106TH CONGRESS
1ST SESSION

S. 935

To amend the National Agricultural Research, Extension, and Teaching Policy Act of 1977 to authorize research to promote the conversion of biomass into biobased industrial products, and for other purposes.

IN THE SENATE OF THE UNITED STATES

APRIL 30, 1999

Mr. LUGAR introduced the following bill; which was read twice and referred to the Committee on Agriculture, Nutrition, and Forestry

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A BILL

To amend the National Agricultural Research, Extension, and Teaching Policy Act of 1977 to authorize research to promote the conversion of biomass into biobased industrial products, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the ''National Sustainable Fuels and Chemicals Act of 1999''.

SEC. 2. FINDINGS.

Congress finds that—

(1) conversion of biomass into biobased industrial products offers outstanding potential for benefit to the national interest through improved strategic security and balance of payments, healthier rural economies, improved environmental quality, near-zero net greenhouse gas emissions, technology export, and sustainable resource supply;

(2)(A) biomass is widely available at prices that are competitive with low cost petroleum; and

(B) the key technical challenge to be overcome in order for biobased industrial products to be cost competitive is reducing the cost of technology for converting biomass into desired biobased industrial products;

(3) biobased fuels, such as ethanol, have the clear potential to be sustainable, low cost, and high performance fuels that are compatible with both current and future transportation systems and provide near zero net greenhouse gas emissions;

(4) biobased chemicals—

(A) can provide functional replacements for essentially all organic chemicals that are currently derived from petroleum; and

(B) have the clear potential for environmentally benign product life cycles;

(5) many biomass feedstocks suitable for industrial processing show the clear potential for sustainable production, in some cases resulting in improved soil fertility and carbon sequestration;

(6)(A) grain processing mills are biorefineries that produce a diversity of useful food, chemical, feed, and fuel products; and

(B) technologies that result in further diversification of the range of value-added biobased industrial products can meet a key need for the grain processing industry;

(7)(A) cellulosic feedstocks are attractive because of their low cost and widespread availability; and

(B) research resulting in cost-effective technology to overcome the recalcitrance of cellulosic biomass would allow biorefineries to produce fuels and bulk chemicals on a very large scale, with a commensurately large realization of the benefit described in paragraph (1);

(8) research into the fundamentals to understand important mechanisms of biomass conversion processes can be expected to accelerate the application and advancement of biomass processing technology by—

(A) increasing the confidence and speed with which new technologies can be scaled up; and

(B) giving rise to processing innovations based on new knowledge;

(9) the utility of biotechnology allows the design of feedstocks that will meet future needs more effectively;

(10)(A) because of the relatively short-term time horizon characteristic of private sector investments, and because many benefits of biomass processing are in the national interest, it is appropriate for the Federal Government to provide precommercial investment in fundamental and research-driven innovation in the biomass processing area; and

(B) such an investment would provide a valuable complement to ongoing and past governmental support in the biomass processing area; and

(11) several prominent studies, including studies by the President's Council of Advisors on Science and Technology and the National Research Council, support the potential for large research-driven advances in technologies for production of biobased industrial products as well as associated benefits.

SEC. 3. CONVERSION OF BIOMASS INTO BIOBASED INDUSTRIAL PRODUCTS.

Title XIV of the National Agricultural Research, Extension, and Teaching Policy Act of 1977 (7 U.S.C. 3101 et seq.) is amended by adding at the end the following:

"Subtitle N—Conversion of Biomass Into Biobased Industrial Products

"SEC. 1490. DEFINITIONS.

''In this subtitle:

''(1) ADVISORY COMMITTEE.—The term 'Advisory Committee' means the Sustainable Fuels and Chemicals Technical Advisory Committee established by section 1490C.

''(2) BIOBASED INDUSTRIAL PRODUCT.—The term 'biobased industrial product' means any power, fuel, feed, chemical product, or other consumer good derived from biomass.

''(3) BIOMASS.—The term 'biomass' means any organic matter that is available on a renewable or recurring basis, including plants, trees, grasses, agricultural crops and residues, wood and wood residues, municipal waste, animal waste and residues, and aquatic plants.

''(4) BOARD.—The term 'Board' means the Sustainable Fuels and Chemicals Board established by section 1490B.

''(5) INITIATIVE.—The term 'Initiative' means the Sustainable Fuels and Chemicals Research Initiative established under section 1490D.

''(6) POINT OF CONTACT.—The term 'point of contact' means a point of contact designated under section 1490A(d).

''SEC. 1490A. COOPERATION AND COORDINATION IN SUSTAINABLE FUELS AND CHEMICALS RESEARCH.

''(a) IN GENERAL.—The Secretary of Agriculture and the Secretary of Energy shall cooperate with respect to, and coordinate, policies and procedures that promote research and development leading to the production of biobased industrial products.

''(b) PURPOSE.—The purpose of the cooperation and coordination shall be to promote research and development related to—

''(1) understanding the key mechanisms underlying the recalcitrance of biomass for conversion into biobased industrial products, including the use of agricultural crops for conversion into biobased industrial products; and

''(2) advanced technologies that will result in large-scale commercial production of low cost biobased industrial products.

''(c) AREAS.—In carrying out this subtitle, the Secretary of Agriculture and the Secretary of Energy shall promote research and development to—

''(1) advance the availability and widespread use of energy efficient, economically competitive, and environmentally sound biobased industrial products in a manner that is consistent with the goals of the United States relating to sustainable and secure supplies of food, chemicals, and fuel;

''(2) ensure full consideration of Federal land and land management programs as potential feedstock resources for biobased industrial products; and

''(3) assess the environmental, economic, and social impact of production of biobased industrial products from biomass on a large scale.

''(d) POINTS OF CONTACT.—

''(1) IN GENERAL.—To coordinate research and development programs and activities relating to biobased industrial products that are carried out by their respective Departments—

''(A) the Secretary of Agriculture shall designate, as the point of contact for the De-

partment of Agriculture, an officer of the Department of Agriculture appointed by the President to a position in the Department before the date of the designation, by and with the advice and consent of the Senate; and

''(B) the Secretary of Energy shall designate, as the point of contact for the Department of Energy, an officer of the Department of Energy appointed by the President to a position in the Department before the date of the designation, by and with the advice and consent of the Senate.

''(2) DUTIES.—The points of contact shall jointly—

''(A) assist in arranging interlaboratory and site-specific supplemental agreements for research, development, and demonstration projects relating to biobased industrial products;

''(B) serve as cochairpersons of the Board;

''(C) administer the Initiative; and

''(D) respond in writing to each recommendation of the Advisory Committee made under section 1490C(c)(2).

"SEC. 1490B. SUSTAINABLE FUELS AND CHEMICALS BOARD.

''(a) ESTABLISHMENT.—There is established the Sustainable Fuels and Chemicals Board to coordinate programs within and among departments and agencies of the Federal Government for the purpose of promoting the use of biobased industrial products by—

''(1) maximizing the benefits deriving from Federal grants and assistance; and

''(2) bringing coherence to Federal planning.

''(b) MEMBERSHIP.—The Board shall consist of:

''(1) The point of contact of the Department of Agriculture designated under section 1490A(d)(1)(A), who shall serve as cochairperson of the Board.

''(2) The point of contact of the Department of Energy designated under section 1490A(d)(1)(B), who shall serve as cochairperson of the Board.

''(3) A senior officer of each of the following agencies who is appointed by the head of the agency and who has a rank that is equivalent to the points of contact:

''(A) The Department of the Interior.

''(B) The Environmental Protection Agency.

''(C) The National Science Foundation.

''(D) The Office of Science and Technology Policy.

''(4) At the option of the Secretary of Agriculture and the Secretary of Energy, other members appointed by the Secretaries (after consultation with members described in paragraphs (1) through (3)).

''(c) DUTIES.—The Board shall—

''(1) coordinate research, development, and demonstration activities relating to biobased industrial products—

''(A) between the Department of Agriculture and the Department of Energy; and

''(B) with other departments and agencies of the Federal Government; and

''(2) provide recommendations to the points of contact concerning administration of this subtitle.

''(d) FUNDING.—Each agency represented on the Board is encouraged to provide funds for any purpose under this subtitle.

''(e) MEETINGS.—The Board shall meet at least quarterly to enable the Board to carry out the duties of the Board under subsection (c).

"SEC. 1490C. SUSTAINABLE FUELS AND CHEMICALS TECHNICAL ADVISORY COMMITTEE.

"(a) ESTABLISHMENT.—There is established the Sustainable Fuels and Chemicals Technical Advisory Committee to—

"(1) advise the Secretary of Agriculture and the Secretary of Energy concerning—

"(A) the technical focus and direction of requests for proposals issued under the Initiative; and

"(B) procedures for reviewing the proposals;

"(2) facilitate consultations and partnerships among Federal agencies, agricultural producers, industry, consumers, the research community, and other interested groups to carry out program activities relating to the Initiative; and

"(3) evaluate and perform strategic planning on program activities relating to the Initiative.

"(b) MEMBERSHIP.—The Committee shall consist of the following members appointed by the points of contact:

"(1) An individual affiliated with the biobased industrial products industry.

"(2) An individual affiliated with a college or university who has expertise in biobased industrial products.

''(3) 2 prominent engineers or scientists who have expertise in biobased industrial products.

''(4) An individual affiliated with a commodity trade association.

''(5) An individual affiliated with an environmental or conservation organization.

''(6) At the option of the points of contact, other members.

''(c) DUTIES.—The Advisory Committee shall—

''(1) advise the points of contact with respect to the Initiative; and

''(2) evaluate whether, and make recommendations in writing to the Board to ensure that—

''(A) funds authorized for the Initiative are distributed and used in a manner that is consistent with the goals of the Initiative;

''(B) the points of contact are funding proposals under this subtitle that are selected on the basis of merit, as determined by an independent panel of scientific and technical peers; and

''(C) activities under this subtitle are carried out in accordance with this subtitle.

''(d) MEETINGS.—The Advisory Committee shall meet at least quarterly to enable the Advisory Committee

to carry out the duties of the Advisory Committee under subsection (c).

"SEC. 1490D. SUSTAINABLE FUELS AND CHEMICALS RESEARCH INITIATIVE.

"(a) IN GENERAL.—The Secretary of Agriculture and the Secretary of Energy, acting through their respective points of contact and in consultation with the Board, shall establish and carry out a Sustainable Fuels and Chemicals Research Initiative under which competitively-awarded grants, contracts, and financial assistance are provided to, or entered into with, eligible entities to carry out research on biobased industrial products.

"(b) PURPOSES.—The purposes of grants, contracts, and assistance under this section shall be to—

"(1) stimulate collaborative activities by a diverse range of experts in all aspects of biomass processing for the purpose of conducting fundamental and innovation-targeted research and technology development;

"(2) enhance creative and imaginative approaches toward biomass processing that will serve to develop the next generation of advanced technologies making possible low cost biobased industrial products;

''(3) strengthen the intellectual resources of the United States through the training and education of future scientists, engineers, managers, and business leaders in the field of biomass processing; and

''(4) promote integrated research partnerships among colleges, universities, national laboratories, Federal research agencies, and the private sector as the best means of overcoming technical challenges that span multiple academic disciplines and leveraging scarce Federal research funds.

''(c) ELIGIBLE ENTITIES.—

''(1) IN GENERAL.—To be eligible for a grant, contract, or assistance under this section, an applicant shall be—

''(A) a college or university;

''(B) a national laboratory;

''(C) a Federal research agency;

''(D) a State research agency;

''(E) a private sector entity; or

''(F) a consortium of 2 or more entities described in subparagraphs (A) through (E).

''(2) ADMINISTRATION.—After consultation with the Board, the points of contact shall—

''(A) publish annually a joint request for proposals for grants, contracts, and assistance under this section;

''(B) provide a preference in grants, contracts, and assistance under this section to consortia involving experts from multiple institutions and multiple academic disciplines working on cross-cutting or integrative research, development, and demonstration challenges; and

''(C) require that grants, contracts, and assistance under this section be awarded competitively after the establishment of procedures that provide for scientific peer review by an independent panel of scientific and technical peers.

''(d) USES OF GRANTS, CONTRACTS, AND ASSISTANCE.—A grant, contract, or assistance under this section shall be used to conduct—

''(1) research on process technology for overcoming the recalcitrance of biomass, including research on key mechanisms, advanced technologies, and demonstration test beds for—

''(A) feedstock pretreatment and hydrolysis of cellulose and hemicellulose, including new technologies for—

''(i) enhanced sugar yields;

''(ii) lower overall chemical use;

''(iii) less costly materials; and

''(iv) cost reduction;

''(B) novel organism development and cellulose production, including consolidated bioprocessing techniques; and

''(C) approaches other than enzymatic hydrolysis for overcoming the recalcitrance of cellulosic biomass;

''(2) research on technologies for diversifying the range of products than can be efficiently and cost-competitively produced from biomass, including research on—

''(A) metabolic engineering of biological systems (including genetically modified crops) to produce novel products, especially commodity products, or to increase product selectivity and tolerance, with a research priority on the development of biobased products that can compete in performance and cost with fossil-based products;

''(B) catalytic processing to convert intermediates of biomass processing into products of interest;

''(C) separation technologies for cost-effective product recovery and purification;

''(D) approaches other than metabolic engineering and catalytic conversion of intermediates of biomass processing; and

''(E) advanced technologies for biomass gasification and related research in turbine and stationary fuel cell technology for production of electricity from biomass and related research in advanced turbine and stationary fuel cell technology; and

''(3) research aimed at evaluating the sustainability and economic viability of biobased industrial products and their raw material input of biomass, including research on—

''(A) the evaluation of, and strategies to enhance, the sustainability of biomass-based production of fuels and commodity chemicals, including research on—

''(i) accurate measurement and analysis of carbon sequestration and carbon cycling in relation to biobased industrial products and feedstocks;

''(ii) crops that provide a sustainable resource for conversion to industrial prod-

ucts while also serving as a source for other needs such as food or animal feed;

''(iii) development and analysis of best land management practices that enhance the environmental sustainability of the production and harvesting of biomass;

''(iv) development of biomass cropping systems that improve the conservation and use of marginal land; and

''(v) biomass gasification and combustion to produce electricity; and

''(B) the evaluation of, and strategies to enhance, the economic viability of fuels and commodity chemicals produced from biomass, including research on—

''(i) the evaluation of the energy balances for biorefineries;

''(ii) the cost of the required process technology; and

''(iii) the impact of coproduction on product price and large-scale economic viability.

''(e) AUTHORIZATION OF APPROPRIATIONS.—

''(1) IN GENERAL.—In addition to any other amounts that are authorized to be appropriated,

there are authorized to be appropriated to carry out this section $49,000,000 for each of fiscal years 2000 through 2005.

''(2) RESEARCH ON CELLULOSIC BIOMASS.—For each fiscal year, of the amounts that are made available under paragraph (1), not less than 30 percent shall be used to conduct research described in subsection (d)(1).

''SEC. 1490E. ADMINISTRATIVE SUPPORT AND FUNDS.

''(a) IN GENERAL.—To the extent administrative support and funds are not provided by other agencies under subsection (b), the Secretary of Energy shall provide such administrative support and funds of the Department of Energy to the Board and the Advisory Committee as are necessary to enable the Board and the Advisory Committee to carry out this subtitle.

''(b) OTHER AGENCIES.—The Secretary of Agriculture and the heads of the agencies referred to in section 1490B(a)(3) may, and are encouraged to, provide administrative support and funds of their respective agencies to the Board and the Advisory Committee.

''SEC. 1490F. REPORTS.

''For each fiscal year that funds are made available to carry out this subtitle, the Secretary of Agriculture and

the Secretary of Energy shall jointly transmit to Congress a detailed report on—

''(1) the status and progress of the Initiative, including a certification from the Board that funds authorized for the Initiative are distributed and used in a manner that is consistent with the goals of the Initiative; and

''(2) the general status of cooperation and research efforts carried out by each Secretary with respect to sustainable fuels, chemicals, and electricity derived from biomass, including a certification from the Board that the points of contact are funding proposals that are selected on the basis of merit, as determined by an independent panel of scientific and technical peers.''.

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