



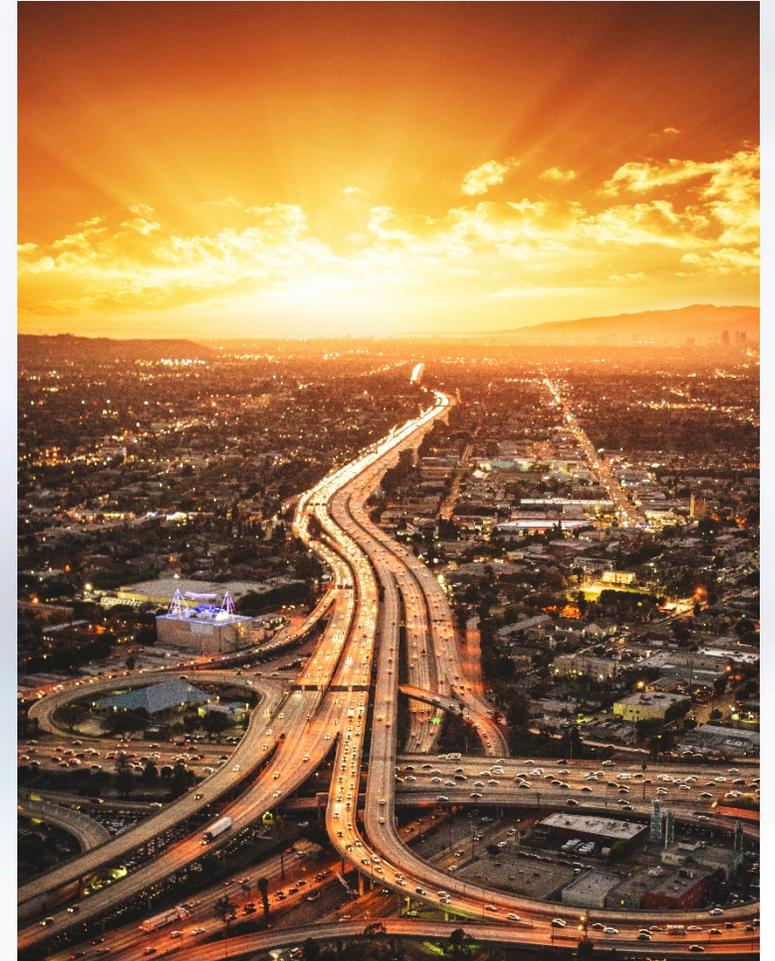
2020 Mobile Source Strategy

December 10, 2020

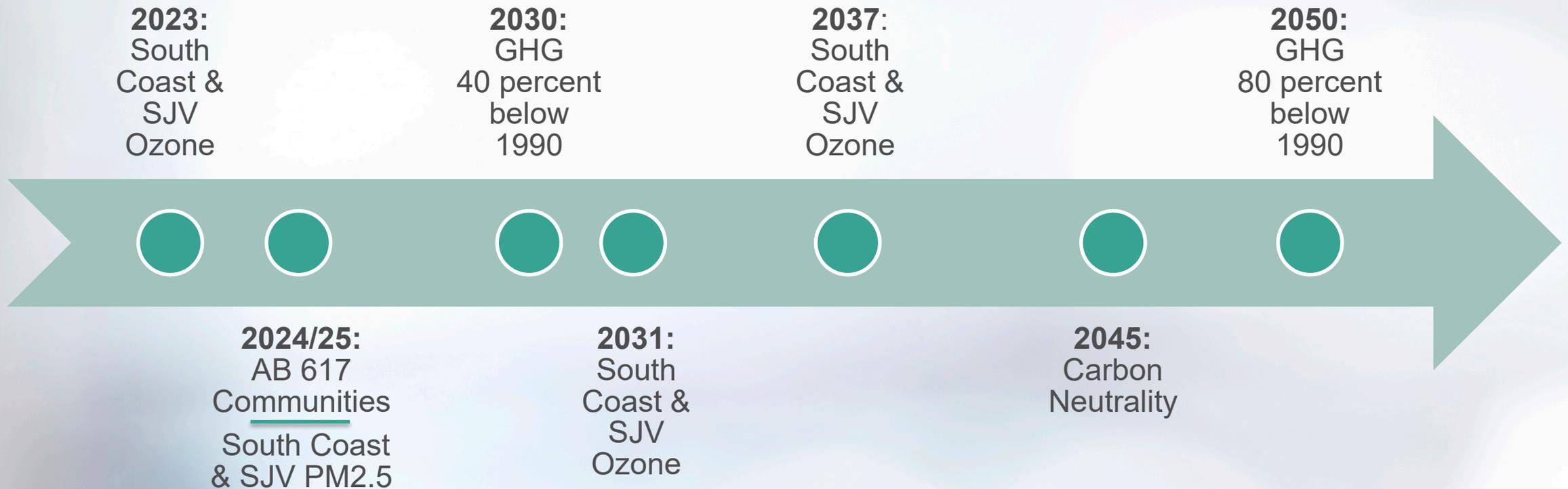


2020 Mobile Source Strategy

- Builds on 2016 Mobile Source Strategy
- Conceptual scenario approach
- Identifies technology mixes needed to meet air quality and climate targets
- Reflects Governor's recent ZEV EO
- Informs policy development



Addressing Multiple Goals



Senate Bill 44

- Requires CARB to update the Mobile Source Strategy every 5 years
- Update must include a comprehensive strategy for the deployment of medium- and heavy-duty vehicles in the State
- Include emissions reduction goals consistent with air quality and climate goals

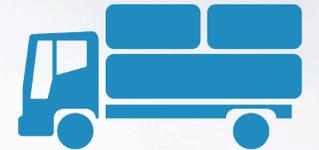


Executive Order N-79-20

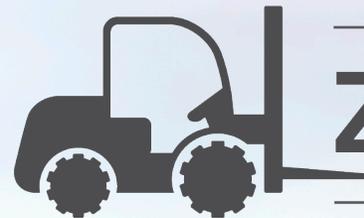


100% ZEV sales by 2035

Full transition to
ZEV short-haul/drayage trucks
by 2035



Full transition to **ZEV buses & heavy-duty long-haul trucks**
by 2045*



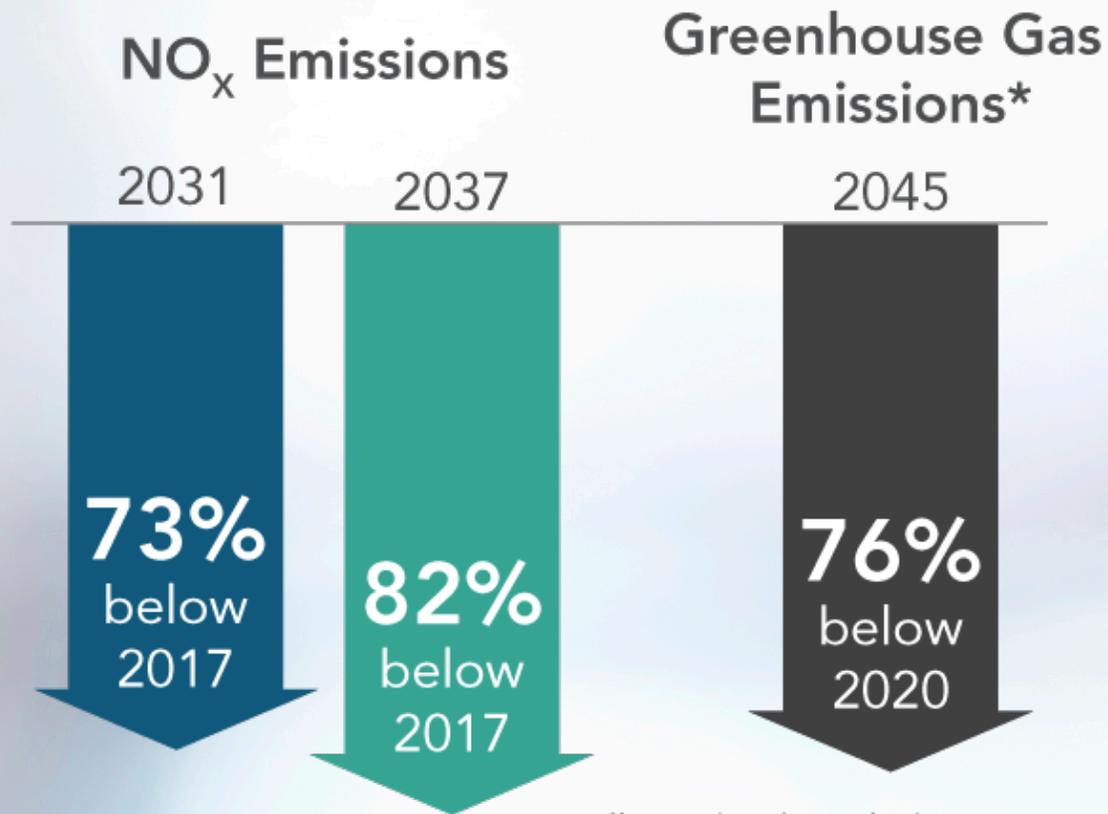
Full transition to
ZE off-road equipment
by 2035*

*where feasible

Potential Benefits

2020 Mobile Source Strategy

November 2020 Draft



*well-to-wheel, excluding aviation

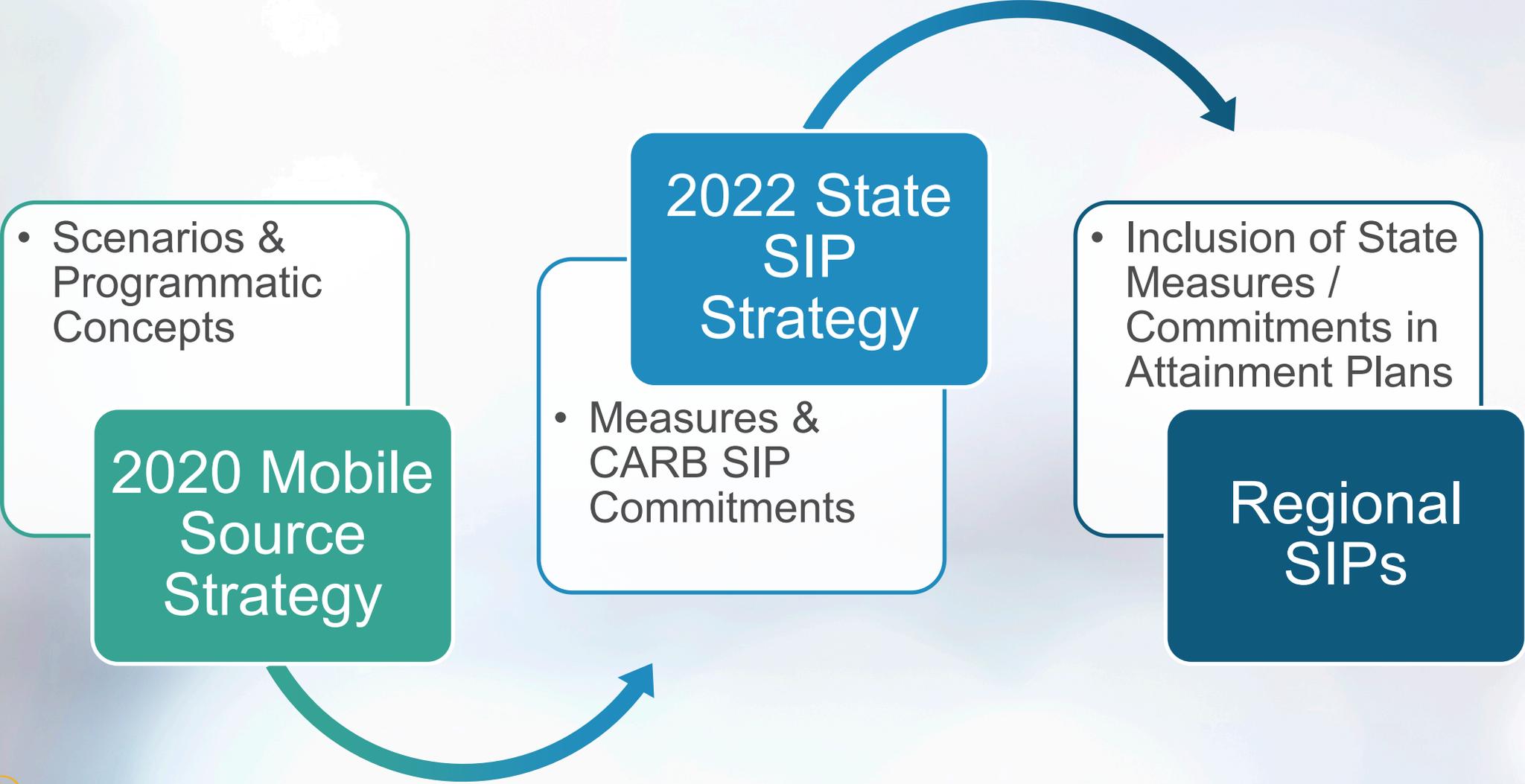


85 percent
of passenger vehicles
ZEV & PHEV in 2045



77 percent
of heavy-duty fleet
ZEVs in 2045

Development Continues



Addressing Near-Term Needs

Measures Under Development	Target Date
Locomotive Measure	Early 2022
First Phase Heavy-Duty Vehicle Inspection & Maintenance	2023
Cargo Handling Equipment Regulation	2023/2024
Construction and Mining Equipment Measure	2024
Co-Benefits from Climate Program	2020-2024

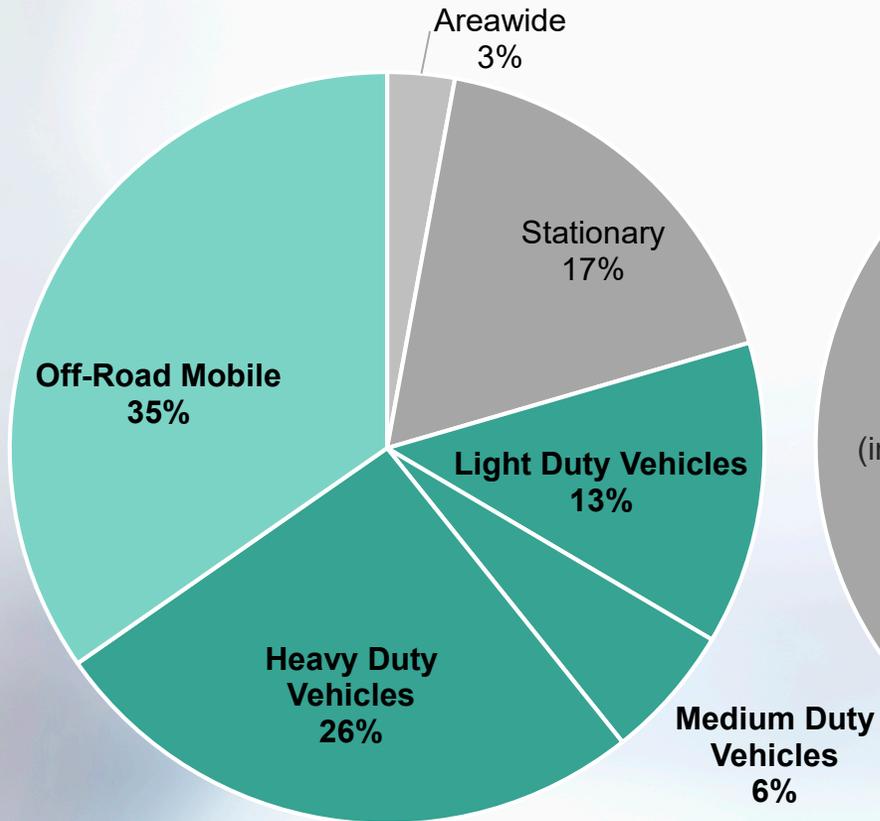
Complementary Effort

South Coast 2022 AQMP Working Groups

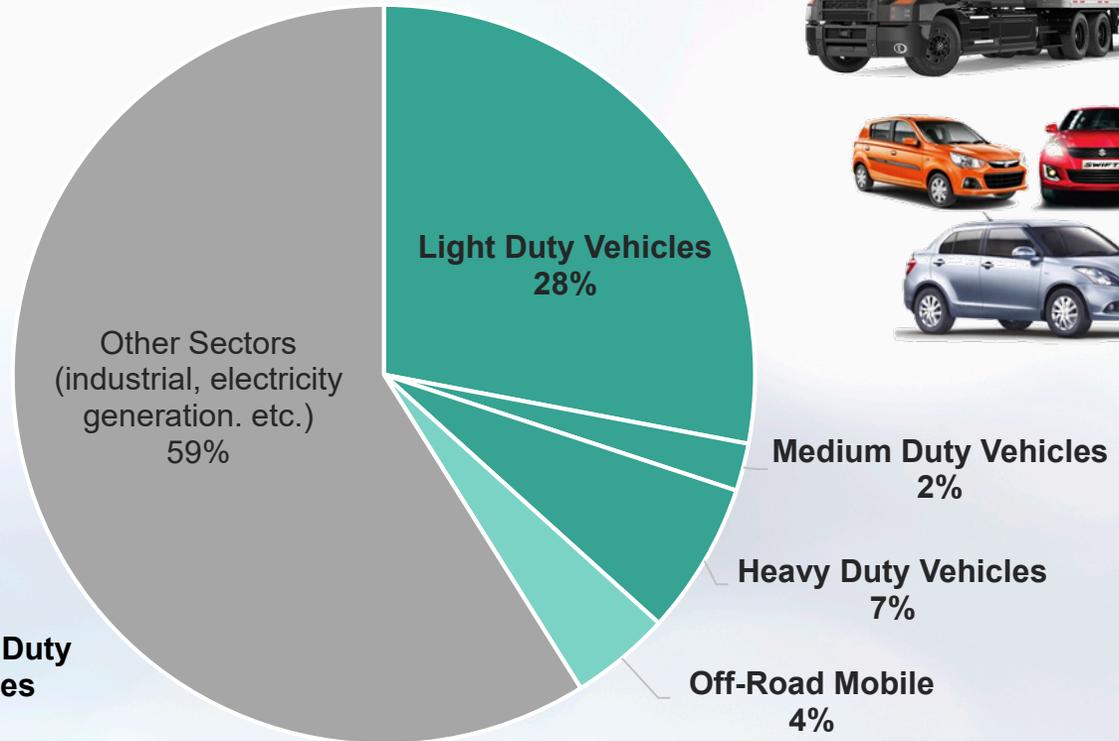
- CARB and South Coast AQMD joint process
- Kickoff this month
- 4 working groups
 - Ocean-going Vessels
 - Aircraft
 - Trucks and Infrastructure
 - Construction and Industrial Equipment
- Will look to identify additional near-term benefits

Importance of Mobile Source Emissions

Statewide NOx Emissions



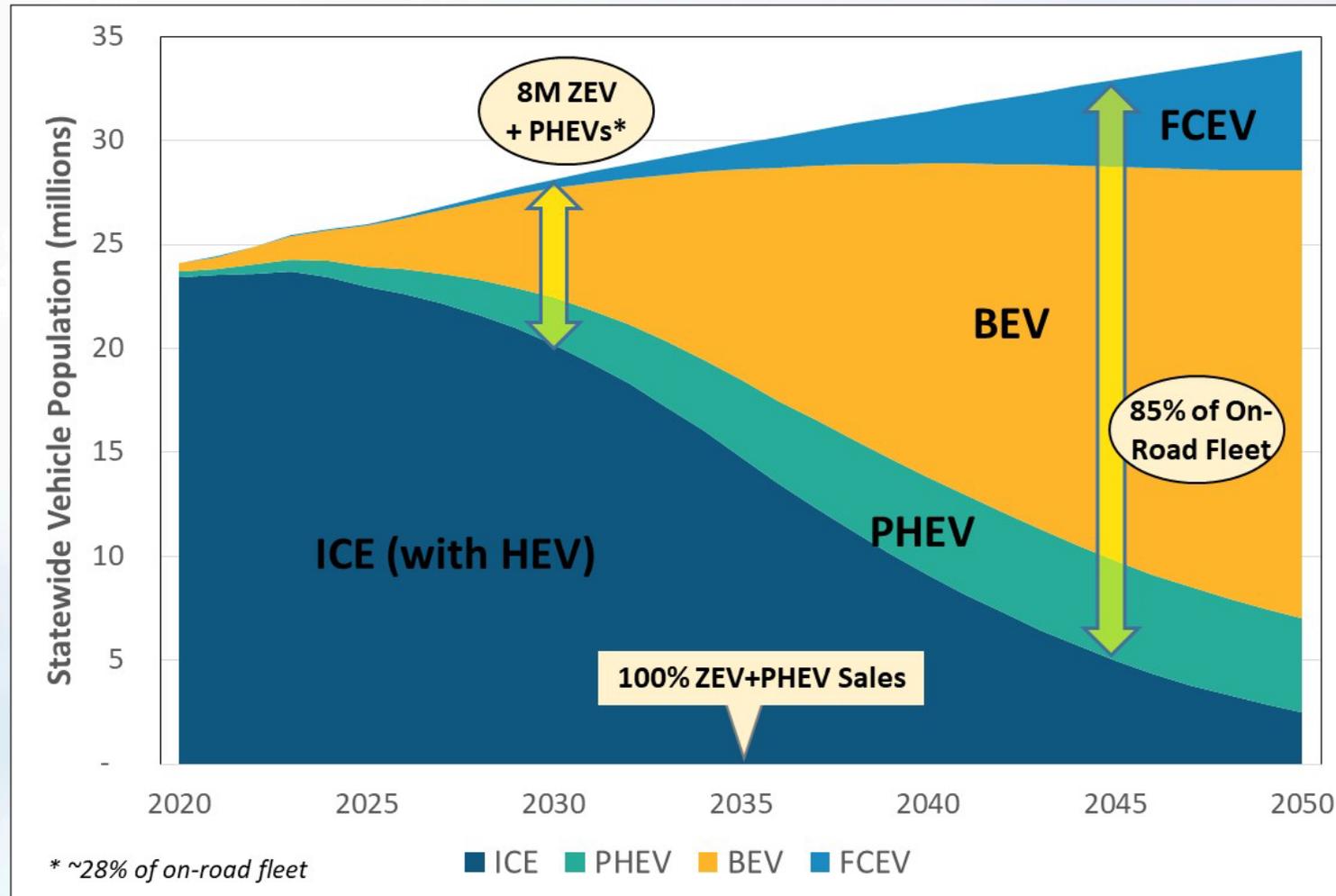
Statewide GHG Emissions



On-Road Vehicle Strategies

Light-Duty	Medium-Duty	Heavy-Duty
Aggressive ZEV penetration	Aggressive ZEV penetration	Aggressive ZEV penetration, and accelerated replacement of older vehicles
Enhanced ZEV and LEV regulations	Enhanced LEV regulations	Omnibus Rule
Reduce Vehicle Miles Travelled	Continued energy efficiency improvements	Continued energy efficiency improvements
		In-use performance measures
		Renewable fuels where electrification is not feasible

Light-Duty Vehicle Scenario



Reducing VMT in California

Secure and sustain emissions reductions by linking transportation investments and land use decisions

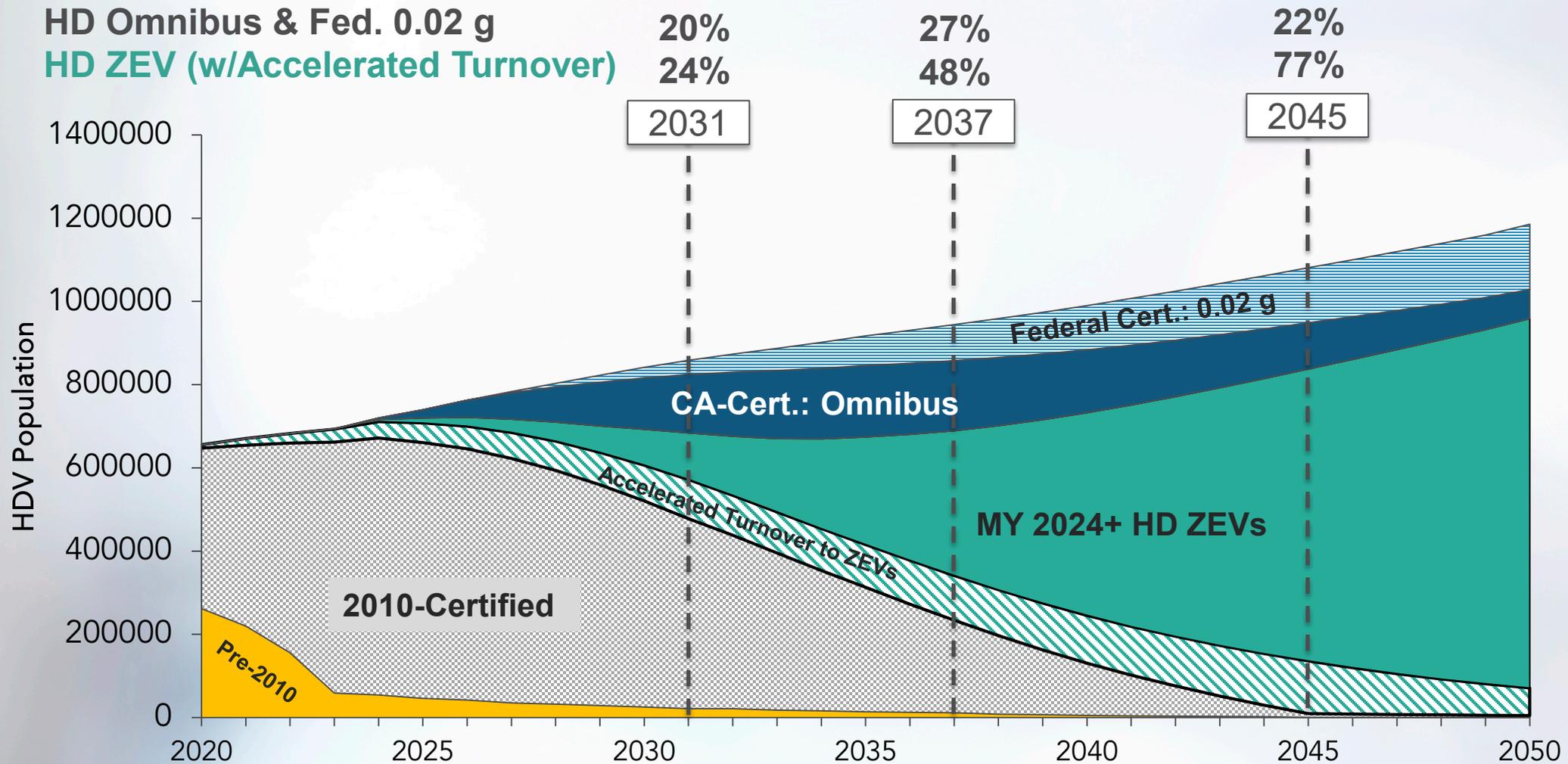
Develop a VMT/GHG mitigation bank to assist with implementation of new requirements for project transportation impact mitigation

Align with the State's initiative to establish a framework for integrated travel planning and payment through incentives and rebates

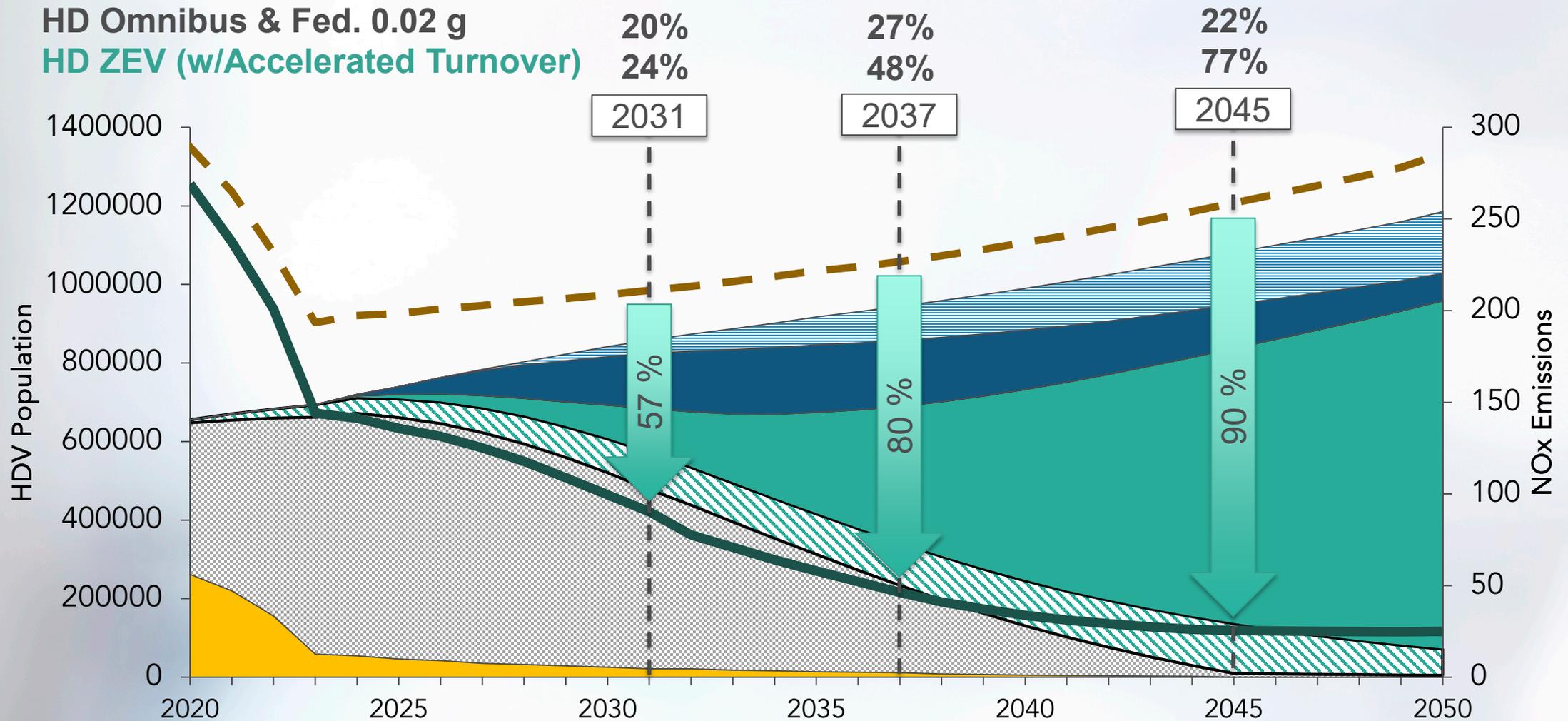
Explore non-regressive transportation pricing and demand management



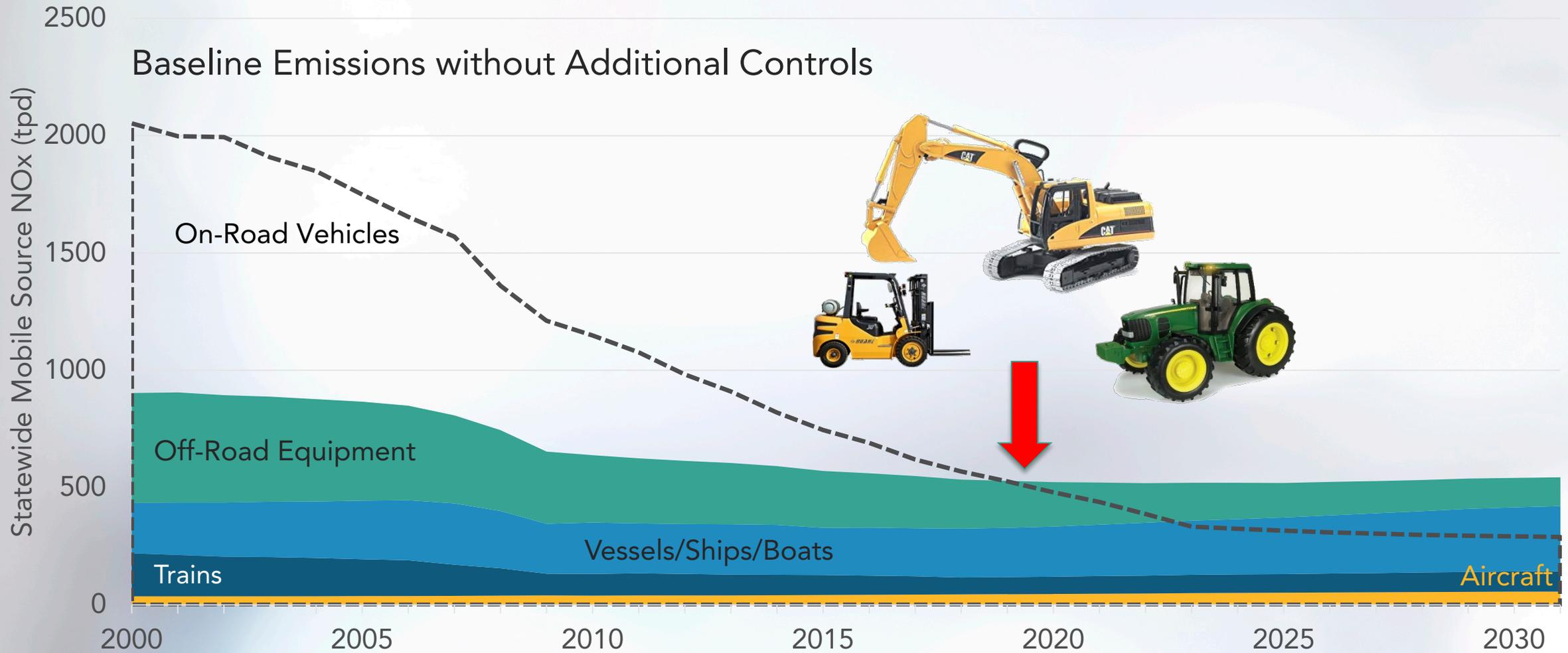
On-Road Heavy-Duty Scenario



On-Road Heavy-Duty Scenario



Growing Importance of Off-Road



Off-Road Engine Strategies

- Zero-emission technology wherever feasible
- Cleaner combustion engines
- Accelerated replacement of older equipment with cleanest available technology
- Retrofit with after-treatment technologies
- Renewable fuels where electrification is not feasible

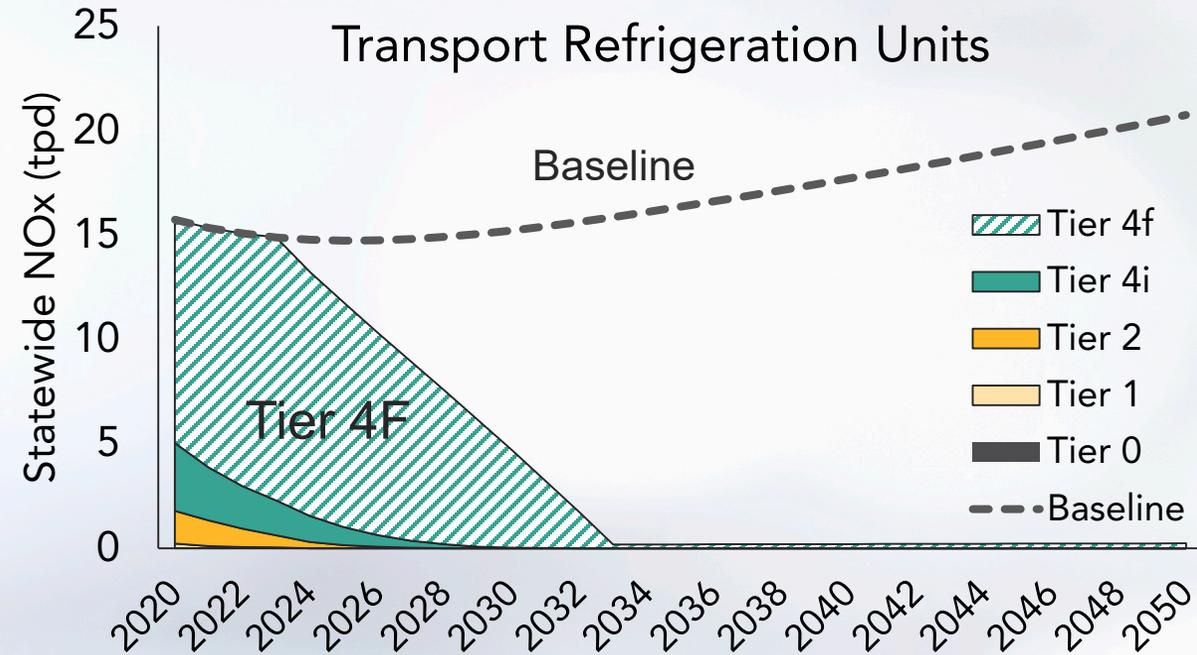
Zero-Emission and Cleaner Off-Road Engine Standards

Full transition to ZE for most sectors with smaller engines

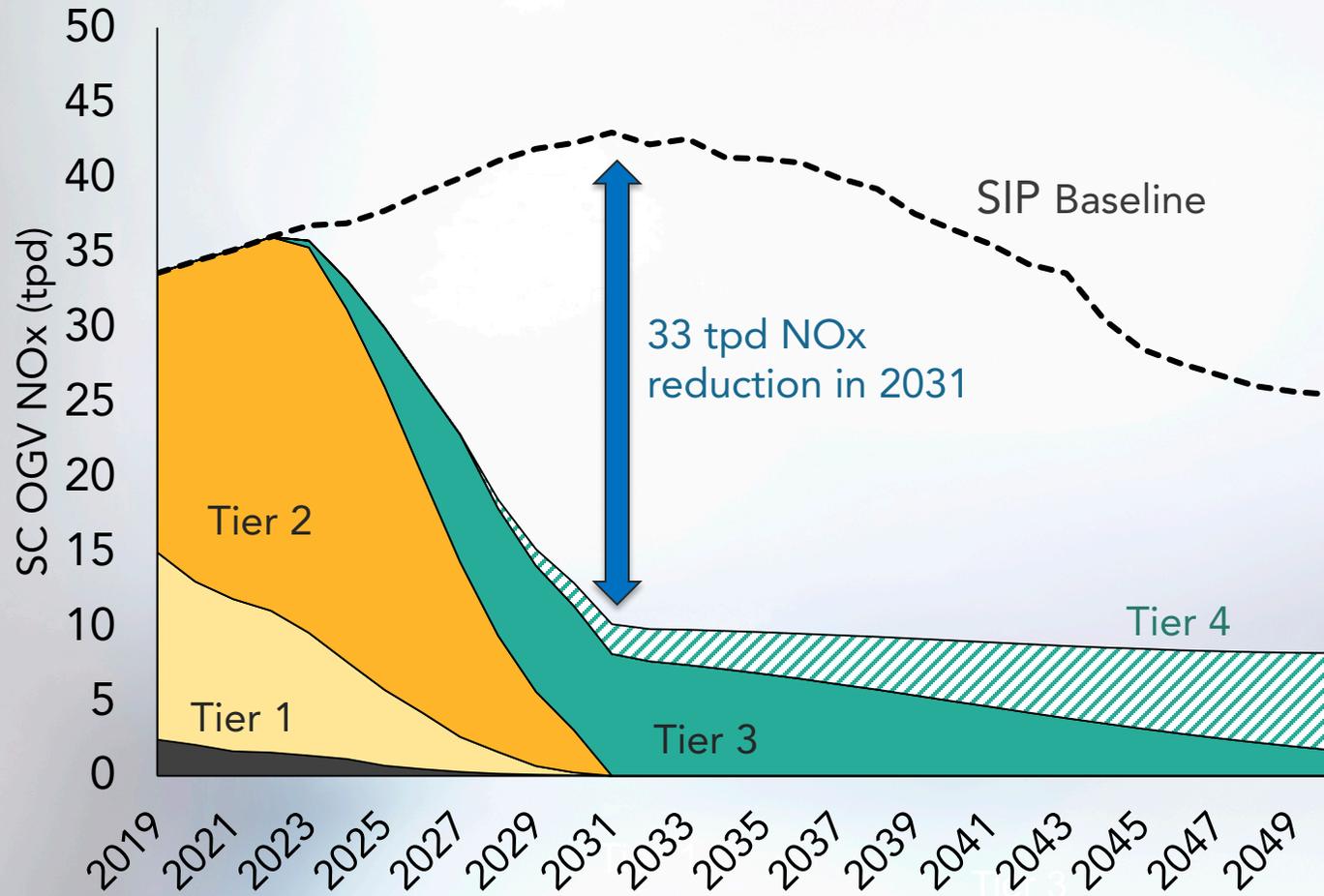
- Small Off-Road Engines
- Cargo Handling Equipment
- Airport Ground Support Equipment
- Transport Refrigeration Units
- Forklifts

Off-Road Tier 5

- 50%-90% NOx and PM reduction from Tier 4F
- Adoption around 2028



Ocean-Going Vessel Scenario

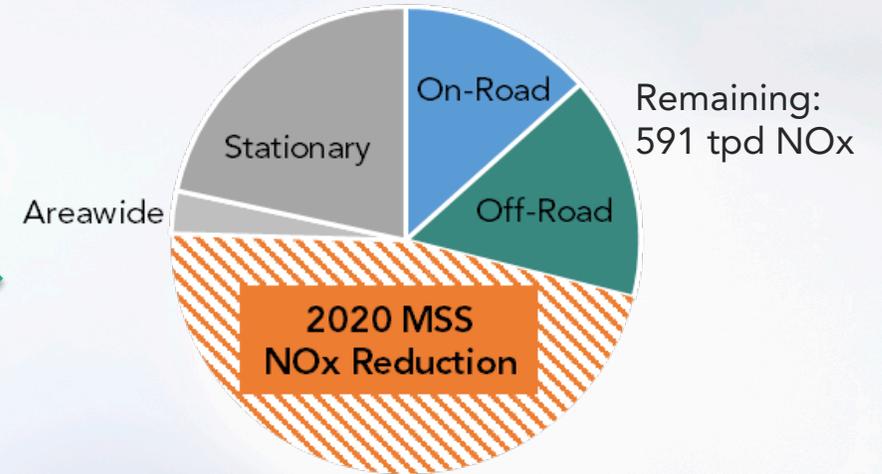
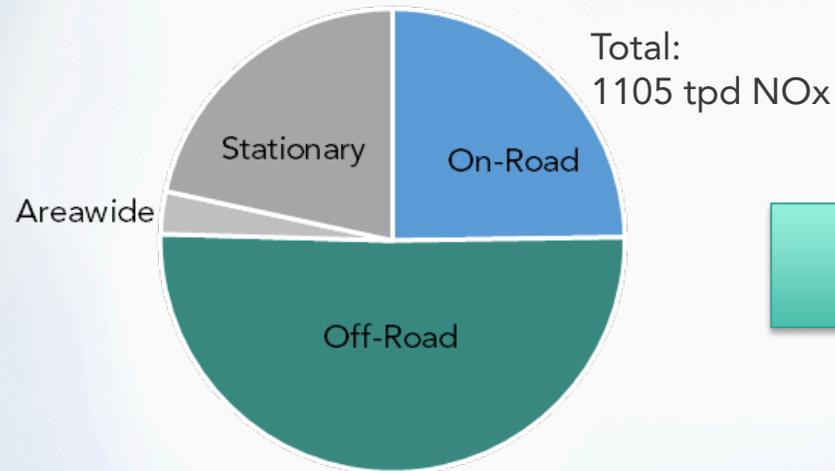


Address transit, anchorage and maneuvering emissions

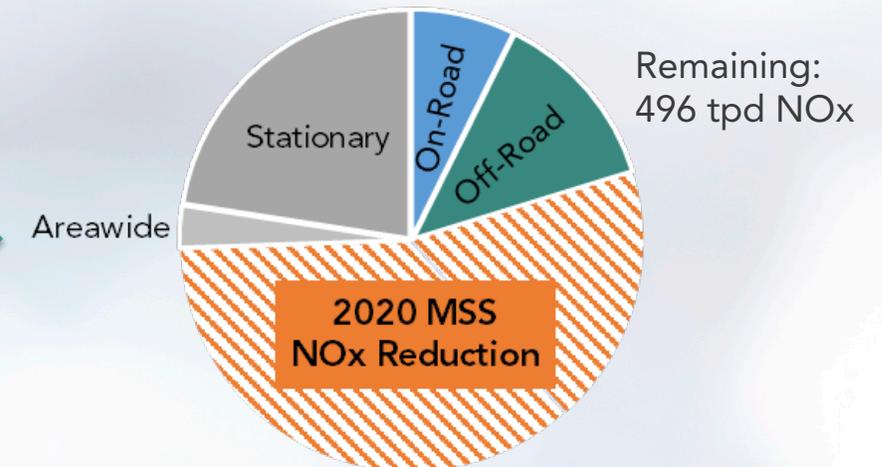
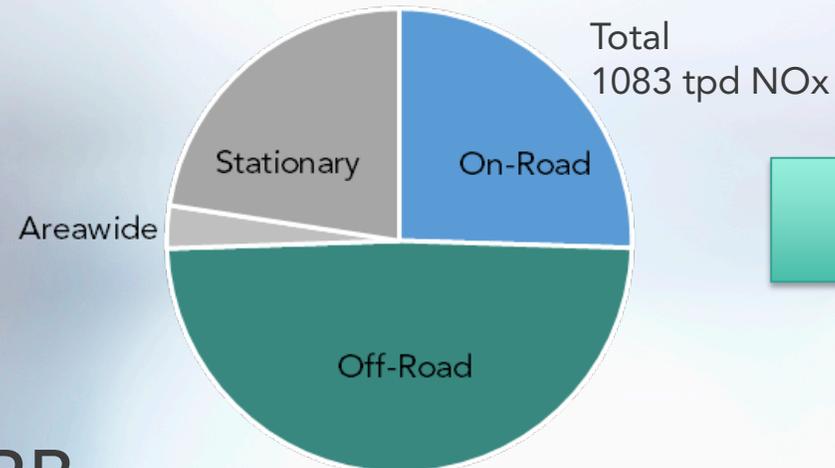
- Replace Tier 0/1/2 visits with Tier 3 or cleaner by 2031
- Introduce Tier 4 marine standards in 2028
- Working with SC AQMD on a scenario to retrofit Tier 2 vessels

2020 MSS Estimated NOx Reductions

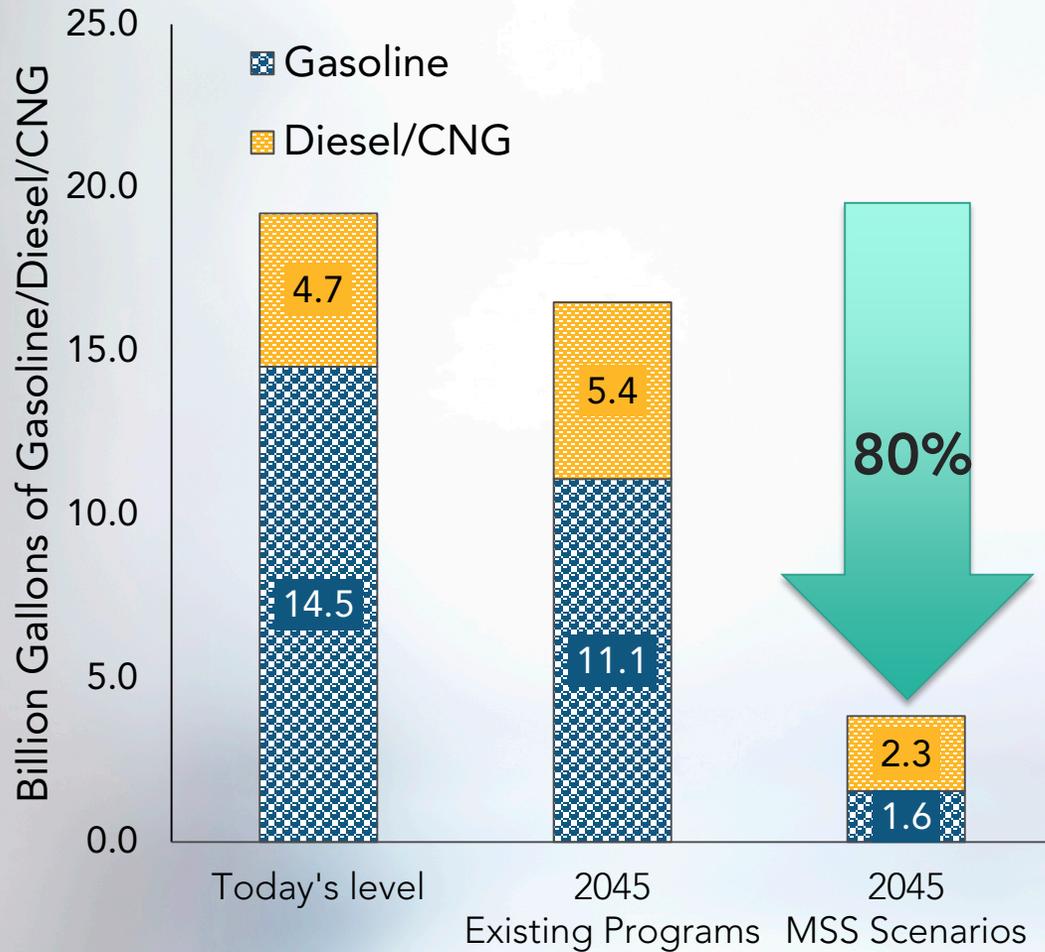
2031



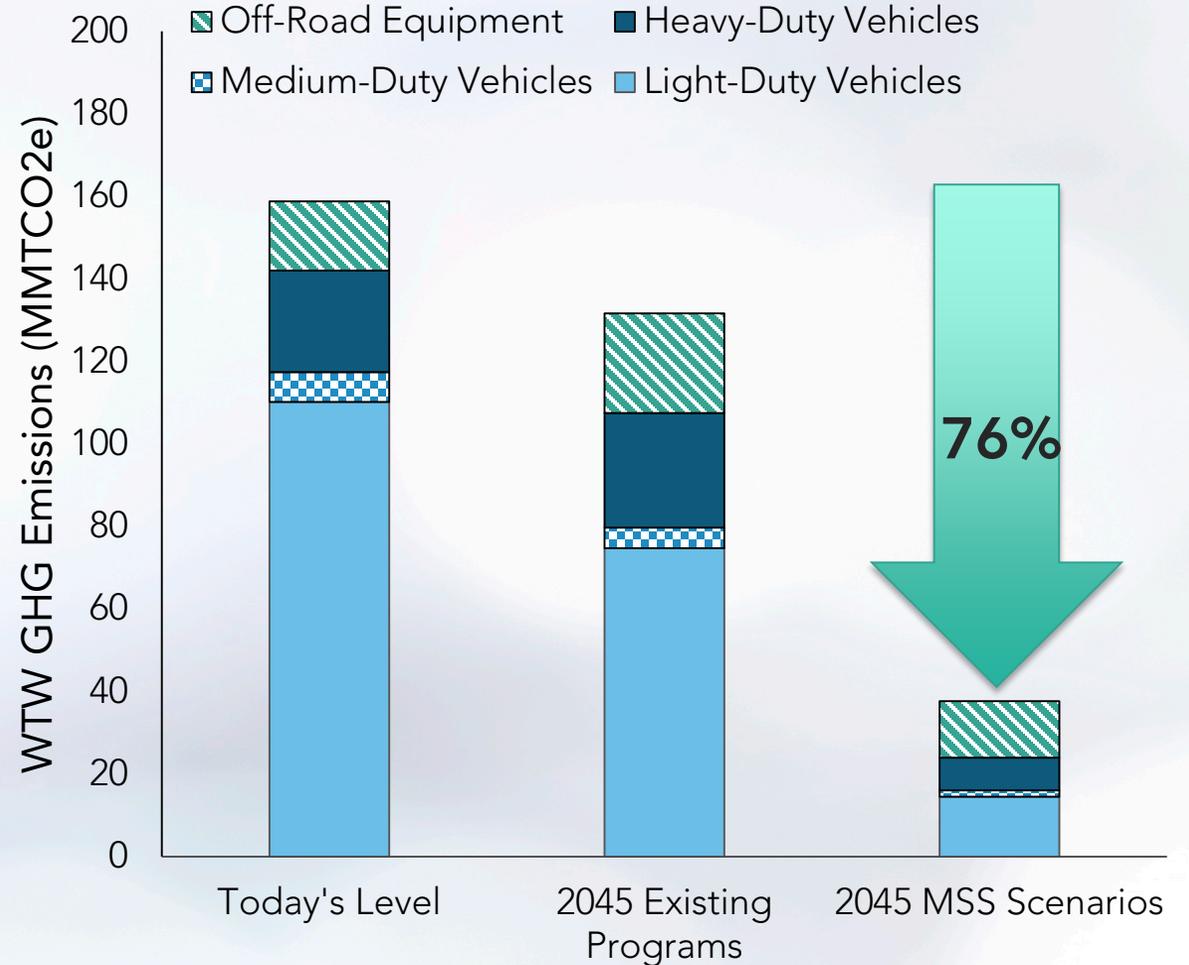
2037



Fuel & GHG Reductions



Fuel Consumption



WTW GHG Emissions

Potential Health Benefits

- Transitioning away from combustion will reduce pollution-related death and illness
- Beginning to analyze the impact of the 2020 MSS potential emissions reductions on future air quality & health benefits
- Reporting back to the Board with results next year



Important to Prioritize Benefits in Low-Income and Disadvantaged Communities



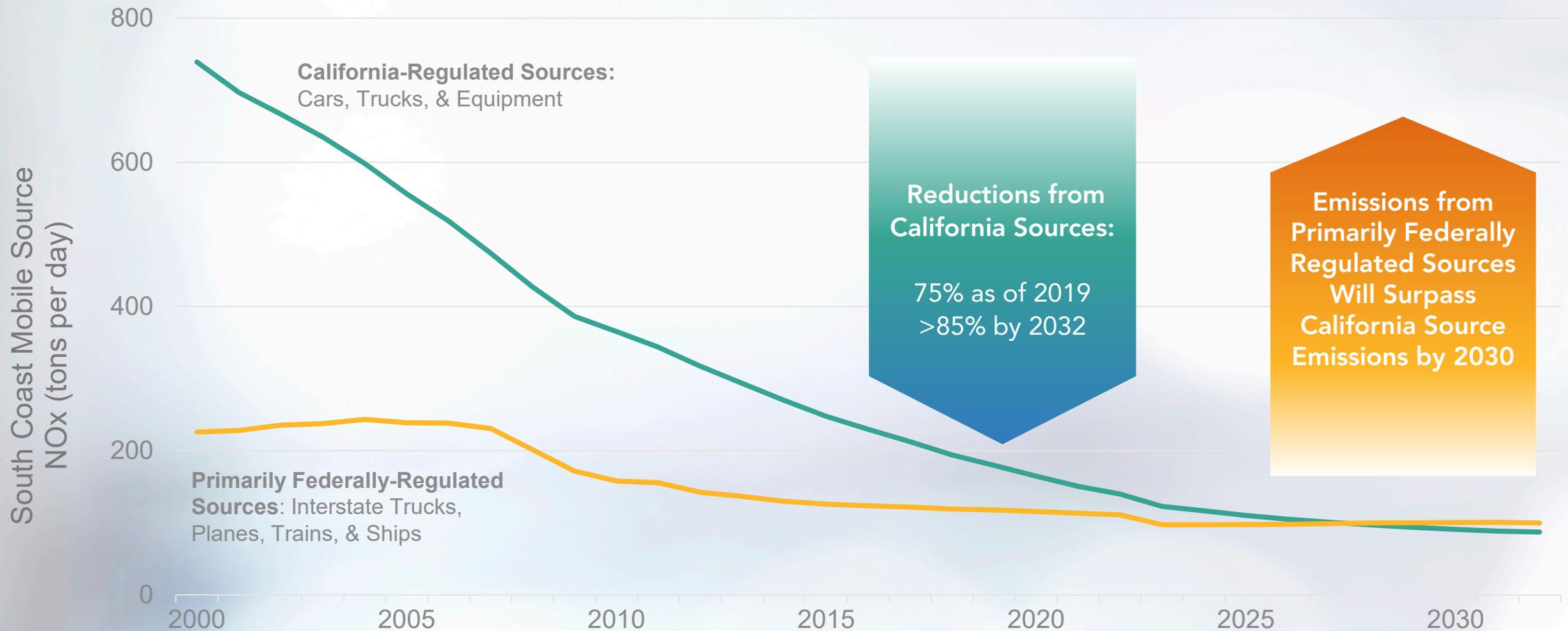
- DACs and people of color are disproportionately affected by both mobile and stationary source pollution
- MSS reductions will highly benefit DACs
- Seeks rapid transition to zero-emission technology in and near DACs
- Complements AB 617 strategies & consistent with CARB's equity goals

Interagency Coordination on Infrastructure

- Zero-emission technology for both on- and off-road sectors requires streamlined infrastructure build-out
- Staff have been working with CEC, CPUC, and GoBiz throughout development of the 2020 MSS
- Results from the 2020 MSS are being incorporated into the CEC's technical analysis for AB 2127 report



Controlling Federal Sources is Critical to Achieving our Clean Air and Climate Targets



Source: CARB, CEPAM 2016 SIP - Standard Emission Tool (v1.05), <https://www.arb.ca.gov/app/emsinv/fcemssumcat/fcemssumcat2016.php>

Public Process for 2020 MSS



Thank you

