

# NEW AND PROPOSED FEDERAL INCENTIVES FOR BIOENERGY PRODUCTION

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**Abstract:** The Farm Security and Rural Development Act of 2002 (H.R. 2646/P.L. 107-171), signed into law May 2002, is the first U.S Farm Bill to contain an energy title (Title IX). Title IX creates several new incentives for farmers, ranchers, and rural small businesses to produce electricity, chemicals, fuels, and other co-products from biomass. In addition, the House of Representatives and the Senate have each passed comprehensive energy bills (H.R. 4/S. 517), which must be reconciled in a conference committee before Congress adjourns. Both bills would renew the production tax credit for biopower and expand it to include open-loop biomass. The Senate bill would create national requirements for the production of renewable electricity and biofuels. This paper examines these new a proposed incentives, and how their implementation and success could impact the future of bioenergy production in the United States.

### Introduction

Biomass is an abundant and renewable resource throughout the United States. Biopower has the advantage of being cleaner than most forms of fossil energy and greenhouse gas neutral. The reliability of biopower gives it an advantage over intermittent forms of renewable energy, such as wind and solar. In addition, biomass is the only form of renewable energy that is readily convertible into liquid fuels and chemical byproducts, which can be used to displace imported petroleum.

Currently, biopower supplies more than 7,000 megawatts (MW) of electricity in the United States, making it the largest source of non-hydroelectric renewable electricity. However, this accounts for only about one percent of total U.S. electricity production, and is largely concentrated in the pulp and paper industry [1]. With production of 1.77 billion gallons (6.7 billion liters) of ethanol, primarily from corn, and 20 million gallons (76 million liters) of biodiesel in 2001 [2],

biofuels account for slightly less than one percent of the U.S. motor fuels market.

Federal support has been key to the development of biobased power, fuels, and products. Federally sponsored research has helped overcome technical hurdles in the conversion of biomass to useful forms of energy. A partial exemption to the federal excise tax on motor vehicle fuels has helped make ethanol more competitive with gasoline. In April 1999 President Bill Clinton issued Executive Order 13134: "Developing and Promoting Biobased Products and Bioenergy," which established a federal initiative to coordinate federal research efforts in the area of bioenergy and biobased products, with the goal of tripling the use of bioenergy and biobased products by 2010. In June 2000, Congress passed the Biomass Research and Development Act of 2000 with bipartisan support, which further defined the goals of the initiative and authorized funds for its implementation.\*

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\* To this date, no dedicated funds have been appropriated to the initiative.

Most recently, Congress has acknowledged the multiple benefits of bioenergy in the 2002 Farm Bill, signed into law May 2002. The Farm Security and Rural Development Act of 2002 (H.R. 2646/P.L. 107-171) is the first Farm Bill to contain an energy title. Title IX establishes several new incentives to promote the development of agriculture-based renewable energy. In addition, the House of Representatives and the Senate have each passed comprehensive energy bills, which must be reconciled in a conference committee before the adjournment of the 107th Congress. Both bills would renew the production tax credit for biopower and expand it to include open-loop biomass. The Senate bill would also create national requirements for the production of renewable electricity and biofuels. The implementation and success of these programs will have a significant impact on the future of bioenergy production in the United States.

### The 2002 Farm Bill Energy Provisions

The energy title (Title IX) of the Farm Security and Rural Development Act of 2002 establishes several new programs to promote the development of bioenergy and biobased products. Title IX also reauthorizes the Biomass Research and Development Act of 2002, as well as the Commodity Credit Corporation's (CCC) bioenergy program, and provides mandatory (non-discretionary) funding to both programs. The types of incentives included in Title IX include: federal procurement, grants and loans, research and development, and renewal of the CCC bioenergy program. In total, Title IX provides \$405 million in mandatory funding over the five-year term of the bill, and authorizes additional discretionary funds subject to appropriations (see Table 1). In addition, Title II (Conservation) and Title VI (Rural Development) also contain important bioenergy provisions.

Table 1. 2002 Farm Bill, Title IX - Energy

<b><u>Programs Receiving Mandatory Funding</u></b>	<b><u>Funding Level</u></b>
SEC. 9002 Federal Procurement of Biobased Products <i>USDA Contact: Roger Conway, 202-401-0461</i>	\$6 million (\$1M/yr. FY02-07)
SEC. 9004 Biodiesel Fuel Education Program <i>USDA Contact: Carmela Bailey, 202-401-6643</i>	\$5 million (\$1M/yr. FY03-07)
SEC. 9006 Renewable Energy System & Energy Efficiency Improvements <i>USDA Contact: William Hagy, 202-720-7287</i>	\$115 million (\$23M/yr. FY03-07)
SEC. 9008 Biomass Research and Development Act of 2000 (Authorized an additional \$49M/yr. for FY02 – 07, subject to appropriations) <i>USDA Contact: Merlin Bartz, 202-720-6519</i>	\$75 million (\$5M FY02, \$14M/yr. FY03-07)
SEC. 9010 Continuation of (Commodity Credit Corporation) Bioenergy Program <i>USDA Contact: Steve Gill, 202-720-2121</i>	\$204 million (FY03-06)
<b><u>Total Mandatory Funding (Non-discretionary)</u></b>	<b>\$405 million</b>
<b><u>Programs Authorized</u></b> (Discretionary funding subject to annual appropriations)	
SEC. 9003 Biorefinery Development Grants	
SEC. 9005 Energy Audit and Renewable Energy Development Program	
SEC. 9009 Cooperative Research and Extension Projects	

Sources: The Farm Security and Rural Development Act of 2002 (H.R. 2646/P.L. 107-171), staff contacts provided by USDA

Federal Procurement – Section 9002 of Title IX amends the Consolidated Farm and Rural Development Act to encourage procurement of biobased products by federal agencies.

Biobased products can substitute for nearly all types of petroleum-based products, including fibers, adhesives, lubricants, inks and dyes, cleaning products, plastics, or

building materials. Many biobased products offer the advantage of being biodegradable and less toxic than petroleum-based products. Current production of biobased products is estimated at 15 billion pounds (6.8 billion kilograms) per year, representing 0.5 percent of U.S. chemical production in 2001 [3]. The intent of Sec. 9002 is to utilize the enormous collective purchasing power of the federal government to stimulate production of biobased products, lower the cost for private-sector purchasers, and mainstream their use in the economy. According to the General Accounting Office, the federal government purchases about \$200 billion worth of products and services each year to run its operations. Sec. 9002 is modeled on the recycled materials purchasing program within the Solid Waste Disposal Act (42 USC 6962), which has succeeded in significantly reducing the cost of recycled paper.

Sec. 9002 directs the Department of Agriculture (USDA) to develop an approved list of biobased products for federal procurement, in consultation with the Environmental Protection Agency (EPA), General Services Administration and Department of Commerce. Federal agencies are directed to give purchasing preference to items on the list if they are reasonably comparable in price, performance, and availability to conventional products. Sec. 9002 requires that biobased products undergo testing to ensure they comply with established performance guidelines and with a minimum standard for biobased content (to

be established by USDA). Sec. 9002 also directs USDA to establish a voluntary labeling program, similar to the Energy Star program for appliances administered by the EPA and Department of Energy (DOE), to award use of the label “USDA Certified Biobased Product” to manufacturers of qualifying biobased products.

Implementation of Sec. 9002 is assigned to the Office of Energy Policy and New Uses within the office of the Chief Economist. USDA plans to publish proposed guidelines for implementing the program in mid-October 2002 with 60 days for public comment. USDA has established a cooperative agreement with Iowa State University to utilize the FY02 funds for biobased product testing. As the Agricultural Research Service has already begun work on a list of approved biobased products, USDA expects to have a list in place within two years. USDA will work with the American Society for Testing and Materials (ASTM) to develop a minimum biobased content standard, and plans to use existing National Institute of Standards and Technology standards for environmental performance. USDA also has begun preliminary discussions with the Department of Defense (DOD) regarding certification of biobased products to military specifications, as DOD is a major federal purchaser. USDA’s ultimate vision is to establish several biobased product testing centers, which will operate on a cost-shared basis with industry. [4] Prior to enactment of the 2002 Farm Bill, USDA had formed “Buy Bio” working group composed of procurement officials from throughout the federal government, with the goal of increasing federal procurement of biobased products. This group will play a key role in working with industry to navigate the many regulations governing procurement.\*

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\* The Environmental and Energy Study Institute serves as an industry liaison to the Buy Bio group.

Grants and Loans – Sec. 9006, perhaps the most significant provision of the new energy title, creates a new grant and loan program to assist farmers, ranchers, and rural small businesses (such as farmer-owned cooperatives) in purchasing renewable energy systems and in making energy efficiency improvements. Grants can be issued for up to 25 percent of a proposed project, with grants and loans combined not to exceed 50 percent of project costs; USDA may also make loan guarantees under this program. Sec. 9006 provides \$23 million in mandatory funds for Fiscal Years 2003-2007.

Loans and grants under Sec. 9006 could provide important seed money to leverage private financing of biomass projects, such as anaerobic digester systems, biofuel facilities, or gasification projects. The Rural Development Program area within USDA has been given responsibility for implementing this program. A group composed of the Rural Business-Cooperative Service (RBS), the Rural Utilities Service, Natural Resources Conservation Service, the Farm Services Agency and others are working to establish selection criteria for the program, which they plan to release in 2003 [4].

Sec. 9005 of Title IX creates a program to fund farm energy audits and renewable energy assessments. This provision is particularly important to biomass development, as resource assessments and feasibility studies are often essential for securing private financing. State departments of agriculture and energy, land-grant universities, rural electric cooperatives or other entities designated by USDA are eligible to provide these services, with a requirement that the farmer pay at least 25 percent of the costs. Title IX encourages USDA to give priority funding for grants and loans under Sec. 9006 to farmers who

have completed energy audits and resource assessments under Sec. 9005. However, appropriators did not provide funding for Sec. 9005 in the FY03 Agriculture Appropriations bill. USDA will consider including a funding request for the program as part of the agency's FY04 budget [4]. Sec. 9003 establishes a biorefinery grant program to support the development of facilities that convert biomass into several marketable products, including electricity, fuels and chemicals. This program is also subject to appropriations, and was not funded for FY03. The biorefinery model, in which multiple marketable co-products are produced in the same facility, may be the key to producing bioenergy that is economically competitive with fossil energy. It is unclear whether USDA will include a funding request for both Sec. 9003 and 9005 in its FY04 budget.

Sec. 9004 of Title IX establishes a competitive grant program to educate government and private vehicle fleet managers and the public about the benefits of biodiesel. USDA plans to issue a request for proposals for the program in 2003 [4].

In addition to grant authority created in Title IX, the 2002 Farm Bill also opens up two existing grant programs within Title VI (Rural Development) to renewable energy production. The Value-Added Grant Program (Sec. 6401) is modified to clarify that farm or ranch-based renewable energy qualifies as a value-added product under the program. Biofuel projects have qualified for these grants in the past. Sec. 6013 amends the Consolidated Farm and Rural Development Act to allow wind systems and methane digesters to qualify for USDA development loans and loan guarantees.

Research and Development – Executive Order 13134 and the Biomass Research and Development Act of 2000 (Title III if the

Agricultural Risk Protection Act of 2000, P.L.106-224) established a cabinet-level Research and Development Board on Biobased Products and Bioenergy, co-chaired by the Secretaries of Energy and Agriculture, and a Technical Advisory Committee composed of industry, academic, agricultural and environmental leaders. The task of the board is to coordinate federal bioenergy and biobased product research, with the goal of tripling the use of bioenergy and biobased products by 2010. Since its creation, the Board has focused on improving communication between USDA and Department of Energy (DOE) program managers. The Technical Advisory Committee has been working on a “roadmap” for future biomass research, which will establish concrete short-to-long term goals and measures for success. These efforts have been funded through existing USDA and DOE authority, as Congress has yet to appropriate any funds to the initiative. Sec. 9008 of Title IX extends the Biomass R&D Act until 2007, and provides mandatory funding to the initiative.

USDA plans to use the \$5 million provided for FY 2002 to fund proposals submitted to DOE, which were turned down due to lack of funding. A team of USDA and DOE staff is working to develop a request for proposals (RFP) document, in consultation with the R&D board, which will be published in FY 2003. [4]

The funding provided for the Biomass R&D Act should be used to fill an important gap in current research and development activities: the commercialization of biomass conversion technologies. DOE and the Agricultural Research Service have made significant discoveries in bioenergy and biobased product research. However, the necessary processing, transportation, and marketing research needed to translate these

research successes into business successes has been lacking. The Technical Advisory Committee is well equipped to identify these hurdles to commercialization, and set reasonable goals for overcoming them.

CCC Bioenergy Program – The Commodity Credit Corporation (CCC) is the financing organization for USDA’s commodity programs. The bioenergy program was established by Congress in 2000, using appropriated funds, to provide partial compensation to producers of ethanol and biodiesel for the purchase of commodities used to expand existing production. Sec. 9010 of Title IX continues the program and provides it with mandatory funding. At \$204 million, the CCC program accounts for over half the funding in the energy title.

To date, this program has largely been used to reimburse ethanol producers for corn purchases, although cellulosic crops are also listed as an eligible commodity under the program. Should facilities utilizing cellulosic biomass to produce ethanol come on line during the life of the Farm Bill, USDA could encourage the growth of this industry by giving such facilities priority funding.

Conservation Title – The Conservation Reserve Program (CRP), established in 1985, is the largest of USDA’s conservation programs with a current enrollment cap of 39.2 million acres. The CRP program provides rental payments to farmers to keep marginal and highly erodible land out of production to enhance soil and water quality and provide wildlife habitat. Sec. 2101 of Title II (Conservation) amends the Conservation Reserve Program to allow managed harvesting of biomass on CRP enrolled lands, consistent with CRP’s conservation goals, and with an appropriate reduction in rental payments for any

economic benefit received by the farmer, while still providing a net incentive. The Natural Resources Conservation Service is working to establish rules for biomass harvesting on CRP enrolled lands, along with other allowable uses granted under the Farm Bill (including wind turbine siting), with the goal of having rules in place by the next CRP general enrollment, the date of which has not yet been announced [4].

Allowing the sustainable harvesting of biomass for energy production on CRP lands opens up significant new biomass resources, and a potential new income stream for farmers. Research is already underway on utilizing this new resource. The FY 2000 agriculture appropriations bill authorized the creation of up to six biomass energy pilot projects on CRP land. Currently, approved projects are underway in Illinois, Iowa, Minnesota, New York, Oklahoma, and Pennsylvania, which are experimenting with a variety of energy crops including willows, switchgrass and hybrid poplars. Initially, co-firing this biomass with coal might be the most economical use, with the eventual goal of establishing dedicated biomass facilities.

USDA should use the knowledge gained from the pilot projects to establish rules for future bioenergy projects on CRP, which the House Agriculture Committee recommended in its conference report accompanying the House Farm Bill. Sustainability will be a key concern to the wildlife community, but with proper siting and by taking natural migration and nesting cycles into consideration when harvesting, biomass development can be consistent with CRP's primary conservation goals.

Implementation – Title IX of the 2002 Farm Bill provides an incredible opportunity to grow the market for agriculture-based bioenergy and biobased products. To ensure

the success of these programs, USDA should avoid the temptation of applying a “one-size-fits-all” approach to implementation. The new rules governing the energy title programs should take into account the variety of biomass resources throughout the country, as well as the strengths of existing programs. This will require the formation of partnerships with local entities to seek their input, and to educate their constituencies about the new opportunities presented by Title IX. Key stakeholders in this effort include state and local agencies, farmer owned entities, non-governmental organizations, utilities, rural electric cooperatives, and USDA's own local network of agencies including the Cooperative State Research Education and Extension Service, Farm Services Agency, Natural Resource Conservation Service, and the Resource Conservation and Development Councils.

Several existing partnerships between federal and state agencies may serve as useful models for the new Title IX provisions. Farm energy audit programs and methane digester demonstration projects exist in several states. The Vermont Methane Pilot project, for example, is a joint venture of the state's Departments of Agriculture and Public Service, with funding from the U.S. Department of Energy. In Iowa, the Chariton Valley Switchgrass project is exploring the use of switchgrass for co-firing with a local coal power plant as well as for direct gasification. Several state agencies, local organizations, USDA and DOE are all involved in this project, which utilizes CRP enrolled lands. Many opportunities like these exist to combine state and federal financing, as well as research funds, to maximize the success of future bioenergy projects.

State and local government procurement is another substantial market for biobased products. When federal standards are in place for certifying biobased products, this information will be valuable to state and local governments in designing their own procurement programs. Outreach to potential industrial customers of biobased products will be critical to the industry's success, as will be increasing public awareness of the benefits of biobased products. Past federal partnerships with industry have been successful in increasing the market for recycled content products and energy efficient-equipment, and will serve as valuable case studies for implementing the biobased product procurement program.

### **Pending Energy Bills**

In August 2001, the House of Representatives passed the Securing America's Future Energy (SAFE) Act of 2001 (H.R. 4). The following April, the Senate passed its own comprehensive energy package, the Energy Policy Act of 2002 (S. 517). Both bills propose to renew the production tax credit for biopower and expand the definition of qualifying biomass feedstocks. The Senate bill also proposes to set national requirements for the production or renewable electricity and biofuels. See Table 2 for a comparison of the two bills.\*

#### Electricity

*Renewable Electricity Production Tax Credit* – The renewable electricity

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\* All the information contained in this section is current as of September 2002. However, as negotiations are ongoing, all provisions discussed are subject to amendments or elimination in the final conference committee report.

production tax credit (PTC), established in 1992, provides a tax incentive to qualifying wind and biopower producers, as well as facilities utilizing poultry waste to produce power. The credit, which is adjusted for inflation, currently stands at 1.7-cents per kilowatt-hour (kWh), and can be claimed for ten years after a facility is placed into service. Currently, the credit applies only to "closed-loop" biomass facilities, defined as operations using biomass grown solely for the commercial production of biopower. Although the PTC has been a critical driver for the expansion of the wind industry, to this date, no biopower facility has met the criteria to qualify for the credit.

Both H.R. 4 (Sec. 3102) and S. 517 (Title XIX) propose extending the PTC to 2007, and allowing "open-loop" biomass facilities to receive partial credit, though not for the full ten-year period. Potential open-loop feedstocks include agricultural residues and forestry wastes. H.R. 4 would allow open-loop facilities to receive a reduced credit for five years, whereas S. 517 allows new facilities to receive the full credit – existing facilities are eligible to receive a reduced credit – for three years. S. 517 also permits facilities co-firing closed-loop biomass with coal to qualify for the credit. In its FY 2003 budget, the administration supported the expansion of the tax credit to include open-loop biomass, in addition to the co-firing of both open and closed-loop biomass. In addition, while H.R. 4 allows the poultry waste provision to expire, S. 517 renews the provisions and adds swine and bovine wastes as qualifying energy sources.

Under current law, the credit is of no use to tax-exempt power producers such as public power utilities, rural electric cooperatives and Indian tribes. S. 517 takes the novel approach whereby tax-exempt power producers are allowed to receive the PTC for

their renewable energy production, and trade or sell the credits to taxable entities. H.R. 4 contains no similar provision.

**Renewable Portfolio Standard** – Sec. 264 of S. 517 establishes a national renewable portfolio standard (RPS), which sets a target of 10 percent renewable electricity generation by 2020. The provision allows for credit trading among utilities to meet their targets, with a cost cap of 1.5 cents per kWh per credit. The actual amount of renewable generation will be less than 10 percent nationwide however, as public power is exempt from the RPS. If enacted, the RPS is projected to increase use of biopower from current production of 37.5 billion kWh annually to 160 billion kWh by 2020. Co-firing, at current production of 0.5 billion kWh annually, is expected to grow to 4.1 billion kWh by 2020 under current market conditions, but is projected to increase to 97.7 billion kWh annually by 2020 if the RPS is enacted [5]. In addition to the RPS, S. 517 also requires that at least 7.5 percent of electricity purchased by the federal government be derived from renewable energy sources, such as biopower, by 2020.

**Renewable Fuels Standard** – As with electricity, S. 517 sets a renewable target for motor vehicle fuels. Sec. 820 establishes a national renewable fuels standard (RFS), that would require the use of 5 billion gallons of renewable fuels by 2012, and an equivalent percentage of the motor fuels market thereafter. Eligible fuels include ethanol and biodiesel. Refiners, blenders, and marketers of motor vehicle fuel would be permitted to trade credits among themselves to meet the RFS target, but such credits would need to be used within one year. The provision would allow each gallon of ethanol derived from cellulosic biomass to be counted as 1.5 gallons of renewable fuel toward meeting the RFS targets. In addition, the fuel additive MTBE is banned within four years of enactment, and governors are allowed to waive the oxygenate requirement for reformulated gasoline, ending years of controversy and debate on the elimination of MTBE. Sec. 820A also requires federal fleets to begin using 10-percent ethanol blended gasoline where reasonably available, and 20 percent biodiesel blends where available within ten years. Although, H.R. 4 contains no similar provision, it does require the Environmental Protection Agency and the Department of Energy to study the feasibility of enacting a RFS.

Table 2. Pending Energy Legislation in Congress

<b>Provision</b>	<b>House</b>	<b>Senate</b>
Renewable Energy Production Tax Credit Expanded to Include Open-Loop Biomass	X	X
Renewable Portfolio Standard (Electricity)		X
Renewable Fuels Standard		X

Sources: Securing America's Future Energy Act of 2001 (H.R. 4), Energy Policy Act of 2002 (S. 517)



## Conclusion

An increased federal investment in the development of bioenergy is warranted by the multiple societal benefits bioenergy provides, including reduced emissions of air pollutants and greenhouse gasses, increased economic development, and greater energy diversity with reduced dependence on foreign petroleum. Past investments have been successful at reducing the cost of bioenergy. The new Farm Bill programs provide a unique opportunity to promote the

development of agriculture-based biopower, biofuels, and biobased products. These new “cash crops” can provide new revenue streams to farmers, while providing clean and affordable energy and products to the nation. Congress also has an opportunity to ensure that bioenergy is a significant component of any national long-term energy strategy. Setting reasonable goals today will benefit many generations to come.

## References

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3. Biomass Research and Development Technical Advisory Committee. “A Vision for Bioenergy and Biobased Products in the United States,” revised draft, August 30, 2002.
4. Based on information provided by USDA program managers.
5. U.S. Department of Energy. Energy Information Administration. “Impacts of a 10-Percent Renewable Portfolio Standard,” February 2002 (SR/OIAF/2002-03).