Alternative and Renewable Fuel and Vehicle Technology Program

Advisory Committee Meeting

February 10, 2014

University of California, Irvine
Advanced Power and Energy Program
Engineering Laboratory Facility

Meeting Agenda

10:00	Introductions and Opening Remarks
10:15	Program Overview
10:30	Program Status Update
11:00	Development of 2014-2015 Investment Plan Update
11:30	Advisory Committee Comments and Discussion
12:30	Lunch
1:30	Advisory Committee Comments and Discussion, cont.
2:30	Public Comment

Program Overview and Status Update

Jim McKinney
Program Manager

Alternative and Renewable Fuel and Vehicle Technology Program (AB118)

Purpose

To transform California's transportation market into a diverse collection of alternative fuels and technologies and reduce California's dependence on petroleum.

*"…**develop and deploy innovative technologies that transform California's fuel and vehicle types to help attain the state's climate change policies."*** (Health and Safety Code Section 44272(a))

Up to $150 Million in Annual State Funding Program

The Energy Commission will receive $100 million/year to implement the ARFVT Program: Fuel Production, Infrastructure, Vehicles, Manufacturing, Training

California Air Resources Board will receive $40 million/year for *Enhanced Fleet Modernization* and *Air Quality Improvement:* Light Duty Vehicles, Buses and Trucks.

Extended through January 1, 2024

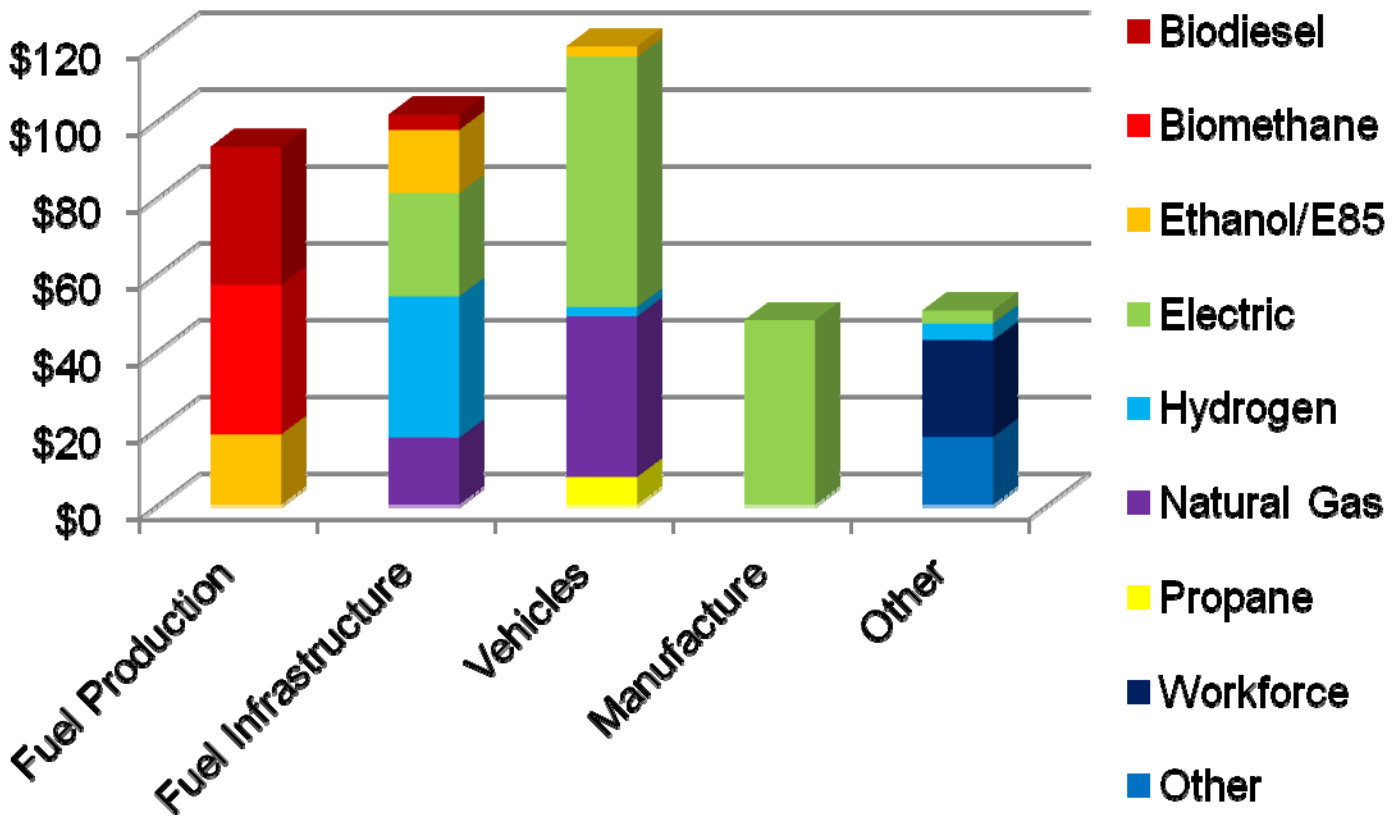
California's Policy Goals and Objectives

Policy Objectives	Goals and Milestones
GHG Reduction	Reduce GHG emissions to 1990 levels by 2020 and 80% below 1990 levels by 2050
Petroleum Reduction	Reduce petroleum fuel use to 15% below 2003 levels by 2020
In-State Biofuels Production	Produce in California 20% of biofuels used in state by 2010, 40% by 2020, and 75% by 2050
Low Carbon Fuel Standard	10% reduction in carbon intensity of transportation fuels in California by 2020
RFS2	36 billion gallons of renewable fuel by 2022
Air Quality	80% reduction in NOx by 2023
ZEV Mandate	Accommodate 1M EVs by 2020 and 1.5M by 2025

Funding Summary: 2009-2013

Investment Areas	Funding Amount (millions)	Percent of Total (%)	Number of Awards
Biofuels	$118.5	28	45
Electric Drive	$143.5	35	87
Natural Gas/Propane	$66.6	16	56
Hydrogen	$43.6	11	11
Workforce Development	$25.2	6	39
Market and Program Development	$15.6	4	26
Total	**$413.0**	**100**	**264**

Existing Agreements



EV Charger Support

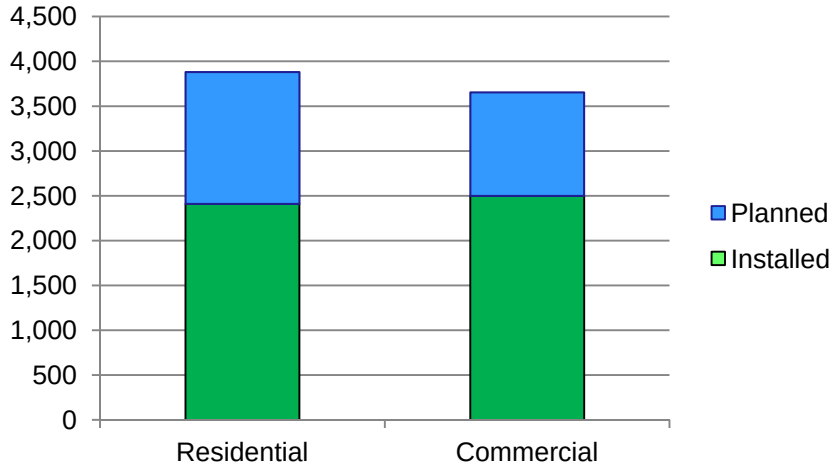
EVSE Funding to Date = $26.8 million

Total Funded = 7,798 charge points

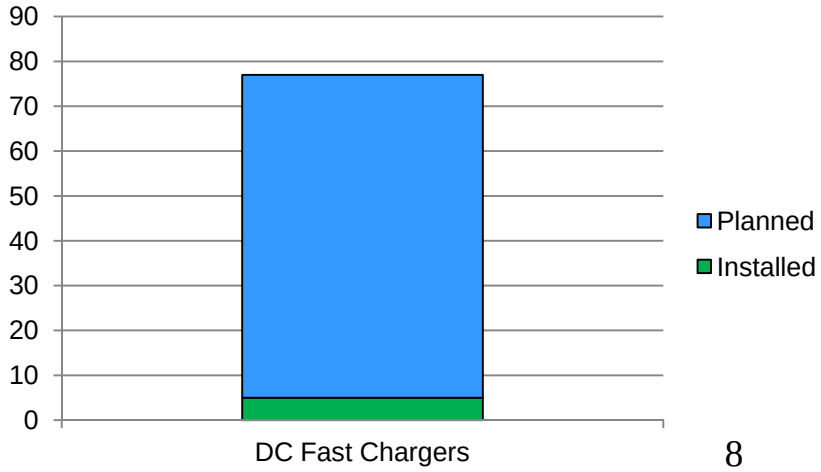
- Commercial = 3,096
- Residential = 3,882
- Workplace = 743
- DC Fast = 77

Plus 10 Regional Readiness Planning Grants = $2.0 M

Level 1 & 2



77 DC Fast Chargers



Hydrogen Station Funding

Funding to Date = $42.6 million

Public Station Funding

17 Stations	= $27.1 million (existing awards)
~5 Station Upgrades	= $6.7 million
11-12 New Stations	= $30 million (open solicitation)

Other Funding Activities

AC Transit Fuel Cell Bus Station	= $3 million
CDFA Div of Weights and Measures	= $4 million
Retail Dispensing Fuel Standards	
UC Irvine STREET Model	= $1.5 million
SCAQMD Regional Readiness	= $299,360

Biofuels Funding

Category	Funding ($ millions)	No. of Sites
Fuel Production		
Biogas	38.9	11
Biodiesel / Renewable Diesel	35.9	14
Ethanol	12.4	5
CEPIP	6.0	3
Total Fuel Production	**93.2**	**34**
Fueling Infrastructure		
Biodiesel Tankage	4.0	4
E85 Retail Stations	16.5	205
Total Infrastructure	**20.5**	**209**

ARFVTP Truck Sector-Related Funding

About 30 Percent of Total Program Funding

Technology	Funding ($ Millions)	No. of Vehicles, Fueling Stations or Projects
Commercial Natural Gas Trucks	33.5	1,375 Trucks (inc. pending)
Natural Gas Infrastructure	17.5	62 Stations
Commercial Propane Trucks	7.3	600 Trucks (inc. pending)
Commercial ZEV Trucks (Class 6 package delivery)	4	160 Trucks
Advanced Technology Truck Demonstration or Manufacturing	70.4	36 Projects
Total Funding	**132.7**	

Previous and Active Awards

Category	Funded Activity	Cumulative Awards to Date (in millions)	Projects
Alternative Fuel Production	Biomethane Production	$38.9	12
	Gasoline Substitutes Production	$18.4	8
	Diesel Substitutes Production	$35.9	14
Alternative Fuel Infrastructure	Electric Vehicle Charging Infrastructure	$26.8	28
	Hydrogen Fueling Infrastructure	$36.8	8
	E85 Fueling Infrastructure	$16.5	4
	Upstream Biodiesel Infrastructure	$4.0	4
	Natural Gas Fueling Infrastructure	$17.5	48
Alternative Fuel and Advanced Technology Vehicles	Natural Gas Vehicle Deployment	$33.5	3
	Propane Vehicle Deployment	$7.3	1
	Light-Duty Electric Vehicle Deployment	$20.1	3
	Medium- and Heavy-Duty Electric Vehicle Deployment	$4.0	1
	Medium- and Heavy-Duty Advanced Vehicle Technology Demonstration	$54.5	28
Related Needs and Opportunities	Manufacturing	$48.1	18
	Workforce Training and Development	$25.2	39
	Fuel Standards and Equipment Certification	$4.0	1
	Sustainability Studies	$2.1	2
	Regional Alternative Fuel Readiness and Planning	$3.7	16
	Technical Assistance and Program Evaluation	$15.6	26
Total		**$413.0**	**264**

Program Status Update

- Recent Additions to Awards
- Current and Planned Solicitations
- Benefits Report
- Implementing the ZEV Action Plan

Recent Proposed Awards

- Alternative Fuel Readiness Plans (PON-13-603)
  - 6 awards totaling $1.7 million
  - Most regions focused on planning for PEVs; SCAQMD on planning for early market FCEVs
- Commercial Scale Biofuel Production (PON-13-601)
  - 2 awards totaling $9.9 million
  - Awardees will increase their production capacity by a combined 12 million gallons per year
  - Expected to reduce GHG emissions by 40 percent and 88 percent compared to diesel

Active Solicitations

- Electric Vehicle Charging Infrastructure (PON-13-606)
  - $6 million available
  - Funding for specific charger types (multi-unit dwellings, workplaces, corridors, destinations)
  - Application deadline closed February 4; proposed awards expected in Spring
- Federal Cost Share for Emerging Technologies (PON-13-604)
  - $2.2 million available
  - Funding for ARFVTP eligible projects that have received federal funding awards.
  - Application deadline closed January 21; proposed awards expected in Spring

Open Solicitations

- Alternative Fuel Readiness Plans (PON-13-603)
  - First-come, first-served for passing proposals (until April 30)
  - Roughly $400,000 remaining out of $2.1 million

- Hydrogen Fueling Infrastructure (PON-13-607)
  - $29.9 million available
  - Includes funding for new stations, renewable fuel stations, upgrades, mobile refuelers, and station O&M
  - Sliding scale of funding encourages early project completion
  - Applications due February 14

Open Solicitations

- Advanced Biofuels Production (PON-13-609)
  - Applications due March 11
  - $24 million available, by fuel type
    - $9 million for diesel substitute production
    - $9 million for gasoline substitute production
    - $6 million for biomethane production
  - Up to $3 million available per award for pilot and demo projects; up to $5 million for commercial-scale projects
  - At least 50% match share required
  - Must possess carbon intensity less than in-state corn ethanol or soy biodiesel (roughly 20% less than gasoline or diesel)

Open Solicitations

- Natural Gas Vehicle Incentives (PON-13-610)
  - Reservations accepted February 28 - May 1
  - $10.8 million available (FY 12-13)
  - Incentive level depends on weight class ($1,000-$25,000)
  - Continuing discussions with stakeholders on how to efficiently administer future fiscal years' funding

Upcoming Solicitations (Online)

Upcoming Solicitations

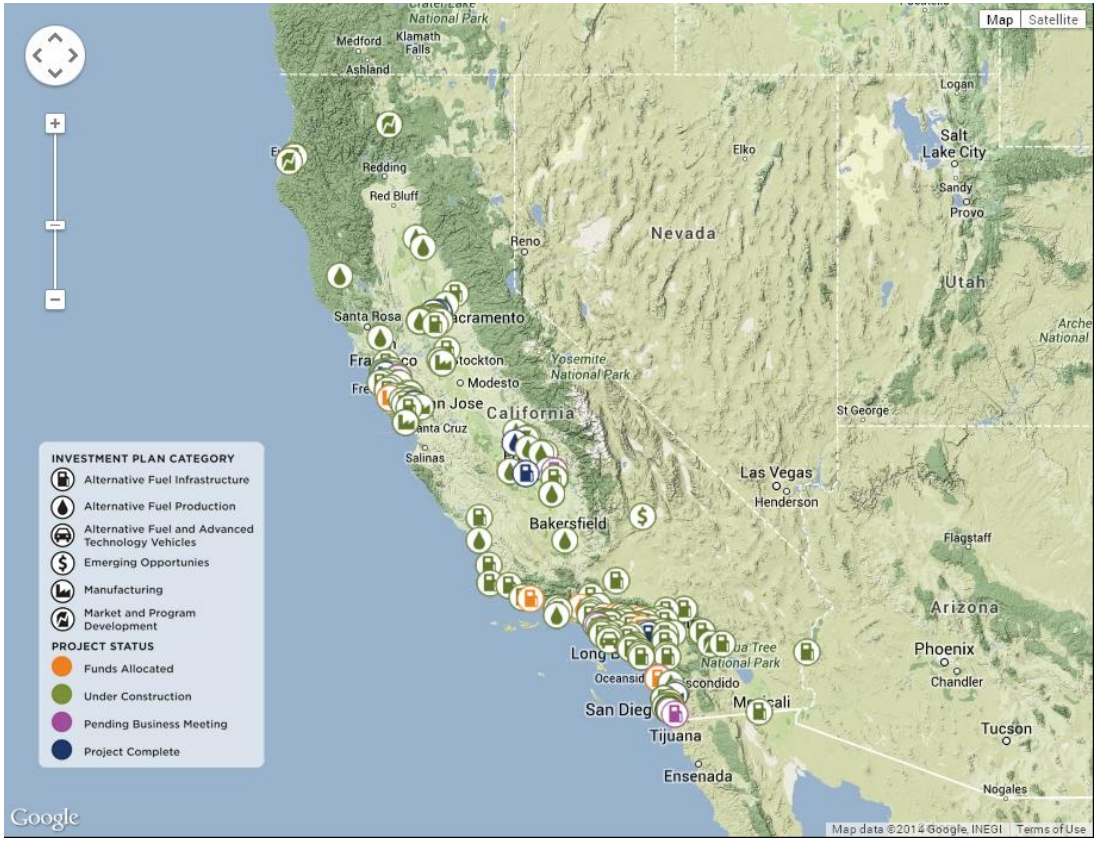
Investment Plan Category	Upcoming Funding Opportunities	Anticipated Funding Amount*	Proposed Release Date (Calendar Quarter)
Alternative Fuel Production	Pilot-Scale and Commercial-Scale Advanced Biofuels Production Facilities	$24 million	Open - PON-13-609 (see application deadline below)
	Early Stage Biofuel Production and Supply	$3 million	Q2 - 2014
Alternative Fuel Infrastructure	Regional Alternative Fuel Readiness Planning	$2.1 million	Open - PON-13-603 (see application deadline below)
	Hydrogen Refueling Infrastructure	$29.9 million	Open - PON-13-607 (see application deadline below)
Alternative Fuel and Advanced Technology Vehicles	Natural Gas Vehicle Incentives	$10.8 million	Open - PON-13-610 (see application deadline below)
	Medium and Heavy Duty Advanced Vehicle Technology Demonstrations	$9.8 million	TBD
Related Needs and Opportunities	Manufacturing Facilities and Equipment	$5 million	TBD

Additional upcoming funding opportunities will be posted periodically.

***The Energy Commission reserves the right to adjust funding amounts noted for individual solicitations.**

Available at: http://www.energy.ca.gov/contracts/transportation.html

ARFVTP Project Map



http://www.energy.ca.gov/drive/projects/map/index.html

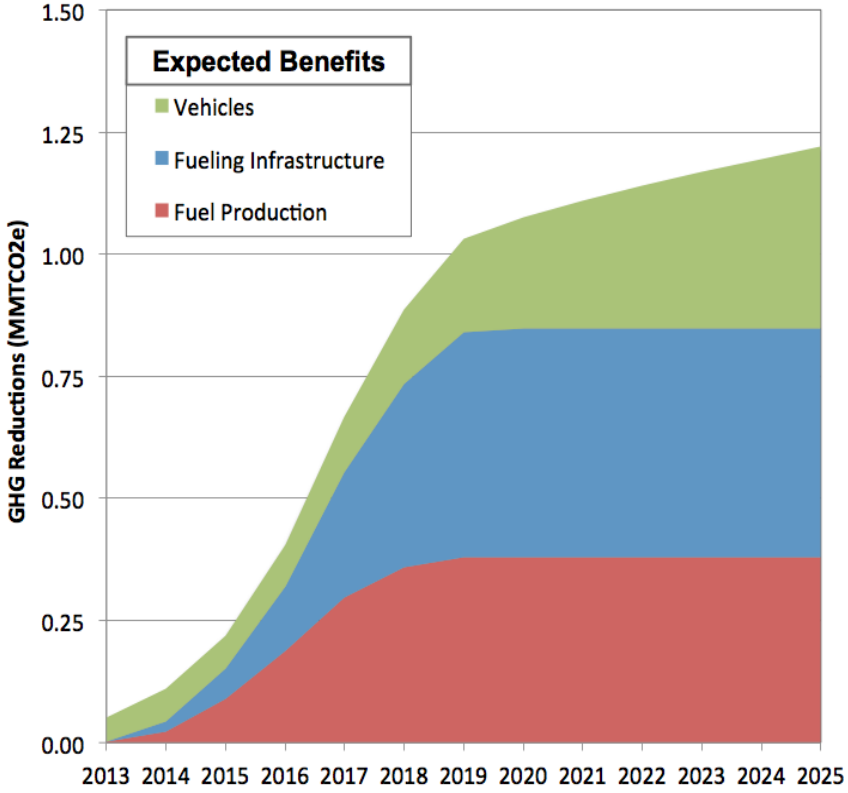
2013 Benefits Report Summary Results

Key Findings from NREL Benefits Guidance Report

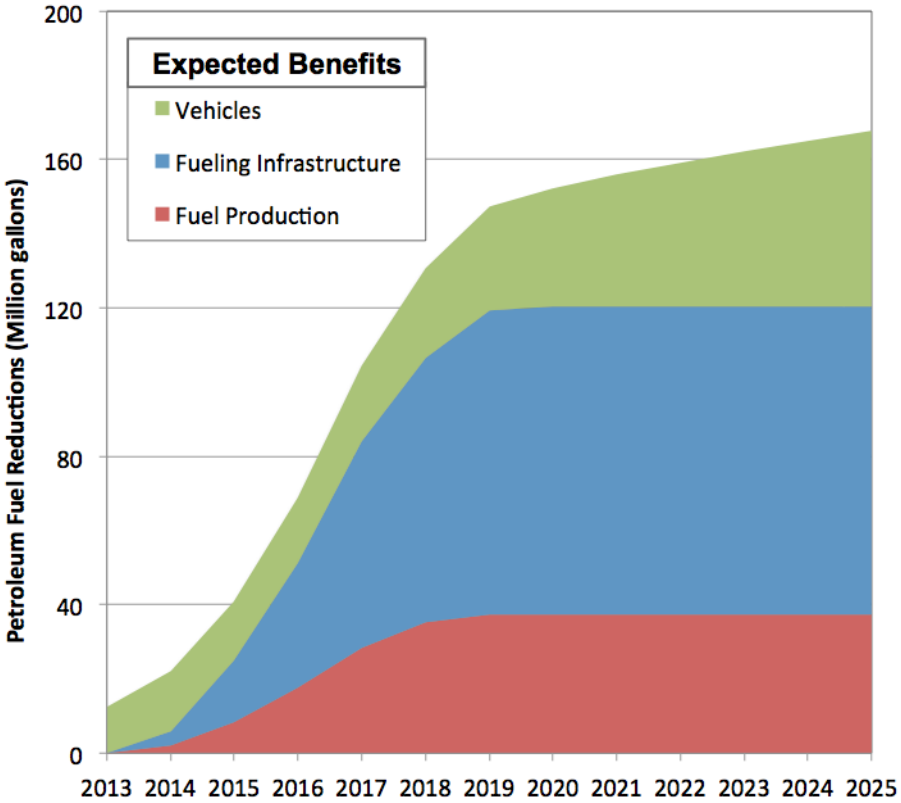
Dr. Marc Melaina, Principal Investigator

Expected Benefits through 2025

GHG Reductions (MMMT CO2e)



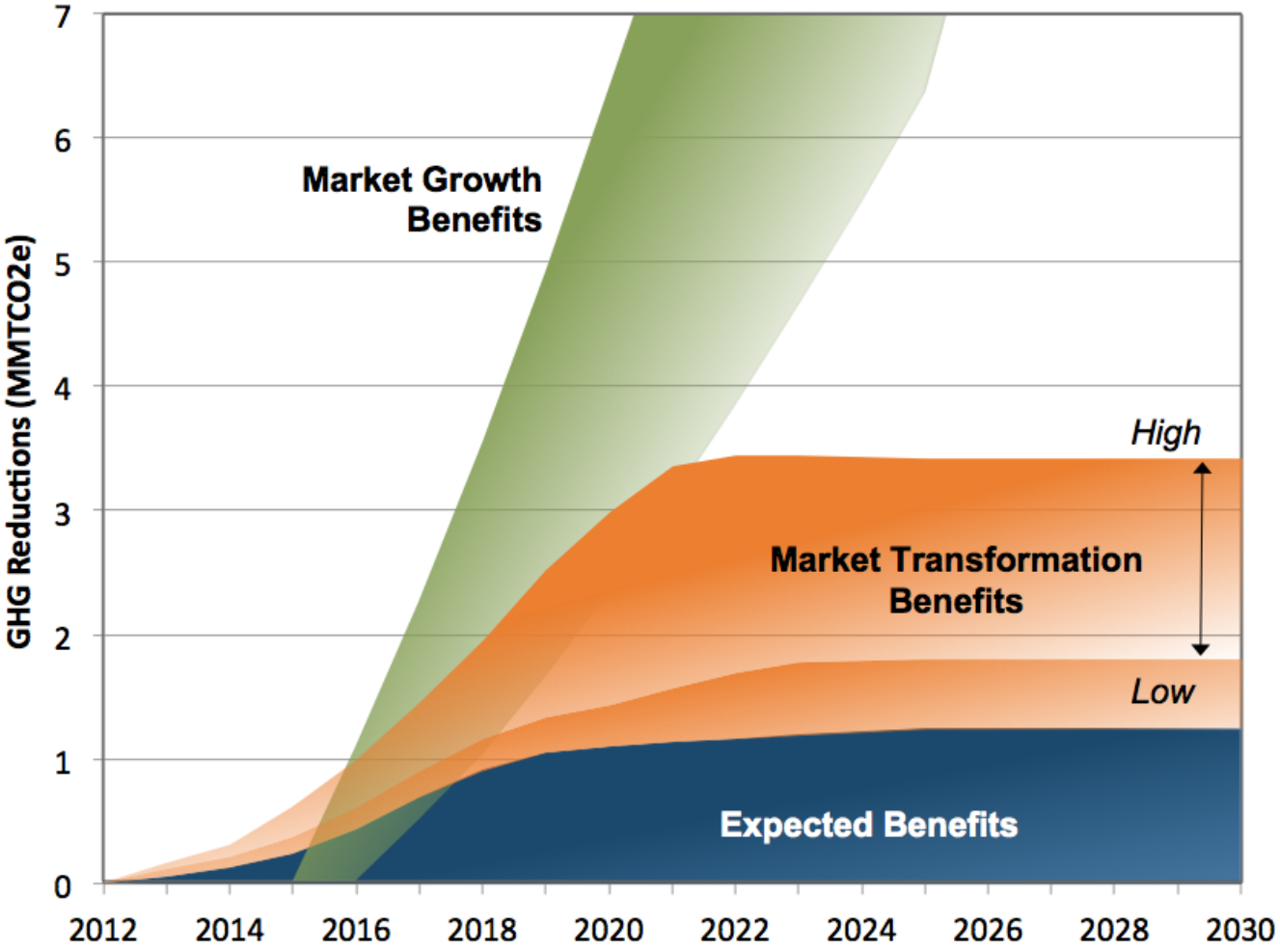
Petroleum Reductions (Million Gallons)



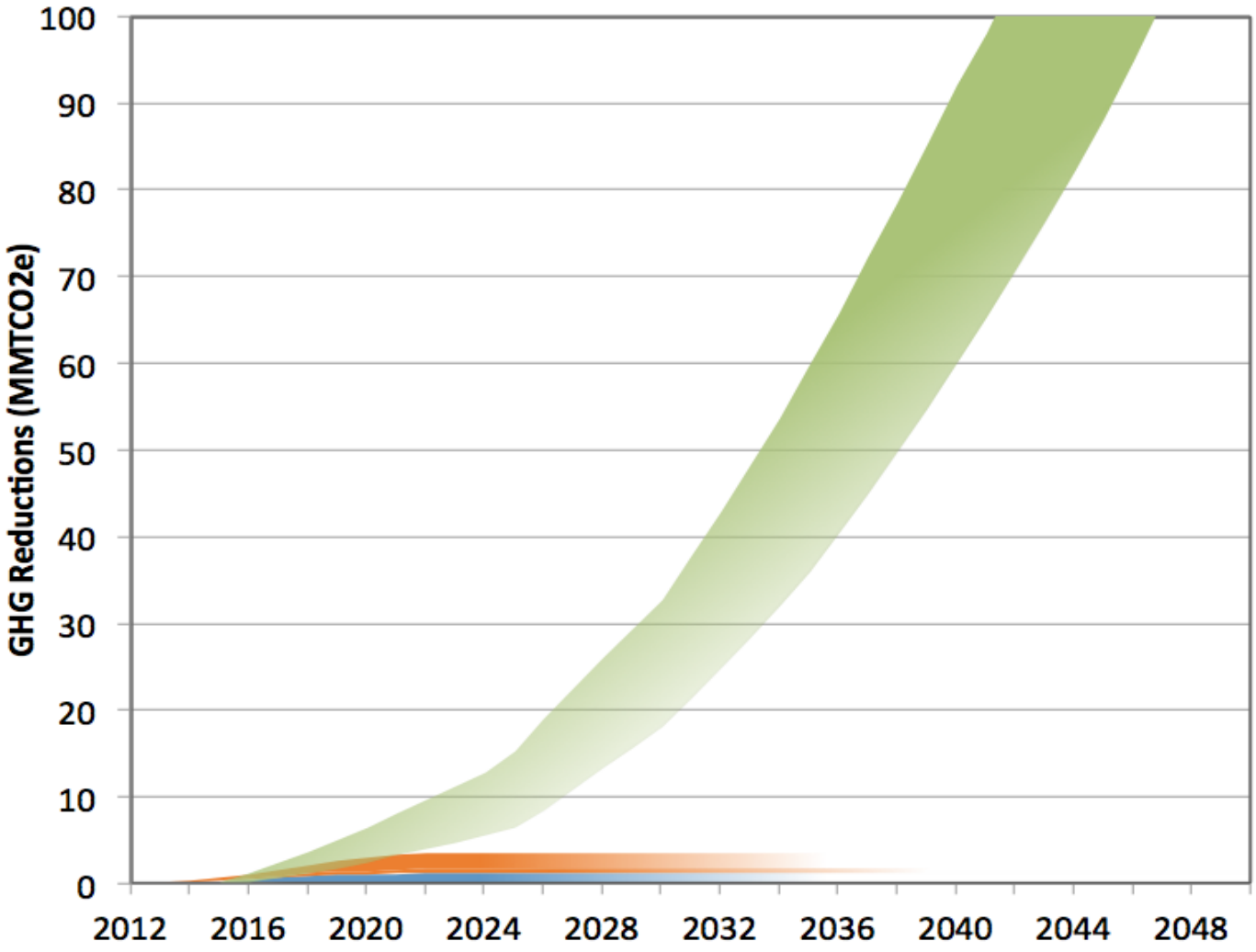
ARFVTP GHG and Petroleum Reduction Benefits through 2025

Benefit Category	GHG Reductions (Thousand Metric Tonnes CO2e)			Petroleum Fuel Reductions (million gallons)		
	2015	**2020**	**2025**	**2015**	**2020**	**2025**
Expected Benefits						
Fueling Infrastructure	63.6	468.3	468.3	16.5	82.9	82.9
Vehicles	67.2	227.4	370.9	16.2	31.9	47.4
Fuel Production	89.1	380.6	380.6	8.3	37.5	37.5
TOTAL	**219.9**	**1,076.3**	**1,219.8**	**41.0**	**152.3**	**167.8**
Market Transformation Benefits						
High	406.8	1,938	2,220	61.4	264.7	298.4
Low	138.2	326.4	545.5	9.2	27.9	51.0

Market Transformation and Expected Benefits through 2025



GHG Reductions Required through 2050



2014-2015 Investment Plan Update

Charles Smith
Project Manager

Role and Purpose

- Basis for FY 2014-2015 solicitations, agreements and other funding opportunities
- $100 million funding allocation for a portfolio of fuels, technologies, and supporting elements
- Allocations based on the identified needs and opportunities for individual fuels, technologies and vehicle types

Schedule

Activity	Date
Release Staff Draft	October 23
First Advisory Committee Meeting	November 4
Release Revised Staff Draft	January 10
Second Advisory Committee Meeting	February 10
Release Lead Commissioner Report	Late March
Business Meeting Approval	April

Revised Staff Draft

- Provided to Legislature in January 2014 as part of the Governor's proposed budget
- Updated information throughout
  - Recent solicitations and awards
- Benefits from previous stakeholder comment
  - 20 items submitted to docket 13-ALT-02
  - 14 public comments and 16 Advisory Committee members represented at last Advisory Committee meeting
- No funding modifications proposed

Summary of Updates

- Biofuel Production and Supply
  - Added summary of most recent awards
  - Revised Table 3 to emphasize our oversubscription of *qualifying* proposals
  - Retained $20 million allocation, but with the discretion to set aside funding for individual fuel types in future solicitations

Summary of Updates

- Electric Charging Infrastructure
  - Added potential for future investments in medium- and heavy-duty vehicle charging, as well as vehicle-to-grid demonstration
  - Vehicle-Grid Integration Roadmap
  - Statewide PEV Infrastructure Plan
  - $15 million allocation

- ZEV Readiness Implementation Workshop
  - Held on January 30 – materials available online
  - Future solicitation for ZEV readiness implementation
  - How to convert regional plans into actions?
    - Signage, education/outreach, permit streamlining, etc.

Summary of Updates

- Hydrogen Fueling Infrastructure
  - Added discussion on comparability of FCEVs and PEVs in reducing GHG emissions
  - Updated information about current hydrogen solicitation
  - Ongoing discussions with stakeholders regarding station estimates
  - $20 million allocation

Summary of Updates

- Natural Gas Fueling Infrastructure
  - Added language recognizing value of station upgrades and expansions
  - $1.5 million allocation

- Natural Gas Vehicles
  - Updated information on GHG emission reductions from biomethane and NO_x emission reductions in general
  - $9 million allocation

Summary of Updates

- Medium- and Heavy-Duty Truck Demonstration
  - Added a summary of recent awards for demonstration of all-electric truck retrofits
  - Added Table 10 summarizing previous investments by fuel and technology type
  - Added consideration of supportive, non-propulsion technologies, such as vehicle-to-grid, en-route charging, power takeoff, etc.
  - $15 million allocation

- Light-Duty Electric Vehicles
  - Updated status of ARB's Clean Vehicle Rebate Project
  - May revisit if cap-and-trade funds become available
  - $5 million allocation

Summary of Updates

- Emerging Opportunities
  - Updated information about current solicitation for federal cost-sharing
  - $7 million allocation
- Manufacturing
  - Clarified fuel and technological neutrality
  - $5 million allocation
- Workforce Training
  - Removed language regarding Proposition 39
  - $2.5 million allocation

Future Steps

- Seeking feedback from all stakeholders
  - Comments requested by February 14
  - E-mail: docket@energy.ca.gov, Subject: 13-ALT-02
- Continue review of existing ARFVT Program investments, as well as related programs and policies
- Release Lead Commissioner Report in March
- Seek approval at April Energy Commission Business Meeting

Category	Funded Activity	Proposed Funding Allocation
Alternative Fuel Production	Biofuel Production and Supply	$20 million
Alternative Fuel Infrastructure	Electric Charging Infrastructure	$15 million
	Hydrogen Fueling Infrastructure	$20 million
	Natural Gas Fueling Infrastructure	$1.5 million
Alternative Fuel and Advanced Technology Vehicles	Natural Gas Vehicle Incentives	$9 million
	Light-Duty Electric Vehicle Deployment	$5 million
	Medium- and Heavy-Duty Advanced Vehicle Technology Demonstration	$15 million
Related Needs and Opportunities	Emerging Opportunities	$7 million
	Manufacturing	$5 million
	Workforce Training and Development	$2.5 million
	Total Available	**$100 million**