Progress and Challenges in Meeting 1997 8-Hour Ozone National Ambient Air Quality Standard in South Coast Air Basin

Public Consultation Meeting

July 19, 2019

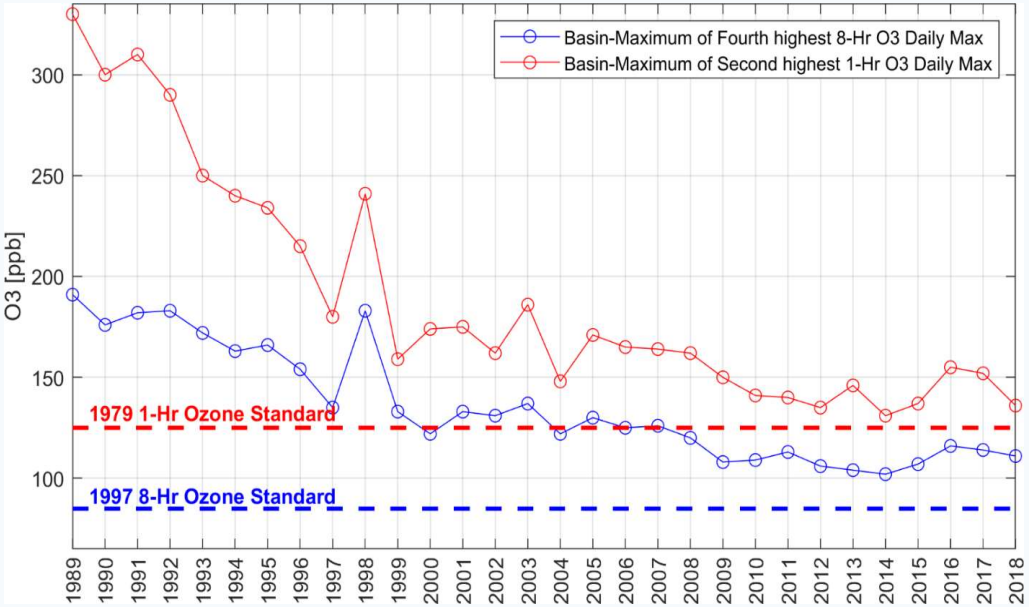
Presentation Outline

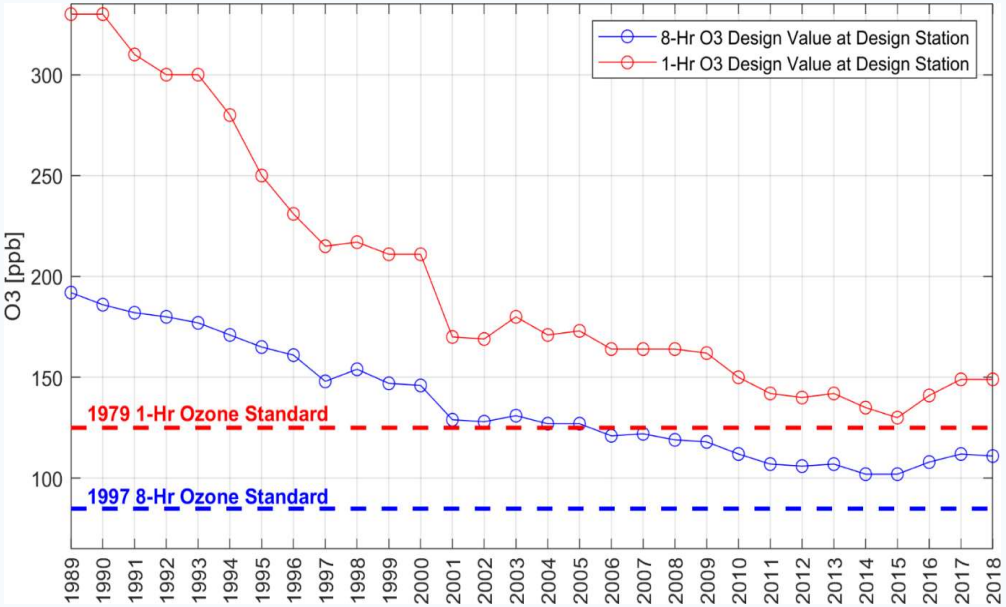
- Background
- 2016 AQMP (NOx control path, 2023 attainment challenge)
- Progress made to date
- Clean Air Act (CAA) 182(e)(5) measures and requirement
- Role of federal sources
- Proposed contingency measure action plan
- Next steps

Upcoming Deadlines to Attain Ozone National Ambient Air Quality Standards

Standard	Concentration	Classification	Attainment Year
1979 1-hour Ozone	120 ppb	Extreme	2022
1997 8-hour Ozone	**80 ppb**	**Extreme**	**2023**
2008 8-hour Ozone	75 ppb	Extreme	2031

Ozone Trends in South Coast Air Basin





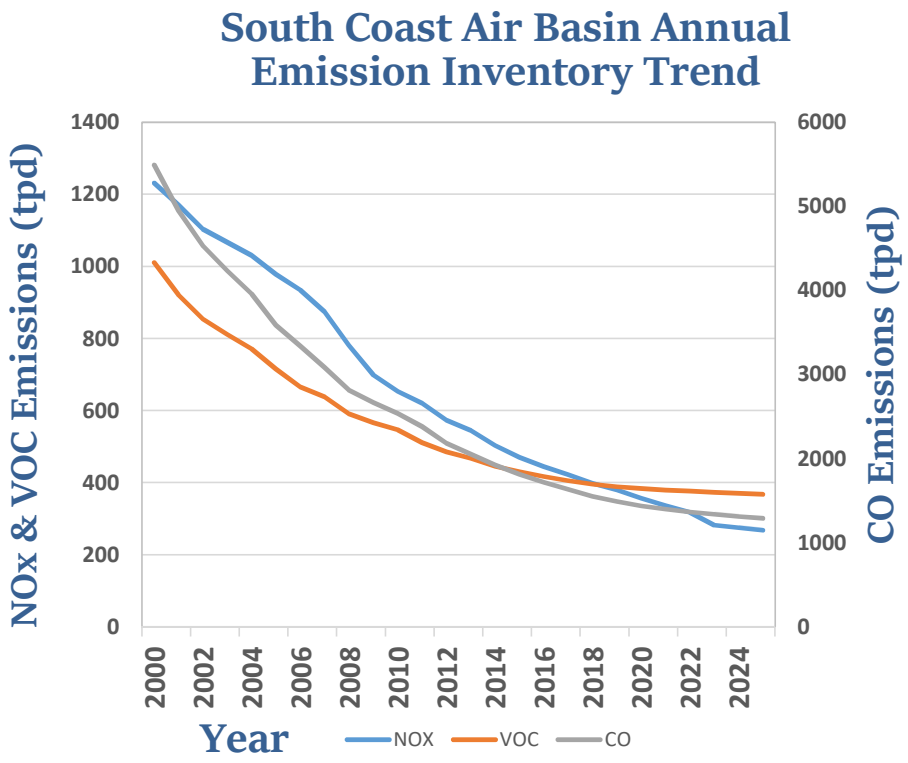
Annual

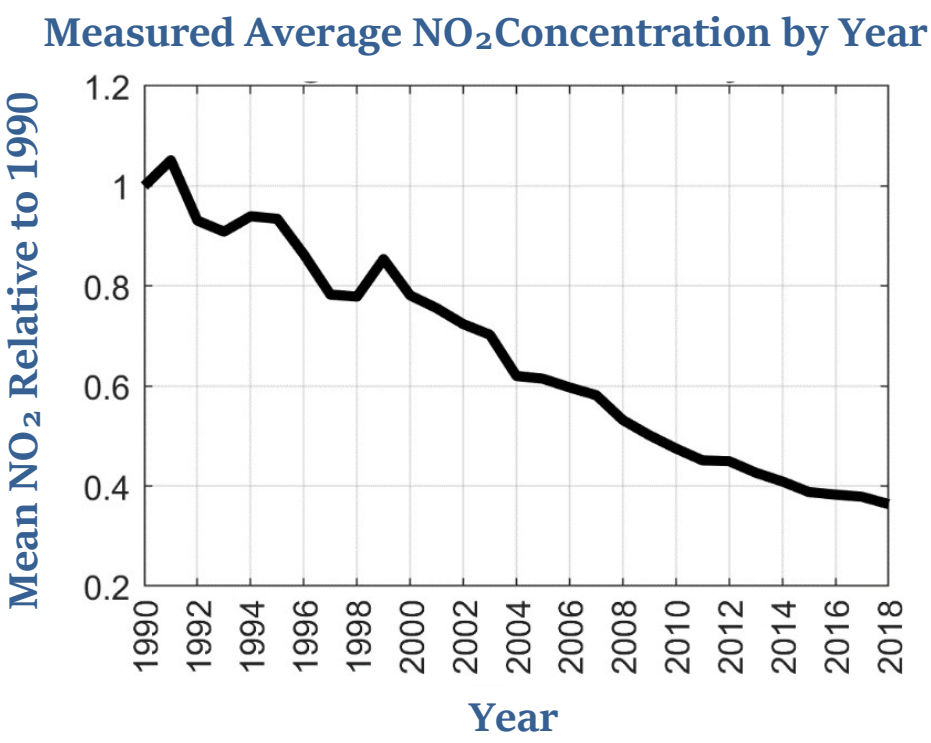
Approximate 3-Year Rolling Average

Design Value

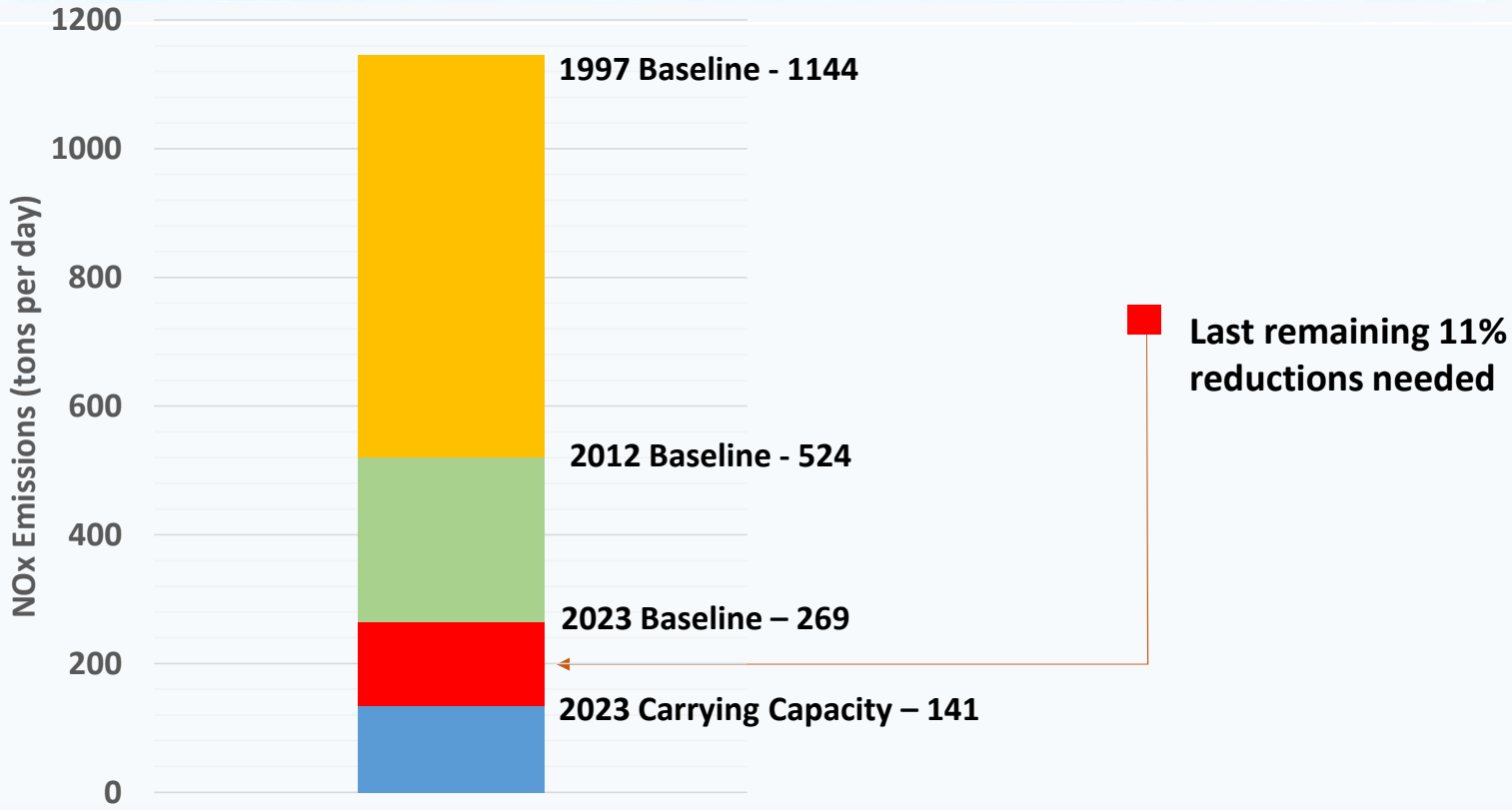
ppb – parts per billion

Trend in Emissions and Measurements

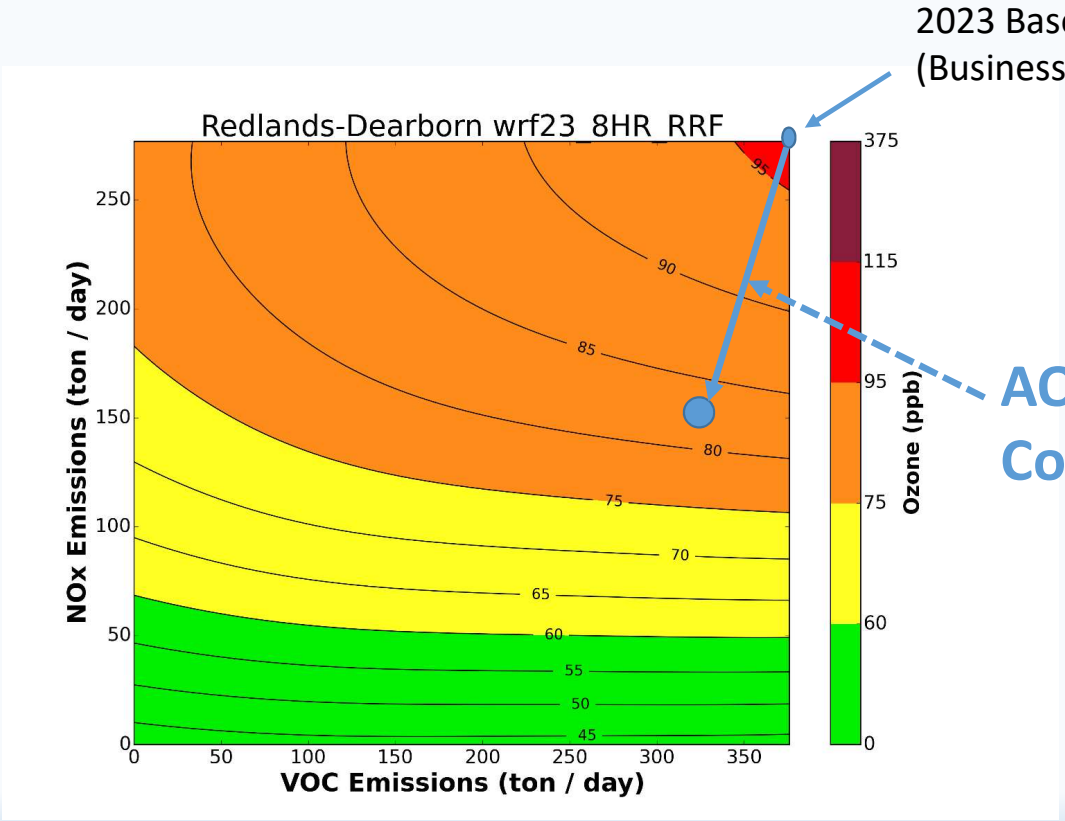




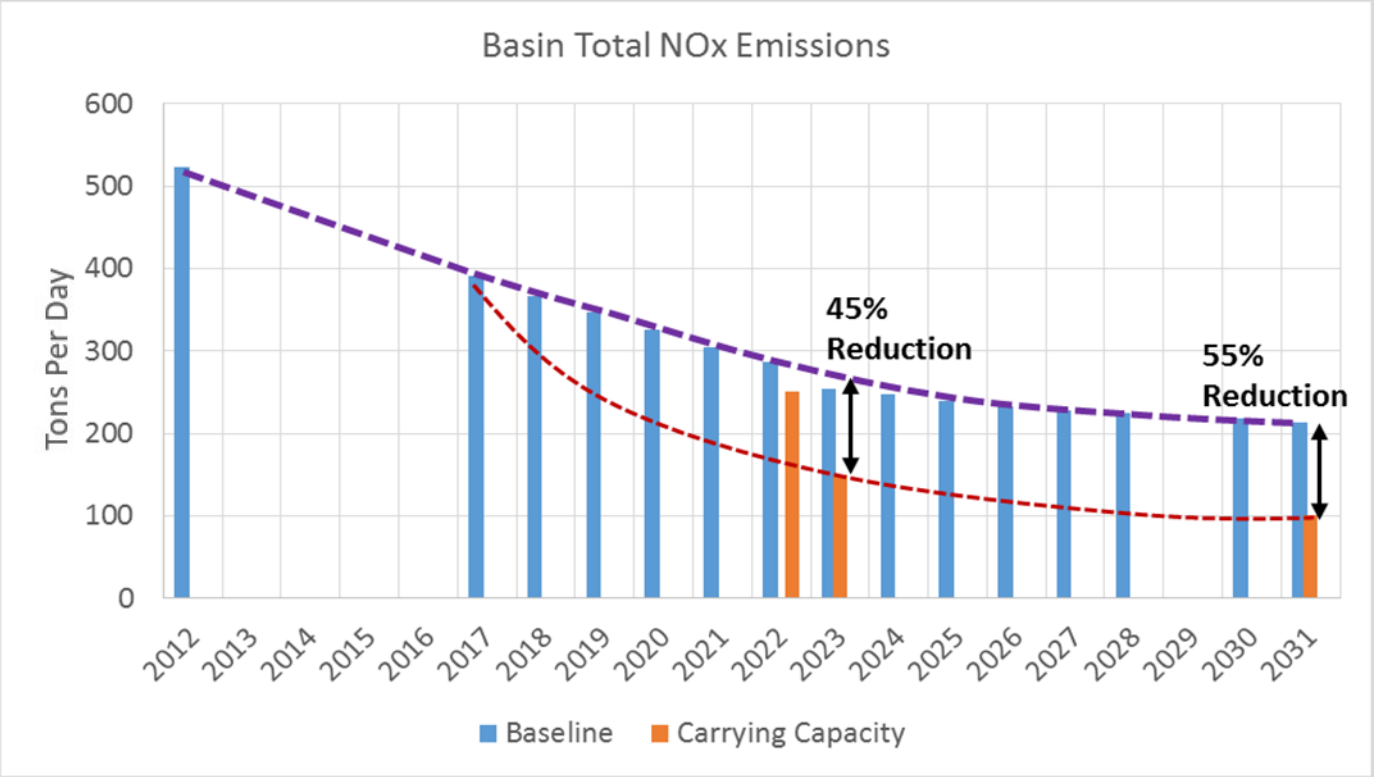
Progress in Overall NOx Reductions Since 1997 (tons per day)



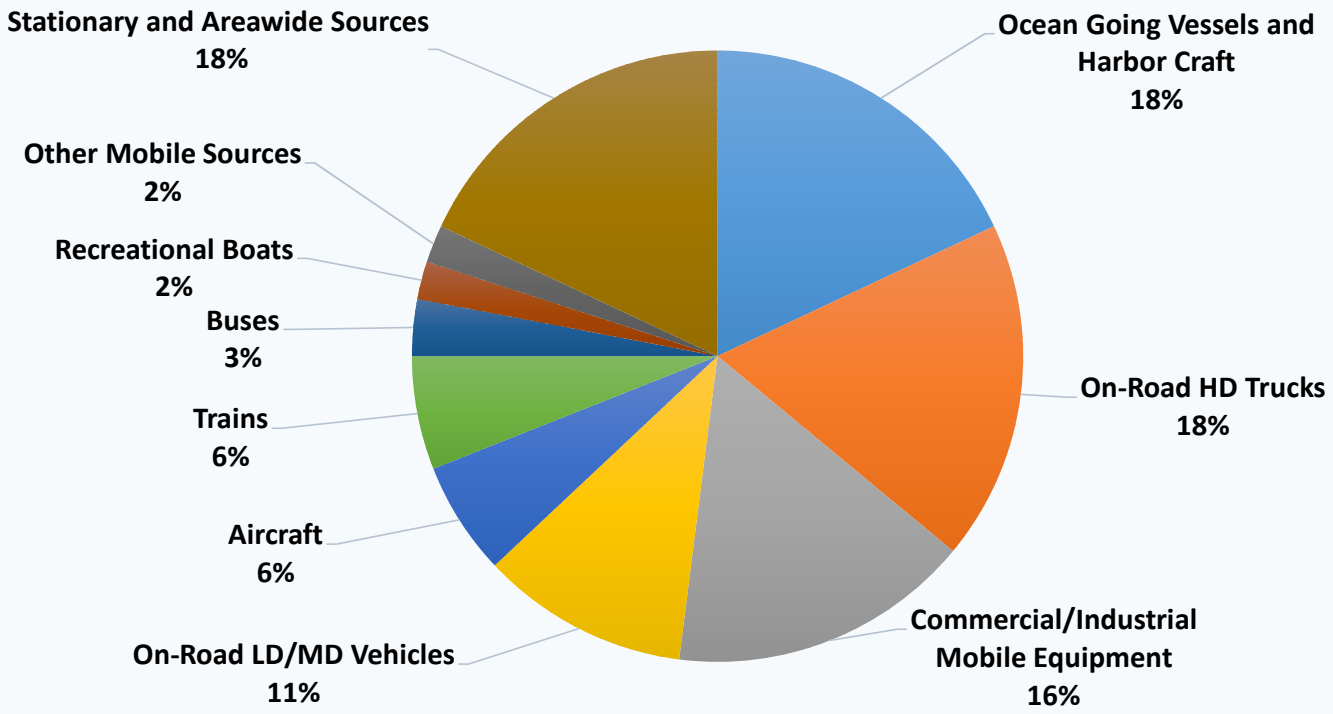
2016 AQMP – NOx Reductions, Most Efficient Control Path for Ozone Attainment



2016 AQMP - Significant Challenge in Meeting 8-hour Ozone Standards in 2023 and 2031

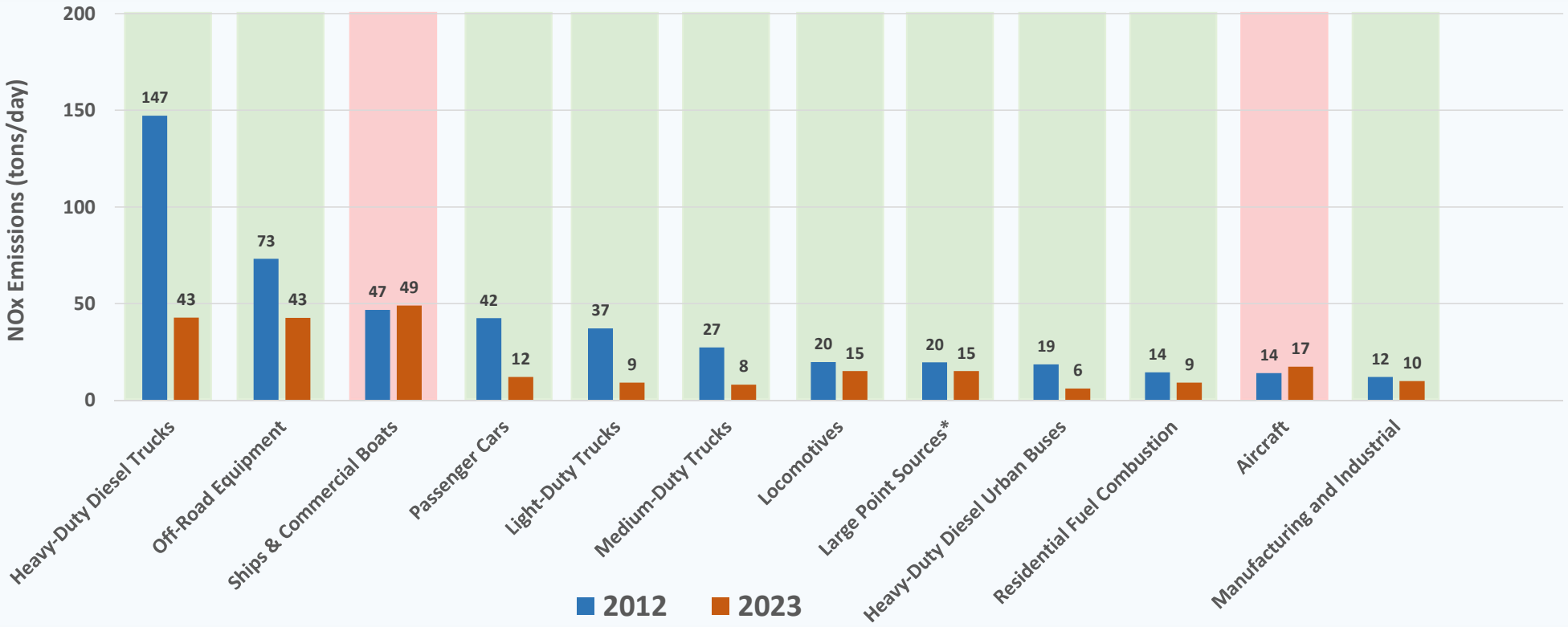


2023 NOx Share by Major Source Category



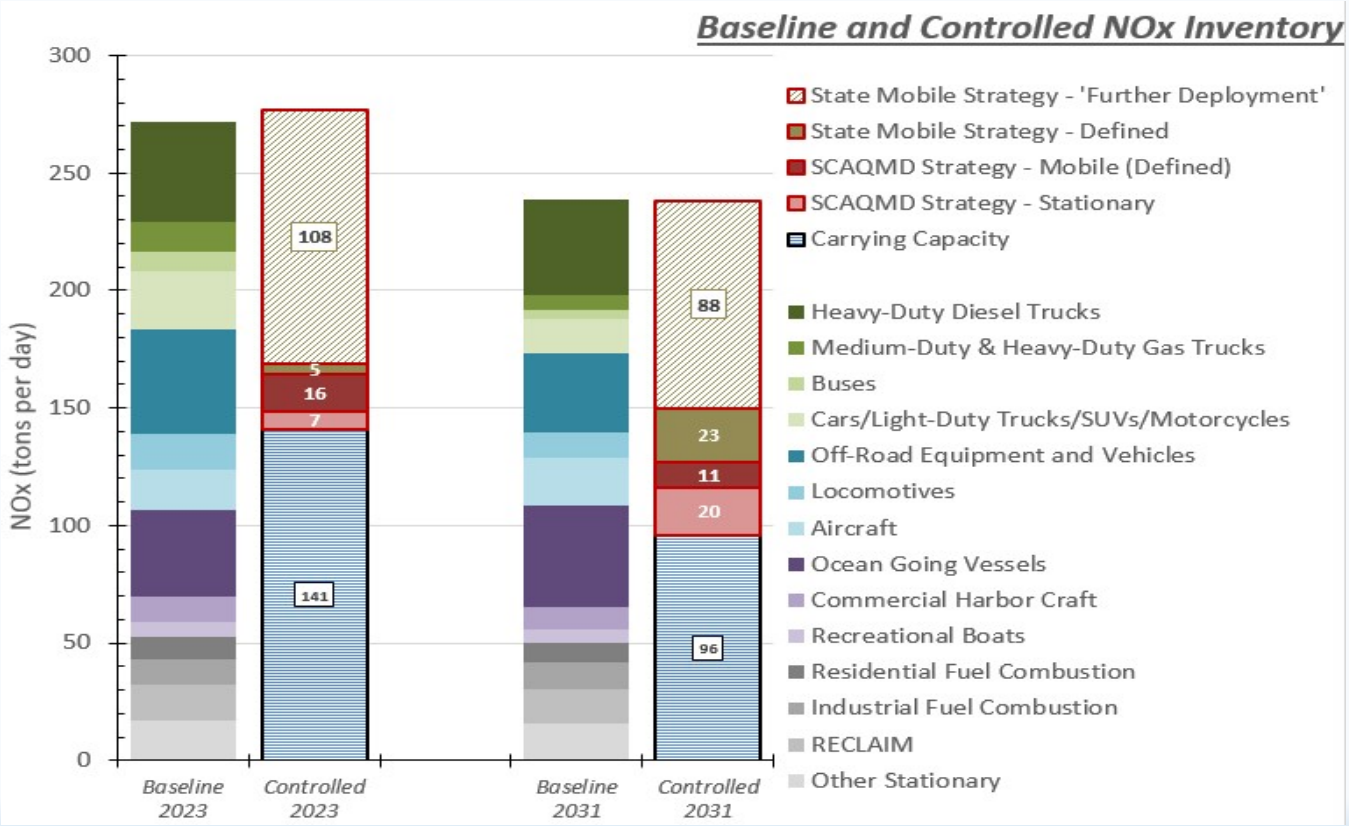
LD = Light-Duty; MD = Medium-Duty; HD = Heavy-Duty

Top NOx Emitters in 2012 and 2023 (Baseline Emissions)



* RECLAIM (SIP Commitment - 10 tpd remaining by 2025)

2016 AQMP - Overall Control Strategy (NOx)



South Coast AQMD Measures:

- Stationary Sources
- Localized Mobile Sources
- Regulatory Paths
- Incentives Components

CARB Measures:

- Mobile Sources (On-Road, Off-Road)
- Consumer Products
- Regulatory Paths
- Incentives Components
- Further Deployment of Cleaner Technologies Measures

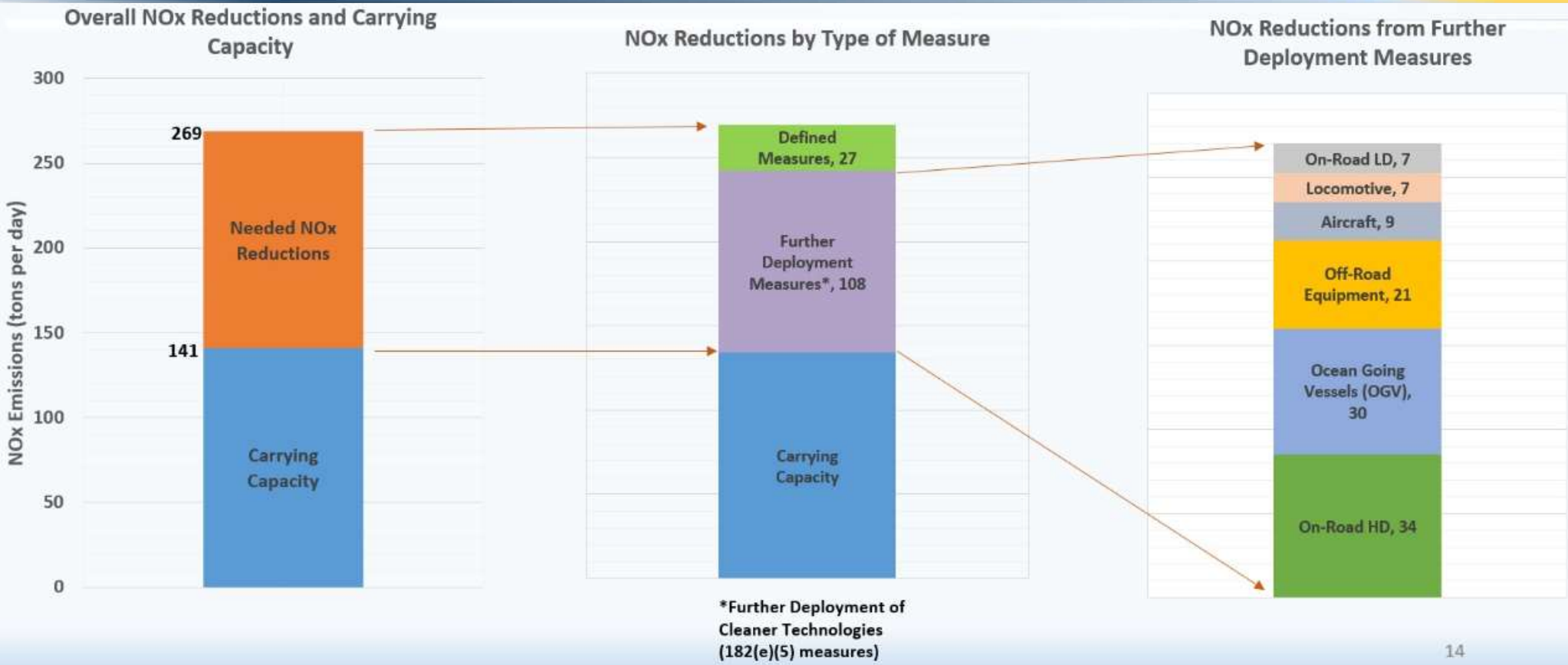
CAA Section 182(e)(5) for Extreme Non-Attainment Areas

- Federal CAA Section 182(e)(5) allows for anticipated development of new control techniques or improvement of existing control technologies for attainment demonstration in extreme areas
- Contingency measures required 3 years prior to implementation date (i.e., 2023 attainment date)
  - Should provide full reductions assigned to 182(e)(5) measures
  - Should include measures already adopted

2016 AQMP - Further Deployment of Cleaner Technologies Measures (182(e)(5))

- ✓New federal and state regulatory actions
- ✓System efficiencies
- ✓Local authority/measures (e.g., facility-based measures)
- ✓Incentives to accelerate deployment faster than regulations can achieve

Further Deployment of Cleaner Technologies Measures by Mobile Source Category (tons per day)



2007 AQMP vs. 2016 AQMP - Reduced Reliance on 182(e)(5) Measures

Evolution of 182(e)(5) "Black Box" Reductions

2007 AQMP	2016 AQMP
• Anticipated future development of new technologies	• Technologies under development requiring commercialization (e.g., zero-emission [ZE] trucks)
• Future improvement of existing technologies	• Technologies developed requiring accelerated deployment and cost reduction (e.g., near-zero emission [NZE] trucks)
• New emission standards (e.g., OGV, harbor craft, aircraft)	• Emission standards adopted, requiring accelerated deployment (e.g., OGV, locomotives)
• Expanded modernization and retrofits of trucks, buses and off-road equipment	• New emission standards needed (e.g., ZE/NZE technologies, aircraft)
• Extensive replacement of older high emitting vehicles/equipment	• Significant funding needed to accelerate turn over ($1 Billion per year)

South Coast AQMD Adopted NOx Rules Since 2016 AQMP

Control Measure	AQMD Rule	Actual Expected Reductions (tpd)
CMB-03	Rule 1118.1 – Non-Refinery Flares	0.2
CMB-05	Rule 1134 – Stationary Gas Turbines	2.8
CMB-05	Rule 1135 – Electricity Generating Facilities	1.8
CMB-05	Rule 1146 – Non-Refinery Boilers and Heaters	0.27
TOTAL		**5.1**

Successful Implementation of Incentive Programs

Carl Moyer Program

- Trucks
- Transit Buses
- Refuse Trucks
- Public Agency/Utility Vehicles
- Emergency Vehicles
- Construction/Ag
- Marine Vessels
- Shore Power
- Locomotives
- Cargo Handling
- Infrastructure

www.AQMD.gov/Moyer

- **1998 – Present**
- **$467 Million**
- **6,708 vehicles**
- **Emissions Reduced (tpy): NOx: 7,598 PM: 222**

Prop 1B

- Trucks & Transport Refrigeration Units
- Locomotives
- Shore Power
- Cargo Handling

- **2009 - Present**
- **$485 Million**
- **>7,300 vehicles**
- **Emissions Reduced (tpy): NOx: 7,086 PM: 220**

South Coast AQMD

Successful Implementation of Incentive Programs (cont'd)

Replace Your Ride

- Light-Duty Vehicles
- Alternative Mobility Options (transit passes, Uber, Lyft)
- Electric Vehicle Chargers

www.ReplaceYourRide.com

- **2015 - Present**
- **$24 Million**
- **3,100 vehicles**
- **Emissions Reduced (tpy): NOx: 29 HC: 67 CO: 8,031**

Lower Emission School Bus Program

- School Buses
- Infrastructure
- CNG Tank Replacements

- **2001 - Present**
- **$280 Million**
- **5,000 vehicles**
- **Emissions Reduced (tpy): NOx: 219 PM: 25**

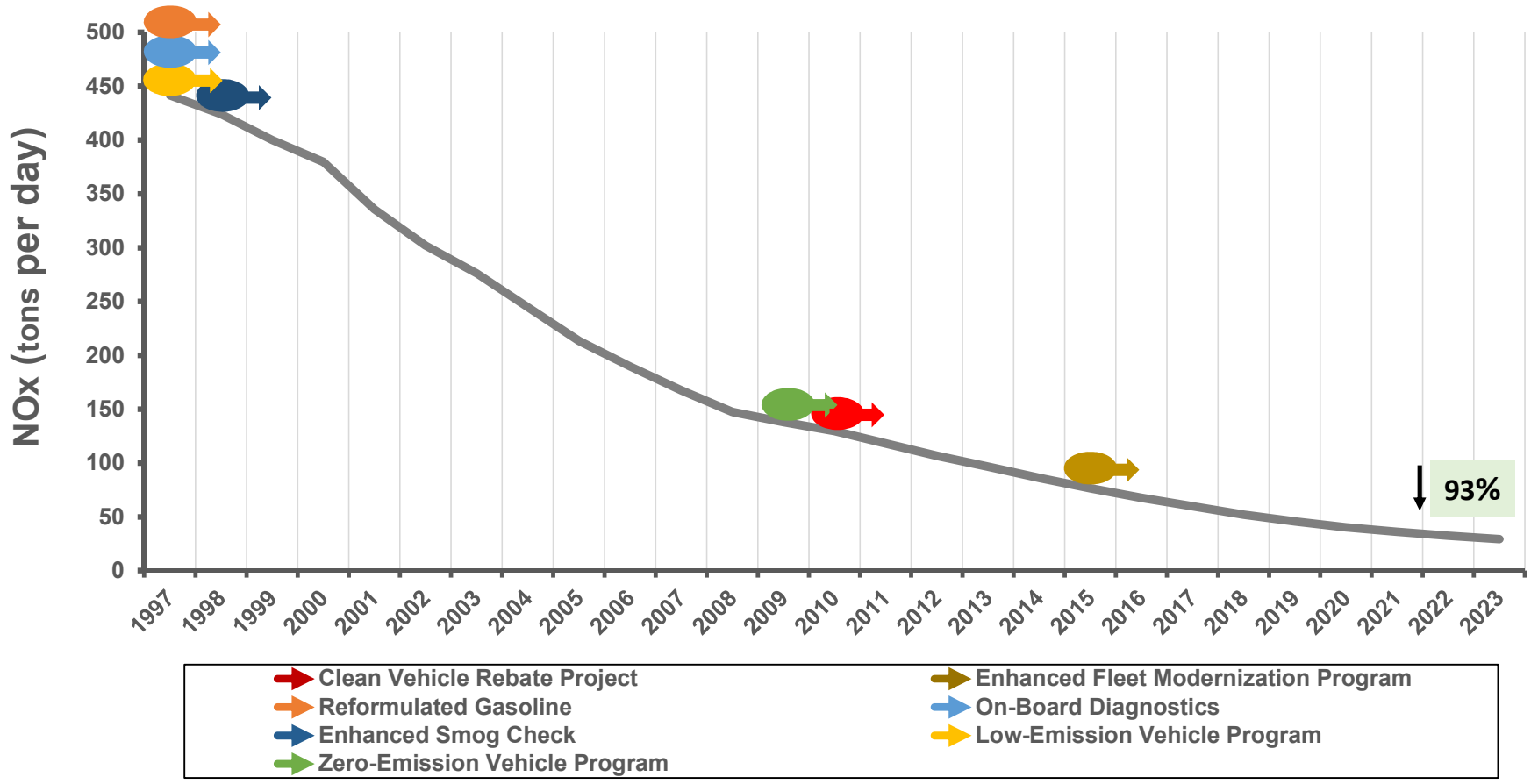
South Coast AQMD

CARB Adopted NOx Rules Since 2016 AQMP (2023 Expected vs. Adopted)

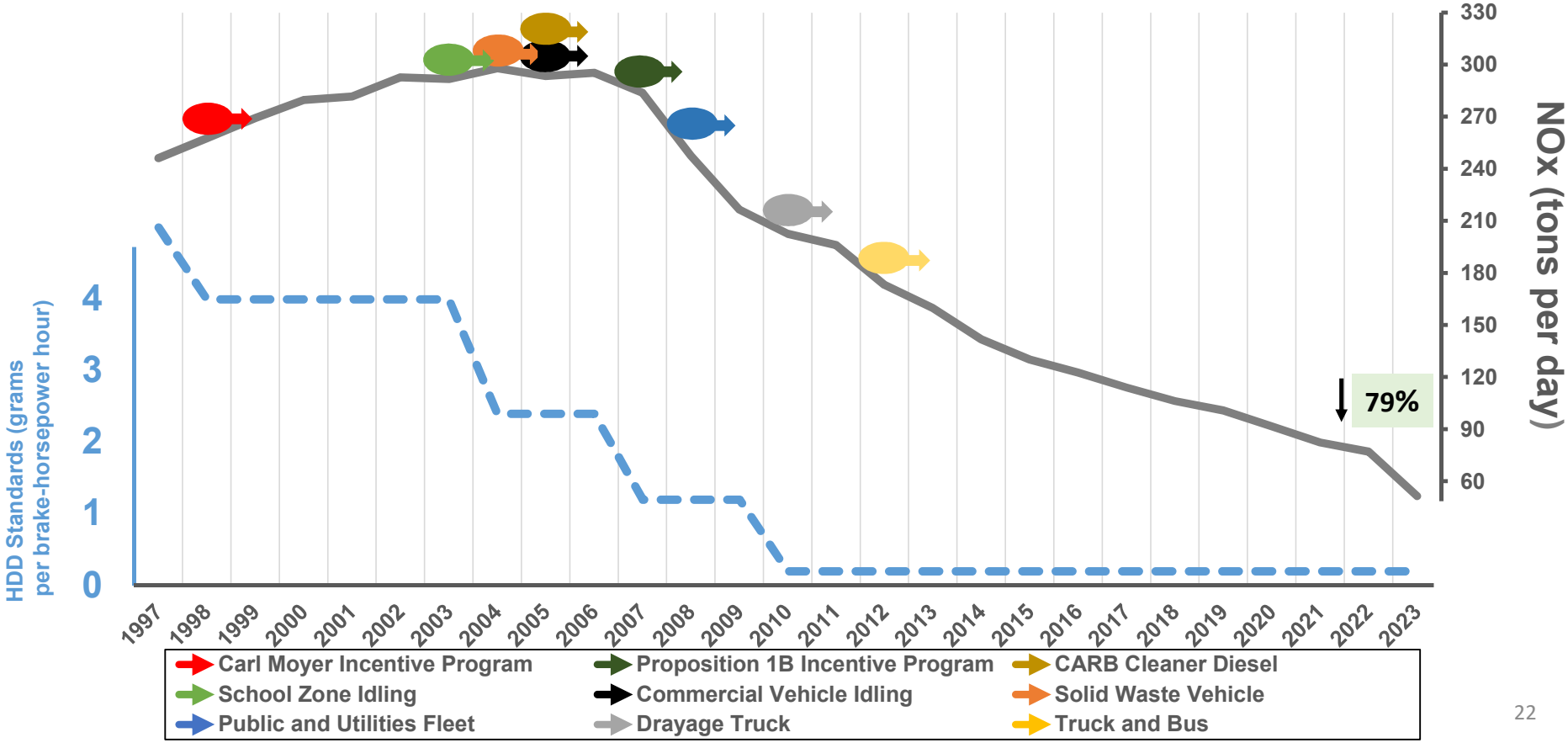
State Strategy Control Measure	CARB Rule	AQMP Expected Reductions (tpd)	As Adopted Reductions (tpd)
Incentive Funding to Achieve Further Emission Reductions from On-Road Heavy-Duty Vehicle	South Coast On-Road Heavy Duty Vehicle Incentive Measure	3	1.0
Zero-Emission Airport Shuttle Buses	Zero-Emission Airport Shuttle Buses	NYQ*	<0.01
Lower In-Use Emission Performance	Heavy-Duty Diesel Vehicle Emission Control System Warranty Regulation Amendments	NYQ*	0.02
Not Included	Portable Equipment Registration Program Regulation	--	0.25
Not Included	Low Carbon Fuel Standard and Alternative Diesel Fuels Regulation	--	1.7
TOTAL		**3**	**3**

* NYQ = not yet quantified

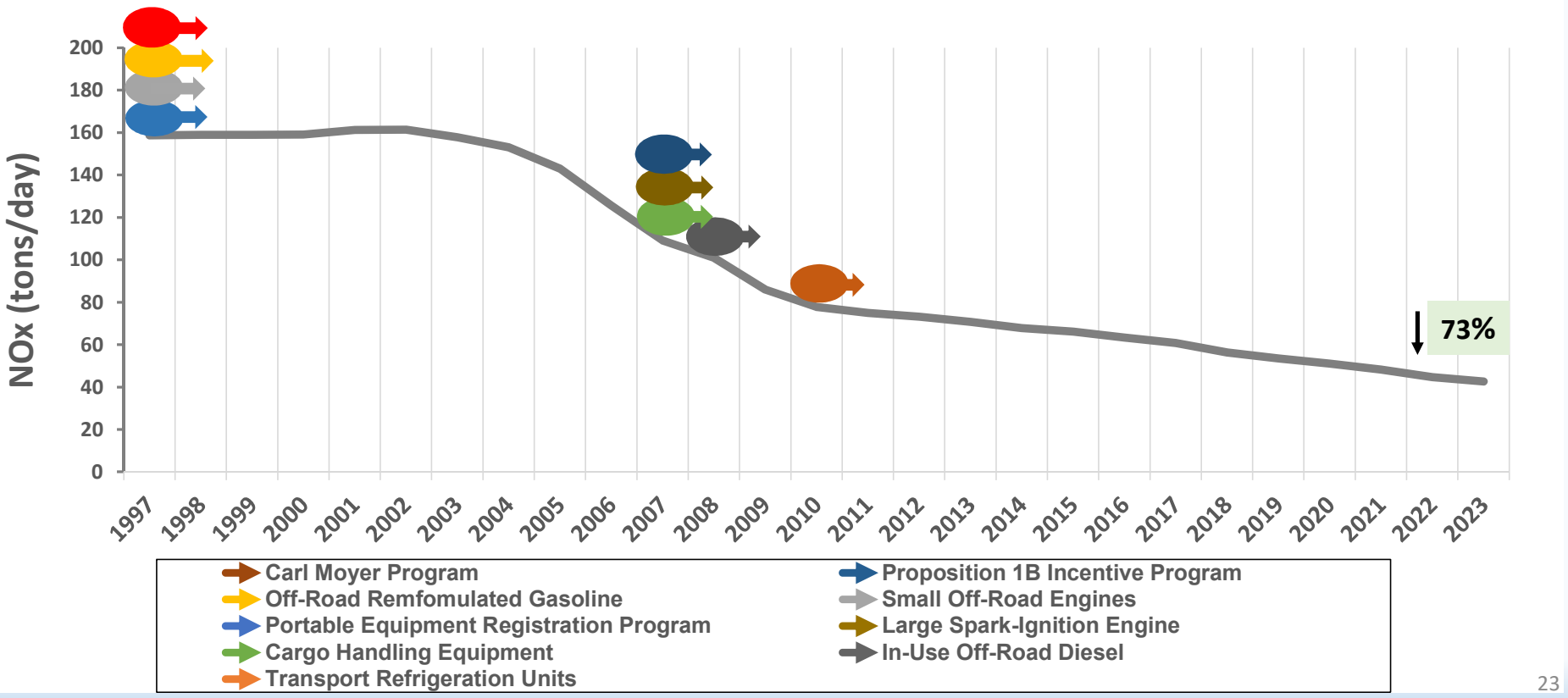
NOx Emissions Trend for LD Vehicles with Existing Regulations and Programs



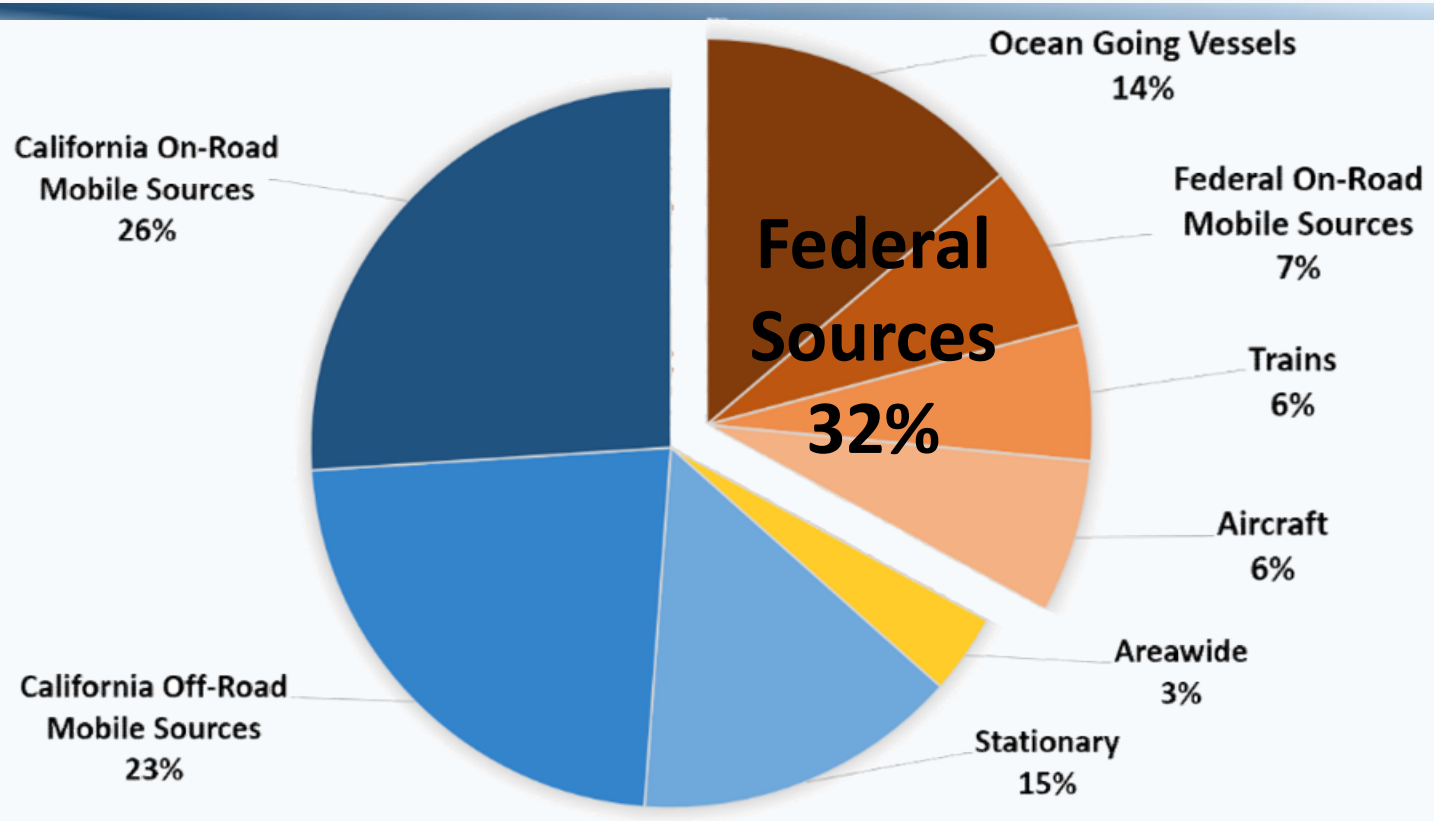
NOx Emissions Trend for HD Vehicles with Existing Regulations and Programs



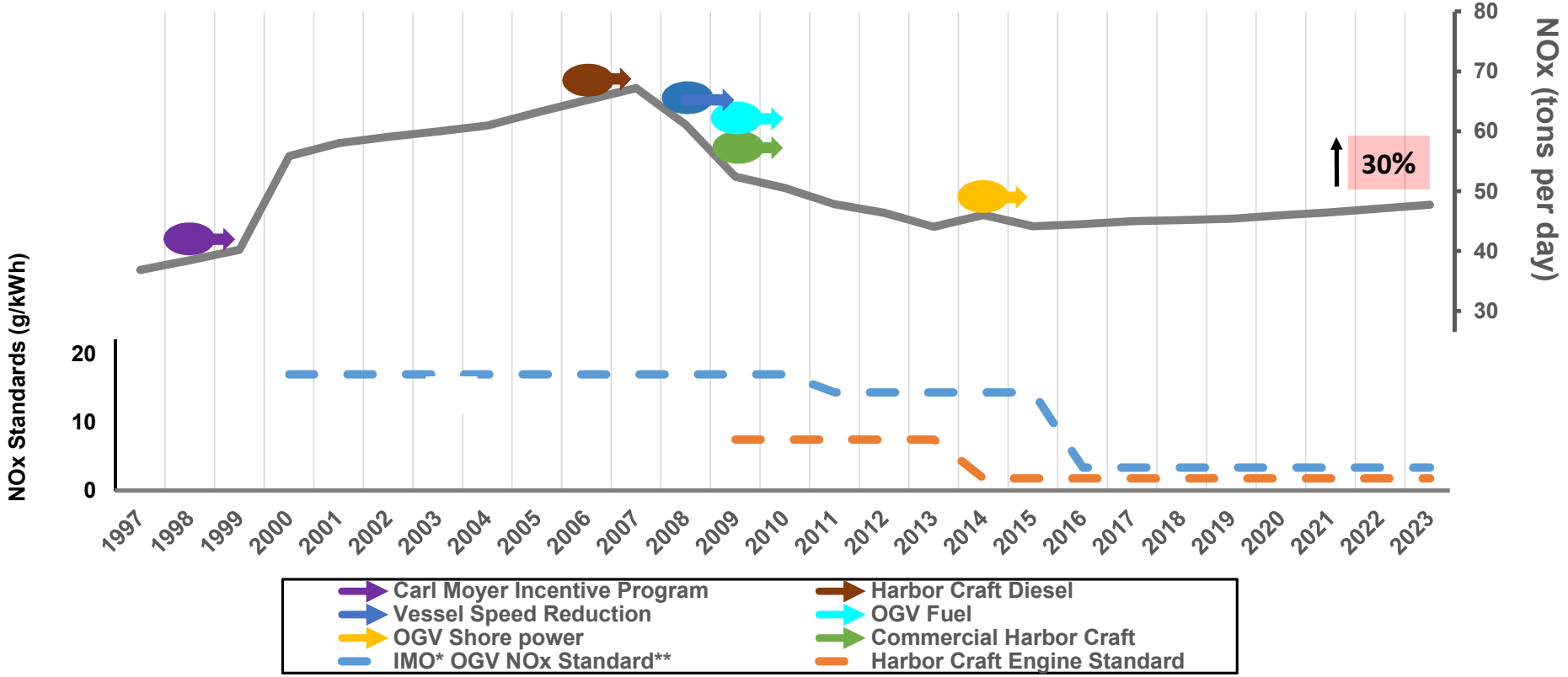
NOx Emissions Trend for Off-Road Equipment with Existing Regulations and Programs



Contribution of Federal Sources (2023 NOx emissions)

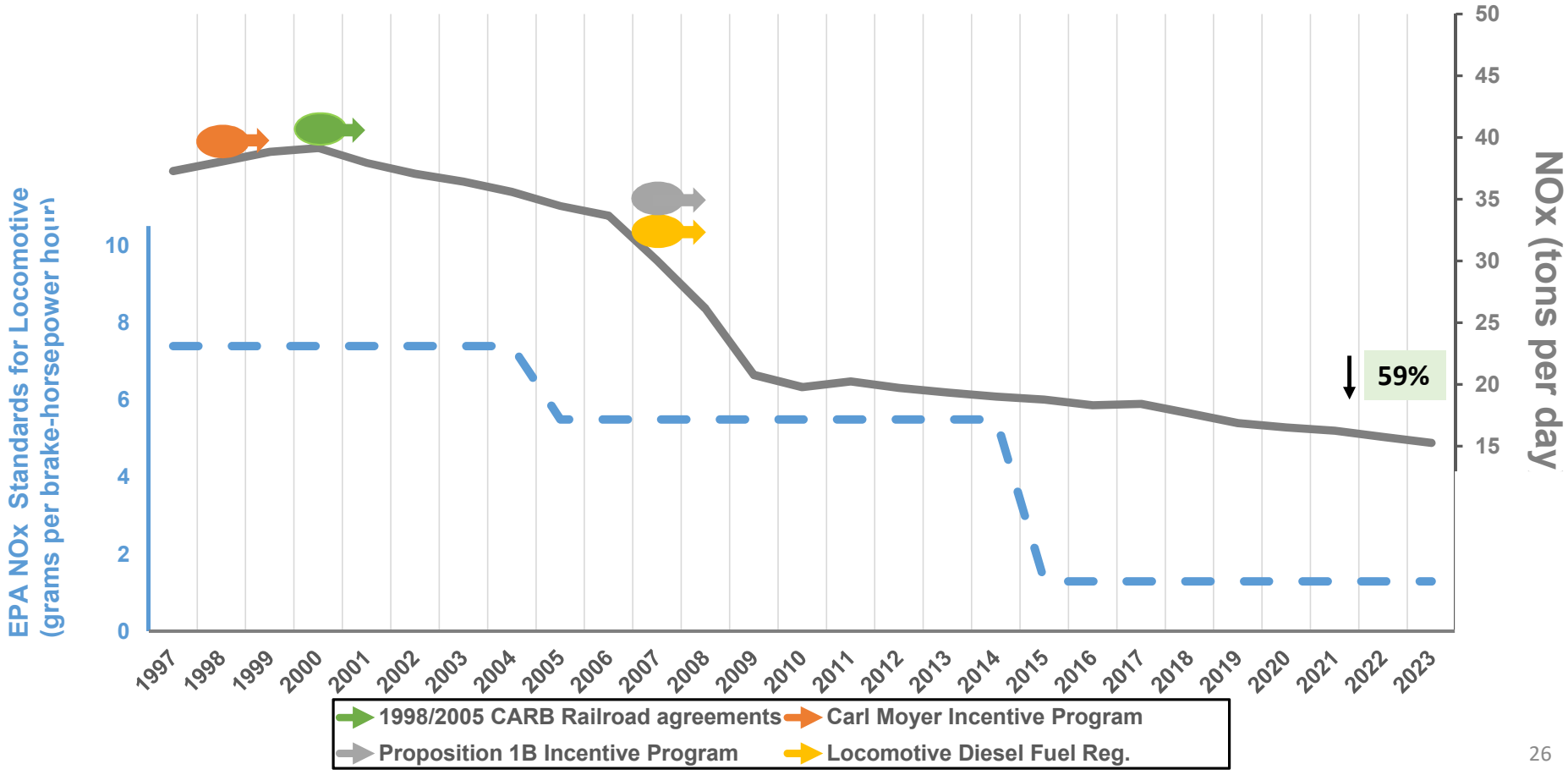


NOx Emissions Trend for OGVs with Existing Regulations and Programs

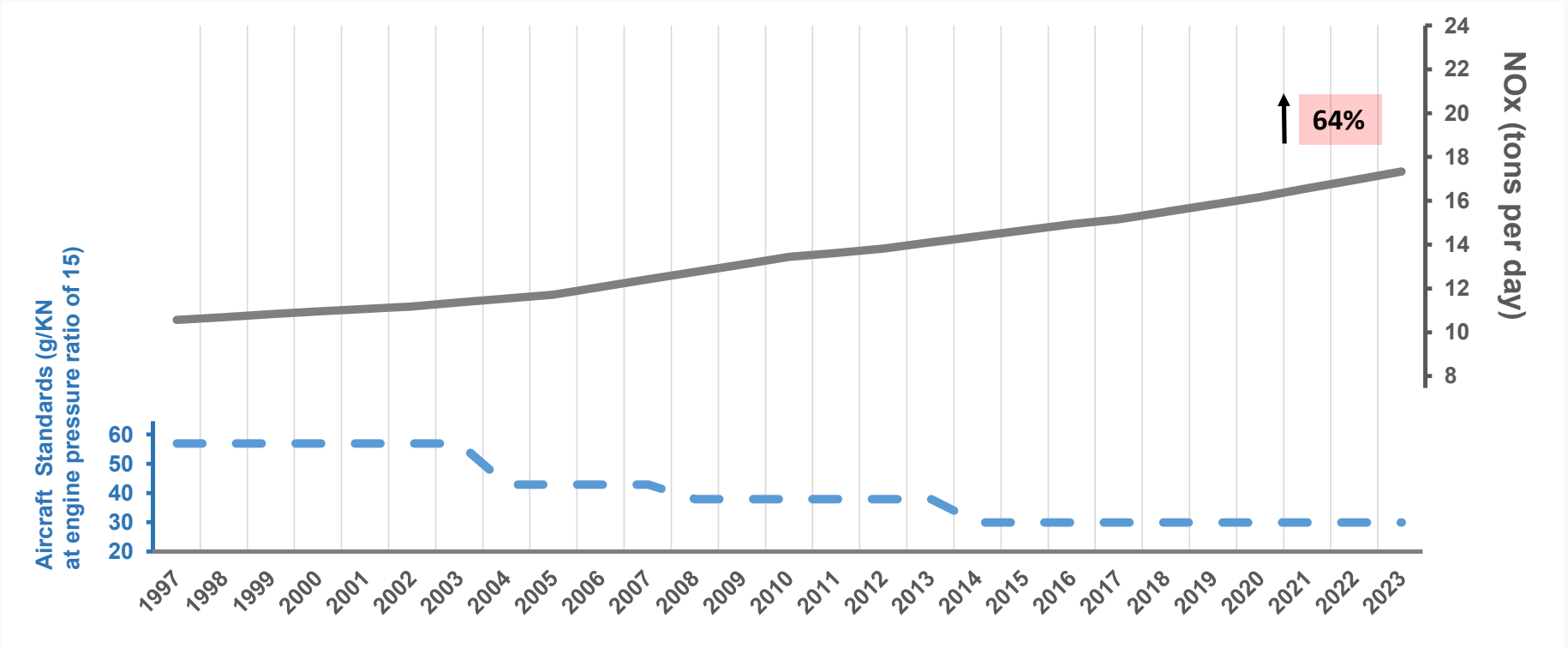


*International Maritime Organization (IMO) **Gram per kilowatt-hour with engine rpm < 130

NOx Emissions Trend for Locomotives with Existing Regulations and Programs



NOx Emissions Trend for Aircraft with Existing Regulations



South Coast AQMD and CARB's Efforts on Federal Sources

- On-Going Incentive Programs
- CARB's Regulations
  - OGV At-Berth
  - OGV Low-Sulfur Fuel
  - Intrastate Locomotives – CARB Diesel Fuel
- Petitions to U.S. EPA on New HD Engine Standards and Locomotives
- South Coast AQMD's Development of New Incentive Programs
  - OGVs
    - Technology Forum
    - Pacific Rim Initiative for Maritime Emission Reductions (PRIMER)
  - Stationary Sources

On-Going NZ and ZE Technology Development and Deployments

- Daimler Technologies North America (DTNA)
  - 20 battery-electric heavy-duty Freightliner trucks for real world demonstration
    - 15 Class 8 trucks (455 hp and 150-200 miles of service range)
    - 5 Class 6 trucks (220 hp and 150-200 miles of service range)
  - Funded by South Coast AQMD, U.S. EPA, Ports of LA and LB
- Volvo LIGHTS
  - 23 Class 8 battery-electric trucks for demonstration and deployment
    - 8 pre-commercial demonstration trucks (495 hp & 150+ miles)
    - 15 commercial/pre-commercial trucks (495 hp & up to 350 miles)
  - Funded by South Coast AQMD, CARB
- Additional 65+ Class 8 zero emission and zero emission capable trucks funded
- Low NOx Truck Replacements
  - 500 heavy-duty diesel drayage trucks with low NOx natural gas trucks
  - Funded by South Coast AQMD Incentive Programs, Ports of LA & LB

Future Incentive Funding Needs

- 2016 AQMP
  - Over $1 Billion per year over 14 years
  - Current effort will update this estimate based on latest information
- Reasonably Expected Future Funding
  - $210 - $240 million per year
    - AB 617-related Incentives – Approximately $90-100 M/yr
    - Carl Moyer - $50-60 M/yr
    - AB2766 Subvention Fund - $30 M/yr
    - VW Settlement - $20-30 M/yr
    - Mobile Source Air Pollution Reduction Review Committee - $20 M/yr
- Additional Funding Needed (Funding Action Plan)
  - Voting District Authorization legislation
  - Federal funding mechanism
  - Other

Proposed Contingency Measure Development Plan

- Accounting of NOx reductions achieved to date
  - Adopted CARB and South Coast AQMD measures since 2016 AQMP adoption
  - Proposed measures/programs to be adopted by end of 2019/early 2020
  - Incentive measures funded to date
- Additional reductions expected from anticipated sources of funding
- Identify remaining balance
  - Contribution of federal sources and federal responsibility
  - Measures for additional incentive funding, regulations, actions
- Due to U.S. EPA December 31, 2019

Public Process/Next Steps

- Public Consultation Meeting – Today
  - Seeking comments on proposed contingency measure development
  - Email comments to aqmpteam@aqmd.gov
- Initiate AQMP Advisory Group Meetings – September 2019
- Release Draft SIP Update Staff Report – October 2019
- 4-County Regional Public Workshops – October 2019
- South Coast AQMD Board Adoption – December 2019
  - Schedule very tight, ensure sufficient time for public process
- CARB Board Adoption/Submittal to U.S. EPA – Following South Coast AQMD Board adoption