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Issue Primer

Low Carbon Fuel Standard (LCFS)

Michigan and the United States have come to realize that we must become less dependent upon foreign oil for transportation. As such, new types of fuels are entering the marketplace as substitutes for oil from the Middle East. Among these are:

- Ethanol from biomass, including "first generation" ethanol that relies on plant sugars like corn or sugar cane; and "second generation" cellulosic ethanol produced from crop residues such as corn cobs or wheat straw; forest products and byproducts like fast growing aspen and logging debris.
- Biodiesel from soybean oil and other agricultural crops, and waste cooking oils.
- Petroleum products from North America – including oil shale from the Canadian Tar Sands in Alberta – which are currently being processed and sold in Michigan.
- Coal To Liquid (CTL) fuel technologies.

Some of these alternatives, like crude oil from tar sands and liquid coal, have serious and harmful environmental and public health impacts. The habitat destruction caused by strip mining for tar sands and mountaintop removal for coal extraction is significant and irreversible. Both of these fuels also result in much higher greenhouse gas emissions and pollution levels than traditional fuels.

Renewable fuels, such as cellulosic ethanol and biodiesel, hold significant promise for helping America break our dependence on foreign oil. If done wrong, however, even the most promising renewable fuels can pose significant environmental and economic risks. This can even include increasing (rather than decreasing) the greenhouse gas (GHG) emissions of our transportation sector.

A LCFS can help Michigan make significant strides toward addressing the problem of global warming while helping our state become a leader in the production of "second generation" biofuels and advanced battery storage technologies to power our vehicles.

What is a LCFS?

A LCFS is a policy to ensure that new fuels reduce our overall global warming impacts while encouraging the development of clean, sustainable energy sources for transportation. A LCFS of 10% by 2020 would require fuel producers to reduce the overall carbon footprint of the fuels they provide by 10% over the next 11 years.

A LCFS requires a reduction in GHG emissions over time, but it does not dictate the type of feedstock or fuel that should be used to get there. Rather, it allows market forces and sustainability criteria to determine how best to achieve the required GHG reductions.

A LCFS has significant advantages over simply mandating the use of a certain renewable fuel. The recent boom and bust of corn ethanol is a perfect example of how the deployment of alternative fuels can go wrong. With corn ethanol, market and sustainability factors were largely ignored when the federal government enacted mandates requiring significant use of corn-based ethanol, and the federal government and Michigan enacted subsidies to boost production.

The rapid expansion of corn ethanol use helped cause imbalances within agricultural markets, causing corn prices to surge, food supplies to decline, and finally food prices to soar. As a result, dozens of planned ethanol facilities went bankrupt, or ran out of money before the processing facilities could be built. Farmers and others who invested in corn ethanol lost millions. These negative impacts could have been avoided had the economic and ecological sustainability of corn ethanol been taken into consideration. As environmentalists had warned, corn ethanol requires huge subsidies to make it viable, and its overall carbon footprint is no better than traditional petroleum.

As we learned with corn, all renewable fuels are not created equal. A LCFS can ensure that truly sustainable fuels can compete fairly in the marketplace, and that the boom/bust of corn ethanol doesn't happen again.

In Michigan, a LCFS will create an important market for two industries that are receiving significant economic development assistance from the State: advanced battery technologies and "second generation" cellulosic ethanol.

Life Cycle Analysis

A LCFS requires evaluation of GHG emissions based upon a life-cycle analysis. Every aspect of a particular fuel source must be calculated into the analysis. In the case of biofuels, this "seed to tailpipe" analysis would include: the crop being utilized as fuel; the kind of land it's planted on; chemical fertilizers and pesticides applied; harvesting techniques; processing; refining; transportation, and emissions after the fuel is burned.

The analysis must also take into consideration the direct and indirect land use impacts of a chosen fuel type. Converting land that naturally grows a diversity of native plants to a mono-crop, such as switchgrass for cellulosic ethanol production, has a direct negative land use impact. Likewise, if the conversion of agricultural land in the United States from food to fuel crops results in the clearing of rainforests in Brazil to replace the lost food acreage (an indirect land use impact), the carbon reduction benefits (and ecological sustainability) of the fuel crop in question would be doubtful.

A LCFS ensures that the overall carbon footprint of the alternative fuel is actually less than what we're currently using.

Sustainability Criteria

A great deal of attention has been focused on the potential of "cellulosic ethanol" – fuels derived from grasses, non-edible components of crops, trees and forest by-products. However, as most people know, there is no "waste" in nature. Everything that dies in the forest becomes food for the next generation of growing things. Likewise, there is no waste in sustainable agriculture – crop residues enrich the soil, providing the nutrients needed to grow the next crop. To ensure the long term viability of renewable biofuels, we must protect soil and forest health, the biodiversity they support, and their capacity to store carbon for generations.

Therefore, a LCFS must include sustainability criteria for biofuels production to ensure that environmental protection is taken into consideration beyond carbon reductions. In addition, any subsidies or incentives must be reserved for only those renewable fuels that meet the strict sustainability criteria.

LCFS – Adoption & Consideration

A LCFS can be adopted at the state, regional or national level. California is the first state to adopt a LCFS. Governor Granholm's Michigan Climate Action Council (MCAC) has included promoting low carbon fuel in their recommendations for addressing global warming. The Midwest Governor's Association is considering making a recommendation to adopt a LCFS. And, the Northeast/Mid-Atlantic States have signed a Letter of intent to develop a regional LCFS.

Michigan can lead the country in the transition toward truly sustainable, low-carbon fuels and battery technology, industries that have significant job-creation potential. Energy from low-carbon fuels will be critical to both environmental sustainability and economic prosperity for Michigan and the country. A Low Carbon Fuel Standard can help ensure that we produce sustainable, renewable fuels in a way that protects biodiversity, enriches communities and reduces global warming impacts.

Additional Resources:
Canada's Highway to Hell, by Andrew Nikiforuk – this major article in the Natural Resources Defense Council's On Earth Magazine provides an in-depth look at the devastation being wrought on Alberta Canada by the Canadian tar sands oil rush. The United States gets approximately 16% of our oil imports from northern Alberta.

The Canadian Oil Boom, by Robert Kunzig – this is a feature article in National Geographic Magazine on the tar sands in Canada.

Principles of Sustainable Biofuel Production

With corn ethanol, we saw very clearly what happens when we do biofuels “wrong.” To do biofuels “right,” we need to:

1) Use Bio-Based Resources Efficiently: Ensure that Michigan’s biofuels and biomass resources are devoted to the highest and best use, creating the most jobs and economic activity per unit extracted, with the least ecological disruption and the best net-energy balance. Criteria should include long-term economic viability and improving local economies. New bio-based industries should not displace more jobs than it creates. For example, Michigan’s forests should not be cut indiscriminately for biofuels, as forest products such as lumber for furniture or even paper are far more valuable and employ more people.

2) Use Precaution/Best Available Science to Assess and Minimize Impacts: Use the best available science and a precautionary approach to estimate and minimize the full life-cycle impacts of all fuels, including impacts from direct and indirect land use conversion on a global scale. Impacts analyzed should include climate change, air quality, biodiversity, wildlife habitat, sensitive lands, soil and forest health, water quality, water consumption, environmental justice and food security in Michigan and throughout the country and world. Significant effort should be devoted to minimizing the risk of unintended consequences.

3) Provide Incentives for Only Truly Sustainable Fuels: Promote incentives and/or directives to encourage the development and use of Michigan-based or imported biofuels only if they are grown and harvested in an ecological and socially sustainable manner, as measured by the impacts listed above. This will ensure the development and deployment of advanced, clean, ultra-low impact fuels for the long term.

4) Eliminate Subsidies for Unsustainable Fuels: Eliminate public subsidies for Michigan biofuel development that have negative environmental and social profiles relative to traditional fuels and technologies.

5) Stop Fuels with Negative Carbon Balances or Unacceptable Risks: Importing biofuels or petroleum-based fuels that have a negative carbon balance or land-use impact relative to US crude oil should be decreased now and eventually stopped. Examples include strip mining for tar sands and mountaintop removal for coal extraction, both of which inflict a tremendous amount of irreversible ecological damage.