The ‘Diversified Portfolio’ for Transportation Energy

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California- An Island?
California Nation-State Statistics

• Population: 36.8 million
• GDP: $1.8 trillion - 8th largest economy
  – 7.2% of U.S. Emissions (Pew Center)
  – 10th largest emitter on global scale
  – Transportation accounts for 38% of all GHG emissions
• Vehicles: 26.3 million cars + 0.92 million trucks
• Annual Fuel Consumption: 20 billion gallons
  – 16 billion gallons gasoline
  – 4 billion gallons diesel
  – 3rd largest consumer of vehicle fuels after China and US
## Key Policy Objectives

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<td>GHG Reduction</td>
<td>Reduce GHG emissions to 1990 levels by 2020 and 80% below 1990 levels by 2050</td>
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<td>Petroleum Reduction</td>
<td>Reduce petroleum fuel use to 15% below 2003 levels by 2020</td>
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<td>Alternative and Renewable Fuel Use</td>
<td>Increase alternative and renewable fuel use to 11% of on-road and off-road fuel demand by 2012, 13% by 2017 and 26% by 2022</td>
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<td>In-State Biofuels Production</td>
<td>Produce in California 20% of biofuels used in state by 2010, 40% by 2020, and 75% by 2050</td>
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California’s Petroleum and Alternative Fuels Demand

(millions of gallons)

- Gasoline: 15,713
- Ethanol: 5.7% by volume
- Diesel: 2,904
- Alternative Fuels: 53.5

Source: California Energy Commission
California Alternative Fuels Plan

- Adopted Plan to achieve state petroleum reduction goals.
  - Increase use of alternative fuels by 20 percent
  - Reduce demand for gasoline and diesel to 15 percent below 2003 levels by 2020
- Full-fuel-cycle analysis of all fuels, specific recommendations.
- Goals: 9% in 2012, 11% in 2017, 26% in 2022.
- Displacement of 4 billion gge in 2020 (adding about 1Mg/p/d increased Alternative Fuel use)
Sources of Greenhouse Gas Emissions

Global Warming Solutions Act of 2006

• On September 27, 2006, Governor Schwarzenegger signed legislation, Assembly Bill 32, the Global Warming Solutions Act of 2006.

• California’s initiative is intended to limit greenhouse gas emissions from the state’s largest emitting sources.

• This legislation gives the California Air Resources Board significant, new responsibilities.
California’s Low Carbon Fuel Standard

- On January 9, 2007, the Governor issued Executive Order S-1-07, establishing the world’s first Low Carbon Fuel Standard for transportation fuels.

- Petroleum refiners, gasoline sellers and fuel suppliers must reduce the carbon content of their fuels by 10 percent by 2020.

- By regulating carbon fuel content, this standard will support the state’s greenhouse gas reduction targets, while promoting the use of alternative fuels.

- Adding ethanol or other biofuels into gasoline is one option for meeting the Standard; advanced biofuels show promise.

- The California Air Resources Board expects to complete its rulemaking in late 2008.
Funding and Objectives

• Up to $100 million per year for 7 1/2 Years ($75 million for FY 08-09; $101 million for FY 09-10)

• Develop, produce, manufacture, and deploy alternative and renewable fuels, advanced vehicles, vehicle efficiency improvements for on-road and non-road applications.

• Emphasize workforce training and job creation

• Foster education, promotion and technology centers

• Prepare environmental, market and technology assessments
ARRA Cost-Sharing - $36.52 million

- Install 3,891 electric vehicle charging sites
- Demonstrate over 800 medium- and heavy-duty natural gas and hybrid-electric trucks.
- Develop high energy density lithium-ion batteries
- Provide public outreach and education to promote the deployment of heavy-duty natural gas vehicles
Closed PONs- $124.4 million

- Biomethane production ($21.5 million)
- Alternative and renewable fuel infrastructure ($9.5 million)
- Medium- and heavy-duty vehicles ($13.8 million)
- Manufacturing facilities for electric vehicles, alternative vehicles, vehicle components and batteries ($19 million)
- Biofuel production plants ($15 million)
- Hydrogen fueling infrastructure ($19 million)
- Ethanol production incentive programs ($6 million)
- Hydrogen dispensing equipment certification ($4 million)
- Worforce training and development programs ($15 million)
- Conversion of state-owned hybrid-electric vehicles to plug-in electric vehicles ($600,000)
- Technical assistance for Program administration ($1 million)
Funding Allocation Summary for FY 2010-2011 Investment Plan

- Battery Electric Drive: $24.5 million
- Hydrogen Electric Drive: $13 million
- Gasoline Substitutes: $16.5 million
- Diesel Substitutes: $9 million
- Natural Gas: $22 million
- Propane: $3 million
- Innovative Technologies/Advanced Fuels: $8 million
- Market and Program Development: $12 million

Total: $108 million
Funding Mechanisms under Consideration

- **Block Grants** (public entities and organizations)
- **Loans or Funds Distribution through the Office of the State Treasurer (STO)**
- **Continuous Solicitations** (vehicle procurement, fuel infrastructure)
- **Goods Movement Funding** (suites of projects including vehicle and fuel demonstrations/deployments, necessary infrastructure establishment)
- **Market and Program Outreach** (likely competitive solicitation)
The “Five Spoke Wheel”

GHG Emission Reduction

Criteria Emission Reduction

Petroleum Reduction

Advanced Vehicle Technology Development

Increased Alternative Fuels Use

Economic Development
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