OPPORTUNITIES FOR ADDITIONAL GHG REDUCTIONS FROM PETROLEUM TRANSPORTATION FUELS

AUGUST 20, 2018
WELCOME AND OPENING REMARKS

- All workshop materials and webcast link:
  https://www.arb.ca.gov/cc/scopingplan/meetings/meetings.htm
- Email address for questions:
  coastalrm@calepa.ca.gov
WORKSHOP OUTLINE

- Introduction
- 2017 Scoping Plan Update: 45 Percent Reduction in Petroleum Demand by 2030
- California Agency Presentations
- Lunch Break
- Technical Panels
- Public Comment
- Next Steps
The 2016 GHG Emissions Inventory
- California 2016 GHG emissions are below the 2020 GHG target
- Transportation sector emissions increased 2 percent from 2015 to 2016

Scoping Plan Resolution 17-46
- Evaluate and explore opportunities to achieve significant cuts in GHG emissions from all sources, including supply-side opportunities to reduce production of energy sources
- Update CARB Board by December 31, 2018
CALIFORNIA’S GHG REDUCTION TARGETS

Note: MMT = Million Metric Tons
PROGRESS TO DATE REDUCING GHGS

GHG Inventory vs. Per Capita GHG

2020 Target

millions of tonnes CO$_2$e
CALIFORNIA’S ECONOMY IS GROWING AND WILL CONTINUE TO GROW
Natural & working lands are not included in the scope of the statewide limit.

~898 MMT carbon in “live stocks” – forests, grasses, scrub

2016 Total CA Emissions: 429.4 MMTCO2e

https://www.arb.ca.gov/cc/inventory/data/data.htm

* GWP=Global Warming Potential
Comprehensive strategy to meet California’s 2030 GHG target
Approved by CARB in December 2017
Suite of complementary measures builds on past success
  - Mobile Source Strategy - help State achieve its federal and state air quality standards
  - Sustainable Freight Action Plan
  - SB 375 – support sustainable community development
  - Enhanced Low Carbon Fuel Standard
  - SB 350 - increase renewable energy and energy efficiency
  - SB 1383 - Short-Lived Climate Pollutant Plan
  - Post-2020 Cap-and-Trade Program
All policies interact with the transportation sector
TRANSPORTATION SECTOR

- Successful implementation of the Scoping Plan is estimated to reduce on-road fuel demand by 45% by 2030
- GHG emissions for sector reduced by ~30% in 2030 from 1990 levels
- 2017 Scoping Plan cumulative reductions (2021-2030) needed to achieve the 2030 target
SCOPING PLAN: 2030 MACROECONOMIC IMPACTS

- Relative to Reference scenario in 2030
  - California GDP: $3.4 trillion
  - Employment 23,500,000
  - Personal Income: $3.0 trillion
- The average growth rate of State GDP, employment, and personal income are essentially unchanged relative to the Reference scenario
- Considers interactive impacts of savings and costs of suite of policies
- Uses maximum potential price in the Cap-and-Trade Program of $84.46 real $2018*

*Upper bound is the current highest Reserve price, presenting in real dollars allows for comparisons across years without the effects of inflation
Current Transportation Programs for Greenhouse Gas Emission Reductions
Achieving Reductions in Petroleum Demand and Transitioning to Sustainable Transportation System

• Promote vibrant communities and landscapes
• Build on the State’s successful regulatory and incentive-based policies
• Ensure that emerging automated and connected vehicle technologies reduce emissions
• Improve freight and goods movement efficiency and sustainability
• Connect California’s communities with a state-of-the-art high-speed rail system
Technology and markets have outpaced expectations

**Cumulative California ZEV Sales Projections**

- Navigant Research
- Bloomberg New Energy Finance
- Edison Electric Institute
- U.S. Energy Information Administration
- Minimum Compliance Scenario

California is home to

**NEARLY 50% OF THE ZEVs IN THE U.S.**

**40% OF NORTH AMERICAN CLEAN FUEL INVESTMENTS**

**90% OF TOTAL U.S. INVESTMENT IN CLEAN TRANSPORTATION**
Major State Policies for LDV Emission Reductions

**Vehicles:**
- **Rules:** Advanced Clean Cars Regulations
- **Incentives:** Clean Vehicle Rebate Program

**Efficient Safe Access:**
- **375:** Sustainable Community Strategies
- $$ transit, active trans., affordable housing

**Fuels:**
- **Rules:** Low Carbon Fuels Standard
- **Incentives:** Infrastructure funding, planning
Light Duty Vehicle Regulatory Programs

**Advanced Clean Cars (2017 – 2025)**
- LEV III GHG Vehicle Fleet Standards
- ZEV Regulation
- LEV III Criteria Emission Fleet Ave Standards

**Advanced Clean Cars 2**
- Working on 2026+ model year standards for further emission reductions and ZEVs
- Tentative 2020 Rulemaking for 2026 and beyond model years
Low Carbon Transportation Program Investments

- **CVRP**: Consumer rebates for ZEVs, higher rebates for low-income consumers

- **Transportation Equity Projects to Increase Access**: Car scrap and replace, financing assistance, and car sharing/mobility options

- **HVIP**: Clean truck and bus vouchers for hybrid, zero-emission, low NOx, technologies

- **Freight projects**: demonstrations and early commercial pilots for clean engines and facilities
ZEV Fueling Infrastructure Today and in 2025

- **Current Programs:**
  - Today: Over 15,000 public EV chargers
  - Today: 35 retail-open hydrogen stations
  - By 2025, expect programs project 104,000 EV chargers and 100 H2 stations

- But we need more to support 1.5 million ZEVs + PHEVs on the road:
  - 250,000 EV chargers
  - 200 hydrogen stations
Explore new regulatory actions to accelerate zero emission vehicles in public and private light- and heavy-duty vehicle fleets

- Consider opportunities in a broad range of fleet categories:
  - Public and private
  - New mobility fleets
  - Large employer fleets
  - Rental fleets
  - Freight service fleets (Last mile delivery)

- Public workshop August 30
Sustainable Freight Strategy

• Vision and Guiding Principles
• 2030 Statewide Freight Targets
  • Increase efficiency by 25%
  • Over 100,000 zero emission vehicles and equipment
  • Establish a target for increased State competitiveness / economic growth
• Freight Funding Approach
• State Agency Actions and Implementation Steps
• Pilot Project Concepts
Proposed Zero-Emission Heavy Duty Vehicle Regulations

**Innovative Clean Transit – 2018**
- Zero-Emission Transit Buses

**Advanced Clean Trucks – 2018**
- Last Mile Delivery and Local Trucks

**Zero-Emission Airport Shuttle Buses – 2018**
- Zero-Emission Airport Ground Transportation
CARB’s Suite of Low Carbon Transportation Projects

Advanced Technology Demonstration and Freight Facility Projects

- Zero-Emission Drayage Truck Demonstration Project
  - $25 million to demonstrate pre-commercial drayage truck technologies
- Multi-Source Facility Demonstration Project
  - $25 million for large scale demonstrations at multi-source facility locations
- Zero- and Near Zero-Emission Freight Facilities
  - $150 million to be awarded later in 2018

Zero-Emission Truck and Bus Pilot Commercial Deployment Project

- Over $80 million to deploy 146 zero-emission heavy-duty vehicles

Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP)

- Over 4,500 vouchers issued and $300 million invested
Strategic Investments for Sustainable Transportation

- Expand low carbon transit opportunities
- Promote active transportation
- Identify and leverage key early markets
- Transfer technology to other applications
- Each succeeding market builds greater volume
LOW CARBON FUEL STANDARD (LCFS)

- State’s primary program to promote clean alternative fuel use
- Original adoption in 2009, first compliance year in 2011, re-adopted in 2015
- Goal: Reduce carbon intensity (CI) of transportation fuels
- Expected benefits:
  - Reduce greenhouse gases
  - Transform and diversify fuel pool
  - Reduce petroleum dependency
  - Reduce emissions of criteria pollutants and toxics
KEY LCFS REQUIREMENTS AND FEATURES

- Sets annual carbon intensity (CI) standards for transportation fuels (e.g., gasoline, diesel and the fuels that replace them)
- CI based on complete lifecycle analysis
- Providers in California of petroleum fuels are “regulated parties” under the LCFS
- Providers of clean fuels can “opt in” to program and earn credits
- Generated credits can be bought and sold by regulated parties
LCFS SUMMARY

- LCFS is on schedule, having achieved a 3.5% reduction in average CI so far
- Low carbon diesel substitutes made up over 15% of the energy used in heavy duty vehicles in California in 2017
- Over-compliance with the program (nearly 10 million excess credits banked)
- Proposed LCFS targets through 2030 ambitious but achievable, necessary to achieve the SB 32 goal
  - Proposed 20% reduction in CI by 2030
  - ARB’s understanding of the low carbon fuel market is strong
  - Existing low carbon fuel supply is available in the near term but expansion of advanced low carbon fuel production capacity will be needed in the future
Transportation fuels are covered under the Program
- Tailpipe: Includes gasoline, diesel, propane, and natural gas
  - Includes imported fuels
- In-State Processing: Process and combustion emissions at refineries
- In-State Extraction: Process and combustion emissions in oil and gas sector in state

Regulated entities must reduce onsite emissions, supply lower carbon fuels, and/or purchase compliance instruments for GHG emissions

The Cap-and-Trade Program creates incentives to invest in cleaner fuels and use energy more efficiently
The regulation reduces in-state fugitive and vented emissions of methane upstream of transportation fuel production, from both existing and new oil and gas facilities.

The covered facilities include:
- Oil and Gas Production, Processing, and Storage
- Natural Gas Gathering and Boosting Stations
- Natural Gas Underground Storage
- Natural Gas Transmission Compressor Stations
* Estimated continuing reductions of more than 1.4 million MT of CO2 equivalent per year, using a 20 year Global Warming Potential for methane.

* This represents a methane reduction from this sector of over 40% by 2021.

* Co-benefits - reductions of toxic and VOC emissions.
THANK YOU