CALIFORNIA ADOPTS LOW CARBON FUEL STANDARD TO FIGHT CLIMATE CHANGE

By James S. Cannon, President, Energy Futures

On April 23, 2009, the California Air Resources Board (CARB) adopted a groundbreaking Low Carbon Fuel Standard (LCFS), calling for a 10 percent reduction of greenhouse gas (GHG) emissions from California’s highway transportation fuels by 2020. Transportation accounts for 40 percent of California’s total GHG emissions and about one-third of GHG emissions nationwide. At both state and federal levels, control of transportation emissions is an essential strategy in the battle against climate change — and California intends the LCFS as a useful model for the entire country.

The LCFS requires every fuel supplier (producer or importer) to lower the average GHG emissions of the mix of fuels it sells in California by adding increasing quantities of low-carbon fuels to its total pool. GHG emissions are measured over the entire lifecycle of the fuel, from production through combustion. Low-carbon alternatives identified by the Standard include crop-based ethanol and biodiesels, waste-based biodiesel, natural gas, waste-based biomethane, renewably produced hydrogen, and renewably produced electricity.

Biomethane and natural gas are the only commercial fuels on the market today that inherently meet the GHG emissions standards of the LCFS. Two other fuels, still in development, also inherently meet the Standard — renewably-produced hydrogen and renewably-produced electricity — once the higher efficiencies of the hydrogen and electric-battery engine systems are also taken into account. However, no one knows when these carbon-free fuels — which must themselves be produced by another form of energy — will be commercial options.

California’s Standard compared to the Federal Renewable Fuel Standard

In 2005, the U.S. Congress established a national Renewable Fuel Standard (RFS) program and expanded the program in 2007 to mandate that 36 billion gallons of renewable road fuel be sold into US markets by 2022. The LCFS does not conflict with the RFS: Fuels sold in California under the federal mandate can also count toward the state’s LCFS goal. However, the LCFS differs markedly from the RFS in its carbon-control approach to global climate protection, its fuel neutrality, its reliance on market mechanisms, and its assessments of the indirect impact of land-use changes in calculating GHG emissions. Briefly, these differences are as follows:

- California’s LCFS is considerably broader than the federal RFS. The goal of the LCFS is to reduce GHG emissions across the entire on-road transportation sector. The goal of the RFS is to increase the sale of “renewable fuels,” primarily ethanol.

- The incentives and requirements of the LCFS apply to suppliers of all low-carbon petroleum alternatives — liquids, gases, and electric-battery. The RFS incentives apply only to the producers of liquid substitutes for petroleum, mainly ethanol and biodiesel, but not to biomethane or other renewable fuels.

- The LCFS relies on market signals to stimulate the production of petroleum alternatives. The RFS gives direct...
In mid-2009, Energy Vision has much to celebrate. Barely two years ago, ignited by EV's research, Smithtown, Long Island shifted its refuse fleets to natural gas fuel (See EV News Vol. I, Issue 1, 2007.) and established a beachhead for natural gas on the East Coast. By the beginning of 2009, Smithtown's admiring near neighbor, Brookhaven, had shifted its 70 refuse trucks to natural gas. Now Huntington and other towns are following suit, and applying for some of the $300 million in federal "stimulus" monies available to cities that seek to realize the benefits of alternative fuels, especially natural gas which has lower pollution, 50 percent lower greenhouse gas emissions, and freedom from reliance on foreign oil.

Making its research broadly available in the metro region, Energy Vision's March 24th workshop in Bryn Mawr, Pennsylvania, persuaded nine suburban municipalities to examine the benefits of natural gas fuels for their urban refuse and recycling fleets, and our presentations are opening new doors every day. (See EV On the Road – p. 4)

In addition, private fleets seeking financial and environmental benefits are also on the move. In NYC in April, the beer distributor Anheuser Busch, milk distributors Bartlett Dairy and DeLe Farms, and Verizon Communications received close to $5,000,000 in US Department of Transportation funding to purchase CNG trucks in order to reduce health-endangering emissions and to join the ranks of "green leaders."

Thanks to the growing presence of natural gas vehicles on metro-area roads, an even more revolutionary fuel shift is on the horizon — to a renewable form of natural gas, biogas, which is made from organic wastes. Long a cornerstone of European strategies to reduce oil dependence and curb greenhouse gases, biogas is finally entering US markets. This June, in adopting the first regulation in the US of greenhouse gas emissions, California's Air Resources Board documented natural gas's carbon footprint — total planet-warming emissions from production through combustion — to be 27 percent lower than that of standard low-sulfur diesel and biogas's to be 84 percent lower. The new regulation, the Low Carbon Fuel Standard, is expected to drive biogas production in California and to open new sustainable fuel markets across the nation. (See p.1 article.)

This spring, New York City officials also became interested in finding ways to turn residents' household wastes into biogas fuel, based on an analysis done by Gail Richardson, our VP for Programs, who is conducting a study of how NYC and municipalities nationwide can turn their costly organic wastes into a valuable fuel. (See EV News Vol. II, Issue 1, 2009.)

While many changes in transportation — the use of cleaner fuels, land use planning, and mass transit expansion — are needed to achieve the sustainable transportation systems of the future, EV is focusing on the heavy duty diesel sector for three key reasons. It is the main urban polluter, a huge generator of greenhouse gases, and an enormous consumer of petroleum-based fuel (consuming 20 percent of all on-road vehicle fuel). It is also the only sector equipped to get on a fast track to sustainability. Cities and communities can begin planning and taking two commercially viable steps today: shifting their urban fleets from diesel to natural gas, and preparing to phase in biogas made from their own organic wastes or organic wastes from other local sources.

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subsidies to the producers of ethanol and biodiesel.

• The LCFS includes land use changes as an “indirect” factor in calculating a fuel’s total GHG emissions. The RFS ignores land use changes in assessing a renewable fuel’s emissions.

**Cap and Trade**

California’s LCFS includes a cap-and-trade system, which allows fuel suppliers who exceed mandated reductions to earn and sell “credits” to suppliers who can’t otherwise meet the Standard. Unlike the carbon market system incorporated into an energy and climate change bill recently passed by the House of Representatives (H.R. 2454), the carbon market established by the LCFS targets a single sector. Only in-state suppliers of California highway fuel can earn and trade carbon credits. This ensures that the GHG reductions rewarded under the LCFS will actually reduce the emissions of California’s highway fuels.

Crafting a climate change strategy is a key challenge facing the Obama administration and every state in the nation. California’s leadership with its LCFS is a beacon and a model for constructive actions ahead.

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**EV ON THE ROAD**

**Feb 2nd.**
EV Comments to New Jersey’s Department of Environmental Protection on the State’s draft Global Warming Response Act. J. Underwood (See EV website for full text.)

**March 24th.**
“Alternative Fuel Refuse Trucks: Healthier Air and Greater Energy Security for Lower Merion Township and Beyond.” A half-day workshop sponsored by EV, Bryn Mawr College’s Environmental Program and Civic Engagement Office, & Greater Philadelphia Clean Cities for municipal leaders and refuse fleet operators from 9 townships.

**April 4th.**
“Trash to Cash: a New Opportunity for NJ Communities.” An after dinner speech by J. Underwood to 150 members of The Solid Waste Association of North America’s Spring Conference in Atlantic City, NJ.

**April 23rd.**
EV Exhibit at the Earthday EXPO for Westchester County sponsored by the Children’s Environmental Literacy Foundation at Pace College and attended by 1200 students.

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EV IN THE PRESS

1/7/09
**LONG ISLAND PRESS**
“Three Lessons from Smithtown: Steps to take in shaping a Successful CNG Fleet Initiative.”
By J. Underwood

1/9/09
**MUNICIPAL WORLD: Canada’s Municipal Magazine**
Feature article, “Garbage Truck Fleets - A Great Way to Go Green.”

1/28/09
**CARIBBEAN LIFE**
“Refuse Trucks Spew Toxic Chemicals.”
By J. Underwood

8/05/09
**FLEET MAINTENANCE, NYC**
To Energy Vision: “Let’s explore converting waste in transportation fuel”

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EV is a national non-profit organization that analyzes and promotes ways to make a swift transition to pollution-free renewable energy sources and to the clean, petroleum-free transportation fuels of the future.

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BIOMETHANE BONANZA
How to Use NYC Waste to Power Municipal Refuse Trucks—
A Pioneering Study by Energy Vision

New York City pays $325 million to export its “gas fields”—the vast organics-laced residential waste stream which ends up in landfills every year. The size of this throw-away is indicated on the graph below.

[Graph showing the number of refuse trucks that could run on NYC garbage over time]

IF NYC’S 3-MILLION-TONS-PER YEAR OF RESIDENTIAL WASTE WERE TAPPED FOR ITS BIOGASES OVER A 20-YEAR PERIOD, AND IF THESE BIOGASES WERE CLEANED UP AND USED TO FUEL REFUSE TRUCKS—

BY YEAR 3, THE DEPARTMENT OF SANITATION COULD FUEL ITS ENTIRE 2400-VEHICLE REFUSE FLEET, AND DURING THE YEARS OF PEAK PRODUCTION, THE FUEL SUPPLY COULD KEEP MORE 10,000 TRUCKS ON THE ROAD.

EXPLORING “Bio-methane Scenarios” with Private and Public Sector Leaders

After reviewing Energy Vision’s findings on the biomethane potential of NYC wastes, the NYC Sanitation Commissioner, John Doherty, has invited EV to collaborate in studying the answers to these key questions:

Question 1. What partnerships could NYC and private companies develop to convert NYC waste into biomethane fuel for City trucks?

Question 2. How could these arrangements benefit the City in financial, environmental, health, and energy-security terms?

Question 3. What policy or technical obstacles would need to be resolved along the way, and how could this be done?

Dozens of waste management, technology, and engineering companies and experts are participating EV’s study, which is the first of its kind in the US. Results will be broadly disseminated to municipal, state, and federal policy audiences and used to assist cities in building their own waste-to-fuel initiatives.

Energy Vision is a national non-profit (501 (c) (3) environmental research organization founded by Joanna Underwood in 2007 to analyze and promote policies and technologies that can achieve the most rapid transition by the US to the sustainable (pollution-free and renewable) energy and transportation systems needed for the 21st century. The Energy Vision team brought to this new organization 15 years of research analyzing and reporting on alternative petroleum-free fuels and advanced vehicle technologies — research widely respected and used by public and private leaders in the alternative-fuel vehicles field both in the US and internationally. For more information on EV, please visit www.energy-vision.org or contact Jennifer Fortin at 212-228-0225 or at fortin@energy-vision.org. Regarding the NYC study, please contact Gail Richardson at 718-222-5575 or at garichardson@verizon.net.
BIOMETHANE BASICS

**BIOMETHANE** is the *chemical twin of natural gas*, with four atoms of hydrogen and just one atom of carbon per molecule, but it is made from renewable sources.

- Biomethane can be made literally everywhere in the US by cleaning up biogases emitted by decomposing organic materials from residential, commercial, and agricultural sources.
- When used in vehicles, it has the *lowest “lifecycle” greenhouse gas emissions*—total emissions from production, transportation, and use combined—of any alternative fuel on the market, according to California Air Resources Board (CARB) and the European Union.
- Biomethane is not only renewable, local, and clean—but secure and low-cost.

**BIOMETHANE** is the only sustainable vehicle fuel that could, beginning tomorrow, displace the 20% of petroleum-based diesel fuel burned by the 5% of all road vehicles that are buses and trucks.

- It is already in commercial use by urban fleets in Sweden, France, Spain and Germany and has the potential to supply up to 20% of Europe’s highway fuel.
- Biomethane could replace 29% of the diesel fuel used in California, according to CARB.