

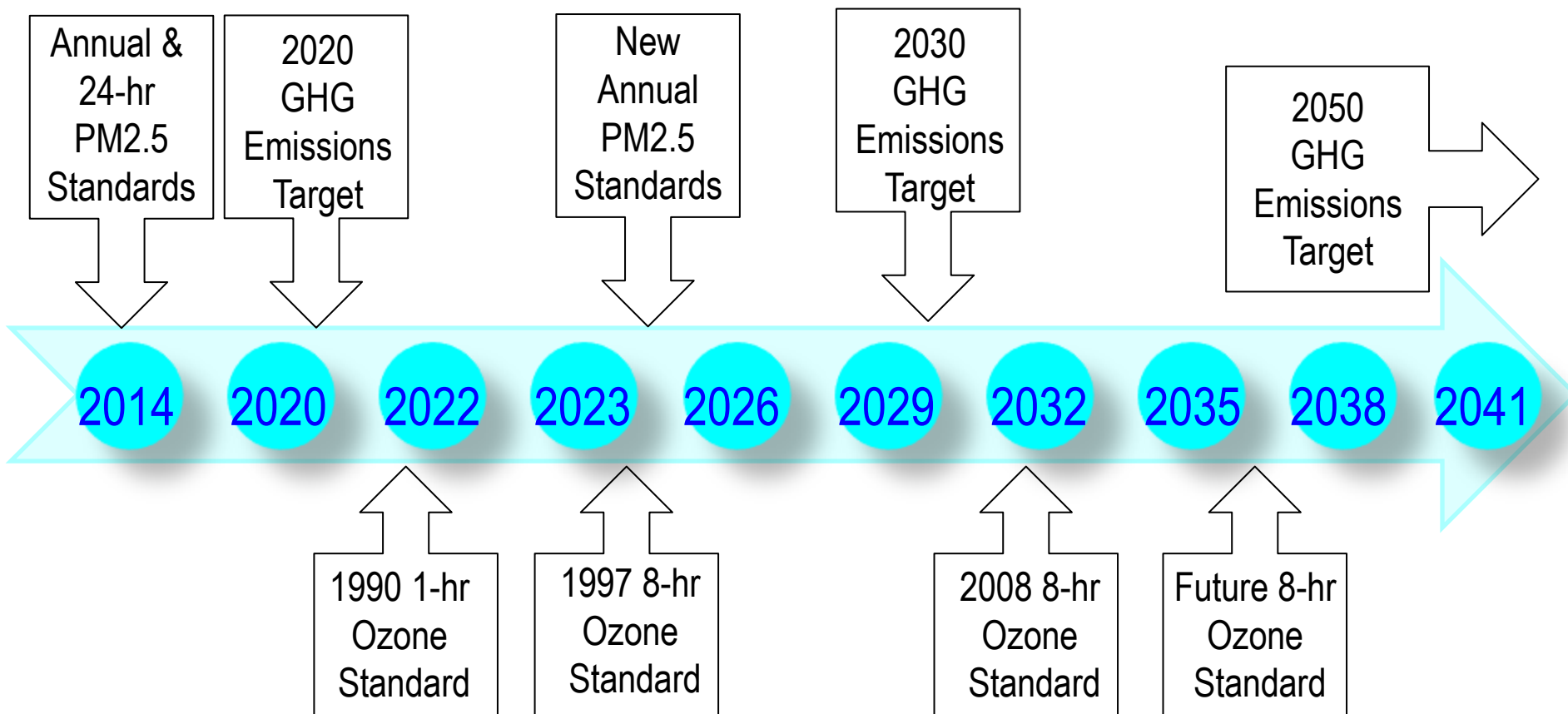
Draft White Papers for 2016 AQMP



Henry Hogo
Science and Technology Advancement

Clean Fuels Program Advisory Group Meeting
September 3, 2015

National Ambient Air Quality Standards

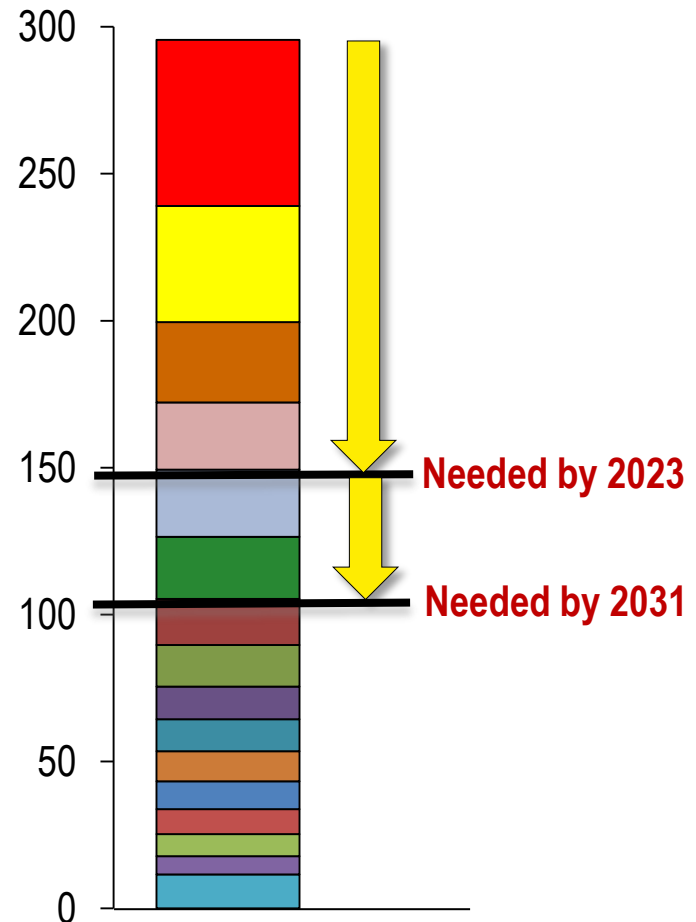


2016 Air Quality Management Plan

- Attainment Demonstration
 - 2008 8-Hour Ozone (75 ppb) – Attainment by 2032
 - 2012 Annual PM_{2.5} Standard (12 µg/m³) – Attainment between 2021 – 2025
- Additional Analysis
 - Update to Previous 1997 8-Hour Ozone SIP – Reductions by 2024
 - Update to 1-Hour Ozone SIP – Reductions by 2022
 - Serious Area 24-Hour PM_{2.5} SIP – Reductions by 2019

Needed Pollution Reduction to Meet Ozone Air Quality Standards

- Heavy-Duty Diesel Trucks
- Off-Road Mobile Equipment
- RECLAIM
- Ocean Going Vessels
- Locomotives
- Cars/Light-Duty Trucks/SUVs
- Aircraft
- Manufacturing and Industrial
- Residential Fuel Combustion
- Heavy-Duty Gas Trucks
- Commercial Harbor Craft
- Service and Commercial
- Buses
- Medium-Duty Trucks
- Recreational Boats
- Other



Source: Preliminary Draft 2023 Baseline Emissions Inventory, July 2015

Ongoing Activities

- Draft White Paper Development
 - Released Preliminary Draft Versions
- Monthly AQMP Advisory Group Meetings
 - Meeting Information And Presentations Available Online at <http://www.aqmd.gov/home/about/groups-committees/aqmp-advisory-group>
- Working with CARB staff on Mobile Source Control Strategy Development
- Working with SCAG staff on Demographics, Growth Factors And Transportation Control Measures

Schedule

- Draft AQMP Development – Fall/Winter 2015
- Draft AQMP Release – Winter 2015
- Public Workshops – Spring 2016
- SCAQMD Governing Board Consideration – April 2016
- CARB Approval – June 2016
- Submittal to U.S. EPA – July 2016

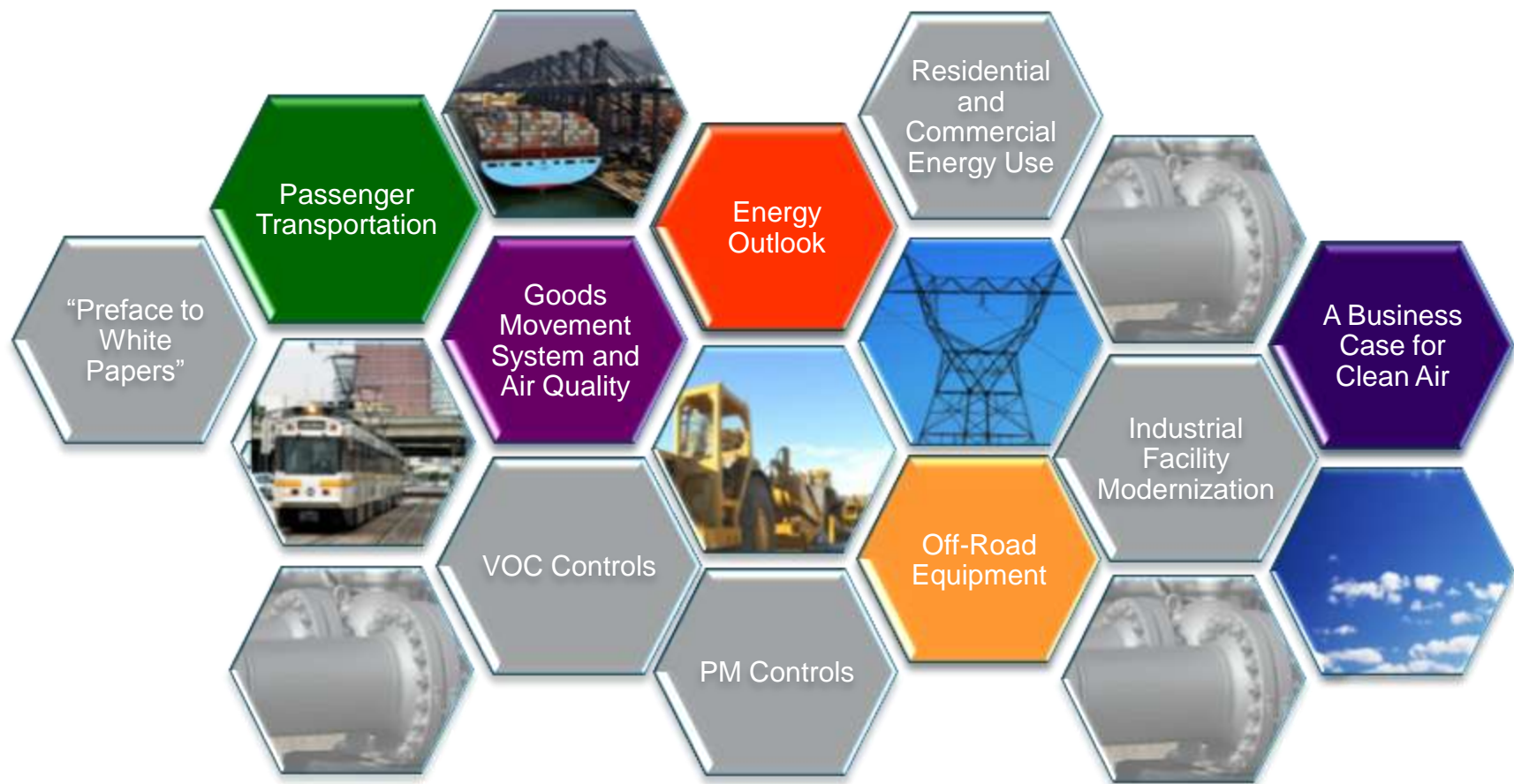
2016 AQMP White Papers

- Identify Successes/Challenges in Reducing Emissions
- Develop/Discuss Emission Reduction Scenarios
- Major Policy Issues and Factual Background
- Facilitate Input Regarding AQMP Development

2016 AQMP White Papers



Mobile Source Related White Papers



White Paper Development Process

- Periodic Updates to SCAQMD Mobile Source Committee and AQMP Advisory Group
- AQMP White Paper Subgroup
 - AQMP Advisory Group Members
 - Other Interested parties
 - Technology Experts
 - Open to the Public
- Multiple Meetings with Working Groups

Emission Reduction Scenarios

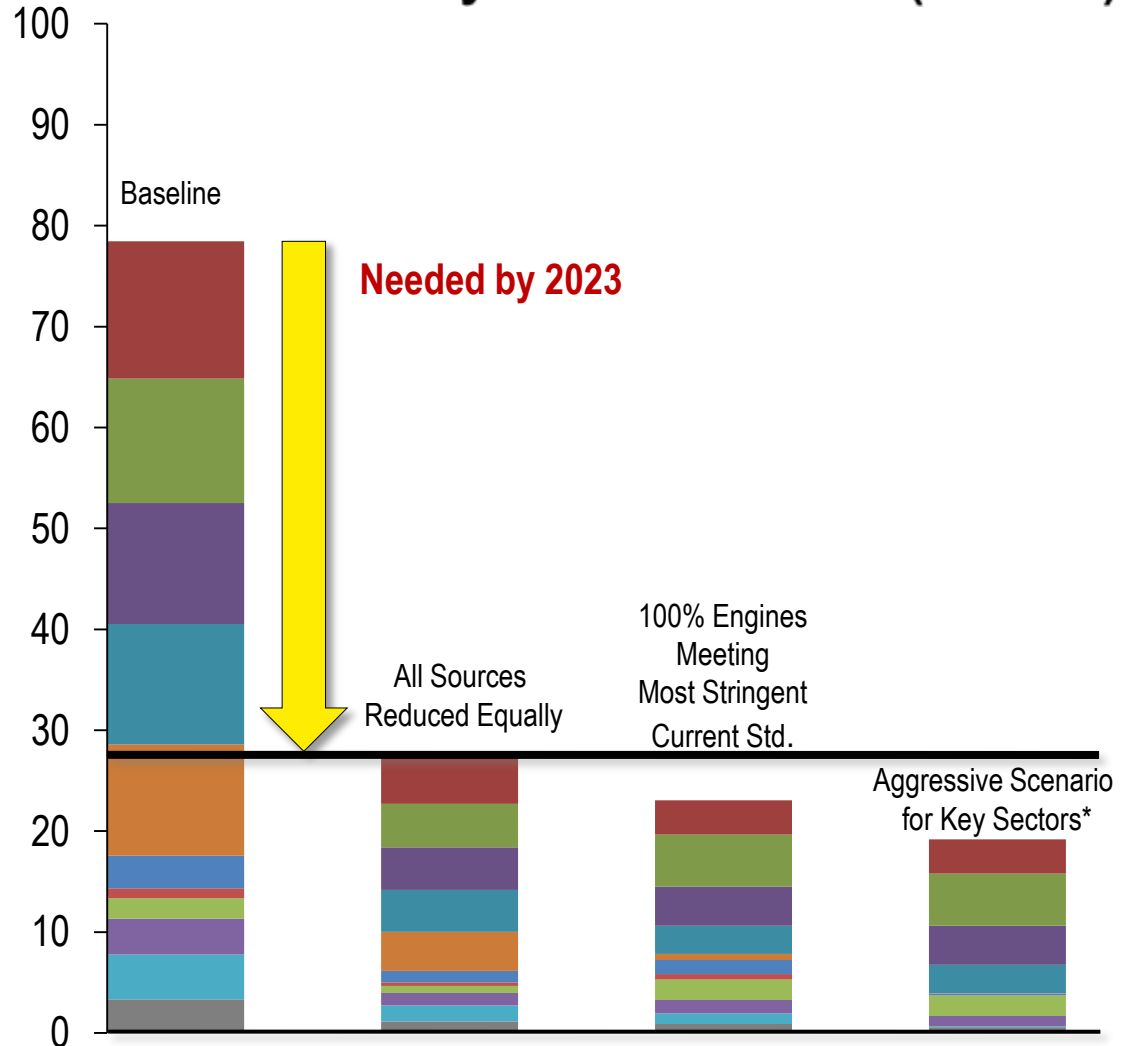
- Highlight Key NO_x Emission Contributors Based on 2012 AQMP Emissions Inventories
- For Illustrative Purposes
 - Does Not Represent Control Strategies to Achieve Scenario Levels
- Provide Information for Discussion on Areas to Focus Future Technology Development/ Commercialization and Timing for Deployment

Passenger Transportation Sectors

- Passenger Cars
- Motorcycles
- Light- Duty Trucks (<8,500 lbs GVWR)
- Passenger Vans and SUVs
- Transit Buses and School Buses
- Motorhomes
- Passenger Locomotives
- Cruise Ships/Ferries
- Passenger Aircraft/Ground Support Equipment

Passenger Transportation NOx Emission Reductions to Achieve 8-Hr Ozone Air Quality Standards (2023)

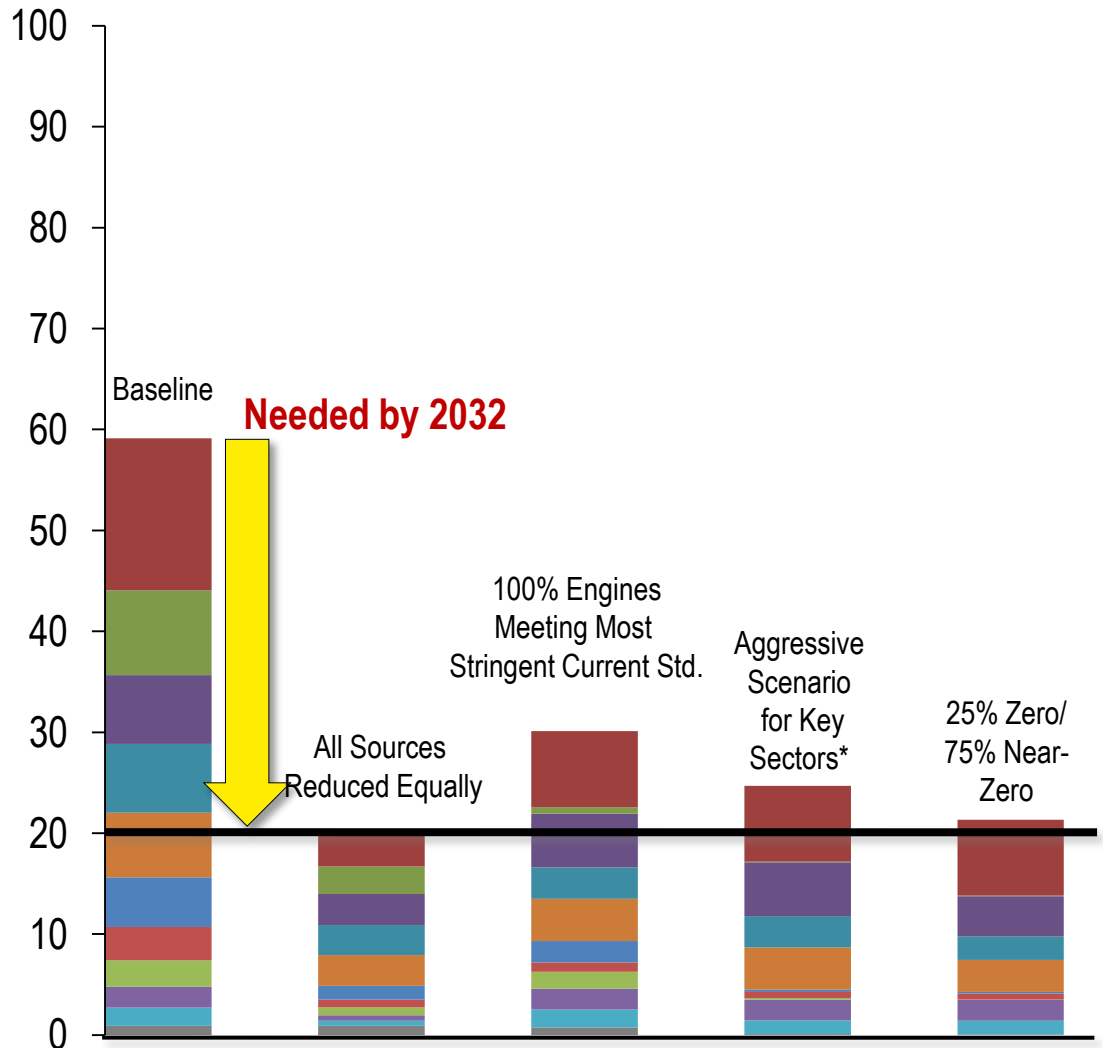
- Aircraft
- Passenger Cars
- LD Trucks
- MD Vehicles
- Urban Buses
- School Buses/Other Buses
- Motorhomes
- Motorcycles
- Ocean Going Vessels
- Passenger Locomotives
- Harbor Craft



*Key Sectors: Buses, Passenger Locomotives, Harbor Craft

Passenger Transportation NOx Emission Reductions to Achieve 8-Hr Ozone Air Quality Standards (2032)

- Aircraft
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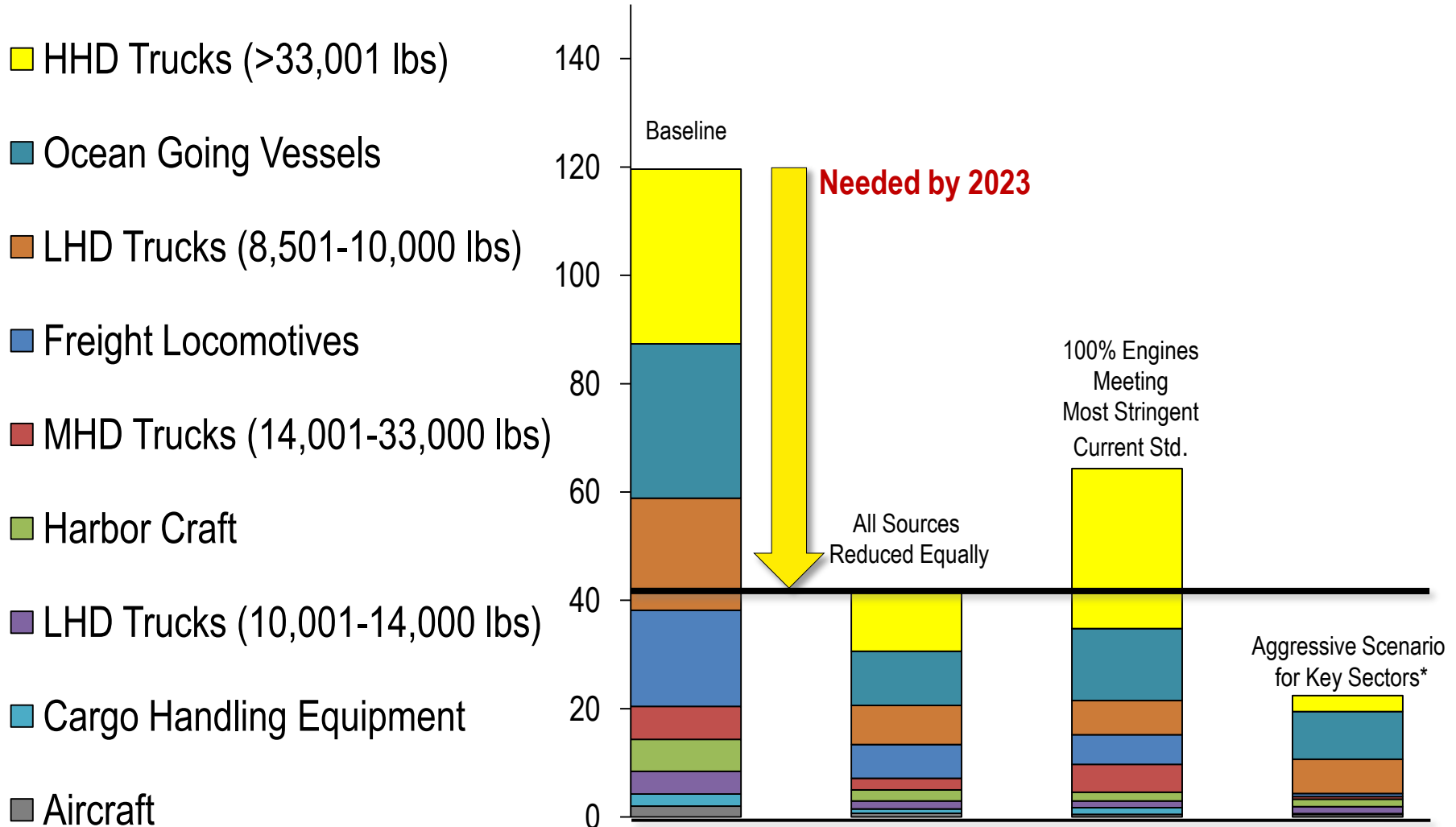


*Key Sectors: Buses, Passenger Locomotives, Harbor Craft

Goods Movement Sectors

- Heavy-Duty Trucks (>8,500 lbs GVWR)
- Locomotives
- Marine Vessels
- Harbor Craft
- Cargo Handling Equipment
- Air Cargo

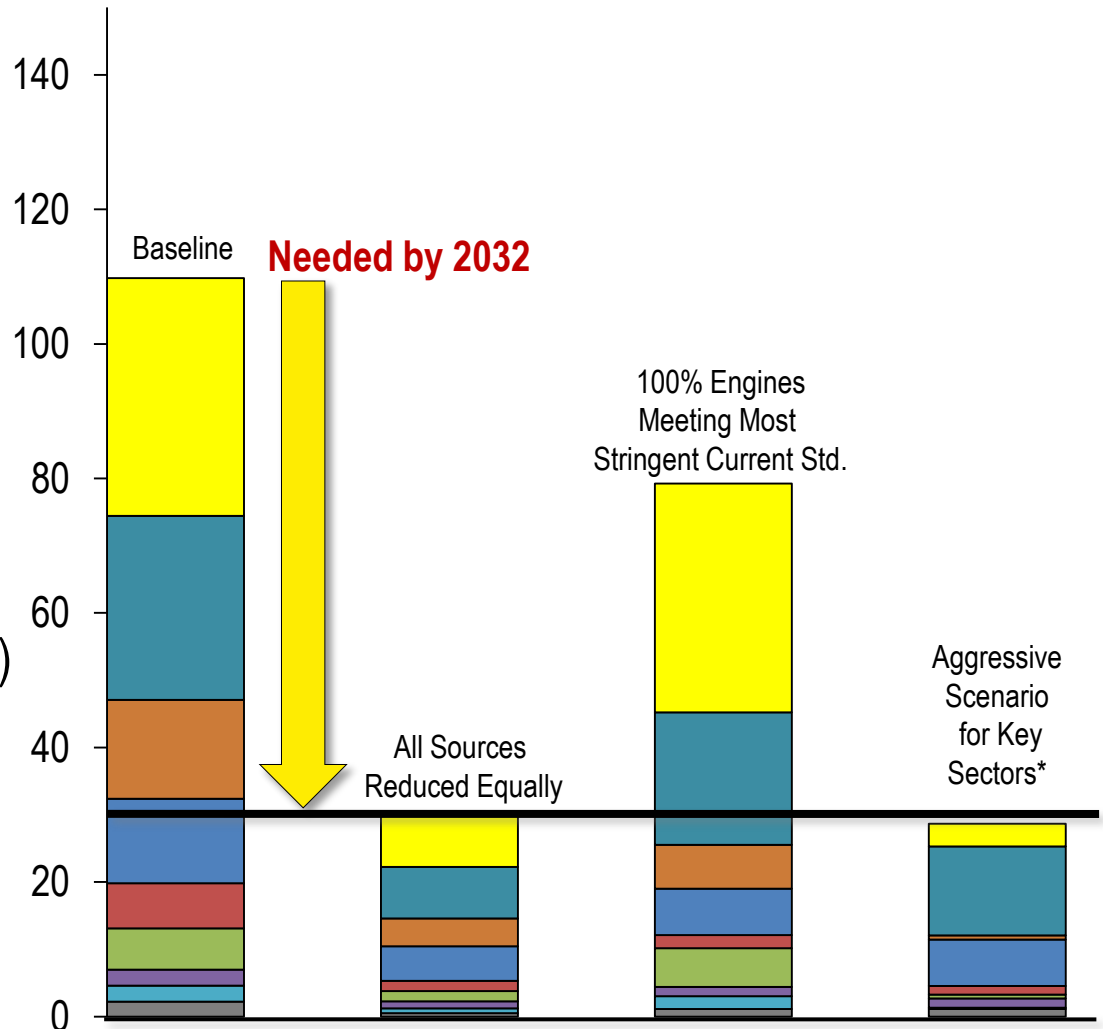
Goods Movement NOx Emission Reductions to Achieve 8-Hr Ozone Air Quality Standards (2023)



*Key Sectors: Medium and Heavy- Heavy-Duty Trucks, Freight Locomotives, Harbor Craft, Ocean-Going Vessels, and Cargo Handling Equipment

Goods Movement NOx Emission Reductions to Achieve 8-Hr Ozone Air Quality Standards (2032)

- HHD Trucks (>33,001 lbs)
- Ocean Going Vessels
- Freight Locomotives
- LHD Trucks (8,501-10,000 lbs)
- Harbor Craft
- MHD Trucks (14,001-33,000 lbs)
- LHD Trucks (10,001-14,000 lbs)
- Cargo Handling Equipment
- Aircraft



*Key Sectors: Medium and Heavy- Heavy-Duty Trucks, Freight Locomotives, Harbor Craft, Ocean-Going Vessels, and Cargo Handling Equipment

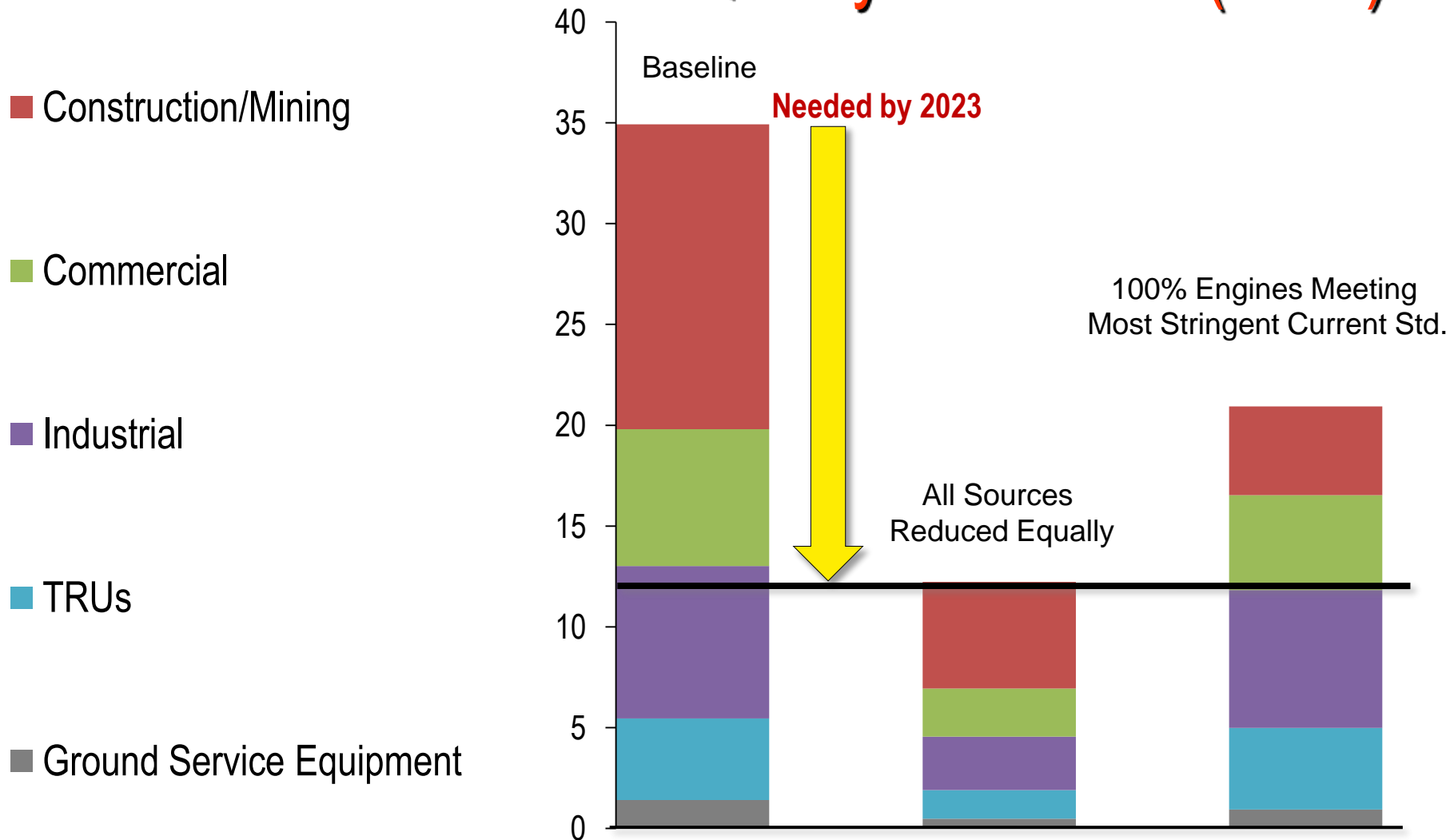
Estimated Off-Road Equipment Population and Emissions in 2014

Emissions Source Category	Population	VOC (tons/day)	NOx (tons/day)
Construction and Mining	86,607	3.45	25.54
Commercial	219,190	7.84	11.41
Industrial	34,070	1.97	10.01
Transportation Refrigeration Units	51,553	0.51	5.07
Cargo Handling Equipment	3,365	0.33	3.39
Lawn and Garden	6,801,314	38.50	4.62
Airport Ground Support Equipment	4,559	0.56	2.67
Oil Drilling and Workover	519	0.13	1.43
Miscellaneous	521	0.02	0.26
Total	7,201,698	53.31	64.40

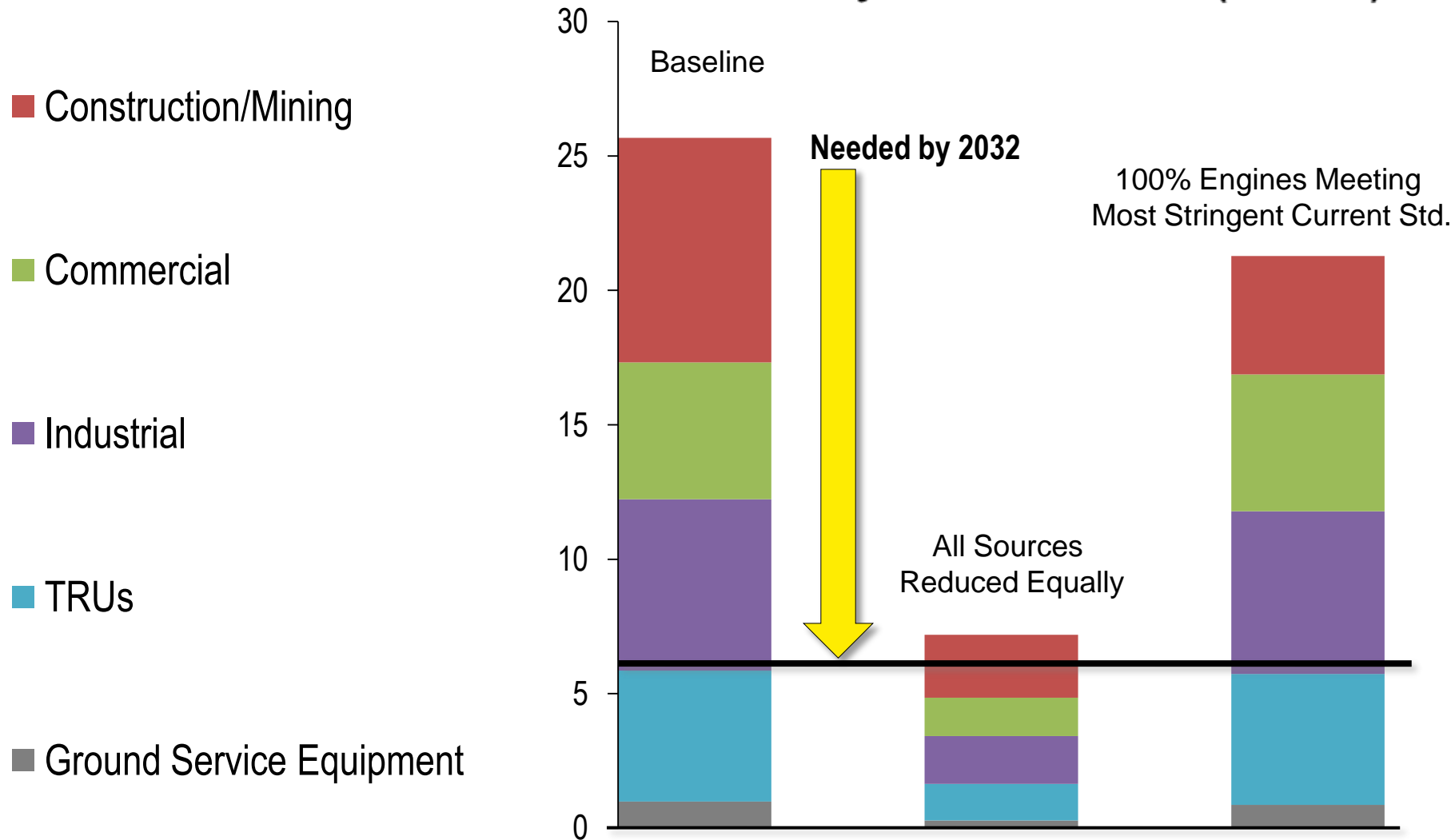
Estimated Off-Road Equipment Population and Emissions in 2032

Emissions Source Category	Population	VOC (tons/day)	NOx (tons/day)
Construction and Mining	111,213	1.86	8.35
Commercial	235,261	3.75	5.09
Industrial	53,007	1.10	6.37
Transportation Refrigeration Units	73,577	0.64	4.87
Cargo Handling Equipment	6,521	0.61	2.37
Lawn and Garden	8,612,866	29.25	6.44
Airport Ground Support Equipment	5,986	0.30	0.99
Oil Drilling and Workover	416	0.10	0.92
Miscellaneous	522	0.00	0.03
Total	9,099,369	37.61	35.43

Off-Road Equipment NOx Emission Reductions to Achieve 8-Hr Ozone Air Quality Standards (2023)



Off-Road Equipment NOx Emission Reductions to Achieve 8-Hr Ozone Air Quality Standards (2032)



Key Initial Observations

- Not Likely to Reach “Equal Share” Levels with Current Emissions Standards
- Some Emission Sources May Not Reach “Equal Share” Level – Need for Other Sources to Further Reduce Emissions
- Potential to Reach “Equal Share” Levels of Emission Reduction with Greater Penetration of Zero- and Near-Zero Emission Technologies

Key Initial Observations

- Need for New Exhaust Emission Standards
- Need for Earlier Penetration of Zero- and Near-Zero Emission Technologies (Commercialization/ Deployment)
- Developing Effective Strategies - Combination of Advanced Technology Deployment, Incentives (Including Funding) Programs, Alternative Mobility Options, Infrastructure Enhancements, and Urban Transformative Form
- Operational Efficiency Enhancements can be Made Relative to Congestion Relief, Intelligent Transportation Systems, Connected Vehicle Technologies, and Deliver of Goods

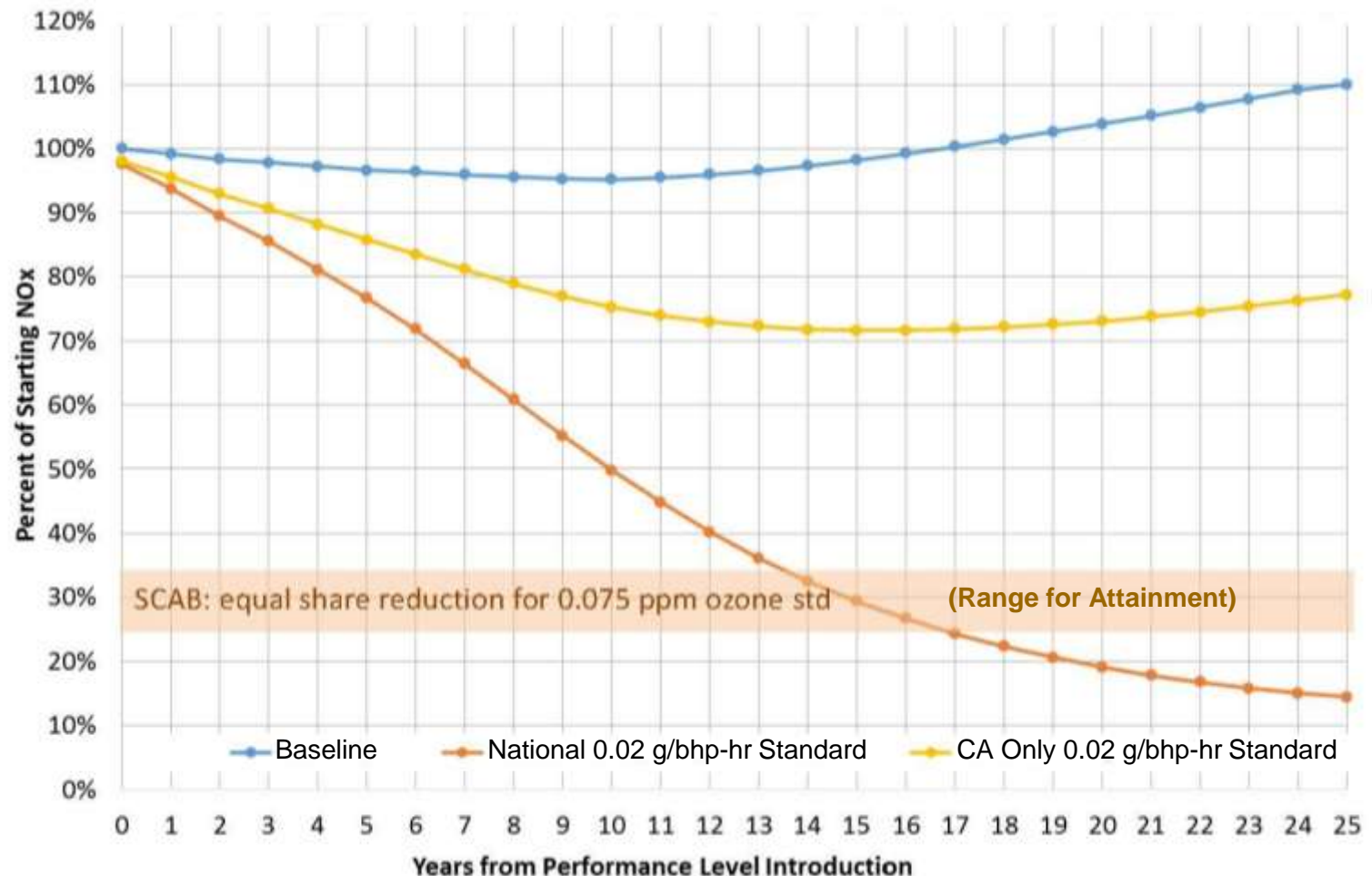
Key Initial Observations

- Nexus Between Passenger Transportation and Goods Movement Sector
- Increased Public Funding Assistance will be Beneficial for All Categories of Emissions
- Priority Placed on Reducing Emissions from Largest Contributors (i.e., Sub-Categories of Emissions)
- Economic Considerations (e.g., Cost of New Technology Equipment)

Key Recommendations

- Establish a New NO_x Emissions Standard for Heavy-duty Trucks and Buses that is 90% Cleaner Than Current Heavy-duty Engine Exhaust Emissions Standards
- Develop Mechanisms to Significantly Increase Deployment of Zero- and Near-zero Emission Technology Vehicles. Such Mechanisms May Take the Form of Regulations or Monetary and Non-monetary Incentives
- Seek Additional Funding Opportunities for Near-Zero and Zero-Emission Technology Deployment

Emissions Analysis of a Statewide vs National Introduction of a New Technology*



Source: Presentation by Mr. Cory Palmer, ARB at the Symposium on California's Development of its Phase 2 Greenhouse Gas Emission Standards for On-Road Heavy-Duty Vehicles (April 22, 2015)

Key Recommendations

- Support Greater Use of Renewable Fuels that Potentially Provide Criteria Pollutant Emission Reduction Benefits Along with Greenhouse Gas Emissions Benefits
- Accelerated Vehicle Retirement Combined with Incentives to Purchase Cleaner, Fuel Efficient Vehicles and Advanced Technology Vehicles Can Help Accelerate Penetration of Advanced Technology Vehicles for the Foreseeable Future
- Support FAA CLEEN Program in the Development of Cleaner, More Fuel Efficient Aircraft Engines

Key Recommendations – Operational Efficiencies

- Work with SCAG and CTCs to Pursue and Effectively Implement SB 375 to Reduce VMT
- Work with CTCs to Promote Alternative Forms of Transportation to Single Occupant Vehicles Which May Include Greater Usage of Public Transit and Commuter Rail, and Active Transportation
- Encourage Municipalities to Consider “Last Mile” Travel Options in Future Land Use Planning Efforts
- Dedicated Truck Lanes Should Give Preferential Treatment to Zero- and Near-Zero Trucks

Next Steps

- Incorporate Working Group Members/ Stakeholders Input and Comments (July – August 2015)
- Release Draft White Papers at the SCAQMD Governing Board Meeting (September 2015)
- 30-Day Comment Period
- Additional Discussions Part of the Control Measure Development for 2016 AQMP