



Benefits of a Low Carbon Fuel Standard: Performance Based, Technology-Neutral Policy To Reduce Emissions from Transportation Fuel

Background

Reliance on petroleum for transportation fuel leaves America vulnerable to the instability of the global oil market. At the same time, transportation is one of the largest sources of global warming pollution, which must be reduced dramatically to avoid the most catastrophic effects of climate. One promising strategy to simultaneously address our petroleum addiction and the global warming crisis is a Low Carbon Fuel Standard (LCFS).

Under a well-designed LCFS, fuel suppliers must reduce the life cycle emissions of the fuels they sell on an average per-gallon basis. Rather than promoting particular technologies or specific fuels, fuel suppliers are free to choose how they meet the emissions targets. For example, they could blend lower-carbon biofuels, such as cellulosic ethanol (ethanol made from a wide variety of plant materials including wood waste, corn stalks and grasses), into the gasoline they sell; sell low carbon biofuels as E85 for use in flex fuel vehicles; reduce emissions from the refining process; or sell natural gas for use as a transportation fuel. Market mechanisms allow for trading credits, which provides additional flexibility and lowers the cost of compliance. For example, fuel suppliers can purchase credits from electric utilities that supply low carbon electricity to plug-in hybrids or battery-powered electric vehicles.

By allowing compliance flexibility, the LCFS supports innovation in transportation fuels while contributing to both energy and climate security.

Accurate Lifecycle Global Warming Pollution

A low carbon fuel standard is only as good as the regulations and measurements upon which it is based. A LCFS must be based on the full lifecycle global warming pollution of the fuel in question, including emissions generated at the extraction source, through the refinery process and all the way to the tailpipe of the vehicle (“well-to-wheels”). For biofuels, this means all the emissions from tractors and fertilizer used to grow the crop, all the energy used to convert the crop to a fuel, and other indirect sources of pollution, including emissions generated from changes in land use resulting from increased biofuel production. For unconventional fossil fuels like tar sands or oil shale, the lifecycle will include all the extra processing that is required to make marketable fuels. Lifecycle analysis is a complex and developing field, and there are many technical issues to address. But these issues must be settled in an open and transparent process based on science without political interference. Ultimately a distorted analysis will undermine the ability of an LCFS to deliver the truly low carbon fuels we need.

Inclusion of Indirect Emissions is Essential

The world’s agricultural economy is changing. Increased demand for crops to make fuel is contributing to the clearing of additional land for agriculture, and, by raising global

commodity prices, inducing farmers in other countries to plow up sensitive ecosystems (including rain forests in South America and Southeast Asia that have a high degree of biodiversity). For some carbon-rich land types such as forests, a great deal of global warming pollution can be released from the soil and trees when this land is cleared and plowed. While there is no scientific consensus about the exact magnitude of indirect land-use effects, and details of the methodology used to measure these effects are still being developed, scientists generally agree that the impact is real and significant.¹ Any fuel policy that ignores these indirect consequences of biofuels production can lead to perverse outcomes that appear to decrease emissions in the US fuel sector, but actually increase global warming pollution worldwide. Biofuel life cycle analysis should include a non-zero estimate, based on the best available science, of emissions associated with indirect land-use changes.

Why Adopt an LCFS?

- **Promote Improvements in the Supply Chain**

Using full lifecycle accounting of emissions provides an incentive for improvements anywhere along the supply chain for fuels. For example, an ethanol production facility that uses coal for process heat creates much more global warming pollution than one that uses biomass. Under an LCFS, the ethanol from the biomass-based facility will have lower lifecycle emissions, and this will result in more credits for that ethanol supplier in the LCFS credit marketplace and ultimately a more profitable operation.

- **Protect against High-Carbon Fuels**

The LCFS creates an incentive to use clean fuels and a matched disincentive for the use of especially polluting fuels. Coal-to-liquids technology, for example, produces lifecycle global warming pollution almost twice that of gasoline. Under the LCFS, any fuel supplier that sells this fuel would increase their average emissions. They would need to use even more low-carbon fuels, or purchase credits from others to meet the standard. In this way, the dirty fuels would have to pay the price for their higher pollution. In effect, an LCFS creates a level playing field where all fuels can compete according to the overall benefits they provide and their cost.

- **Create Choices and Spur Innovation**

The LCFS does not rely upon assumptions about the technical or commercial feasibility of any particular technology. The standard provides regulatory certainty for the fuel suppliers and for innovators and investors in emerging low carbon fuel technologies without picking winners among these technologies. Whether or not cellulosic ethanol, plug in hybrids or hydrogen fuel cells prevail in the marketplace will depend on their ability to deliver cost-effective low-carbon fuel, rather than government mandates to use particular technologies or fuels. But as investors consider these technologies, they have the certainty that there will be a steadily growing market for low-carbon fuels, regardless of the price of oil. This will spur investment and let the marketplace decide on the ultimate winners.

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¹ See: UCS. Land use changes and biofuels. Online at http://www.ucsusa.org/clean_vehicles/technologies_and_fuels/biofuels/addressing-the-global-warming.html.