The California Energy Commission and Biofuels

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Western Statewide Wood Energy Team Forum 2017
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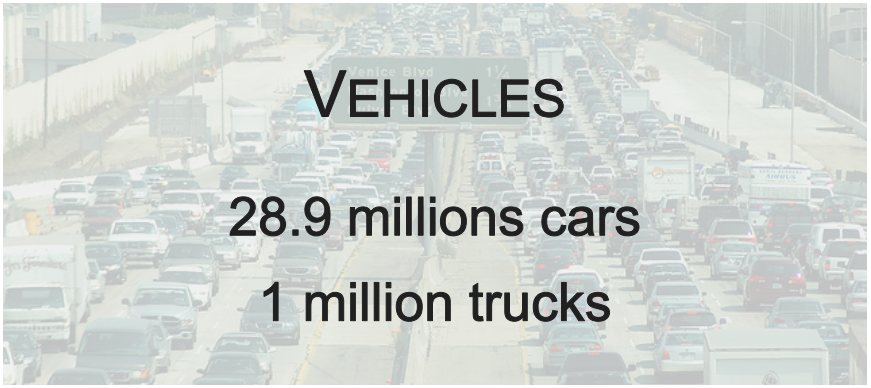
California Transportation Statistics



Vehicles

28.9 millions cars

1 million trucks

GHG Emissions

440.4 MMT CO2e (2015)

39% from transportation

Air Quality

Severe Non-Attainment for Ozone

San Joaquin Valley & South Coast

Petroleum Consumption

13.9 billion gallons gasoline

3.3 billion gallons diesel

CALIFORNIA CLIMATE STRATEGY

An Integrated Plan for Addressing Climate Change

VISION

Reducing Greenhouse Gas Emissions to 40% Below 1990 Levels by 2030

GOALS

- 50% renewable electricity
- 50% reduction in petroleum use in vehicles
- Double energy efficiency savings at existing buildings
- Carbon sequestration in the land base
- Reduce short-lived climate pollutants
- Safeguard California

Guiding Policies and Regulations

Policy Objective	Goals
AB 32 SB 32; E.O. B-30-15 E.O. S-3-05	Reduce GHG Emissions to 1990 levels by 2020, 40% below 1990 levels by 2030, and 80% below 1990 levels by 2050
SB 1383	Reduce emissions of short-lived climate pollutants to 40% to 50% below 2013 levels by 2030
Low-Carbon Fuel Standard	Reduce carbon intensity of transportation fuels by 10% by 2020
Clean Air Act	Reduce NOx by 80% by 2023
E.O. B-16-2012; ZEV Regulations	1 million EVs by 2020 and 1.5 million EVs by 2025; Infrastructure to accommodate ZEVs
E.O. B-32-15 Sustainable Freight	Improve freight efficiency and transition freight movement to zero-emission technologies

Feedstock	Amount Technically Available	Billion Cubic Feet Methane	Million Gasoline Gallon Equivalents
Landfill Gas	106 BCF	53	457
Animal Manure	3.4 M BDT	19.5	168
Waste Water Treatment Gas	11.8 BCF	7.7	66
Fats, Oils and Greases	207,000 tons	1.9	16
Municipal Solid Waste (food, leaves, grass)	1.2 M BDT	12.7	109
Municipal Solid Waste lignocellulosic fraction)	6.7 M BDT	65.9	568
Agricultural Residue (Lignocellulosic)	5.3 M BDT	51.8	446
Forestry and Forest Product Residue	14.2 M BDT	139	1,200
BIOGAS POTENTIAL		**351**	**3,030**

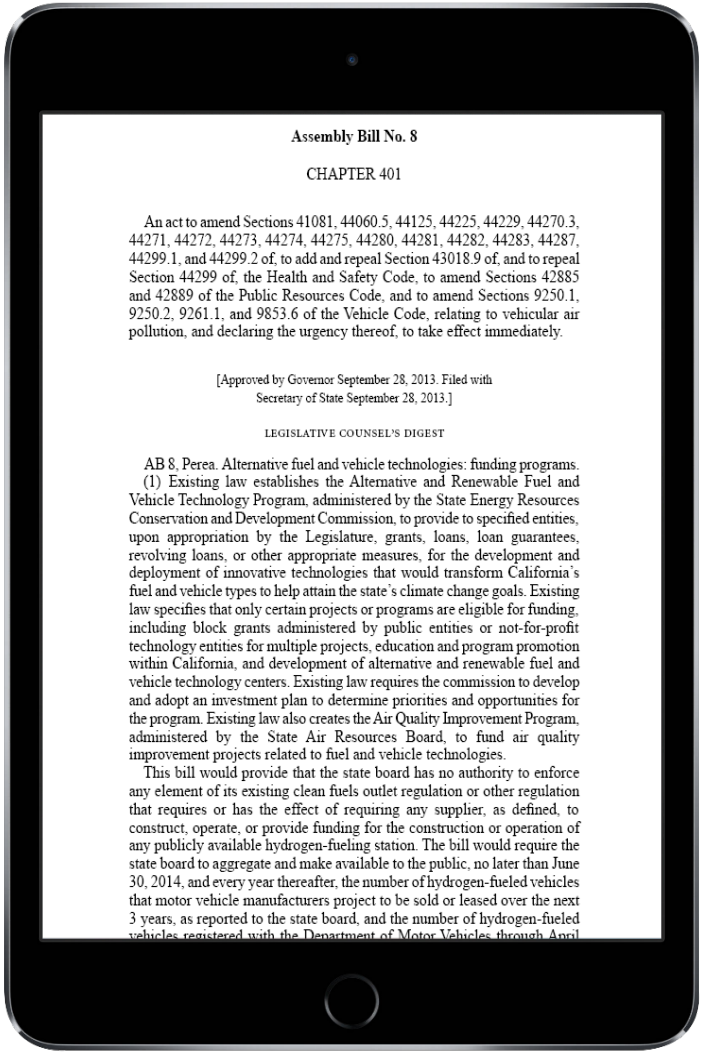
California's Urgent Need

- Forest fires pollute the air, decimate the forest, burn the soil, and hurt the watershed.
- Impacts already being felt and expected to worsen.
- The time is now to rapidly reduce emissions of black carbon that affect climate change.

Purpose of the ARFVTP

"…to 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 44272(a)



Assembly Bill No. 8

CHAPTER 401

An act to amend Sections 41081, 44060.5, 44125, 44225, 44229, 44270.3, 44271, 44272, 44273, 44274, 44275, 44280, 44281, 44282, 44283, 44287, 44299.1, and 44299.2 of, to add and repeal Section 43018.9 of, and to repeal Section 44299 of, the Health and Safety Code, to amend Sections 42885 and 42889 of the Public Resources Code, and to amend Sections 9250.1, 9250.2, 9261.1, and 9853.6 of the Vehicle Code, relating to vehicular air pollution, and declaring the urgency thereof, to take effect immediately.

[Approved by Governor September 28, 2013. Filed with Secretary of State September 28, 2013.]

LEGISLATIVE COUNSEL'S DIGEST

AB 8, Perea. Alternative fuel and vehicle technologies: funding programs.

(1) Existing law establishes the Alternative and Renewable Fuel and Vehicle Technology Program, administered by the State Energy Resources Conservation and Development Commission, to provide to specified entities, upon appropriation by the Legislature, grants, loans, loan guarantees, revolving loans, or other appropriate measures, for the development and deployment of innovative technologies that would transform California's fuel and vehicle types to help attain the state's climate change goals. Existing law specifies that only certain projects or programs are eligible for funding, including block grants administered by public entities or not-for-profit technology entities for multiple projects, education and program promotion within California, and development of alternative and renewable fuel and vehicle technology centers. Existing law requires the commission to develop and adopt an investment plan to determine priorities and opportunities for the program. Existing law also creates the Air Quality Improvement Program, administered by the State Air Resources Board, to fund air quality improvement projects related to fuel and vehicle technologies.

This bill would provide that the state board has no authority to enforce any element of its existing clean fuels outlet regulation or other regulation that requires or has the effect of requiring any supplier, as defined, to construct, operate, or provide funding for the construction or operation of any publicly available hydrogen-fueling station. The bill would require the state board to aggregate and make available to the public, no later than June 30, 2014, and every year thereafter, the number of hydrogen-fueled vehicles that motor vehicle manufacturers project to be sold or leased over the next 3 years, as reported to the state board, and the number of hydrogen-fueled vehicles registered with the Department of Motor Vehicles through April

Complementary state goals

- Improve air quality
- Increase alternative fuel use
- Reduce petroleum dependence
- Promote economic development

ARFVTP Funding To-Date

Fuel Type	Cumulative Awards (in millions)	Percent of Funding	Cumulative Number of Agreements
Biomethane	$60.9	8%	20
Ethanol	$48.5	6%	20
Biodiesel	$51.2	7%	21
Renewable Diesel	$27.8	4%	8
Electricity	$266.5	36%	179
Hydrogen	$139.2	19%	74
Natural Gas	$99.0	13%	151
Propane	$6.0	1%	31
Multiple/Other	$46.8	6%	88
Total	**$745.9**		**592**

As of September 1, 2017

Biofuels Project Funding

(as of 10/31/2017)

Altex Technologies Corporation

CR&R, Inc.

Crimson Renewable Energy LP

ARFVTP Biofuels Production Awards		
Fuel Type	**Awards Made**	**Funds Awarded (in millions)**
Gasoline Substitutes	15	$32
Diesel Substitutes	25	$75
Biomethane	20	$61
Total	60	$168

Biofuels Project Benefits

(as of 10/31/2017)

Production Capacity

- 135.7 million gallons per year funded capacity (diesel gallon equivalents)

GHG Displaced

- 1,300,000 Metric Tons CO2e/year
- 24.1 gCO2e/MJ volume weighted average carbon intensity

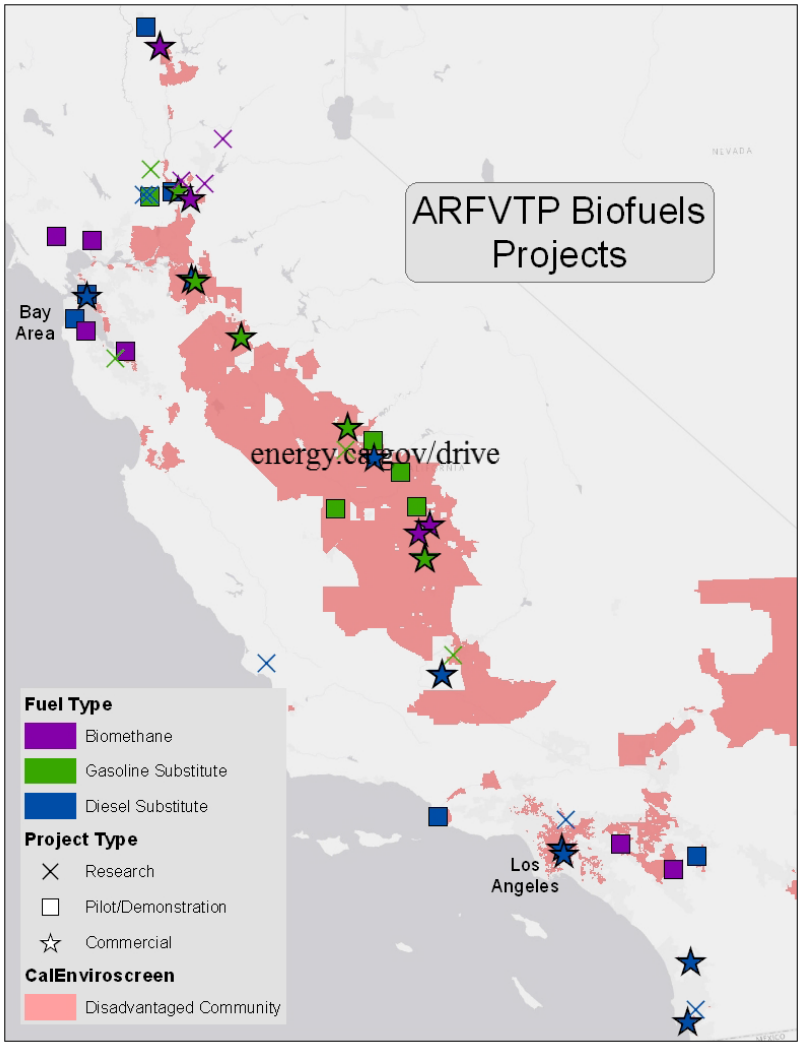
Economic Benefits

- 572 long-term / 1,589 short-term jobs
- $105.8 million in annual tax benefits
- $84.4 million (80%) in DACs

Disadvantaged Communities

- Over $500 million public and private investment statewide
- $390 million (78%) in disadvantaged communities

Biofuel Project Locations energy.ca.gov/drive



Opportunities for Meeting California's Climate Change Goals

Large commercial facilities

- High volumes of low-carbon fuels

Community scale facilities

- Matching production with locally available feedstock supply

Transformative technologies

- Advancements to increase yield, productivity, or cost effectiveness, and hurdle blend wall

New feedstock utilization

- woody biomass

Sustainability

Commercial-Scale Facilities

40+ million gallons/year

Supports 200 direct and indirect jobs

Renewable diesel and jet fuel

AltAir Fuels, LLC

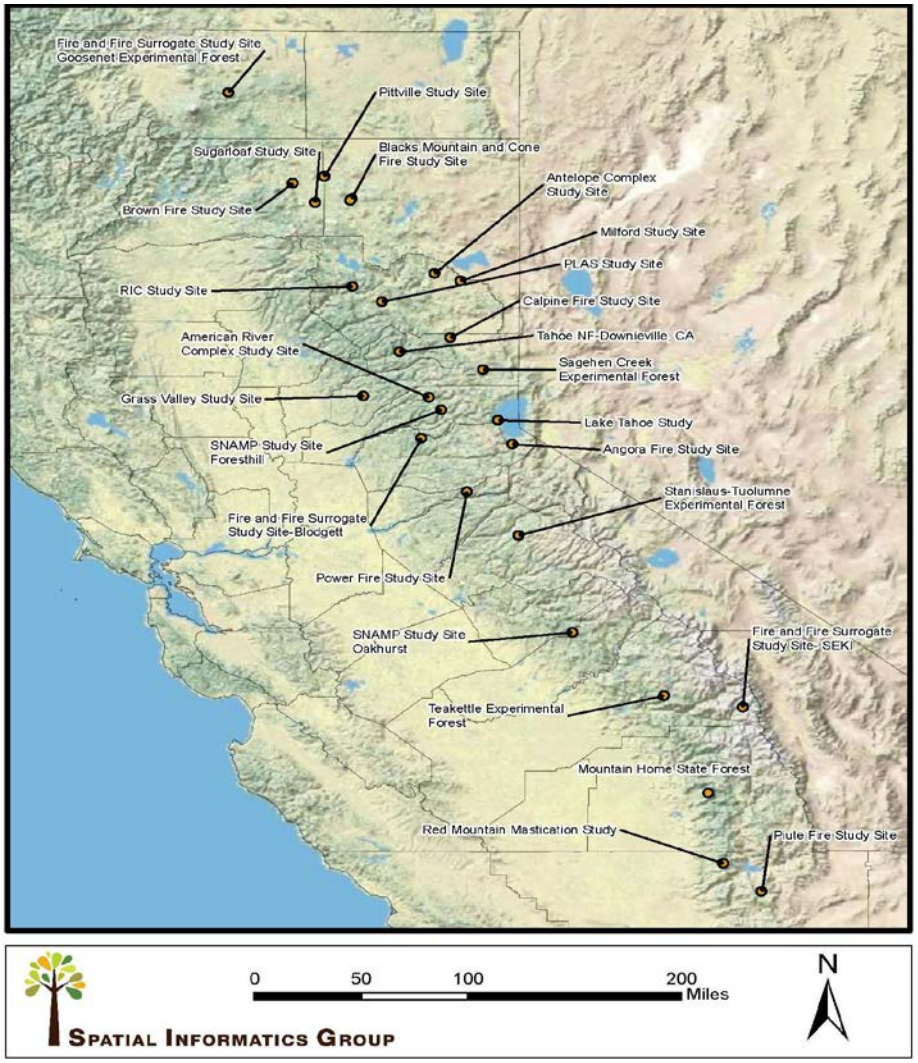
Community-Scale Facilities

Blue Line Transfer, Inc.

Transformative Technologies for Woody Biomass

G4 Insights

Biomass Utilization Sustainability Project



2018-2019 Biofuels Funding

$25 million

Proposed

Demonstration facilities – early 2018
Commercial facilities – late 2018

Liquid and gaseous (non-petroleum) fuels

- Biomethane, diesel substitutes, gasoline substitutes, renewable hydrogen

Focus on waste-based feedstocks

- Woody biomass, wastewater, municipal solid waste

energy.ca.gov/drive

Thank You

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