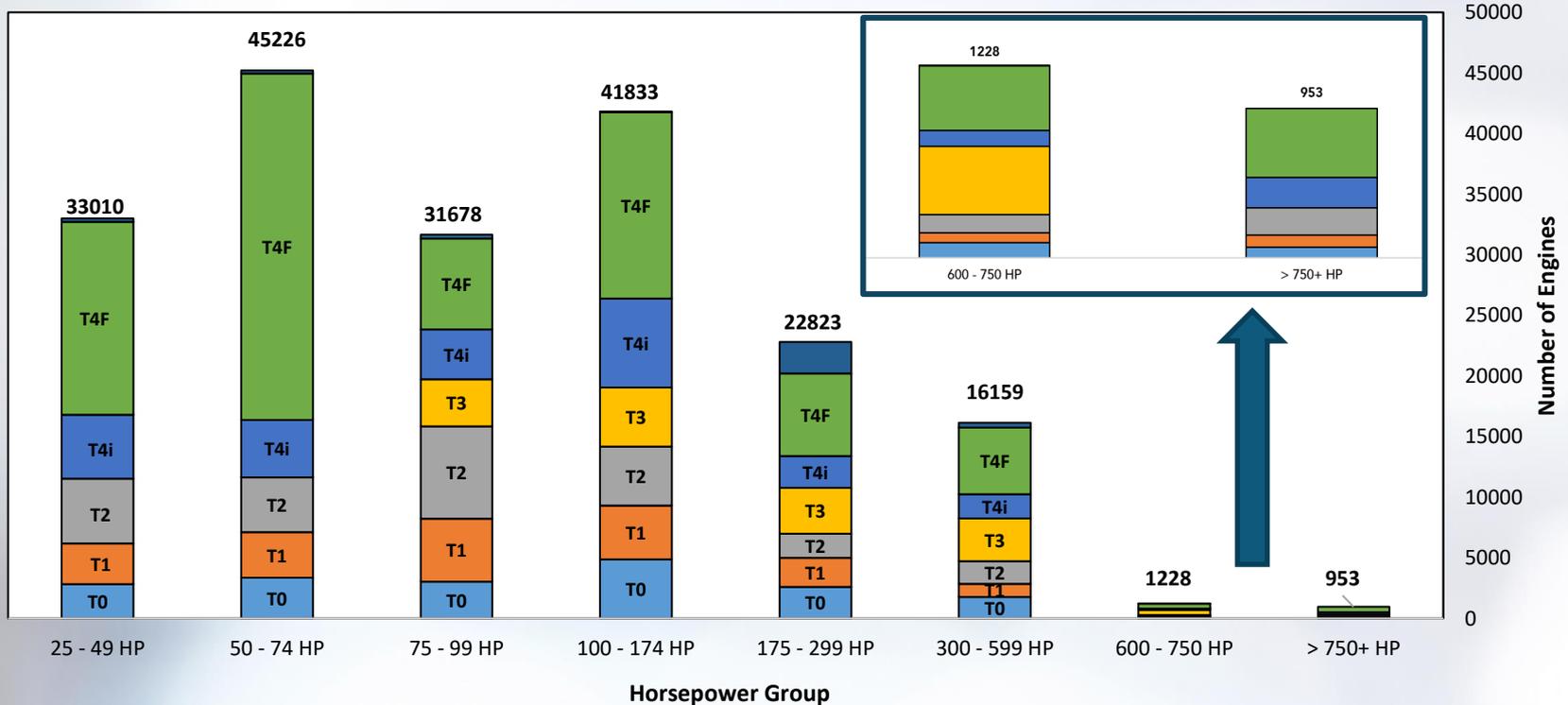
Fleet Size	Tier 0		Tier 1		Tier 2	
	Ban Year	Age of Equipment	Ban Year	Age of Equipment	Ban Year	Age of Equipment
Large	2024	27	2026	24	2028	22
Medium	2026	29	2028	26	2030	24
Small	2028	31	2030	28	2032	26

Extension of Adding Vehicle Provision

	Engine Tier	Additions Banned in ORD Regulation	Lead Time
Current Regulation	T0	2010 (at adoption)	11 years
	T1	2013 L/M	8 years L/M
		2016 S	11 years S
T2	2018 L/M	8 years L/M	
	2023 S	13 years S	
Potential Amendments	T3	On adoption (2023)	13 years L/M 13 years S
	T4i	2024 L/M	10 years L/M
2028 S		14 years S	

Tier 4f Availability Analysis

Engine Tier Distribution By HP Group



Simplify the Low-Use Exemption

Potentially Eliminate Year by Year Option

- Phased in at the same time as the operational backstop on old equipment

Analysis of Permanent Low-Use

- Potential backstop where oldest equipment will not be allowed
- Potential reevaluation of the maximum hour allowance
- Require additional documentation

Other Potential Changes

Add requirements for other entities, such as contractors and third party reporters

Eliminate provision that allows small fleets to keep vehicles with no VDECS indefinitely [2449.1(b)(3)(C)]

Newly reported fleets must meet new fleet provisions [2449(d)(4)]

Restrict adding oldest tiered equipment to emergency, snow removal, and low use exemptions

Clarify applicability

Emission Reduction Potential

Staff used the 2011 In-Use Off-Road Model to calculate the potential emission reductions from this concept, assuming:

- Full implementation of operational bans with turnover to Tier 4 final
- All equipment currently exempt from performance requirements would remain exempt

Reductions	Statewide	South Coast
2031 NOx reductions (tpd)	6.0	1.9
2037 NOx Reductions (tpd)	5.4	1.3

PM 2.5 Reductions

Approximately
37%

Timing and Next Steps



Executive Order N-79-20



Full transition to
ZE off-road equipment
by 2035*
*where feasible

Transition of all off-road equipment operations to zero-emission where feasible by 2035

Strategies, in coordination with other State agencies, U.S. Environmental Protection Agency and local air districts, to achieve 100 percent zero-emission from off-road vehicles and equipment operations in the State by 2035.

Potential Future Strategies

ZE Forklift

Expand
CORE

Green Fleet Recognition Program

(Action by: 2025)

Voluntary program for recognition of cleanest fleets, with an emphasis on zero emissions. Would allow public agencies and partnerships to recognize fleets with minimal environmental impact.

ZE
Equipment
Production

Tier 5

Contacts

Rulemaking

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Inventory Update

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Webpage and Email Sign-Up

- Webpage:
 - <https://ww2.arb.ca.gov/our-work/programs/use-road-diesel-fueled-fleets-regulation/proposed-amendments-use-road-diesel>
- Sign-Up for Off-Road Diesel Amendment Email Updates
 - <https://public.govdelivery.com/accounts/CARB/subscriber/new>
 - “Off-Road Equipment (In-Use) Control Measure”