



CALIFORNIA ENERGY COMMISSION

The Investment Plan for the The Alternative and Renewable Fuel and Vehicle Technology Program

**Webcast for the Natural Gas Vehicle Technology Forum
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Program Purpose and Objectives

- AB 118 Program Purpose:

“develop and deploy innovative technologies that transform California’s fuel and vehicle types to help attain the state’s climate change policies”

- Creating a Framework for Sustainability:

“establish sustainability goals to ensure that alternative and renewable fuel and vehicle development projects, on a full fuel-cycle assessment basis, will not adversely impact natural resources, especially state and federal lands”

- Investing in Clean Economic Development:

Financial incentives and private investment

Encourage market creation and consumer choice

Leverage innovation and use renewable and waste resources



Agenda

- **Advisory Committee Suggestions**
- **Analyses Performed**
- **Regulations Prepared and Submitted**
- **Draft Investment Plan Summary Review**
- **Proposed Funding Recommendations**
- **Advisory Committee Comments**
- **Stakeholder Presentations and Public Comments**
- **Investment Plan Workshops Schedule**
- **Program Implementation Schedule**



Advisory Committee Suggestions

- **Guided by FFCA - Commitment to Updating**
- **Goal Driven Methodology for Allocating Funds**
- **“Reverse Engineering” from 2050 Vision for GHG Reduction**
- **Perform “Gap Analysis”**
- **Continue Sustainability, Market, and Incentive Studies**
- **Coordination with PIER Alternative Fuels Roadmap**
- **Evaluate Capital Efficiency**
- **Emphasize Economic Development, Workforce Training**



Analyses Performed

- **Updating GREET Full Fuel Cycle Assessment**
- **“Back-casting” from the *2050 Vision* (AB 1007)**
 - **Initially Light-Duty Vehicles - Applied CALCARS Model**
 - **Evaluated Medium- and Heavy-Duty Vehicles**
- **Performed GAP Analysis - TIAX**
- **Evaluated Partner and Stakeholder Inputs**



Regulations Prepared and Submitted

- **Criteria For Project Funding**
- **Sustainability Goals and Evaluation Criteria**
- **Definitions**
- **Funding Restrictions**
- **Advisory Body, Member Selection, Duties**
- **Purpose of Investment Plan**



Summary-Draft Investment Plan

- Determining Priorities and Opportunities
 - AB 32 goal to reduce GHG emissions back to 1990 levels by 2020
 - Governor’s Executive Order S-03-05 goal to reduce GHG emissions 80 percent below 1990 levels by 2050
 - Use *2050 Vision* from *State Alternative Fuels Plan* to examine and set necessary “trajectory” to achieve state’s climate change goals
 - Establish market mechanisms to complement existing and future regulations



Summary-Draft Investment Plan

- Step 1: Relative Greenhouse Gas Reductions
 - Use *2050 Vision* (light-duty vehicles only) as starting point, and expand to include medium- and heavy-duty vehicles
 - Establish relative contributions for each fuel and vehicle category - to meet 2020 and 2050 goals
 - Use of Energy Commission's fuel demand forecast; incorporating effects of: "Pavley" regulations, the Low-Carbon Fuel Standard and assumptions for the reduction in vehicle miles traveled



Summary-Draft Investment Plan

- Relative Greenhouse Gas Reductions
 - Evaluates potential scenario to meet “fair share” reduction targets for transportation targets for 2020 and on to 2050
 - Works backward from *2050 Vision*, and populates assumptions with CALCARS model, and extrapolates vehicle/fuel efficiencies expected in 2050
 - Estimates the necessary carbon intensity of 2050 fuels
 - Assumes 20 percent reduction in vehicle miles traveled in 2050
 - Establishes 3 Fuel/Vehicle categories; **Super-Ultra-Low-Carbon, Ultra-Low-Carbon and Low-Carbon**
 - Establishes **Additional Fuel Economy Improvements** category



Summary-Draft Investment Plan

- Step 2. Gap Analysis
 - Determine where existing public and private funding is in place and adequate
 - Determine where “gaps” of needed funding exist in the development and deployment of alternative and renewable fuels and advanced vehicle technologies
 - Determine which identified funding gaps are anticipated and assumable by industry and stakeholders, and where additional funding is not needed



Summary-Draft Investment Plan

- Super-Ultra-Low-Carbon needs:
 - 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's AQIP) for light-, medium-, and heavy-duty PHEVs and BEVs
 - Support for early conversions for PHEVs and BEVs, and charging infrastructure



Summary-Draft Investment Plan

- Ultra-Low Carbon needs
 - Facilitate transition from existing ethanol production to lower-carbon feedstock production facilities
 - Develop new ethanol, renewable diesel, and biomethane production for use as transportation fuels
 - Expand installation of E-85 based on geographic distribution of FFVs
 - Develop fuel storage and blending terminals for renewable diesel distribution in Northern and Southern California



Summary-Draft Investment Plan

- Low-Carbon needs
 - 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-Draft Investment Plan

- Improved Vehicle Efficiency needs
 - Develop and demonstrate new light-duty engine design and vehicle component efficiency improvements
 - Support coordinated (with ARB's AQIP) development and demonstration of medium- and heavy-duty hybrid technology with diesel and alternative and renewable fuel engines



Summary-Draft Investment Plan

- **Non-Greenhouse Gas Funding Categories**
 - Sustainability Studies
 - Analytical and Program Support
 - Workforce Training / Economic Development
 - Support for Standards and Certifications
 - Public Education
 - Outreach



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



Natural Gas and Propane

Action

- Support deployment of OEM and retrofit LDV, MDV, and HDV in early adopter markets.
- Support the development of MDV and HDV engine and fueling and storage technologies.

Rationale

- Offer incentives (rebates) in coordination with ARB to offset differential vehicle costs.
- Co-fund development of low GHG emission technology to increase options for transition and merging with improved efficiency.



Natural Gas and Propane

Action

- Support development and retrofit of existing fueling infrastructure.

Rationale

- Co-fund fueling station projects to support growth in low GHG emission vehicle availability and expansion of fleets and other buyers. Explore loans and loan guarantee financing options.



Vehicle and Engine Efficiency

Action

- Develop and demonstrate LDV, MDV, and HDV engine design and components, hydraulic hybrid, and electric hybridization with diesel engines and alternative fuel engines.

Rationale

- Co-fund vehicle and component development to increase GHG emission reductions in multiple types of engine fuels and market niche applications.



Non GHG Reduction Categories

Action

- Support workforce training initiatives with employers, manufacturers, training programs, and government agencies.
- Support development of sustainability best management practices, standards, verification programs, and technical research.

Rationale

- Emerging industry and new to market vehicle and fuel options require transition funding to meet industry and consumer needs.
- Full fuel cycle analysis and measurement requires independent methods to verify GHG emission reduction results.



Non GHG Reduction Categories

Action

- Support development of standards and certification for fuels and vehicles.
- Support public outreach and education programs.

Rationale

- Co-fund development of government standards, guidelines and certification tests to enhance statewide transition to alternative fuel and vehicle options.
- Co-fund programs to provide independent information source and increase awareness of low GHG transportation options.



GHG Reduction Categories

Action

- Support updates to FFCA, market, fuel and technology assessments, financing mechanisms, reporting metrics, and program effectiveness.

Rationale

- Fund fundamental analysis and program activities to stay current and influence future funding decisions to reflect market changes, research insights, and financing trends.



Manufacturing and Production Incentives

Actions

- Support development of equipment manufacturing facilities located in California.

Rationale

- Provide incentives in conjunction with other state and local business retention, expansion and recruitment programs to accelerate in-state use of low GHG emission fuels and vehicles. Explore tax exemptions, loans and loan guarantees for some options.



Funding Recommendation Conclusions

- Reflect analysis reflecting GHG emission reduction potential and practical, near term market, technology and financing factors.
- Reward early adopters that maximize GHG emission reductions at earliest timeframes to meet 2020 goals and transition to 2050 vision.
- Flexible to shift as demand and market growth justifies optional funding allocations.



Program Implementation Schedule

- January 8, 2009 - Fifth Advisory Committee Meeting
- February 2009 - Public Workshops on the Investment Plan and the AB 118 Program
- March 2009 - Energy Commission Adoption of Investment Plan
- February/March 2009 - Solicitation Preparation and Release
- March/April 2009 - Proposal Evaluation; Recommendations for Funding
- April/May 2009 - Energy Commission Business Meeting Approval
- May 27, 2009 - Target Effective Date for Program Regulations