

## Proposed Changes to the State Alternative Fuels Plan Adopted by the Energy Commission on October 31, 2007

**Note:** The Original Report language is shown in regular text. The proposed modifications are shown in ~~strikeout~~ to indicate deletions and underline to indicate additions.

### ARB Staff's Proposed Modifications to the State Alternative Fuels Plan

#### Page ES-5, modify last paragraph

Lastly, the Plan concludes that a five-part strategy is needed: (1) promote alternative fuel blends with gasoline and diesel in the near and mid term and stimulate innovation through the development of a low carbon fuel standard; (2) maximize alternative fuels in early adopter market niches, such as heavy duty vehicles, fleets, off-road vehicles, and ports in the near and mid term; (3) maximize use of alternative fuels in internal combustion engines, and develop new transportation technologies, such as electric drive and hydrogen fuel cells, in the mid-to-long term; (4) maximize the use of mass transit, encourage smart growth and land use planning to help reduce vehicle miles traveled and vehicle hours traveled, and encourage improvements in vehicle efficiency to improve fuel economy; and (5) most important for the mid to long term, achieve the maximum feasible improvements in vehicle efficiency to reduce the total energy needed to power transportation in California.

#### Page ES-6, Goals and Outcomes, modify number 2, number 4, and number 5

2. Set alternative transportation fuel use goals, designed to ensure that there are further reductions ~~is no net material increase~~ in air pollution, water pollution, or any other substances that are known to damage human health.
4. Achieve maximum feasible emission reductions, relative to baseline. ~~Ensure no net increase~~ in criteria and toxic air pollutants ~~occure~~ under the Plan.
5. Ensure that implementation of the Plan will ~~not interfere with~~ support the state's commitments, under the State Implementation Plan, to improve air quality and achieve ambient air quality standards.

#### Page 11, Key Conclusions of the Plan, modify number 8

8. ~~Except for ethanol and hydrogen, all other~~ Most alternative fuels are cheaper-less costly today than gasoline and diesel on a fuel-use, cents-per-mile basis. Alternative fuel vehicles and fueling stations are still higher priced than gasoline and will need incentives to offset differential costs.

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**Page 12, Recommended Government Actions, California State Government, California Air Resources Board, modify number 1 and number 3**

1. Establish regulations for a Low Carbon Fuel Standard to meet or exceed the Governor's carbon intensity goal for transportation fuels with consideration for California's petroleum reduction goals and in-state Bioenergy Action Plan goals, ~~and~~ sustainability of alternative fuels, and further reduction of criteria and toxic air pollutants. The Low Carbon Fuel Standard will establish a durable framework for the production and use of alternative fuels.
3. Explore the feasibility of allowing utilities to receive carbon credits for investments in electric, ~~and,~~ natural gas, and hydrogen fuel cell transportation vehicles and infrastructure equivalent to the social benefit value.

**Pages 12 and 13; California State Government, California Public Utilities Commission; modify number 1 and number 2**

1. Encourage/allow preferential or special (for example, off-peak) rates for electricity and natural gas transportation fuels and as feedstock fuel for producing hydrogen.
2. Allow ratebase recovery of investments for home natural gas and hydrogen vehicle refueling equipment, and home electric vehicle charging equipment and meter installations.

**Pages 17 and 18, Electric Transportation Technologies – Immediate Actions, modify number 3 and number 18**

3. Modify utility tariff structure to support off-peak rates for PHEVs and hydrogen generation for FCVs.
18. Conduct consumer and market niche education and outreach programs to highlight electric and hydrogen FCV technology attributes, costs, and performance.

**Page 19, Natural Gas Fuel and Technology Immediate Actions, modify number 1 and number 8**

1. Stimulate the development of biomethane/biogas production for use as a transportation fuel and as a renewable feedstock for hydrogen production.
8. Install up to 120 new liquefied natural gas (LNG) and 540 new compressed natural gas (CNG) stations for fleet and public access customers over 10 years and ensure they are designed to accommodate future hydrogen fueling.

**Page 20, Hydrogen Immediate Actions, add new number 1; delete numbers 4, 8, and 14; renumber list; then modify numbers 2, 3, 4, 5, 6, 7, 8, 10, and 13.**

1. Support implementation of high-volume, retail-oriented hydrogen fuel stations strategically located to serve early market vehicles.
- ~~4~~2. Conduct proof-of-concept research and development to determine feasibility and support demonstration of low- cost production of hydrogen from biomass and solid waste stream feedstock.
- ~~23~~3. Vehicle manufacturers should ~~D~~develop proof-of-concept fuel cell plug-in hybrid drive train systems for California applications.
- ~~3-4~~4. Support development of ~~D~~Develop reduced-pressure, low-cost tank designs for fueling station storage and deploy these storage systems at up to 100 fueling stations. Support development of ~~D~~Develop up to 2,500 hydrogen plants producing at least 360,000 kilograms each per year in California.
- ~~4~~5. ~~Evaluate potential to create hydrogen from low cost, large production-facilities, using advanced electricity generation resources.~~
5. ~~Conduct research and development~~ Support demonstrations of proof of concept to evaluate use of fuel cells in transportation market niche applications (that is, truck stop electrification systems).
6. Vehicle manufacturers should ~~I~~integrate new fuel cell plug-in hybrid drive train systems into vehicle applications (passenger light-duty vehicles, airport shuttles, transit buses, and short haul delivery vehicles).
7. Develop fuel cell vehicle (FCV) production plants in California and promote the development of supply chain industries that can build from the State's expertise in electronics and other high-tech components.
- ~~8~~9. ~~Integrate reduced pressure (1,000 psi), flat panel hydrogen tanks into light-duty vehicle platforms.~~
- ~~9- 8~~10. Facilitate ~~expansion of anchor heavy-duty fleet and regional deployment (light-duty vehicle) infrastructure model~~ mixed use hydrogen fuel infrastructure to support both transit buses and other applications (e.g., forklifts), as well as light-duty vehicles fleets.
- ~~10-9~~11. Ensure the credit of GHG emission reductions in business operation plans.
- ~~14-10~~12. Facilitate automaker vehicle volume purchases beyond the threshold business case of at least 3,000 units/year (e.g., through government lease or purchase of hydrogen fueled vehicles).

- 42.11. Conduct consumer and market niche education and outreach programs to highlight vehicle availability, performance, station locations, and fuel cell vehicle attributes.
- 43.12. Install up to 170,000 hydrogen home refueling appliances over 10 years and integrate production from rooftop solar photovoltaic systems through utility programs and rate structure.
- 14. ~~Facilitate automaker production of dedicated passenger FCVs.~~
- 45.13. ~~Develop~~ Support research for reduced-pressure (such as 1,000 psi), low-cost, on-board storage technology for vehicle models.

**Page 26; Energy Input, GHG Emissions, and Sustainability; modify number 5**

- 5. The analysis shows a 50 percent or greater GHG emissions reduction for pure electric, plug-in hybrid, hydrogen fuel cell vehicles, and electric forklift applications. This is due to the naturally high efficiency of electric drive technologies converting electric energy into locomotion.

**Page 38, Light-Duty Vehicle Market, modify paragraph 3**

The major developments needed to facilitate electric drive technologies are the development of robust, cost-effective lithium ion batteries and the development of cost competitive fuel cell powertrains. Stakeholders have projected that lithium ion battery technology will enter the marketplace around 2012 as shown in Figure 5. ~~Cost-competitive~~ Stakeholders have projected that the fuel cell technology is projected will enter the marketplace in the post-2017 2011 to 2017 timeframe.

**Page 40, Heavy-Duty Vehicle Market, modify paragraph 4**

Electric drive technologies including fuel cell transit buses are beginning to play a larger role in heavy-duty vehicles. Transit buses are now available with hybrid drive systems, and truck OEMs are beginning to look to hybrid systems to move accessories like pumps (water, fuel, and oil) and air conditioning off the engine to improve overall efficiency. Auxiliary power is another heavy-duty demand that can be met by alternative fuels.