

Congress and Cellulosic Biofuels

Opportunities and Risks

Curt Rich

Recently, the World Bank issued a report claiming that the demand for biofuels in Europe and the United States is responsible for raising world food prices by 75 percent. This is only the latest in a string of critical reports that have diminished the original enthusiasm for biofuels as a solution to America's domestic energy security and global climate change challenges.

Supplying more than 6.5 billion gallons to the country's gasoline supply in 2007, corn-based ethanol constitutes the current U.S. biofuel industry. But concerns that ethanol raises food prices underscores that there is an upper limit to how much we can continue to rely on corn as the dominant feedstock of the biofuel industry. In fact, that limit is likely to be reached within the next few years.

With its ability to convert a wide range of feedstocks, suitability in all regions of the country and low carbon outputs, cellulosic biofuels—agricultural waste, grasses, municipal solid waste, wood and wood waste—have the potential to leapfrog corn ethanol and emerge over the next decade as a major transportation fuel source. Government is taking notice. At the federal level, Congress has recently put policies in place to help this young industry grow and succeed, and has begun to lay out the policy roadmap for this industry next year with a new Congress and Administration.

Cellulosic Biofuels: The Frontier of Energy Production

Seventy percent of both corn grain and biomass are composed of sugars. Unlike corn grain, biomass (trees, wood and wood waste, agricultural crops and waste, grasses, fibers) is widely available and can be used for



TOP Chipping equipment. Photo courtesy of Doug Page, USDI Bureau of Land Management, www.forestryimages.org.

BOTTOM Woody debris. Photo courtesy of Pennsylvania Department of Conservation and Natural Resources. Forestry Archive, www.forestryimages.org.

the production of transportation fuels. Cellulosic ethanol uses the sugars that are present in all plant matter but are locked up in the cell structure of plants.

All plant matter comprises three main types of material: cellulose (50 to 60 percent), hemicellulose (30 to 40 percent), and lignin (15 to 20 percent). Cellulose forms the primary structural cell wall component of green plants. Hemicellulose is amorphous, possesses little strength, and is found inside cell structures. Lignin provides mechanical strength to the cell walls of plants. Once plant matter is broken down, the sugars found in cellulose and hemicellulose can be fermented into alcohol (ethanol) with a variety of technologies and used as a fuel.

Cellulosic biofuels offer a realistic path for the U.S. to reduce its dependence on imported fossil energy. The U.S. Departments of Agriculture and Energy have considered the question

of whether the nation's biomass resource could foster a biofuels industry large enough to meet a significant portion of our nation's future fuel needs. The report, referred to as "The Billion Ton Study", concludes that the U.S. grows enough surplus biomass annually to replace more than 30 percent of current domestic petroleum consumption with biofuels.

There are other important policy reasons for focusing on a quick transition to cellulosic biofuels. Biomass is available and abundant in all regions of the country, does not compete with the nation's ongoing need for food crops, and can be grown with minimal water or energy inputs compared to cultivated crops. Cellulosic biofuels produce six times the energy that is consumed in their production. Last, and most important for a country increasingly concerned about climate change, cellulosic biofuels reduce greenhouse gas emissions by more than 80 percent

compared to the use of fossil fuels.

The economic and environmental benefits of cellulosic biofuels create a powerful incentive to bring this industry from the laboratory to commercialization as quickly as possible. Today, entrepreneurial companies, major existing ethanol producers, universities and research labs, equipment suppliers, feedstock sources, and, notably, the federal government are beginning to dedicate the financial and intellectual capital necessary to mobilize this fledgling industry.

What Has Congress Done to Support Cellulosic Biofuels?

The current Congress and the Bush Administration have shown strong support for renewable fuels. They have passed laws to mandate a market, provided strong federal financial support for biorefiner and energy feedstock development, and created targeted tax incentives allowing cellulosic biofuels

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to compete with corn-ethanol and gasoline.

Last year, Congress passed the Energy Independence and Security Act. This law expanded the federal Renewable Fuels Standard (RFS) by requiring domestic biofuel production to reach 36 billion gallons – one quarter of current U.S. petroleum consumption – by 2022. The RFS allows 15 billion gallons of the 36 billion gallon mandate to be satisfied by the production of corn ethanol. The remaining 21 billion gallons are required to be produced from cellulosic biofuels. This mandate for cellulosic biofuels

begins in 2010.

Congress and the Administration also increased financial support for biorefinery development, biofuel feedstock research and direct assistance to feedstock suppliers. Over the past two years, the Department of Energy has provided nearly one billion dollars in funding to promote the cellulosic biofuel industry. This support

has come through direct grant funding for research and demonstration scale biorefineries, as well as loan guarantees for commercial cellulosic biorefineries. This month, the Department of Energy announced \$10 billion in available loan guarantee support for renewable energy projects, including cellulosic biorefineries.

Congress also passed a farm bill this year that increases the role of the United States Department of Agriculture (USDA) in promoting bioenergy. The Farm, Nutrition and Bioenergy Act of 2007 will provide \$1 billion in dedicated funding for bioen-

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ergy over the next five years, with the bulk of that funding directed at cellulosic biofuels. Over the next 12 months, the USDA is expected to make funding available to support biomass research, facilitate partnerships between biomass providers and biofuel producers, and help overcome the challenges of feedstock cultivation, harvest, storage, and transportation. The USDA will make more than \$200 million available in 2009 to advance these biofuel initiatives.

Finally, Congress enacted this year a dedicated \$1.01 per gallon tax credit for the production of cellulosic biofuels. While cellulosic biofuels will, over time, be produced at prices far below current gasoline prices, the fuel produced from the first cellulosic biorefineries is likely to cost five to six dollars per gallon. More than any other government policy, this tax credit is expected to help accelerate the commercialization of cellulosic biofuels by erasing the initial market price disparity with corn ethanol and gasoline.

2009 Policy Challenges and Opportunities

While much has been done to help advance the cellulosic biofuel industry, the next Congress and Administration have the opportunity to enact policies to create a substantial, viable commercial industry in the United States. At the same time, the next Congress will need to resolve a policy that threatens to bring the industry to a grinding halt.

The 2005 Energy Policy Act's RFS was the first federal policy to substantially recognize and promote the use of cellulosic biofuels. That law defined qualifying "renewable biomass" feedstocks broadly to include dedicated energy crops, trees, wood and wood residue, plants, grasses, agricultural wastes, fibers, animal wastes, and municipal solid waste. In 2007, Congress modified the RFS to accelerate the production and use of cellulosic biofuels. That accelerated timetable came, however, with a potentially crippling limitation.

In the final hours of negotiations over the 2007 Energy Independence and Security Act (EISA), Congress modified the RFS definition of "renewable biomass" and imposed strict restrictions on both private and public lands for the purpose of biofuel feedstock collection, thereby threatening to substantially restrict where cellulosic refineries can be located. The definition unnecessarily excludes available and potential future renewable energy feedstock sources, particularly from forestlands.

The RFS now included restrictions on significant acreages of private non-industrial forestlands that do not fall within the category of "actively managed plantations". The definition restricts what can be collected for use as a biofuel feedstock from naturally growing and regenerating forests, which make up a large percentage of U.S. forestlands in the northwest,

Great Lakes region, northeast and southeast. Indeed, 92 percent of our nation's non-federal forests are not plantations. The definition also removes potential markets and viable economic options for private forest landowners and managers who have acreages in need of thinning for a variety of sustainable forest management practices.

The law also substantially limits the collection of wood and wood thinning from federal forestlands, thereby eliminating a significant source of cellulosic feedstock that could otherwise be available for the production of renewable fuels.

Fortunately, Congress is now beginning to appreciate that this definition could cripple the cellulosic biofuel industry. Hearings have been held in both the Senate and House of Representatives in which agency officials, professional foresters, and landowners have all voiced strong opposition to the provision. Only the Natural Resources Defense Fund, a national environmental organization, has publicly defended the feedstock limitations as necessary to protect lands from being mismanaged for the sake of biofuel production.

Representatives Stephanie Herseth-Sandlin (D-SD) and Greg Walden (R-OR) have introduced H.R. 5236, the "Renewable Biomass Facilitation Act of 2008" to amend the EISA's definition of "renewable biomass" so that it more closely resembles its definition as



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found in the Farm Bill, as well as the 2005 Energy Policy Act. The definition contained in H.R. 5236 identifies those types of biomass that can be used to produce RFS eligible cellulosic biofuels. These include renewable plants and trees, algae, agricultural crop waste and residue, wood waste, animal waste, construction waste, food waste, and yard waste collected from private lands. It also includes woody debris that is collected off of federal lands in accordance with applicable laws to reduce fire hazards and promote forest health. H.R. 5236 appropriately defines the universe of what must be considered for the future cellulosic biofuel industry.

The new Administration and Congress are likely to engage in a number of policy debates that will also influence the future direction of the

biofuel industry. Debates on climate change, energy policy, and federal highway program reauthorization mean that Congress will actively consider policies that advance biofuel production, distribution, and consumption. Lawmakers are likely to consider such policies as mandating automobile manufacturers to make flexible fuel vehicles, increasing the availability of E85 and biodiesel at your local gas station, and building biorefineries in all regions of the country to meet this demand.

As Congress launches into these debates, it is important for cellulosic biofuel industry stakeholders, including potential feedstock providers, to be actively engaged to ensure that the policies that emerge provide targeted, effective policies that build the industry. The failure to be constructively

involved in this debate means that other interests will shape the rules that the industry and feedstock providers will live or die by over the next decade.

About the Author

Curt Rich is a partner in the Washington D.C. energy law and policy firm of Van Ness Feldman. He represents companies on a wide range of energy and energy tax policy matters before Congress and federal agencies. Curt also represents the Cellulosic Biofuel Working Group, a consortium of companies that advocate federal policies to efficiently and effectively promote the rapid commercialization of the cellulosic biofuel industry in the United States. Curt can be reached at jcr@vnf.com. ♦



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