



Advancing Commercial Scale Production of Low Carbon Biofuels:

State level policy options that improve local economies and environments

This guidebook will be available from the Environmental and Energy Study Institute in October 2008.

Please contact Laura Parsons at (202) 662-1884 or lparsons@eesi.org for more information.

Executive Summary

The Environmental and Energy Study Institute (EESI) created this guidebook to help state governments develop commercial scale low carbon biofuel industries. The impetus for this project was the passage of the national Renewable Fuel Standard (RFS) by the U.S. Congress as part of the 2007 Energy Independence and Security Act (EISA). State policymakers have the opportunity to spur economic development, boost farmer/forest income, create jobs in rural communities, diversify the nation's energy markets, and protect the environment by harnessing their local resources to meet the goal of this ambitious national RFS. The RFS requires 36 billion gallons of renewable fuels by 2022, 21 billion gallons of which must be advanced biofuels that are derived from feedstocks other than corn starch and have 50-60 percent lower lifecycle emissions compared to 2005 baseline levels. Although some low carbon biofuels exist today at demonstration scale, progressive policies will be needed to develop low carbon feedstocks, an infrastructure to support these feedstocks and new conversion technologies. Each state has the opportunity to reap the benefits of this new emerging low carbon industry and contribute to the 21 billion gallons of low carbon biofuels which will be needed each year.

EESI worked with an Advisory Committee consisting of experts in the fields of biomass, biofuels, and state policy to build upon its own knowledge and identify ten policy options to promote the commercialization and production of environmentally sustainable low carbon biofuels. These policy options are complementary and can also build upon various federal programs to address several objectives.

Policy Objectives

After considerable research, EESI identified six policy objectives which are essential to the development of a commercial scale low carbon biofuel industry. Objectives are focused on overcoming key barriers to low carbon biofuel production. The first step is to conduct **assessments** of all biomass feedstocks, human resources, and existing infrastructure. **Research** will be needed to advance feedstock and conversion technologies. **Infrastructure** for both the feedstocks and the fuels will need to be developed. The new industry will require long-term **financial** incentives to level the playing field with conventional energy sources and spur investment. **Regulatory conditions** will also need to be modified to provide equal opportunities for low carbon biofuels. Finally, **stakeholder perceptions and political priorities** may need to be changed in order to galvanize support for these new technologies that are often misunderstood.

Policy Options

The policy options presented here target low carbon biofuel production from research to commercialization and from feedstock development through fuel conversion. A variety of feedstocks are highlighted, allowing for all regions of the country to establish their own local low carbon biofuel industry utilizing local resources and contributing to the federal RFS mandate.

- **Low Carbon Fuel Standards:** Low Carbon Fuel Standards (LCFS) do not mandate the use of particular fuels or technologies, but require an average level of performance (i.e. carbon intensity) for transportation fuels. A LCFS can encourage investment in feedstock and conversion technology research, development, demonstration, and commercialization and would be more effective if implemented on a regional scale than only on a state level.
- **Innovative and Coordinated Research Initiatives:** The low carbon biofuel industry will often face a “chicken and egg” dilemma, where, for example, biofuel feedstocks will not be produced without an established market and biorefineries will not be built without a local supply of appropriate feedstocks. Research initiatives that involve many stakeholders and address the entire supply chain, from growing the feedstock to feedstock infrastructure (harvest, transport, and storage) to conversion technologies, can help solve this problem.

- **Interagency Collaboratives:** Commercialization of low carbon biofuels is a complex endeavor. An interagency collaborative can help conduct a thorough assessment of potential biomass feedstocks, human resources, and existing infrastructure and then create a general roadmap for achieving commercial scale production of low carbon biofuels. This group also can help attract new projects by coordinating funding and streamlining the permitting and approval process for facilities that may not fit into previously defined categories.
- **Tax Incentives:** Tax incentives reduce risk of investing in new technologies and systems, whether in the research and development stage or for commercial production. Tax incentives are particularly important for low carbon biofuels and other new renewable energy technologies in order to account for the associated positive externalities and to help level the playing field with fossil fuels and their established infrastructures.
- **Grant and Loan Guarantee Programs:** Grant and loan guarantee programs can stimulate capital investment in risky research, development, and demonstration projects, and can help move technologies through the "valley of death" into commercial scale production. They can play a vital role in "first of a kind" technology development.
- **Public Education and Outreach Programs:** Programs that educate the public and encourage a wide variety of stakeholder participation in the decision-making process are important in galvanizing consistent support for new technologies such as low-carbon biofuels. Woody biomass and municipal solid waste are two examples of feedstocks that have been particularly prone to opposition based on misperceptions of the true costs and benefits of using them for energy and fuel production.
- **Easement Programs:** In these programs, a private landowner allows the state government or other entity to define the use of his land, usually in return for a payment or tax break. States may adopt easement programs for a variety of complementary reasons, such as protecting farmland or forests, conserving wildlife habitat, improving soil and water quality, inhibiting urban sprawl, and/or producing bioenergy feedstocks.
- **Sustainable Agriculture Programs:** Sustainable agriculture programs can help agricultural feedstock producers lower their life-cycle carbon emissions through education, technology transfer, and/or financial incentives to use low carbon practices. These programs can increase the amount of biomass available for conversion to low carbon biofuels by encouraging practices such as the planting of winter cover crops and utilization of animal manure.
- **Sustainable Forestry Programs:** Forest management guidelines and programs to help implement these guidelines can ensure the environmental sustainability of forest ecosystems while also promoting the use of woody biomass for low carbon biofuel conversion. Marketing programs, financial assistance for harvesting equipment and implementing management plans ensure that forests remain economically and ecologically sustainable as well, providing for a long term source of a renewable, low carbon biofuel feedstock.
- **Municipal Waste Utilization Initiatives:** While waste reduction should always be first priority, municipal solid waste (MSW) will always exist and it can potentially be used as a low carbon biofuel feedstock. By making streams of MSW eligible for renewable energy production incentives and allowing communities to apply biofuel conversion toward waste diversion mandates, states can achieve the complementary objectives of reducing the amount of waste going to landfills and producing low carbon biofuels that can be used locally.

New state policies directed toward the establishment of low carbon biofuel research, development, and commercialization will not only bring new jobs and a clean environment to individual states, but will meet national goals of climate mitigation and national security. Because biomass feedstocks are an inherently local issue, state governments will play an important role in developing the country's low carbon biofuel industry.