



2022 State Strategy for the State Implementation Plan

November 10, 2021

Agenda

- Background and Purpose
- Potential Measures
- Public Measure Suggestions
- Federal Measures and Actions
- Moving Forward

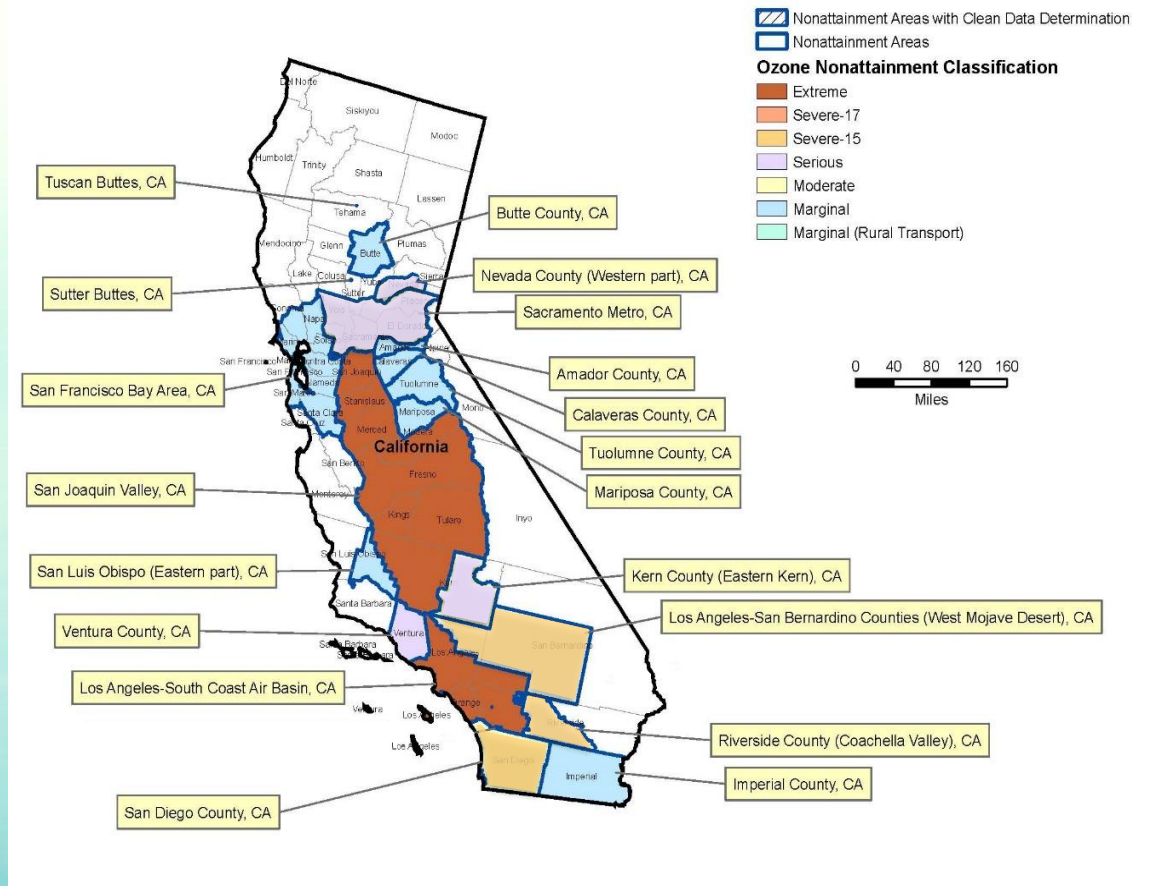
Background and Purpose

70 ppb 8-hour Ozone Standard

- EPA revised the 8-hour ozone standard to 70 ppb in 2015
- 19 areas in California are designated nonattainment
- State Implementation Plan (SIP) revisions required are dependent on classification

California 8-hour Ozone Nonattainment Areas (2015 Standard)

04/30/2020



Attainment Plans and 2022 State SIP Strategy



Potential SIP Measures can Reduce Emissions in Priority Communities



Near-Road Communities



Near-Port Communities



Communities Near Industrial Facilities & Warehouses



Co-Benefits Help Reduce Criteria Pollutants



CARB Actions on Previous SIP Commitments

2020

Heavy-Duty Omnibus Regulation

Advanced Clean Trucks Regulation

Ocean-Going Vessels At-Berth Regulation

2021 and 2022

Advanced Clean Cars II

Heavy-Duty Inspection and Maintenance Program

Small Off-Road Engines

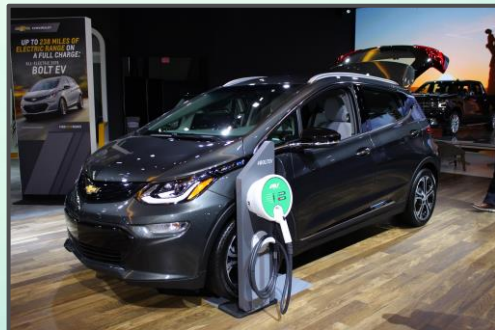
Zero-Emission TRU (Part I)

Zero-Emission Forklifts

Consumer Products

Ongoing

Incentivized Turnover Vehicles and Equipment



Potential Measures On-Road Mobile Sources

Advanced Clean Fleets (ACF)

- CARB adopted Advanced Clean Trucks (ACT) regulation June 2020, sets M/HD ZEV sales requirement for manufacturers
- Potential Advanced Clean Fleets regulation
 - Public fleets - ZEV purchases begin at 50% in 2024 and 100% in 2027
 - Drayage Trucks (Seaports and railyards) - Transition to 100% ZEV drayage fleet by 2035
 - High priority and federal fleets - Phase-in ZEVs as a percentage of the fleet 2025-2042
 - 100% ZEV sales by 2040 for all vehicles

Phase 3 GHG Standards

- Build on Phase 1 and 2 GHG Standards (adopted 2011-2018)
- Staff anticipates the Phase 3 stringency would be set assuming significant penetration of zero-emission vehicles nationally
- Upon U.S. EPA adoption of national Phase 3 GHG standards, CARB staff would propose CARB adopt as well to align California's standards with the national standards and enable CARB to enforce them for California-certified vehicles

On-Road Motorcycles

New Emissions Standards

- CARB first adopted emissions standards for ONMC in 1975
 - Standards have not been updated since 1998
 - ONMCs currently emit ~20 tpd ROG+NOx Statewide
- Potential new standards
 - Align with stringent “Euro 5” regulations (HC+NOx standards reduced by 80%), with more stringent testing requirements, starting with MY 2024
 - Potential requirements beyond Euro 5 (Additional OBD monitors, Improved evaporative emission controls, Zero emissions motorcycle sales targets and credit program) to phase in starting with MY 2028



Clean Miles Standard

- Senate Bill 1014 – Clean Miles Standard to reduce greenhouse gas emissions from transportation network companies (TNCs)
- Reduces greenhouse gas emissions, primarily through electrification and encourages reduction of VMT relative to passenger miles traveled
- Provides co-benefit criteria pollutant reductions
- Board adopted in May 2021

Potential Measures Off-Road Vehicles & Equipment

Tier 5 Off-Road New Compression-Ignition Engine Standard

- Tier 4 Final Exhaust Emission Standards in place after 2014 Model Year
- Potential Tier 5 standards (amendment of off-road diesel reg):
 - NOx standard ~90% more stringent than current Tier 4
 - PM standard ~75% more stringent than current Tier 4
 - CO₂ standards to reduce engine GHG emissions from 5 to 10% below current levels
- Additional elements could include: addressing low-load and low-temp NOx emissions, extending useful life and warranty provisions, work-based in-use compliance procedures, & first-time off-road diesel OBD requirements

In-Use Off-Road Diesel-Fueled Fleets Regulation Amendments

- Existing regulation originally adopted in June 2007, significant amendments in 2010 (meet declining fleet average target through turnover, repower, or retrofits)
- Potential amendments:
 - Operational Backstop on Old Equipment
 - Extension of Adding Vehicles Provision
 - Simplify the Low-Use Exemption
 - Renewable Diesel Requirement
 - Requirements for Contractors and Public Works Awarding Bodies



Airborne Toxic Control Measure for Transport Refrigeration Units (TRU)

- Adopted in 2004 (amended in 2010/11)
- Requires all TRUs operating in California to meet in-use PM standard 7 years after the engine model year (85 percent PM reduction)
- TRU Part 1 (measure in 2016 State SIP Strategy)
 - Zero-emission truck TRUs, PM emission standard for newly-manufactured non-truck TRU engines
- TRU Part 2 (potential measure in 2022 State SIP Strategy)
 - Zero-emission requirements for non-truck TRUs (California- and out-of-state-based)



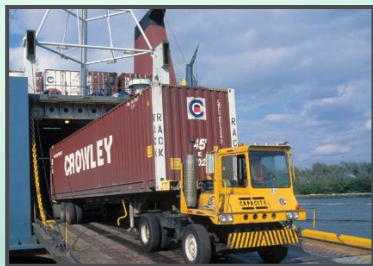
Amendments to the Commercial Harbor Craft (CHC) Regulation

- CHC regulation adopted in 2008, (amended 2010), accelerated turnover to Tier 2 and Tier 3 between 2009-2022
- Applies to diesel-powered commercial craft that do not meet recreational or OGV definitions
- Proposed amendments:
 - Zero-emission: ZE capable new-build excursion vessels, full ZE for all short-run ferries, shore power required for electrical auxiliary power on all vessels when at dock for more than 15 minutes
 - Cleaner combustion: Phase in more Tier 4* + DPF standards for all vessels except commercial fishing, commercial fishing required to meet Tier 2 or newer standard by 2032



Zero-Emission Cargo Handling Equipment (CHE) Regulation

- Equipment used at seaports and rail yards to move containers and freight
- Regulation for Mobile CHE was adopted in 2005 (amended 2011), and established requirements for in-use and newly purchased diesel-powered equipment at ports and intermodal rail yards (fully implemented in 2017)
- Potential Regulatory Concepts
 - Transition to full ZE operations by 2030 – 2037, phase-in beginning with yard tractors & forklifts, followed by rubber tired gantry cranes, then other CHE
 - Extended compliance deadlines for early adoption of hybrid CHE operations to provide certainty for early adopters of advanced technology

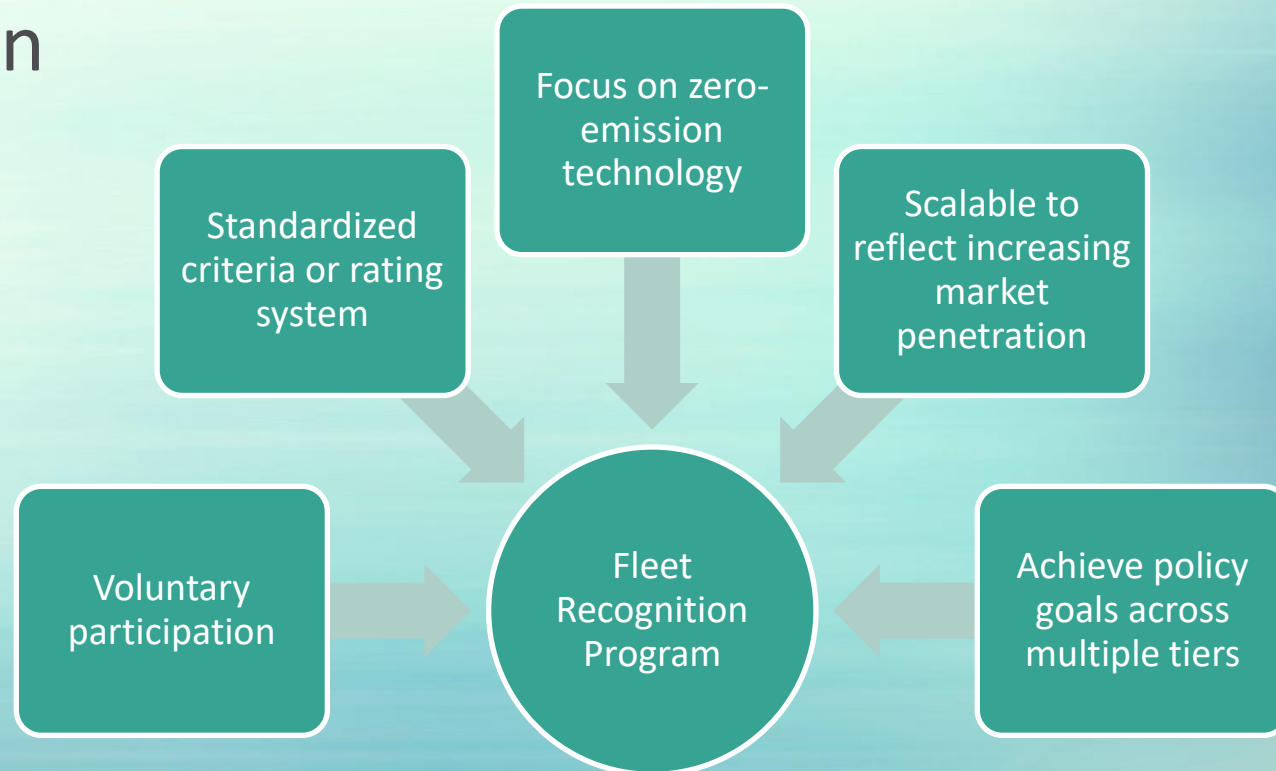


Off-Road Zero-Emission Targeted Manufacturer Rule

- Would apply to manufacturers of off-road equipment including construction, industrial, landscaping, & airport GSE
- Potential regulatory concepts:
 - Require manufacturers to produce zero-emission equipment and/or powertrains as a percentage of their annual statewide sales volume
 - Sales/production mandate levels based projected feasibility of zero-emission technology

Clean Off-Road Fleet Recognition Program

- Off-road vehicles are subject to in-use off-road fleet regulation with declining fleet average target
- Potential recognition program:



Clean Off-Road Equipment Voucher Incentive Program – Construction (CORE –CON)

- CORE is for commercialized off-road vehicles, beyond the demonstration phase
- CORE-CON would provide incentive funding for zero-emission construction equipment
- Would work like previous CORE projects
 - First come, first serve
 - Companies select from CORE eligible equipment catalog <http://californiacore.org/>
 - Helps cost difference between ZE and comparable diesel equipment
 - No scrappage required
- Funding enhancements for
 - Low-Income and Disadvantaged Community Use Area
 - Infrastructure
 - Extended Warranty

Spark-Ignition Marine Standards



- 1998 CARB adopted new outboard (OB) and personal watercraft (PWC) HC+NO_x standards
- Potential measure:
 - Zero emission (ZE) technologies for <19 kW OB and some PWC
 - For ≥40 kW OB and PWC catalyst-based standards
 - Considering 5.0 g/kW-hr HC+NO_x (70% below current levels)
 - For <40 kW OB and PWC improved engine controls
 - Considering 10.0 g/kW-hr HC+NO_x (40% below current levels)
 - Averaging allowed

Potential Measures Other Sources

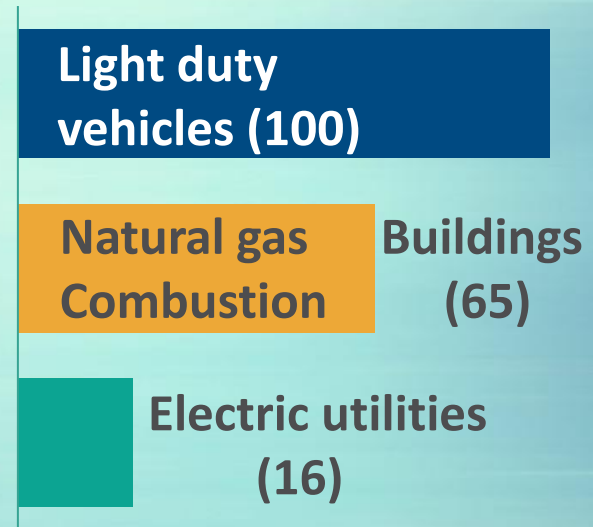
Amendments to the Consumer Products Regulation

- CARB adopted first consumer product regulation in 1989
 - Two dozen amendments have reduced emissions by >50%
- Potential measure
 - Target maximum feasible reductions to offset projected growth in VOC emissions
 - Update category-specific emissions data through surveys
 - Evaluate potential control strategies
 - Focus on high-growth categories with greatest ozone impact
 - Consider technical and commercial feasibility

Zero-Emission Standards for Space and Water Heaters

- **Potential Measure:** Beginning in 2030, 100% of sales of new space heaters and water heaters statewide would meet:
 - Zero-GHG emission limit
 - Provides NOx co-benefits
 - By 2037, building-related NOx and GHG emissions can be reduced by ~40%
 - Total statewide NOx emissions can be reduced by ~3% by 2037
- To electrify all end-uses statewide:
 - An additional ~10% building-related NOx and GHG emissions could be reduced by 2037

**2019 NOx emissions
(65 tons/day)**



Source: NOx emissions from CEPAM: California 2019 - Version 1.02.

Potential Measures

Primarily Federally & Internationally Regulated
Sources

Locomotives

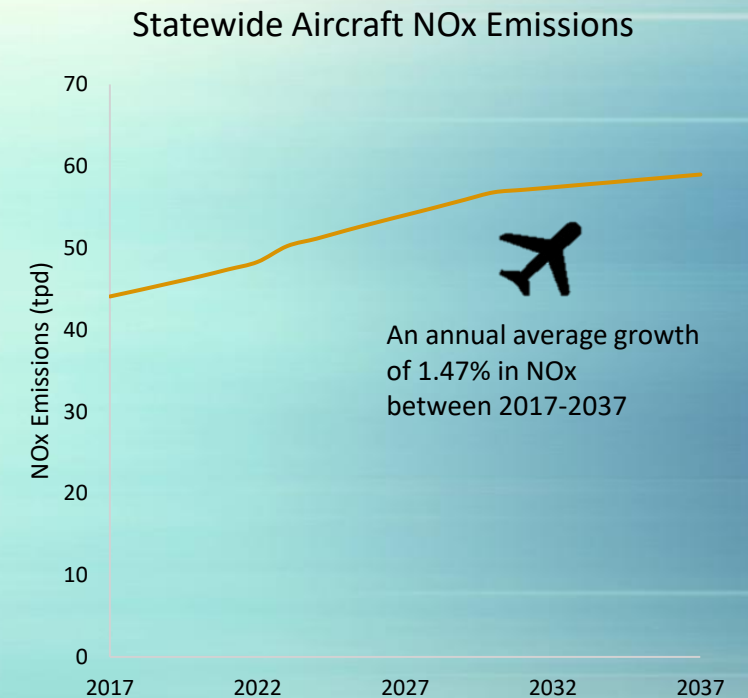
New Regulation for Board Consideration in 2022



- No current California regulation for locomotives
- California regulation is needed to reduce emissions in rail communities
- CARB staff regulatory concepts (still in development):
 - Spending Account
 - In-use Operational Requirements
 - Idling Limit
 - District Level Reporting

Future Measures For Aviation Emissions Reductions

- Further action on aviation is needed, including strong action at the federal and international
- Potential CARB actions:
 - Explore requiring airports to perform a comprehensive and standardized emission inventory
 - Further evaluate federal, State and local authority in setting requirements for aircraft/airports
 - Work with airports, airlines, and stakeholders to evaluate and develop incentive programs
 - Pursue stricter emission reduction strategies



Future Measures for Ocean-Going Vessel Emissions Reductions

- CARB has two main regulations designed to reduce emissions from OGVs: Vessel Clean Fuel Regulation & At Berth Regulation
- Incentive or regulatory measures could be pursued to achieve further emissions reductions from OGVs, including:
 - Cleaner engines or cleaner fuels than those required by EPA and IMO
 - At anchor emissions reductions
 - Sailing at slower speeds while in California waters
 - At berth emissions reductions from bulk and general cargo vessels



Federal Actions Needed

Primarily Federally-Regulated Sources:

Federal Action

On-Road Heavy-Duty Vehicles	Off-Road Equipment:	Ocean-Going Vessels:
On-Road Heavy-Duty Low-NOx Engine Standards (2016 SSS Measure)	Off-Road Equipment Tier V Standard for Preempted Engines	More Stringent NOx and PM Standards for Ocean-Going Vessel Requirements (2016 SSS Measure)
On-Road Heavy-Duty Vehicle Zero-Emission Engine Standards	Off-Road Zero-Emission Standards Where Feasible	Cleaner Fuel and Visit Requirements for Ocean-Going Vessels
Locomotives:	Aviation:	
More Stringent National Locomotive Emission Standards (2016 SSS Measure)	More Stringent Aviation Engine Standards	
Zero-Emission Standards for Switch Locomotives	Cleaner Fuel and Visit Requirements for Aviation	
Address Locomotive Remanufacturing Loophole	Zero-Emission Airport On-Ground Operation Requirements	

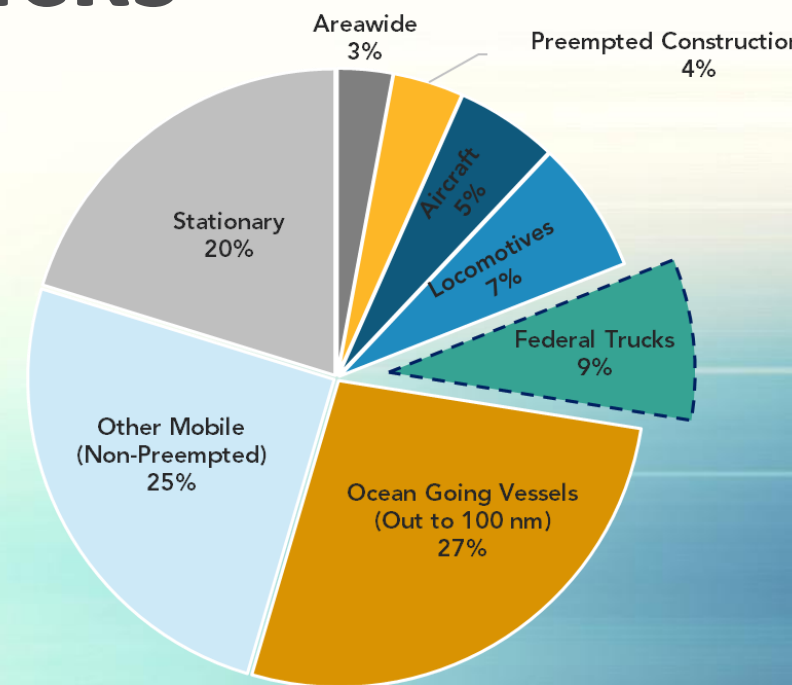
Federally Certified Trucks

Clean Trucks Plan

- EPA last revised the NOx standards for on-highway heavy-duty trucks and engines in 2001- more than 20 years ago
- By December 2022, EPA is planning to propose and finalize new stringent emissions standards to reduce NOx from trucks starting in MY 2027

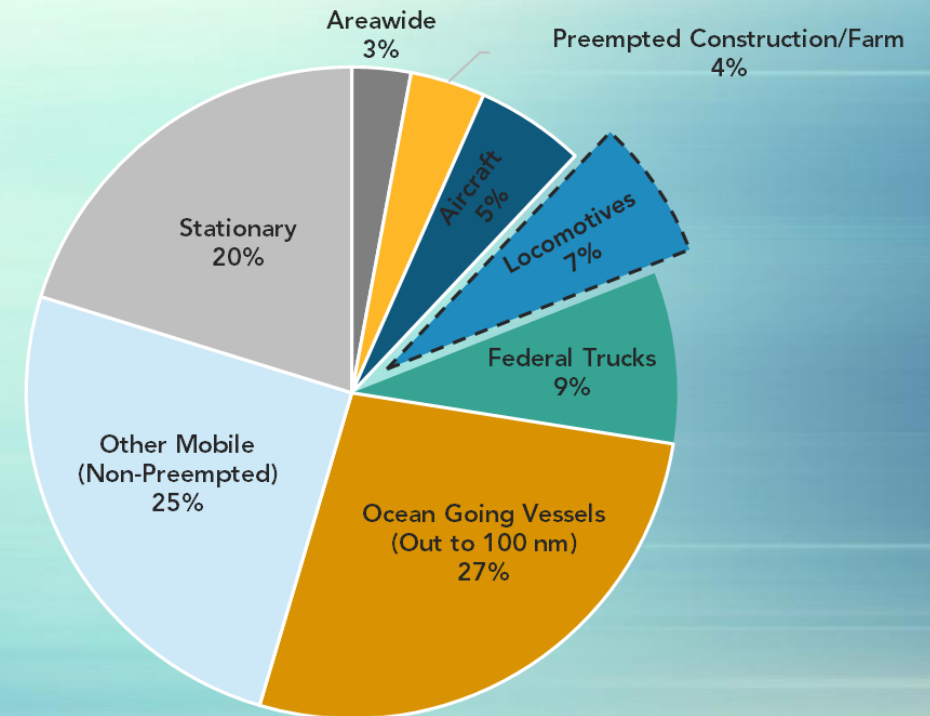
Zero-Emission Heavy-Duty Vehicle Requirements

- Heavy-duty truck manufacturers are already signaling a large-scale migration from gasoline and diesel engines to zero-emission technologies in their products
- CARB would request EPA to adopt national level zero-emission requirements similar to California's Advanced Clean Trucks regulation



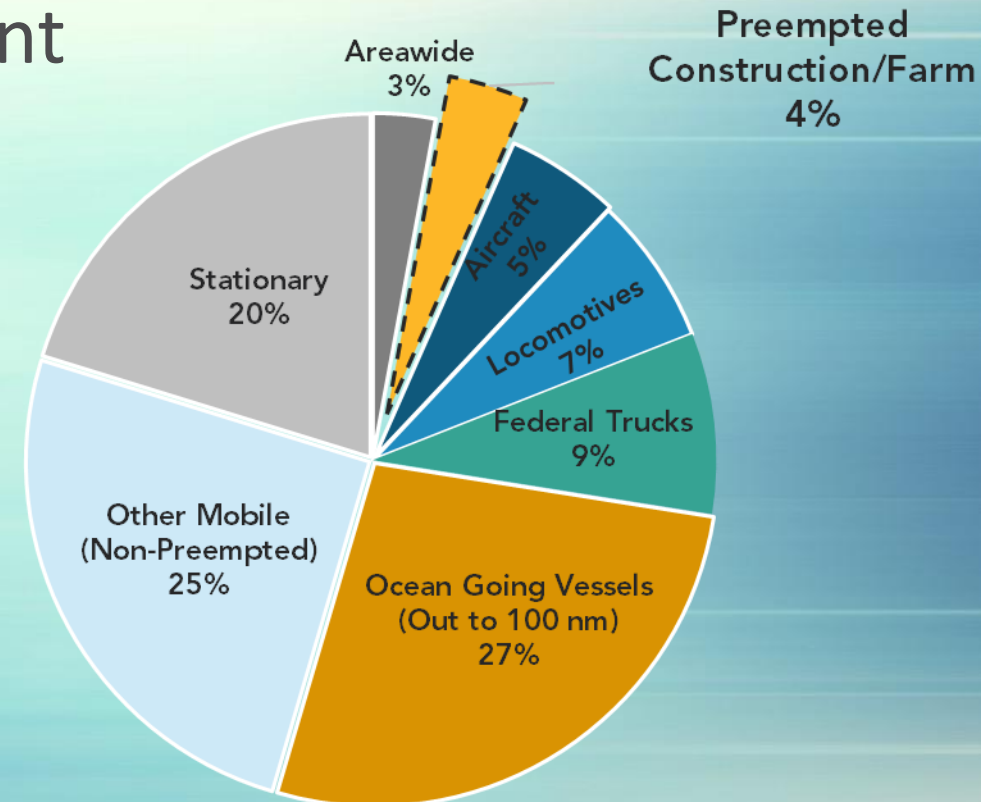
Locomotives

- EPA to adopt more stringent standards for new locomotives and require remanufactured locomotives to meet current standards as described in CARB's 2016 petition*
- EPA to establish ZE standards for switchers and provide funding toward technology and infrastructure development for ZE line-haul locomotives



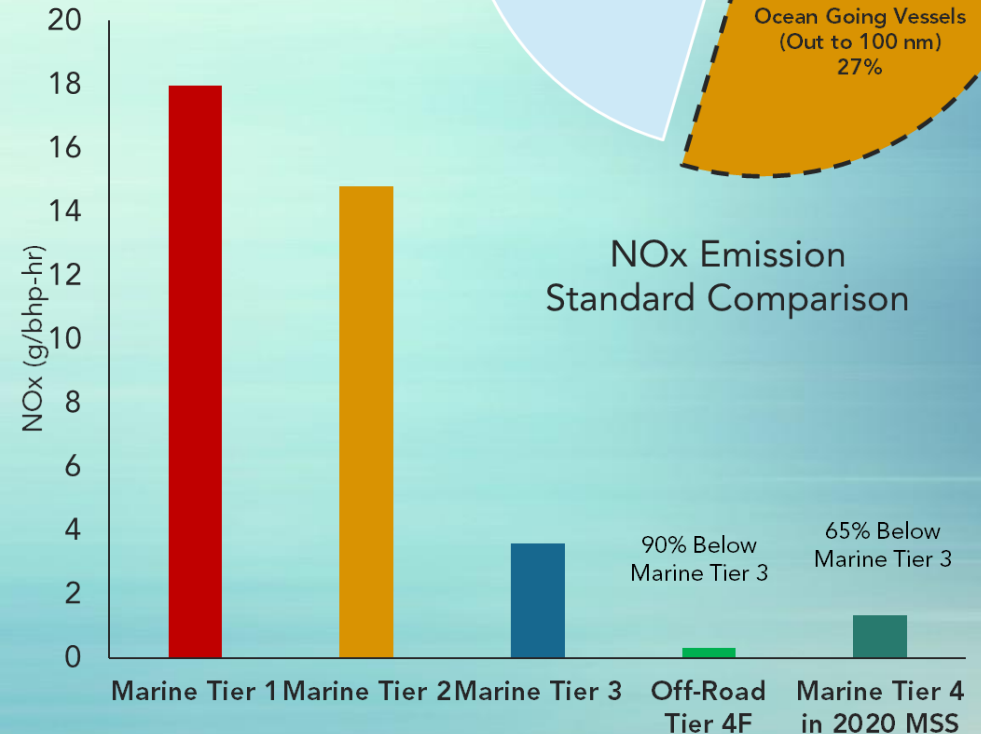
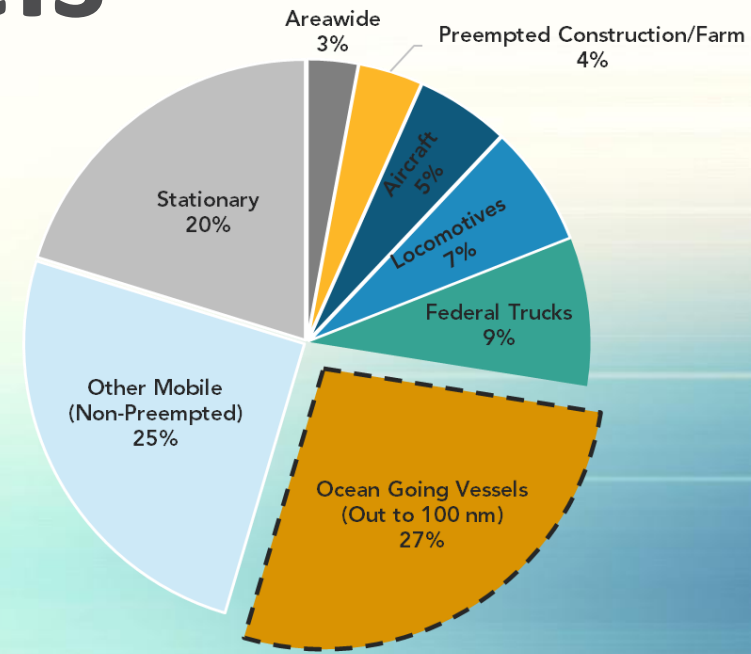
Preempted Off-Road Engines

- EPA to adopt more stringent national level emissions standards for off-road engines (gasoline and diesel)
- EPA to establish national ZE requirement for off-road engines where feasible
- EPA and U.S. DOE to prioritize federal technology demonstration funding to zero emission off-road equipment



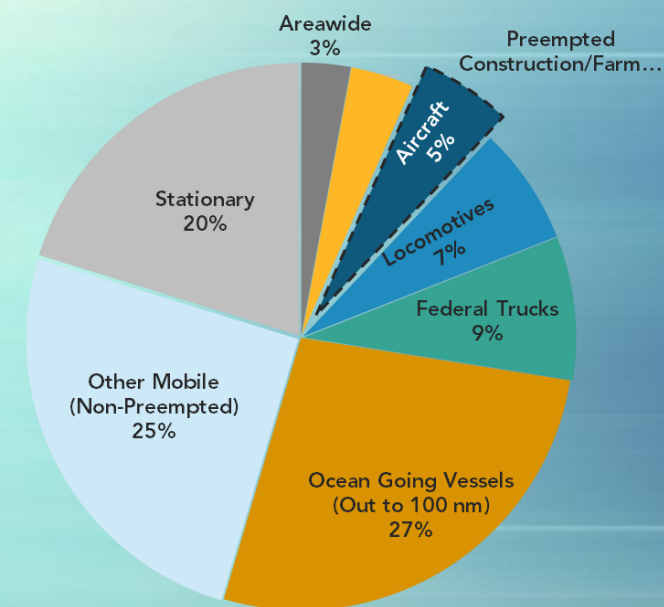
Ocean-Going Vessels

- EPA to advocate in IMO for more stringent NOx and PM standards for marine engines
- EPA to establish clean fuel and clean vessel visit requirements for OGVs at national level
- EPA to consider national level Vessel Speed Reduction (VSR) programs



Aviation

- EPA should initiate public rulemakings for more stringent and technology forcing CO2 and criteria pollutant standards for new and in-service aircraft engines operated at US airports
- Promote/require zero-emission on-ground operations for aircrafts (e.g., ZE APUs, Taxi-bots)
- Establish mechanisms to incentivize cleanest aircrafts visiting U.S. airports



Public Measure Suggestions

Public Measure Suggestions

On-Road Mobile Source Strategies

On-Road Heavy-Duty Useful Life Strategy

Additional Incentive Programs – Zero-Emission Trucks

Enhanced Transportation Choices

Enhanced BAR Consumer Assistance Program

Stationary/Area Source Strategies

Suggested Control Measure – Indirect Source Rule

BACT/BARCT Determinations

Additional Building and Appliance Emission Standards

Pesticide Regulation

Moving Forward

Timing and Next Steps

2022 State SIP Strategy: 2 nd Public Workshop	October 19, 2021
Release Draft 2022 State SIP Strategy	Winter 2022
Informational Update to the Board	Early Spring 2022
2022 State SIP Strategy: 3 rd Public Workshop	Spring 2022
Release Proposed 2022 State SIP Strategy	Early Summer 2022
Board Consideration	Summer 2022

Contact Us!

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<https://ww2.arb.ca.gov/resources/documents/2022-state-strategy-state-implementation-plan-2022-state-sip-strategy>

Program Staff Contacts

On-Road Mobile Measures

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Spark Ignition Marine Engines	Jeff Lowry, Lead Staff, Jeff.Lowry@arb.ca.gov

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Primarily-Federally Regulated – CARB Measures

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