

Biofuels – Critiquing the Craze



Low-Carbon-Fuel-Standard (LCFS) in California & Environmental Justice

March 8, 2008

Overview

1. LCFS overview in California
2. Land use change and the acceleration of climate change
3. EJ considerations
 - criteria & toxic co-pollutants from fuel blends
 - disproportionate impacts from biorefineries
 - food insecurity
1. Technological innovation and Solutions

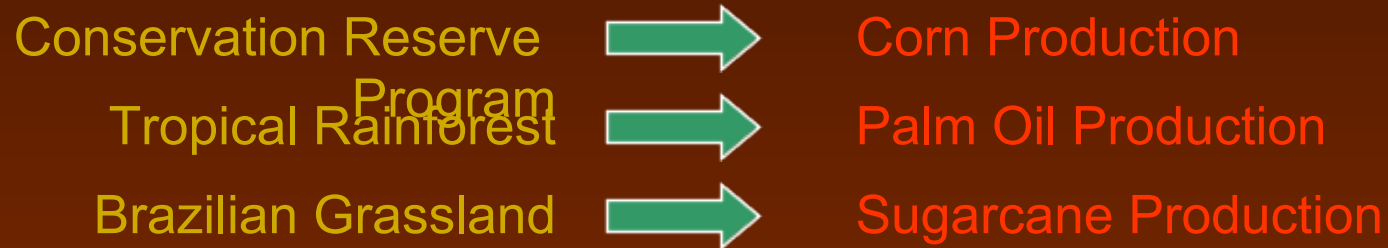


1. Low-Carbon-Fuel-Standard in CA

- California's **LCFS** calls for a 10% reduction in the carbon intensity of transportation fuels by 2020
- Jan. 18, 2007 - Gov. Schwarzenegger signed executive order – LCFS based upon “full lifecycle analysis”
- Fall 2007 – CARB approved as Early Action Measure under AB32 Global Warming Solutions Act
 - Fast-track – ARB regulatory process summer 2008; std. implemented Dec. 2008-2010
- National energy bill signed by Bush in December 2007 calls for the U.S. to increase the use of renewable fuels to 36 billion gallons by 2022, of which 15 billion can be corn-based ethanol.

2. Land Use Change

Direct Land-Use Change



Indirect Land-Use Change



* SOURCE: Tiax LLC, "Introduction to FFCA and the CA-GREET Model," Feb. 14, 2008

- "Projected corn ethanol in 2016 would use 43% of the U.S. corn land harvested for grain in 2004—overwhelmingly for livestock—requiring big land use changes to replace that grain." – Searchinger, Princeton Univ., Feb. 7, 2008

Acceleration of Climate Change

- University of California Berkeley memo – O’Hare & Farrell – initial calculations:
 - Including **Direct land use change** (CRP land to crops) = corn-based ethanol is **2.4 x WORSE** than gasoline
 - Including **Indirect land use change** (global deforestation) = corn-based ethanol is **6 x WORSE** than gasoline
- Cover of the *New York Times* – “Biofuels Deemed a Greenhouse Threat,” Feb. 8, 2008
 - Searchinger, Timothy, et. al., Princeton University, “**Use of U.S. Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land Use Change**,” *Scienceexpress*, Feb. 7, 2008
 - Fargione, Joseph, The Nature Conservancy, et. al., “**Land Clearing and the Biofuel Carbon Debt**,” *Scienceexpress*, Feb. 7, 2008



3. Environmental Justice considerations

A. Criteria & toxic co-pollutants from Fuel Blends

- *AB32 § 38562(b)(4)* – must ensure that activities undertaken do not interfere with state and federal efforts to reduce toxic air contaminant emissions
- *AB32 § 38562(b)(6)* – requires the ARB to consider “overall societal benefits, including reductions in other air pollutants.”
- *AB32 § 38570(b)(2)* – requires the ARB to “Design any market-based compliance mechanisms to prevent any increase in the emissions of toxic air contaminants or criteria air pollutants.”

B. Biorefineries

- *AB32 § 38570(b)(1)* - under any market-based compliance mechanism the State Board shall “consider the potential for direct, indirect, and cumulative emission impacts from these mechanisms including localized impacts in communities that are already adversely impacted by air pollution.”

C. Food Insecurity

- *AB32 § 38562(b)(2)* – must ensure that activities undertaken do not disproportionately impact low-income communities



Criteria & Toxic Co-pollutants from Fuel Blends

- Additional research - needs to be conducted on the various fuel type varieties and blends in order to ensure no increases in criteria & toxic co-pollutants

- E.g. “[e]quivalent CO₂ emissions of particulate black carbon (BC), the second-leading cause of global warming. BC has a global-warming potential of 90-190 times that of carbon dioxide.”



- Example – corn-based Ethanol:
- The EPA concluded in April 2007 that "ozone levels generally increase with increased ethanol use." – a leading indicator of photochemical smog
- “In [a] 2020 Case-1 scenario, E85 was calculated to increase ozone-related mortality by 120 deaths/yr (with a range of 47-140/yr) in LA and 185 deaths/yr (72-216/yr) in the U.S. ... E85 also increased hospitalization by about 650 and 990 in LA and the U.S., respectively, and asthma-related emergency-room visits by about 770 and 1200 in LA and the U.S., respectively.”

Biorefineries

- Increased siting of Biorefineries:
 - 10 biorefineries proposed in CA (2 already in operation)
 - CEC recommended 30-60 bioethanol plants be constructed
- Biorefineries pose new and potentially significant sources of water and air pollution
- Potential Disproportionate Impacts:
 - 5 biorefineries proposed in Central Valley of CA – already competes w/ LA for worst air in U.S.
 - Direct/ Indirect impacts
 - Cumulative impacts



Food Insecurity

- CARB is statutorily required not to disproportionately impact low-income communities. § 38562(b)(2)
- 4,706,130 people in California were considered to be in poverty in 2004, while CA ranked as the 15th worst state for food insecurity.
- Article in *Foreign Affairs* titled 'How Biofuels Could Starve the Poor,' University of Minnesota economists point out that filling the gas tank of an SUV with pure ethanol requires more than 450 pounds of corn -- roughly enough calories to feed one person for a year
- When biofuel production drives up food commodity prices food access is compromised for low-income food purchasers.



Food Insecurity cont.

The Rising Price of Corn

- This year biofuels will take 1/3 of America's (record) maize harvest.
- Price of corn has doubled in last 2 years - from about \$2 a bushel in 2005-06 to \$4 a bushel several times in early 2007, and recently, to \$5/ bushel.
- Last year - price of white corn in Guatemala rose from U.S. \$180 to \$320 per ton = 78% increase in 3 months
- Triggered food riots in Mexico after the price of maize tortillas rose by over 400%
- “As fuel demand for corn increases, and soybean and wheat lands switch to corn, prices increase by 40%, 20% and 17% for corn, soybeans, and wheat respectively.” - Searchinger, Feb. 7, 2008

Food Insecurity Cont.

Rising Prices of other food crops

- The U.S. Department of Agriculture documented that farmers have shifted from growing other crops to corn, creating a short supply of food crops and causing other crop prices to increase as well.
 - *The Economist's* food-price index is higher today than at any time since it was created in 1845... Even in real terms, prices have jumped by 75% since 2005.”
 - The top Food and Agriculture Organization official of the UN warned on December 18, 2007 that in an “unforeseen and unprecedented’ shift, the world food supply is dwindling rapidly and food prices are soaring to historic levels.”
 - According to the UN FAO, the price of wheat is more than 80% higher than a year ago, and corn prices are up by 25%. Global cereal stocks have fallen to their lowest level since 1982.
 - The FAO’s food price index rose more than 40% this year, compared with 9% the year before, while the total cost of foodstuffs imported by the neediest countries rose 25%.
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4. Solutions and Technological Innovation

False Solutions:

- Agrofuels
- Subsidies to ethanol serve to suppress technological innovation
- Second-generation biofuels: cellulosic sources

Real Solutions:

- Plug-in hybrids from renewable solar and wind (long-term)
- Zero-input sources like Algae (interim)
- Recycled yellow waste – local cooperatives (interim)



Ending thought - from Popular Media

- “The great danger of confronting peak oil and global warming isn't that we will sit... and do nothing while civilization collapses, but that we will plunge after ‘solutions’ that will make our problems even worse. Like believing we can replace gasoline with ethanol, the much-hyped biofuel that we make from corn.”
- **“Ethanol Scam: Ethanol Hurts the Environment And Is One of America's Biggest Political Boondoggles,”** *Rolling Stone* , July 2007

