CALIFORNIA ENERGY COMMISSION

State Alternative Fuels Plan
&
Alternative and Renewable Fuel and Vehicle Technology Program

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Legislative and Policy Context

- Strategy to Reduce Petroleum Dependence (2003)
  - Reduce on road gasoline and diesel demand to 15% below 2003 levels by 2020
  - Increase use of non-petroleum fuels to 20% of on road fuel consumption by 2020 and 30% by 2030 transportation IEPR recommendations- 2003 and 2005
- Bioenergy Action Plan/Executive Order (2006)
  - Increase in-state production of biofuels to 20% by 2010, 40% by 2020 and 75% by 2050
- State Alternative Fuels Plan (2007)

State Alternative Fuels Plan

- Develop plan to increase alternative fuel use in CA
- Evaluate Fuel Options on a full fuel cycle basis
- Establish goals (vehicles/fuel consumption) to increase alternative fuels in 2012, 2017, and 2022
- Optimize environmental and public health benefits
- Minimize economic costs to the state
- Maximize economic benefits of producing alternative fuels in CA

Key Findings

- Moderate growth of alternative fuels can achieve
  - Petroleum reduction goals
  - In-state biofuel production goals
  - Partial GHG emission reduction target
- Extend federal incentives
- State incentives needed- $100 million per year for 15 years
- Market investment of at least $100 billion required between 2007-2050
- Establish goals to increase alternative fuels: 9% in 2012, 11% in 2017 and 26% in 2022

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Alternative and Renewable Fuel and Vehicle Technology Program

Purpose

Develop and deploy innovative technologies that transform California's fuel and vehicle types to help attain the state's climate change policies.

Funding

- Up to $120 Million per year for 7 ½ Years ($75 Million in First Year)
- Provide grants, loans, loan guarantees, revolving loans, and other appropriate measures
- Public agencies, private businesses, public-private partnerships, vehicle and technology consortia, workforce training partnerships and collaboratives, fleet owners, consumers, recreational boaters, and academic institutions.

Eligible Projects

- Develop and Improve Alternative and Renewable Low Carbon Fuels
- Optimize Alternative and Renewable Fuels for Existing and Developing Engine Technologies
- Produce Alternative and Renewable Low Carbon Fuels in California
- Decrease the Overall Impact of an Alternative and Renewable Fuel's Lifecycle Carbon Footprint and Increase Sustainability to Meet 2020 and 2050 GHG Goals and Objectives

Eligible Projects

- Fuel Infrastructure, Fueling Stations and Equipment
- Improve Light-, Medium-, and Heavy Duty Vehicle Technologies
- Retrofit Medium-and Heavy-Duty On-Road and Non-Road Vehicle Fleets
- Infrastructure Connected with Existing Fleets, Public Transit, and Transportation Corridors
- Workforce Training Programs
- Education, Promotion and Technology Centers

Priorities and Opportunities

- Expand the use of existing alternative and renewable fuel options in the marketplace to provide immediate GHG reduction benefits and to help create the impetus for the long-term transition and evolution of the transportation sector in California.
- Implement a goal-driven strategy to achieve the AB 32 statutory requirement by 2020 and examine the necessary trajectory of continual climate change emission improvements to achieve the 2050 target.
- Two-step process

Relative GHG Reductions

- The first step includes a scenario of fuel and vehicle penetrations through 2050
- Based on the *2050 Vision* from the *State alternative Fuels Plan*
- Developed funding categories:
  - Super-Ultra-Low Carbon
  - Ultra-Low Carbon
  - Low Carbon
  - Vehicle Efficiency Improvements

Relative GHG Reductions

- Developed relative GHG reductions of each category for through 2050 using the most recent fuel demand forecast, the "Pavley" regulations, the Low Carbon Fuel Standard (LCFS), and assumptions for vehicle miles traveled (VMT).
  - Light-Duty Vehicles
  - Medium- and Heavy-Duty Vehicles

Light-Duty GHG Reductions

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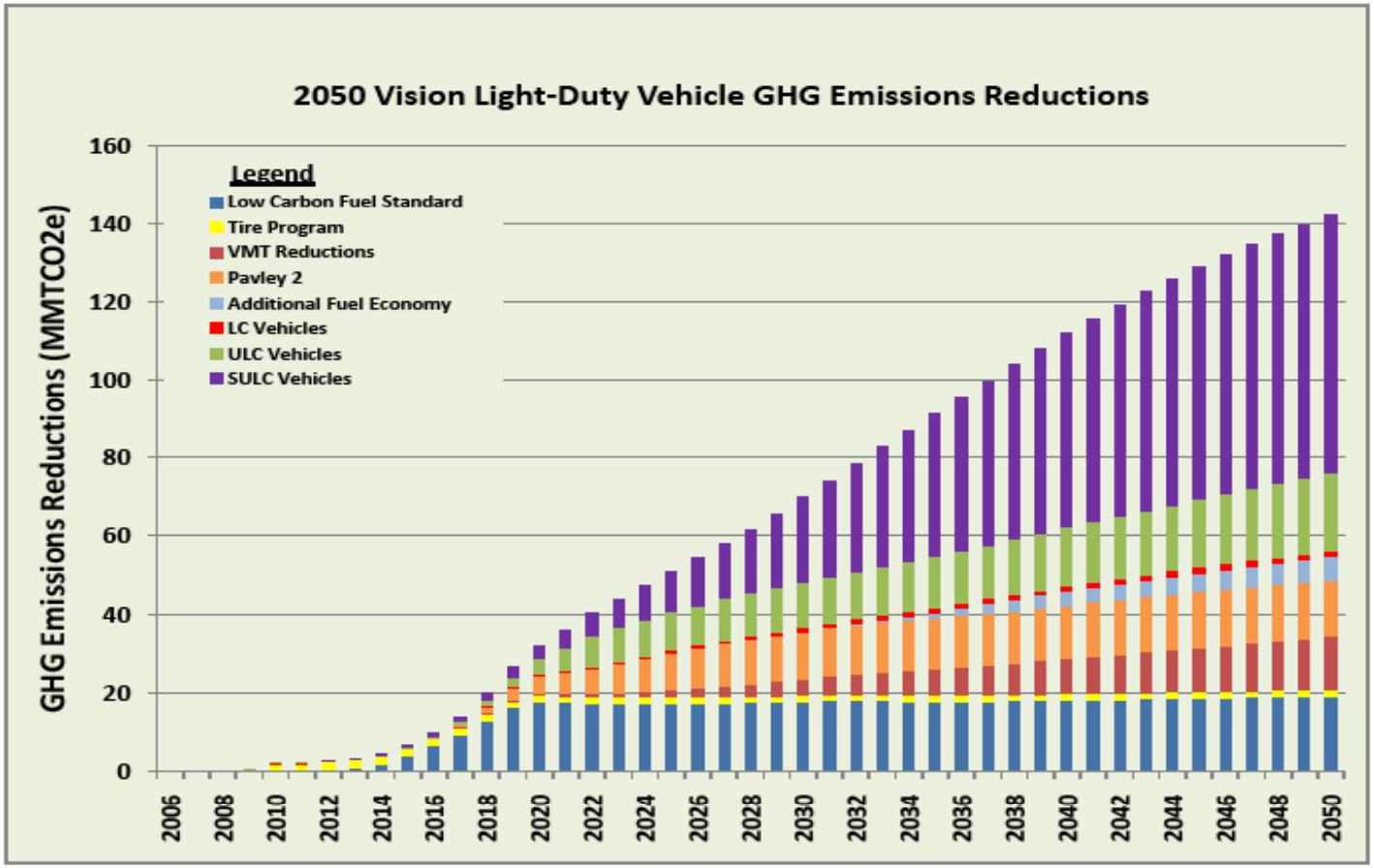
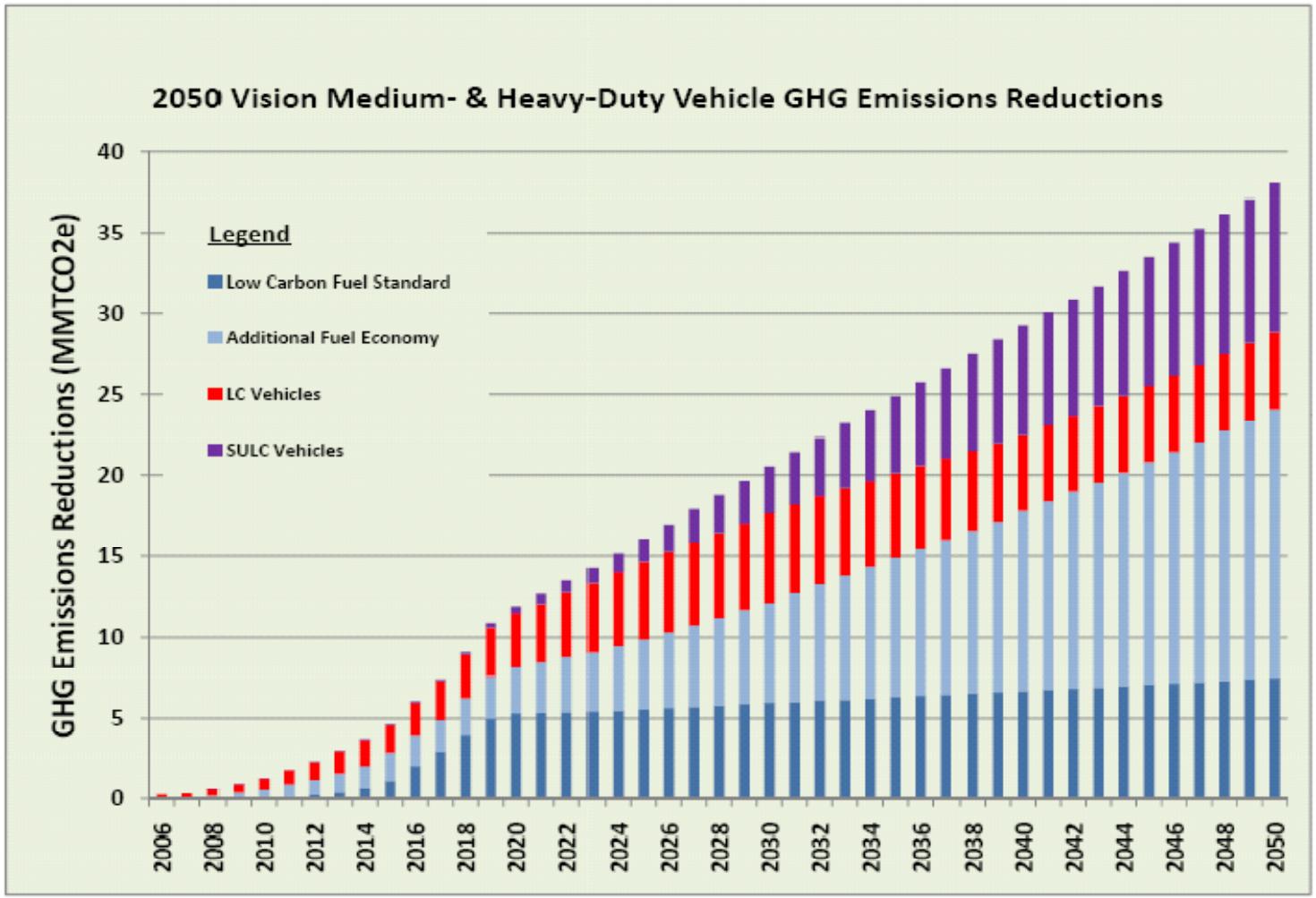


Medium- & Heavy-Duty GHG Reductions



Gap Analysis

- The second step determines where existing public and private funding is already in place and where “gaps” of needed funding exist.
- This second step also addresses funding for other important categories that are not apportioned by emissions
  - funding workforce training
  - sustainability studies
  - standards and certification
  - public education and outreach
  - analytical support
  - Manufacturing and production

Super-Ultra-Low Carbon Fuels

- Support for fleet and retail hydrogen fueling stations
- Support for mixed-use hydrogen fueling infrastructure (with transit, CNG/hydrogen, light-duty fleets and forklifts)
- Support for low-cost renewable hydrogen production
- Coordinated support with ARB for light-, medium-, and heavy-duty PHEVs and BEVs
- Support for early conversions for PHEVs and BEVs, and charging infrastructure

Ultra-Low Carbon Fuels

- Facilitate transition from existing ethanol production to lower-carbon feedstock production facilities
- Develop new ethanol, renewable diesel/biodiesel and biomethane production for use as transportation fuels
- Expand installation of E85 based on geographic distribution of FFVs
- Develop fuel storage and blending terminals for renewable diesel distribution in Northern and Southern California

Low Carbon Fuels

- Provide purchase incentives for light-, medium-, and heavy-duty vehicles coordinated with ARB, local air districts and ports
- Support development of advanced medium- and heavy-duty natural gas and propane engines, and fueling and fuel storage technologies
- Support new and refurbished natural gas and propane fuel infrastructure, in proximity to existing and planned vehicle fleets and populations

Summary of Funding Recommendations

	Relative GHG %	08/09 Recommend	%	09/10 Recommend	%	Total Recommend	%
Low-Carbon	33	26M	35	36M	36	62M	35
Ultra-Low-Carbon	12	10M	13	12M	12	22M	13
Super-Ultra-Low-Carbon	16	18M	24	23M	23	41M	23
Efficiency Improvements	39	7M	9	15M	15	22M	13
Non-GHG Categories	--	9M	12	10M	10	19M	11
Manufacturing & Production	--	5M	7	5M	5	10M	6
	100	75m	100	101M	101	176M	101

Potential Biomass Consumption

Year	Biomass Needed to Meet Transportation Goals (MBDT)	Biomass Needed to meet Electricity Goals (MBDT)	Total Biomass Demand (MBDT)	Waste Biomass Available (MBDT)
2012	5.7	10.4	16.1	36.8
2017	8.5	15.1	23.6	39.6
2020	11.4	17.8	29.2	40.4
2022	21.3	18.3	39.6	40.4
2050	41.5	27.1	68.6	40.4