Vision for Clean Air: A Framework for Air Quality and Climate Planning

Sacramento Vision Workshop

August 22, 2012

California Environmental Protection Agency

Air Resources Board

Introduction

- Integrating air quality and climate planning
- Developing the Vision targets
- Vision sectors
- Vision scenarios
- Key concepts learned

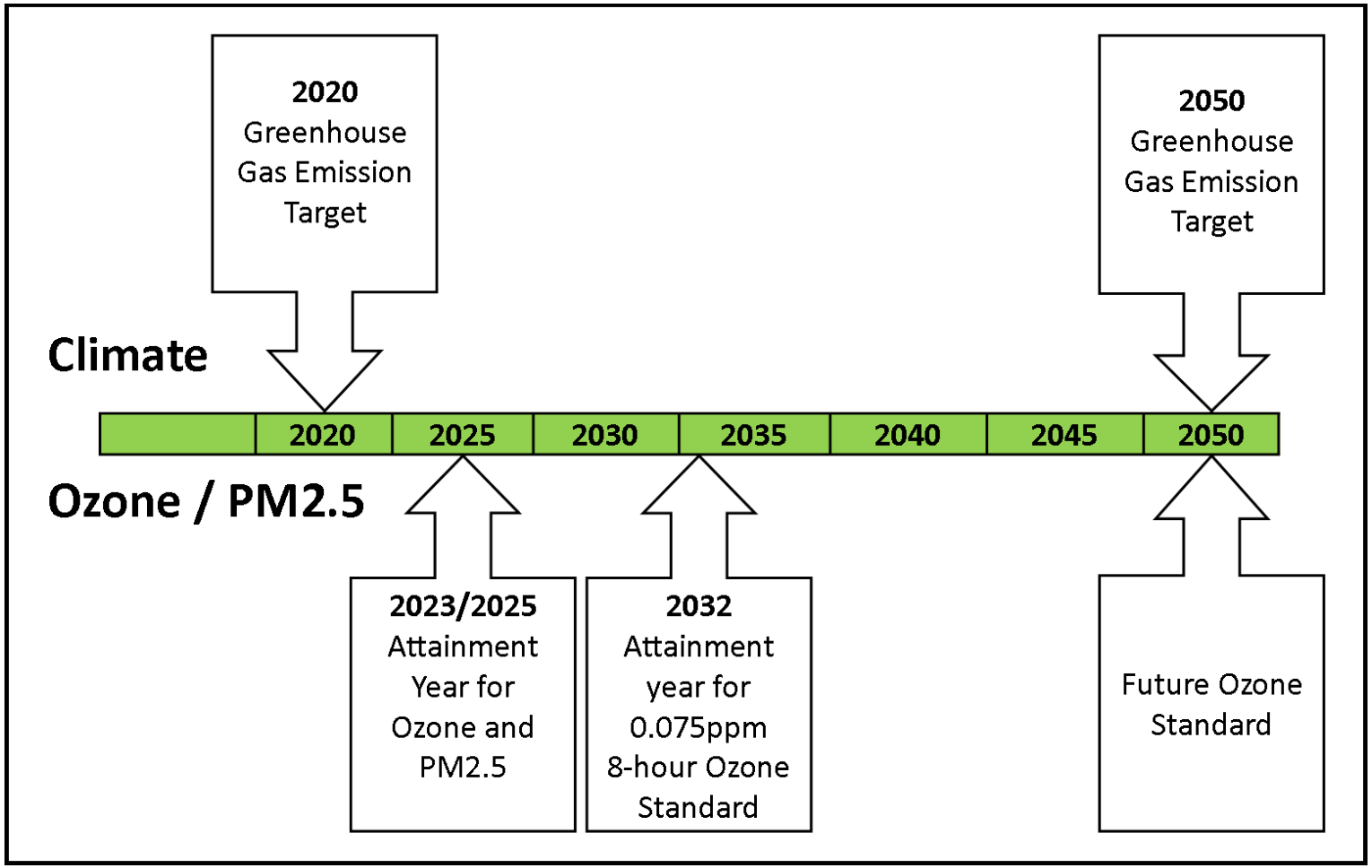
Vision Draft Documents

- Public release for June 2012 Board Meeting
  - Public review draft of *Vision for Clean Air: A Framework for Air Quality and Climate Planning*
  - Draft Appendix: *Actions for Development, Demonstration, and Deployment of Needed Advanced Technologies*
- Additional draft appendices now available:
  - *Scenario Assumptions and Results*
  - *ARB Vision Model Documentation*
  - *ARB Vision Models*

Vision's Planning Framework

- Take a broader view of planning from multi-pollutant perspective
- Integrate planning efforts:
  - Clean Air Act – "SIPs"
  - AB 32 Scoping Plan Updates
  - Freight Transport planning
- Coordinate vehicle and energy policies

Planning Horizons



Vision Targets

Goal	Year	Percent Reductions from 2010	
O3 Standard (ppb)	Target	NOx	CO_2
84	2023	80%	
75	2032	90%	
65*	2050	95%	
GHG	2050		85%

* Assumption based on Clean Air Act Scientific Review Panel Recommendation of a 0.060 to 0.070 range for the 2008 Ozone standard.

The Vision Tool

- Argonne VISION2011 Model estimates energy use and carbon emissions of cars and trucks through 2050.
- Staff modified VISION to include criteria emissions
- Staff developed additional model components for other sectors

Data Sources

- Academic and other research organizations
- ARB's Vision 2011 and other off-road sector tools relied on the most updated inventory data for vehicle emissions
  - EMFAC2011 HD and LD
  - Advanced Clean Cars
  - 2011 Ocean-Going Vessel Rule
  - 2011 Cargo Handling Equipment Rule
  - 2010 In-Use Off-Road Rule

Sectors Analyzed in Vision

- Passenger vehicles
- On-road heavy-duty vehicles
- Freight and passenger locomotives
- Cargo handling equipment
- Commercial harbor craft
- Commercial ships (ocean going vessels)
- Off-road vehicles
- Aviation
- Related energy and fuels

What a Scenario is

- A projection of what could be possible
- A “what if” story that provides context for and inform decision-making
- A combination of technologies and fuels that could yield the scale of needed transformation

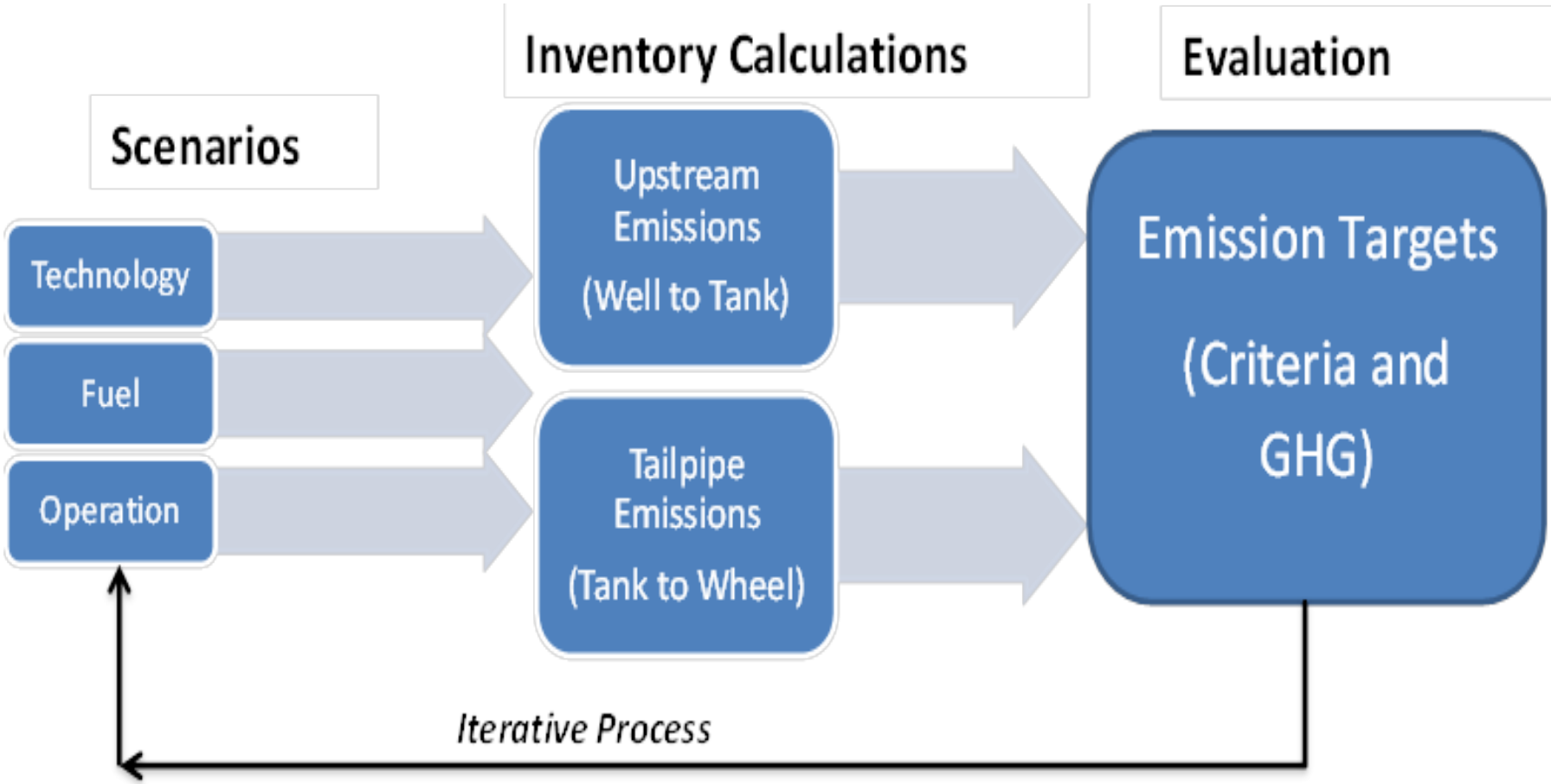
What a Scenario is Not

- A prediction of the future
- A list of SIP-ready control measures
- A policy choice that favors certain technologies and fuels over others

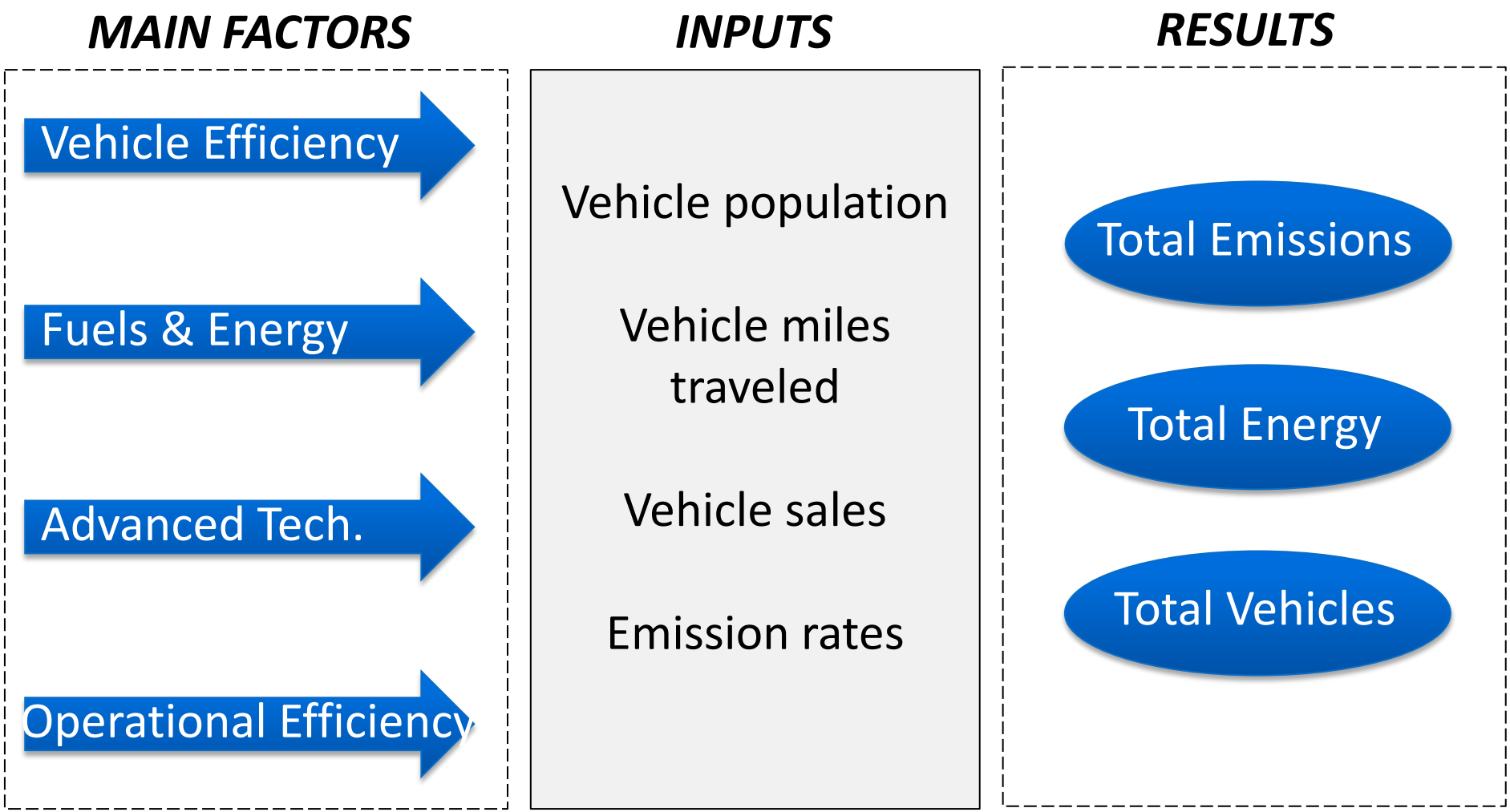
How Scenarios Were Developed

- Start with benefits of existing programs
- Develop storylines for further improvements in efficiency and cleaner technology, fuels, and energy sources
- Look at multi-pollutant results to inform next scenarios

Vision Modeling Structure

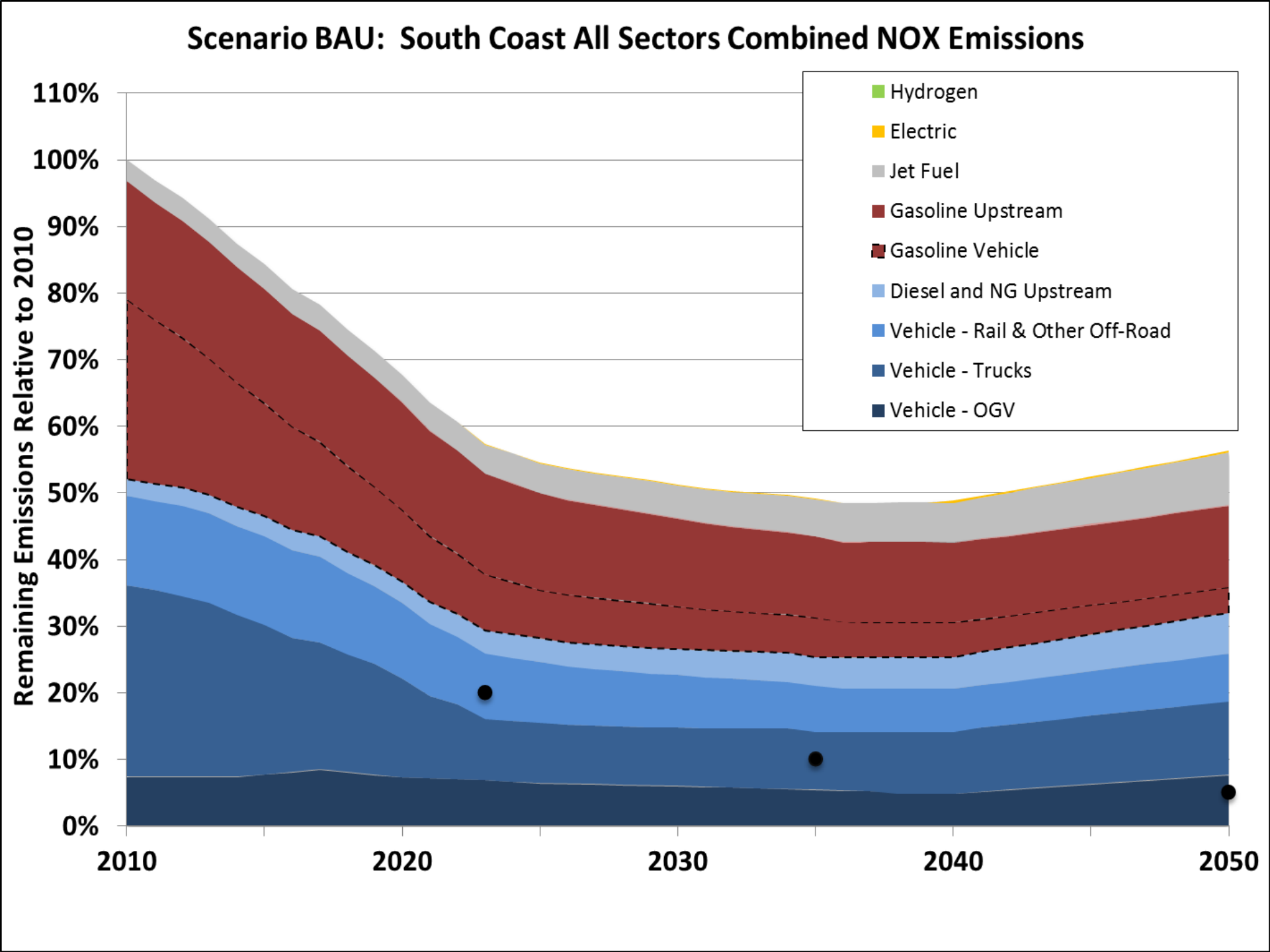


Defining a Transportation Scenario

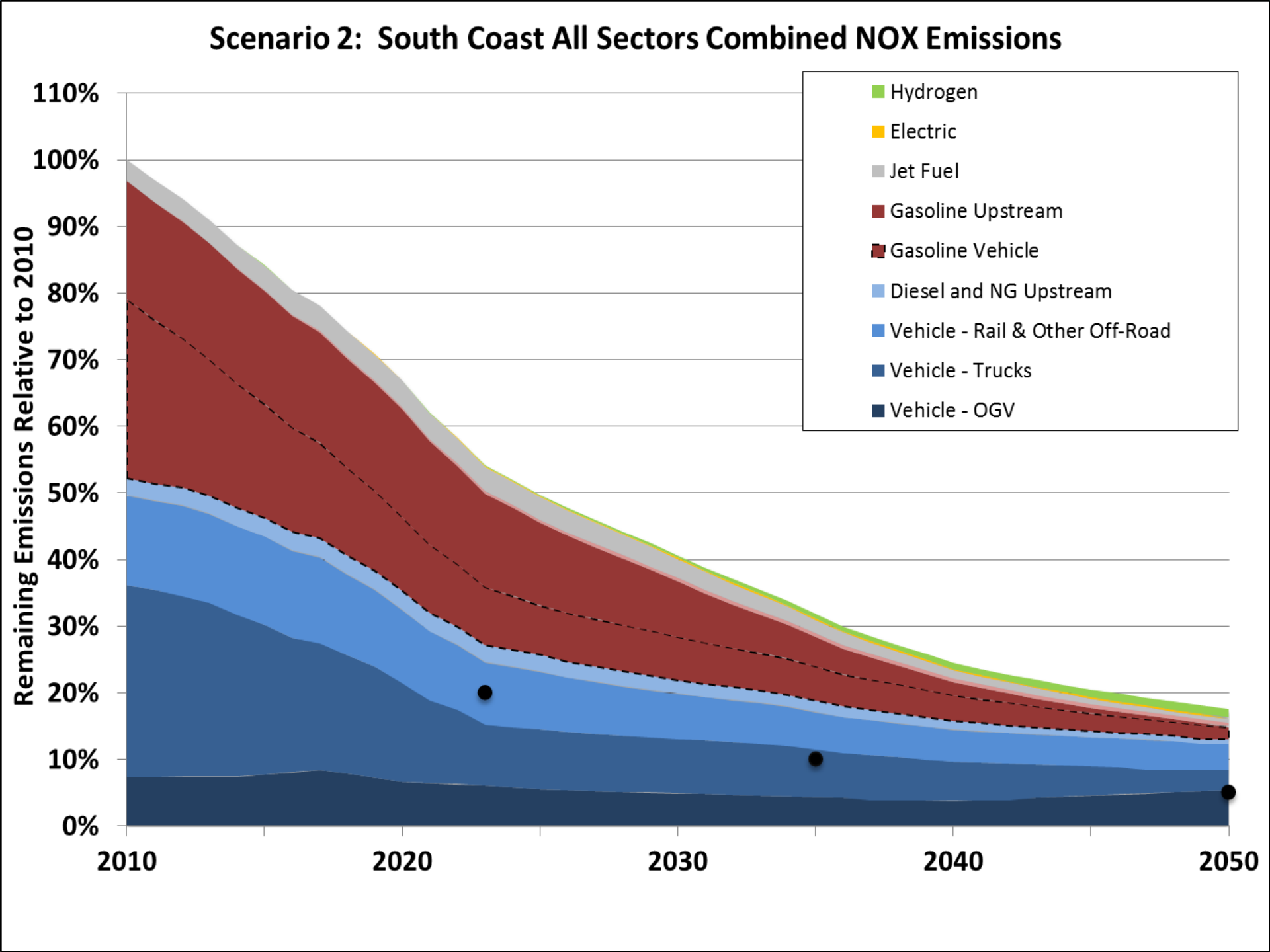


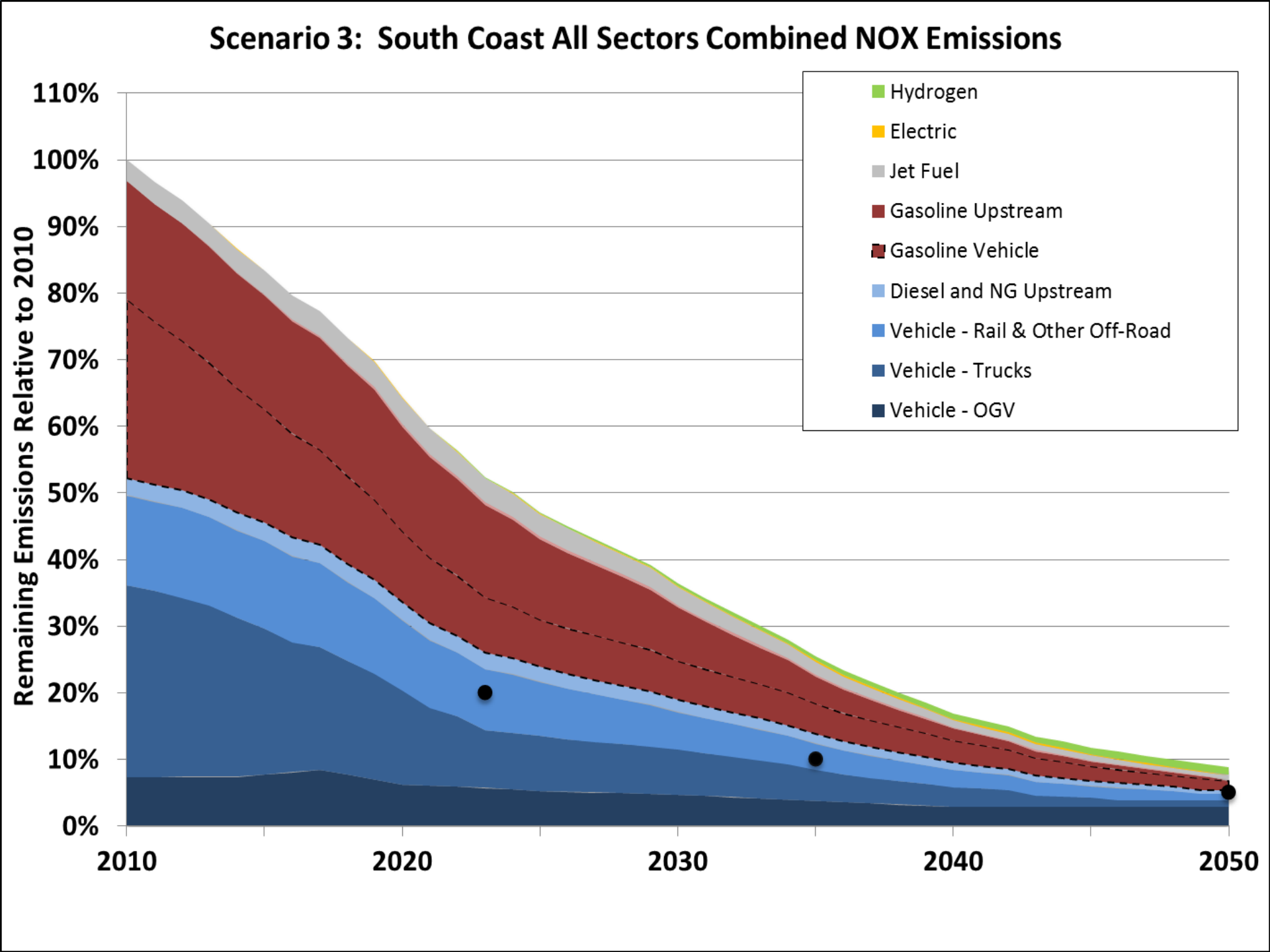
Three Scenarios

- Scenario 1 (BAU) – Represents all currently adopted measures including the In-Use Rules, Advanced Clean Cars, and Scoping Plan benefits through 2020
- Scenario 2: Aggressive penetration of near zero and zero emissions advanced technologies such as hybrids, electric, hydrogen, etc.
- Scenario 3 – Introduction of a new NOx standard 60-80% below the current standards and improved efficiencies in activity

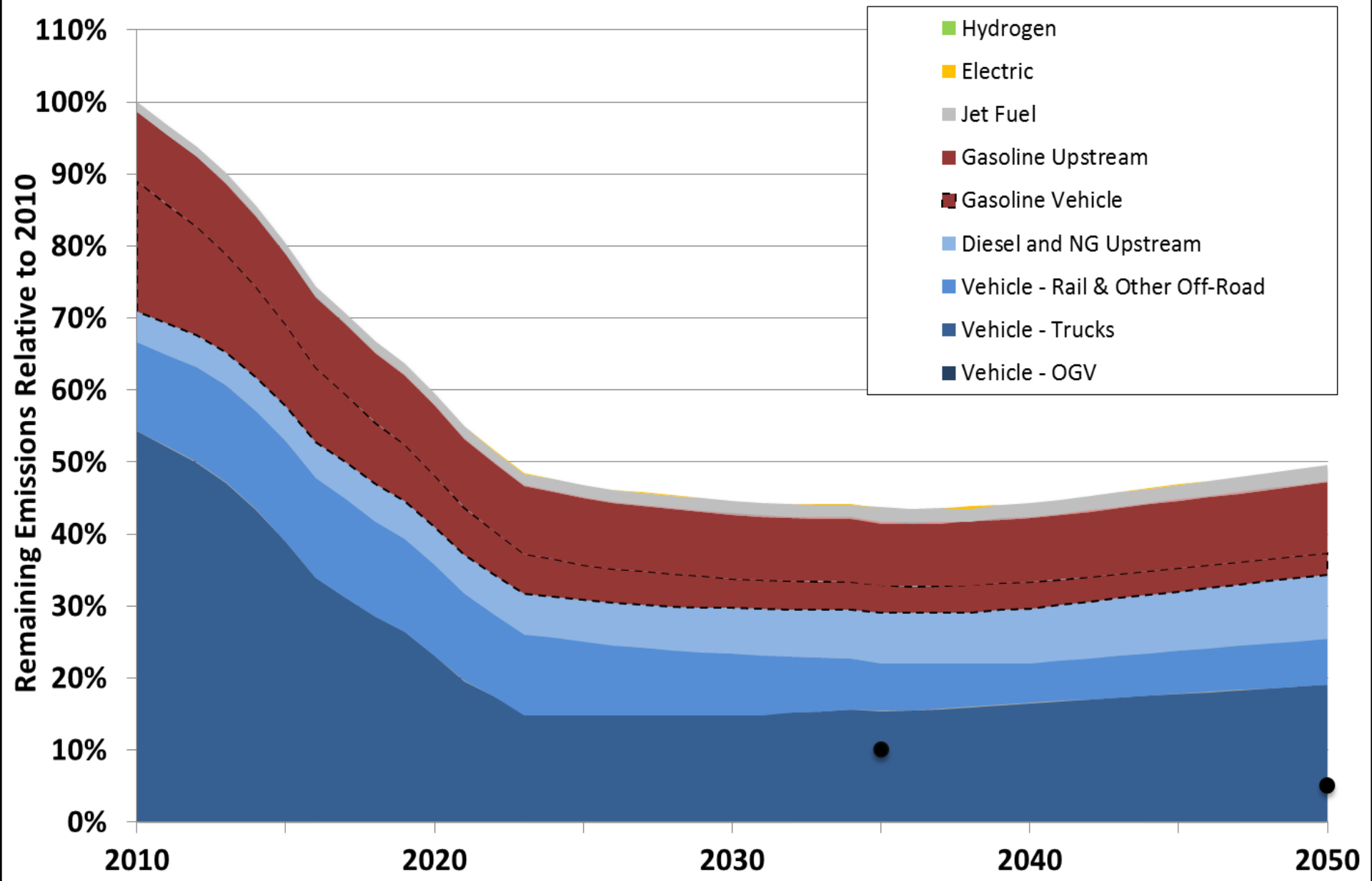

Scenario BAU: South Coast All Sectors Combined NOX Emissions
Remaining Emissions Relative to 2010
110%
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2010
2020
2030
2040
2050
Hydrogen
Electric
Jet Fuel
Gasoline Upstream
Gasoline Vehicle
Diesel and NG Upstream
Vehicle - Rail & Other Off-Road
Vehicle - Trucks
Vehicle - OGV

Scenario 2: South Coast All Sectors Combined NOX Emissions

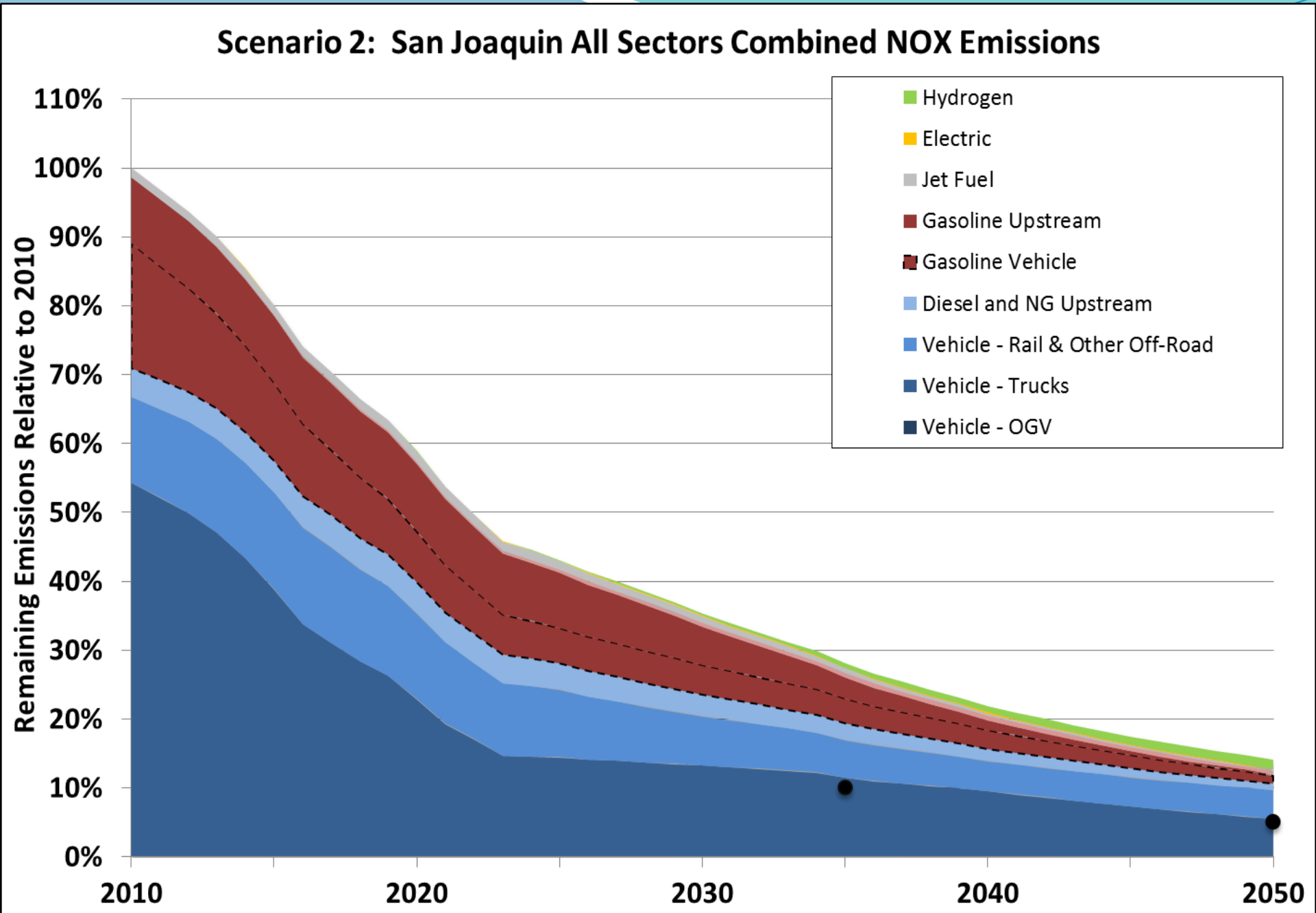



Scenario 3: South Coast All Sectors Combined NOX Emissions
Remaining Emissions Relative to 2010
110%
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2010
2020
2030
2040
2050
Hydrogen
Electric
Jet Fuel
Gasoline Upstream
Gasoline Vehicle
Diesel and NG Upstream
Vehicle - Rail & Other Off-Road
Vehicle - Trucks
Vehicle - OGV

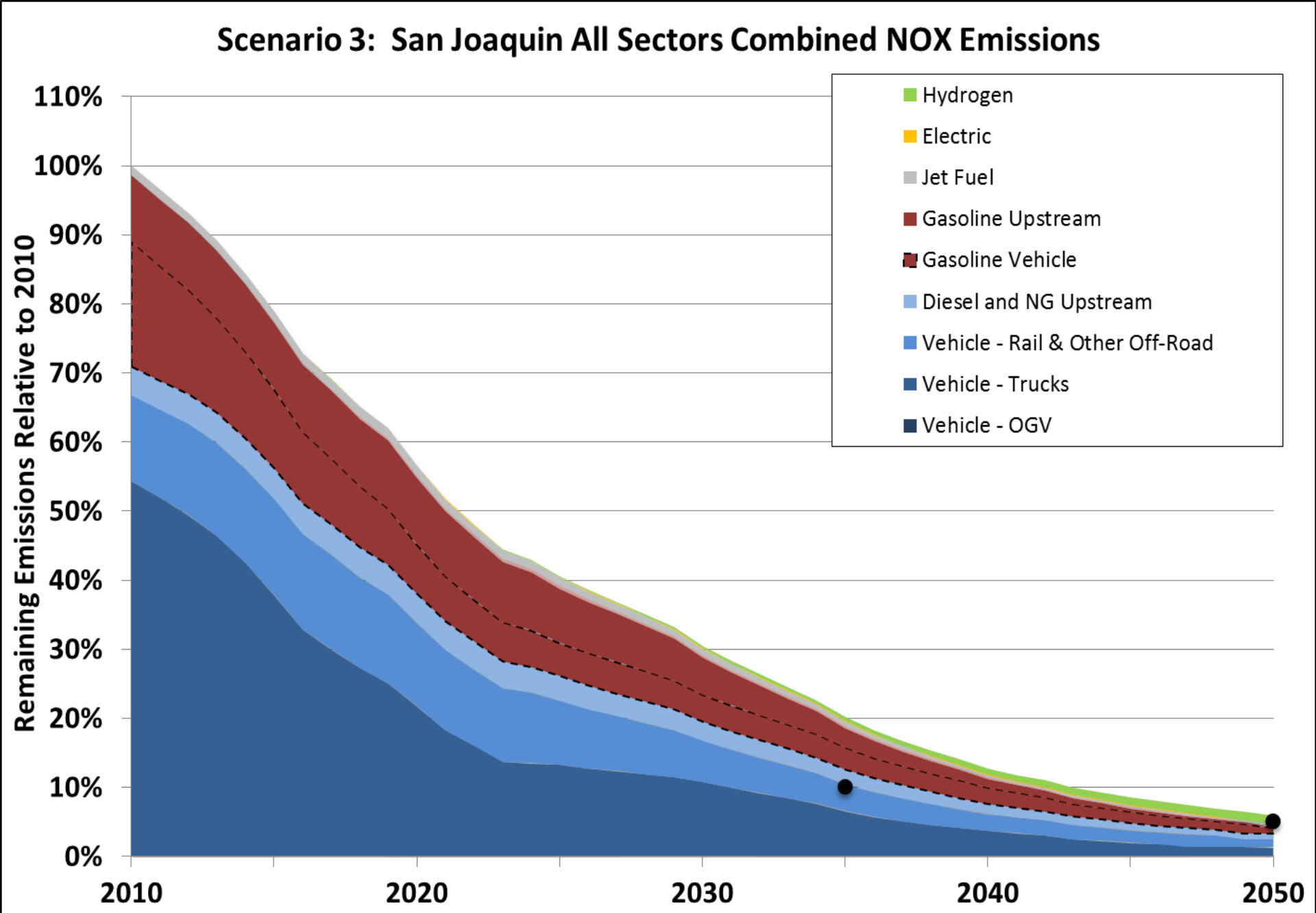
Scenario BAU: San Joaquin All Sectors Combined NOX Emissions



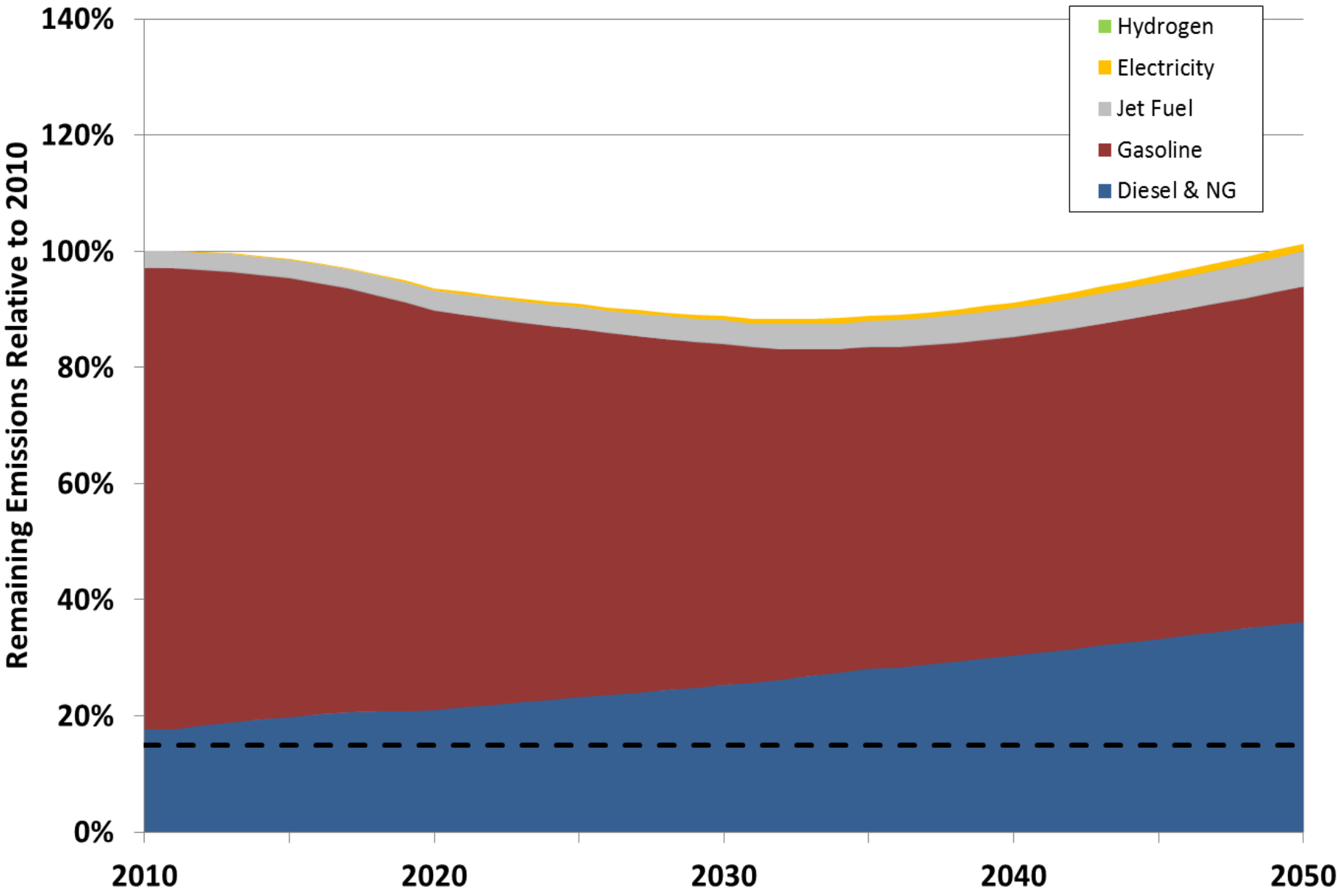
Scenario 2: San Joaquin All Sectors Combined NOX Emissions



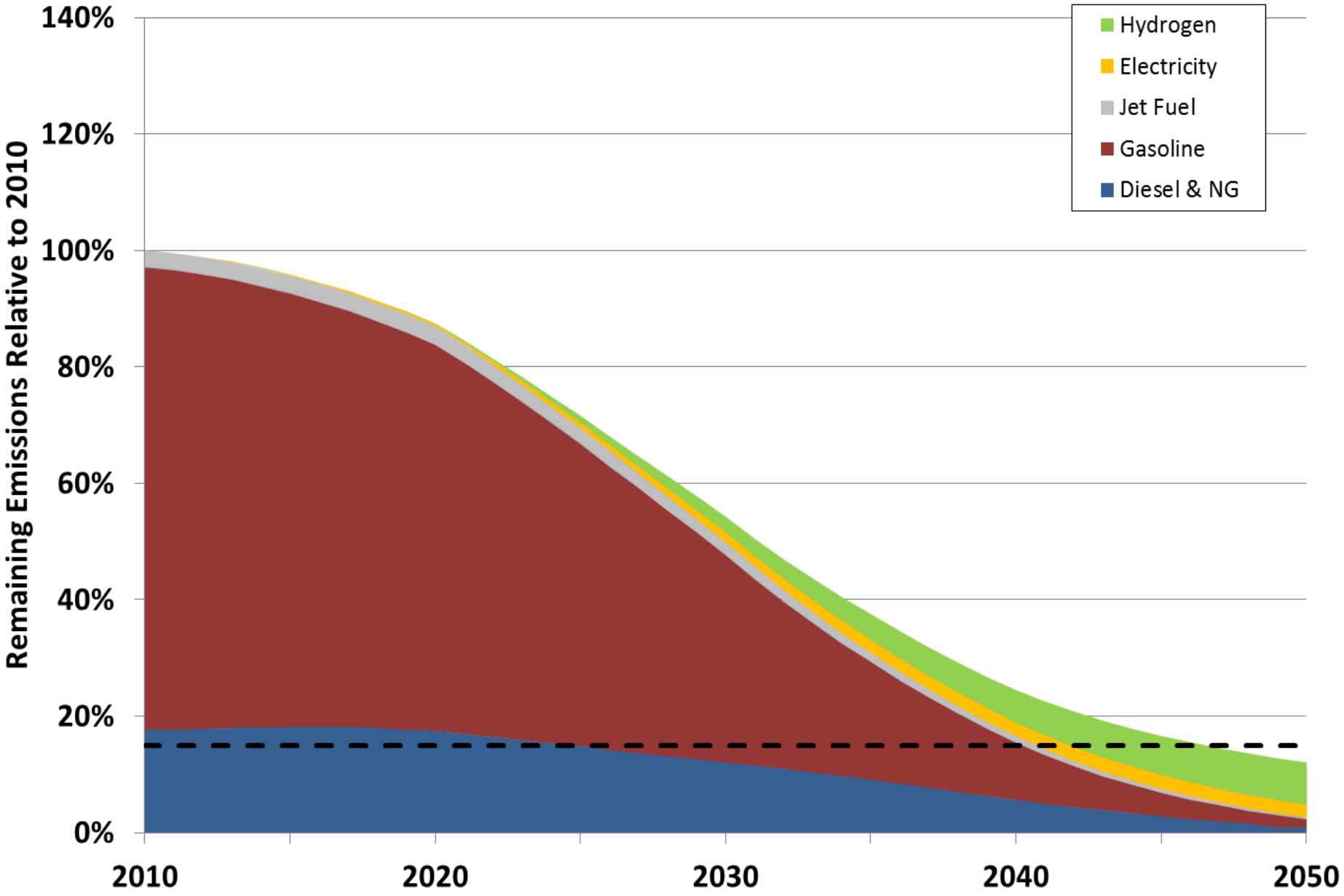
Scenario 3: San Joaquin All Sectors Combined NOX Emissions



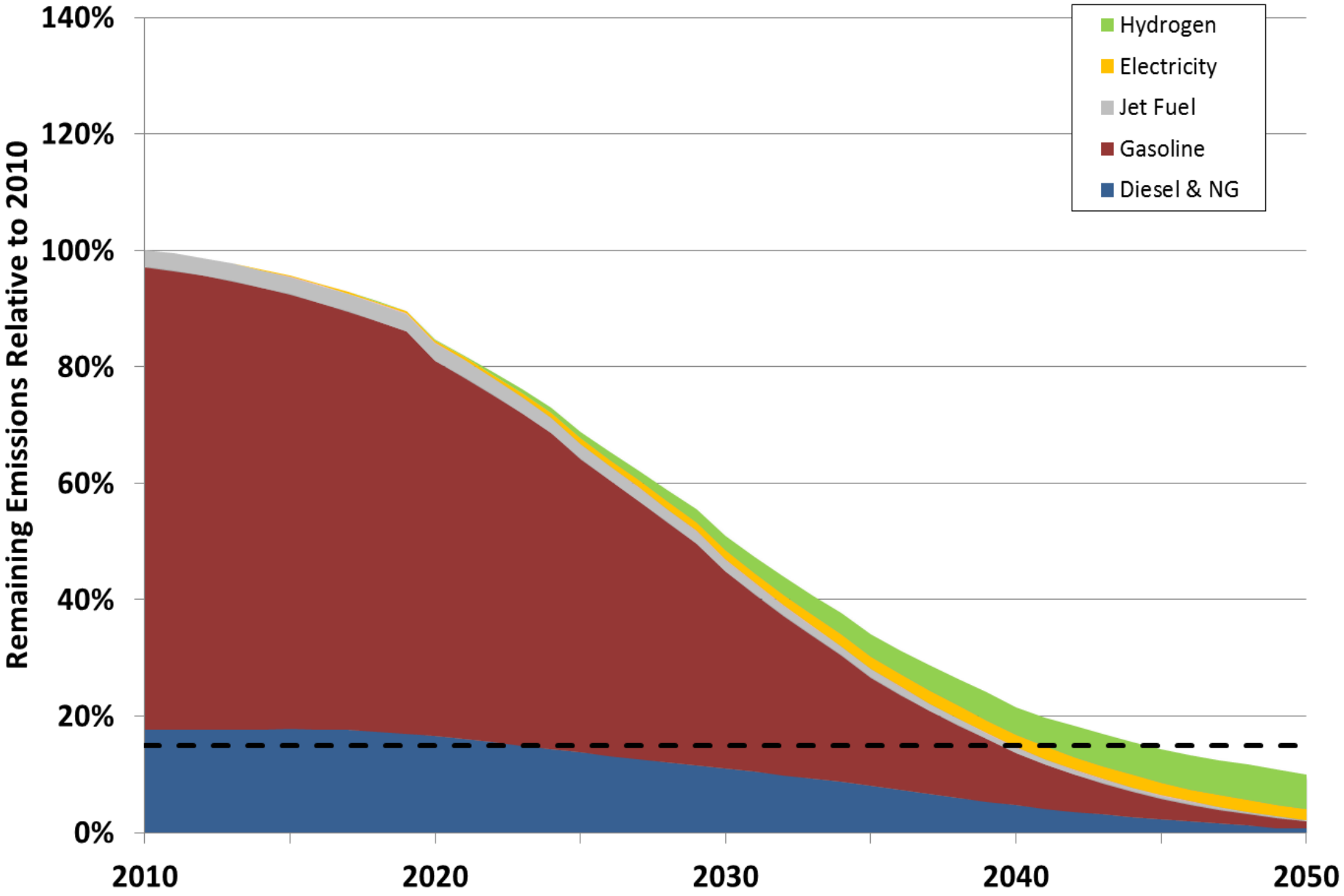
Scenario BAU: Statewide All Sectors Combined CO2 Emissions



Scenario 2: Statewide All Sectors Combined CO2 Emissions



Scenario 3: Statewide All Sectors Combined CO2 Emissions



Key Concepts learned from Vision for Multi-pollutant Planning

- Efficiency Gains
- Cleaner Combustion
- Fuels and electricity transformation
- Technology Transformation
- Early Action
- Multiple Strategies
- Federal Action

Questions Moving Forward

- How best to deploy technologies, fuels, and other strategies to meet both air quality and climate goals?
- How best to coordinate federal, state, and local activities to ensure success?
- What are the implications of air quality deadlines that precede greenhouse gas targets?
- What are the energy demands of air quality and climate strategies?

Next Steps

- Comments due Friday the 21st of September
- Report to Board on final Vision Report at October Board meeting.

More information

- Visit ARB's Vision webpage at: http://www.arb.ca.gov/planning/vision/vision.htm
  - View and download draft documents and models
  - Provide comments

- Questions? Please contact Carol Sutkus at:
  - csutkus@arb.ca.gov
  - (916) 322-0285