



California Energy Commission's

Alternative and Renewable Fuel and Vehicle Technology Program

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www.energy.ca.gov

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California Nation-State Statistics

- Population: 37.7 million
- GDP: \$1.8 trillion - 8th largest global economy
- GHG Emissions: 440 MMT (2004)
 - 7.2% of U.S. Emissions (Pew Center)
 - 10th largest emitter on global scale
 - **Transportation accounts for 38 % of all GHG emissions**
- Vehicles: 26.5 million cars + 0.92 million trucks
- Annual Fuel Consumption: 20 billion gallons
 - 16 billion gallons gasoline (>1 billion gallons ethanol E10)
 - 4 billion gallons diesel
 - **3rd largest consumer of vehicle fuels after China and US**



AB 118 Basics

Alternative and Renewable Fuel and Technology Program

- **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))

- **\$1.5 Billion State Funding Program**

For the *Alternative & Renewable Fuel and Vehicle Technology Program*, the Energy Commission will receive **\$100 million/year for over 7 years**.

California Air Resources Board will receive **\$50 million/year for over 7 years** for *Enhanced Fleet Modernization and Air Quality Improvement*.



Key Policy Objectives

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



Reduce Petroleum Use



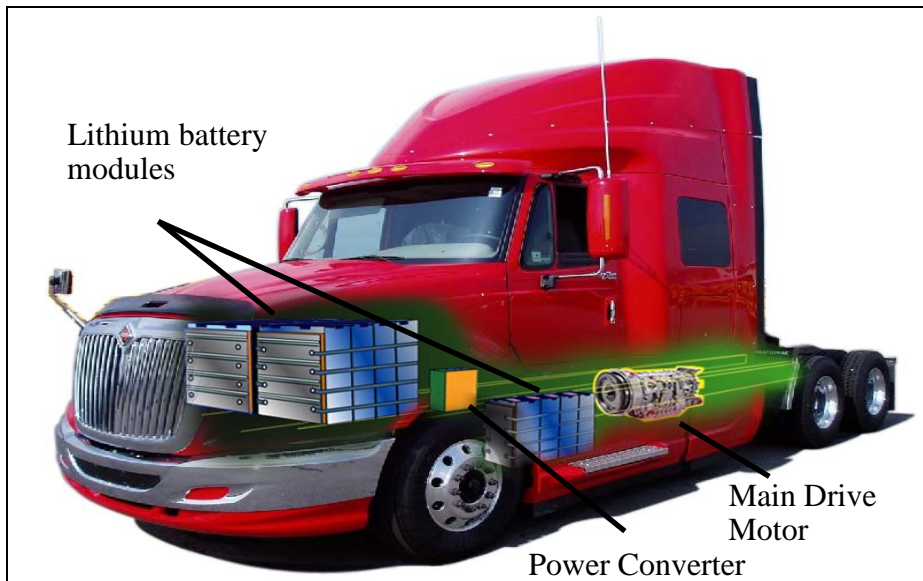


California Has
26.5 Million
Light Duty
Vehicles (2009)



Alternative Technology Trucks

Transpower's ElecTruck Class 8 All-Electric Tractor



Navistar's Class 6 CNG Truck



AB 118 Funding and Objectives

- Invest in a portfolio of alternative low-carbon and renewable fuels and advanced vehicles in California to help meet our energy, environmental, and economic goals.
- Alternative fuel production, distribution and dispensing
- Alternative technology vehicle development and manufacturing (EVs, CNG/LNG, Fuel Cell, Flex Fuel)
- Workforce training
- Education and outreach
- Environmental, market and technology assessments



Investment Plan

- The Energy Commission annually develops and adopts Investment Plan.
- FY 2008-10: \$176 million (combined two funding cycles)
- FY 2010-11: \$108 million--reduced to \$86.4 million.
- FY 2011-12: Under development--\$100 million
- <http://www.energy.ca.gov/2010-ALT-1/documents/index.html>



2008-2010 Solicitations and Awards

Solicitation Number	Description of Solicitation	Total Award (Initial Plus Headroom)	Total Number of Projects
ARRA	Federal Cost Sharing	\$36.5 million	9
PON 09-003	Biomethane production from waste feedstocks	\$26 million	5
PON 09-004	Medium- and heavy-duty vehicle demonstration of alternative fuels and advanced technologies	\$12 million	8
PON 09-006	Plug-in electric vehicle charging stations and upgrades, natural gas fueling stations and upgrades, E85 fueling stations, and biomass-based diesel distribution infrastructure	\$16.2 million	20
PON 09-604	Biofuels production	\$17.1 million	13
PON 09-605	Manufacturing plants for alternative fuel vehicles, vehicle components, and batteries	\$24.9 million	11
PON 09-607	Ethanol production incentive	\$6 million	TBD
PON 09-608	Hydrogen fueling stations	\$15.7 million	3
Total		\$154.2 million	69



FY 2008-09 and 2009-10 Public Agency Agreements

Funding Category	Funds Awarded (Millions)
Workforce training and development (EDD, ETP, CCCCCO)	\$15.0
Fuel standards development (CDFA)	\$4.0
Plug-in Prius demonstration (DGS)	\$0.6
Light duty vehicle deployment (ARB)*	\$2.0
Woody biomass sustainability research (US Forest Service)*	\$1.5
UC Irvine STREET model (UCI)*	\$.75
National Renewable Energy Laboratory (NREL)*	\$1.2
Hydrogen fueling station (AC Transit)*	\$3.0
*Agreement under development	Total: \$28.1



Funding Status Report FY 2008-09 and 2009-2010

8 Solicitations

- 313 proposals reviewed, requesting \$1.2 billion

Grant Awards and Agreements

- \$154.2 million among 69 grant awards*
- \$28.1 million among 10 agreements
- Total: \$182.3 million
- Percent of FY 2008-09 and 2009-10 Funds Committed: **96.3%**

* Includes \$13.8 million from FY 2010-11



Summary of Awards to Date



FY 2009-10 AB 118 Funding Awards and Results 2009 ARRA and AB 118

\$36.5M AB 118 match for 9 projects to leverage \$105M in Federal funding for California

- 2,860 electric vehicle charging stations
 - Support Nissan Leaf and Chevrolet Volt deployments in California
 - State-wide public EV charging
- 75 E85 retail fueling stations
- Demonstrate >700 MD-HD NG and hybrid-electric trucks
- Workforce development and training



Alternative Fueling Infrastructure Awards

32 Grants Totaling \$31.7 million for statewide alternative fuel infrastructure

- EV Infrastructure
 - Update 500 EV charge-points statewide
 - Approximately 500 new charge-points
- Natural Gas Fueling Infrastructure
 - 19 new and upgraded stations
- E-85 Fueling Stations
 - 10 new stations
- Hydrogen
 - 11 new and upgraded stations



Medium- and Heavy-Duty Vehicles Results

**8 Grants Totaling \$12 million for
development of advanced technology
medium- and heavy-duty vehicles**

- Electric and natural gas hybrids
- Hydraulic hybrids
- Battery-powered lifts for utility trucks

(MD-HD Trucks are 4% of vehicle population, but use
16% of total fuel)



Workforce Development Awards

3 Grants totaling \$16 million

- Employment Development Dept
- Employment Training Panel
- California Community Colleges

3,500 technicians trained to date for alternative vehicle technology work



Electric Vehicle Component Manufacturing Results

11 Grants Totaling \$24.9 million for In-State EV Component Manufacturing

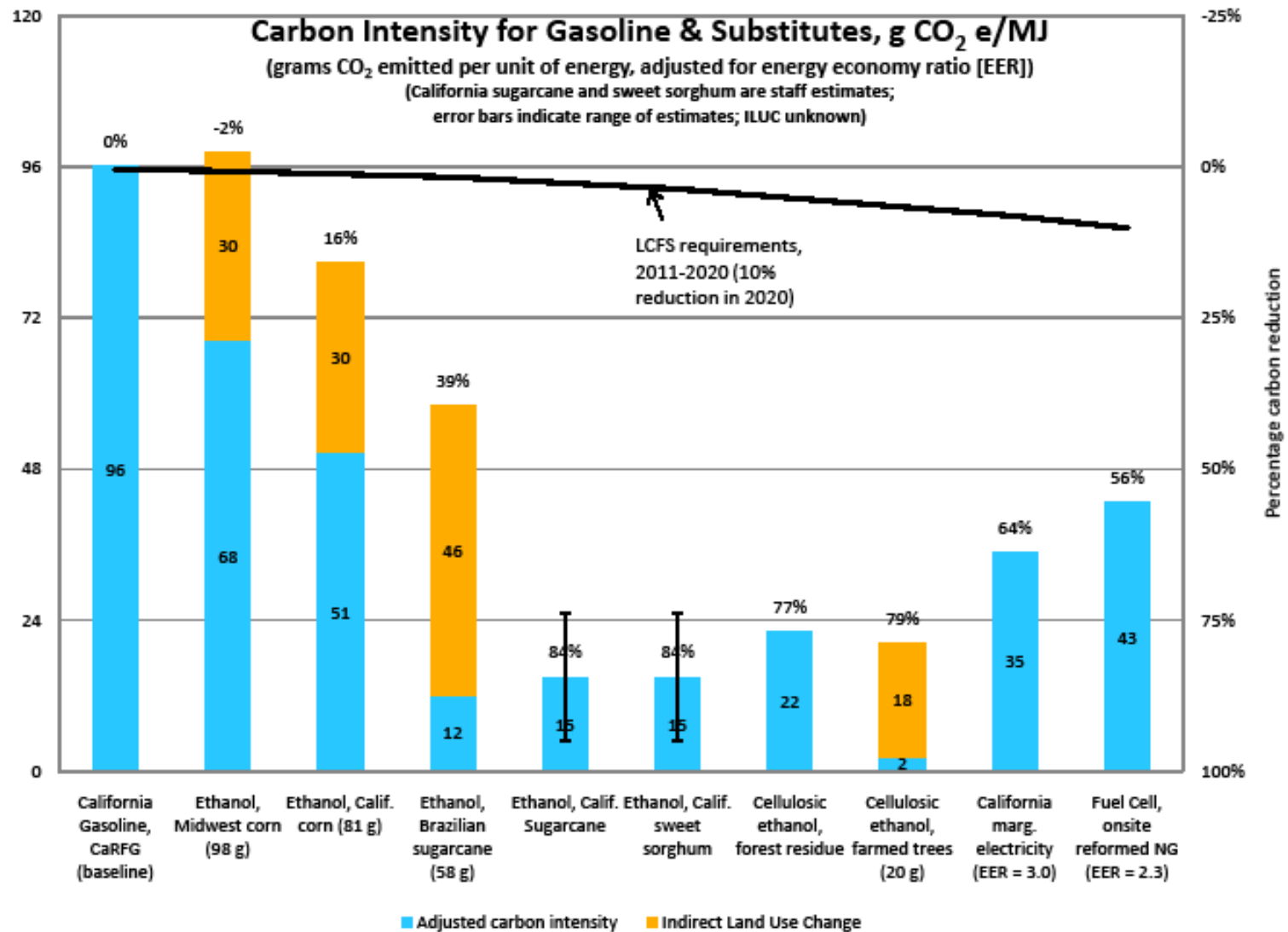
- Lithium ion battery assembly
- Electric motorcycles
- Electric drivetrain components
- Class 8 electric truck assembly



Biofuels Production Results

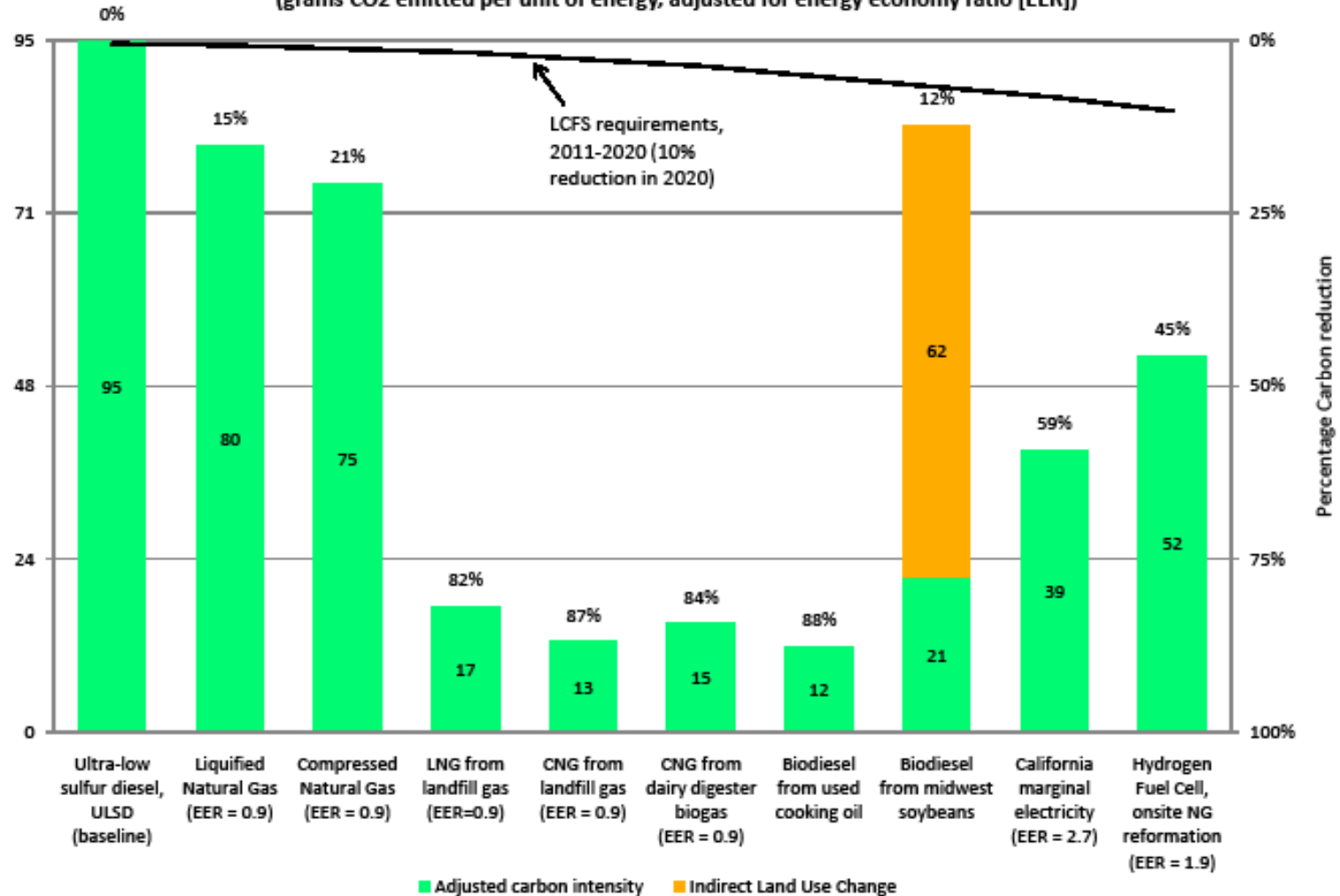
18 Grants Totaling \$43.1 million for In-State biofuels production for transportation

- Biomethane from municipal solid waste, wastewater treatment plants, and agricultural and rendering plant waste
- Liquid and gaseous biofuels from agricultural and forestry waste
- Fuels from algae





Carbon Intensity for Diesel & Substitutes, g CO₂ e/MJ (grams CO₂ emitted per unit of energy, adjusted for energy economy ratio [EER])





SUSTAINABILITY FOR AB 118



AB 118 Sustainability Provisions

California Health and Safety Code

Section 44271(a)(2)

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



Sustainability and AB 118

- “A rapid transition to alternative fuels has the potential to encourage environmentally destructive production practices
- We have developed sustainability goals and criteria for AB 118, and will consider sustainability in every funding decision we make”

Energy Commissioner

Karen Douglas

– January, 2009





3 Sustainability Goals

1. **Substantially reduce the greenhouse gas emissions** associated with California's transportation system to help meet California's 2020 and 2050 climate goals
2. **Protect the environment** from the effects of alternative and renewable fuel development and to **promote the superior environmental performance** of alternative and renewable fuels, infrastructure and vehicle technologies:
11 evaluation criteria
3. **Enhance market and public acceptance of sustainably produced alternative and renewable fuels** by developing, promoting, and creating incentives for the production of such fuels in **accordance with certified sustainable production practices and standards**



Evaluation Criteria

- **Goal 3 – Promote certified sustainable production practices and standards**

Program Examples:

RSB

RSPO

UK RTFO

Council Sustainable Biomass Production

Sustainable Biodiesel Alliance

European Commission Sustainability Criteria and Certification

Forest Stewardship Council

Primary tool for driving sustainable practices in international arena



Upcoming 2011 Solicitations

Technology	Amount (Millions)
Gaseous Fuels – LD, MD-HD Vehicle Buy-Downs	\$14.5
MD-HD Demonstrations – Electric Drive and Gaseous	\$15
Hydrogen Fueling	\$10.2
Biofuel and RNG Production and Feasibility	\$36.7
Alternative Fuel Infrastructure	\$25.5
PEV Planning Support	\$1
Innovative Technologies and Federal Cost Sharing	\$6.3
Market and Program Support	\$9.4
Total	\$118.6