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PROPOSED NEW INSTITUTE AT IOWA STATE UNIVERSITY BIOECONOMY INSTITUTE

Action Requested: Consider approval of the request by Iowa State University to establish a new Bioeconomy Institute that will report to the Vice President for Research and Economic Development.

Executive Summary: The goals of the proposed Institute are to build upon a five-year initiative at ISU and to advance the use of biorenewable resources for the production of chemicals, fuels, and energy. The bioeconomy will use biomass, including lignocellulose, starches, oils, and proteins, rather than fossil sources of carbon and energy, to sustain economic growth and prosperity. The multi-disciplinary activities of the proposed Institute include creating, sharing, and applying knowledge relevant to producing biomass feedstocks and converting them to various products. Agriculture will supply renewable energy and carbon to the bioeconomy while engineering will transform these resources into transportation fuels, commodity chemicals, and electric power. This proposal was reviewed by the Board Office and the Council of Provosts and is recommended for approval. This request addresses the Board of Regents' Strategic Plan priorities (3.0) to "discover new knowledge through research, scholarship, and creative activities and (2.0) to provide needed service and promote economic growth."

Background:

- Objectives of the proposed Institute.
  - ☑ Reduce dependence on petroleum from politically unstable regions of the world.
  - ☑ Develop sustainable feedstock production practices that protect land and water resources.
  - ☑ Improve environmental quality by reducing pollutant emissions associated with fossil fuel usage, especially sulfur, heavy metals, and greenhouse gases.
  - ☑ Diversify markets for crops, improving the profitability of farming and reducing the need for agricultural subsidies.
  - ☑ Create jobs and economic opportunities in rural communities where biomass crops are grown and processed.

- Relationship to Bioeconomy Initiative. In 2002, ISU established the Bioeconomy Initiative to organize faculty and staff to advance the use of biorenewable resources in the production of chemicals, fuels, materials, and energy. Currently, 150 faculty members contribute to the Bioeconomy Initiative with more than $43 million in sponsored research funding from industry and federal agencies. The proposed Institute will be responsible for the research, education, and outreach missions of the Bioeconomy Initiative.

- Relationship of proposed Institute to other centers/institutes at the University. The proposed Institute will be organized as an "institute of programs" rather than an "institute of centers." Such programs build on the research platforms of its predecessor, the Office of Biorenewables Programs, and will include Vegetable Oil Performance; Corn-to-Biofuels; Thermochemical Technologies; Harvest, Storage, and Transportation; Feedstock Production; and Biorenewables Education, with each program area led by a faculty member. This structure is expected to bring together faculty from diverse disciplinary backgrounds for systems approaches to problems in these program areas and to shift resources to the most promising opportunities in biorenewables as they emerge.

- Duplication. The most closely related centers at other Regent universities are the Center for Biocatalysis and Bioprocessing (CBB) at the University of Iowa and the national Ag-Based Lubricants (NABL) Center at the University of Northern Iowa. The CBB focuses on pharmaceuticals biotechnology rather than biorenewables biotechnology. The NABL Center focuses on biobased lubricants, which are only a small subset of biobased products. Neither center covers production agriculture or has programs focusing on biorefineries and biorenewables education. The proposed Institute will collaborate with other Regent universities in areas of common interest.

- Opportunity in bioeconomy. Iowa has more than 34 ethanol plants in operation or under construction and more are expected. More than 40% of gasoline in the U.S. is blended with grain ethanol. Ethanol manufacturing is expected to double in less than two years. Through technological innovation, Iowa can attract advanced biofuels companies to Iowa, produce biofuels at competitive prices, and supply biorenewables technologies to the world.

- New faculty. The University is committed to hiring three new faculty to enhance core competencies in research areas that are technical barriers to advancement of the bioeconomy. The new faculty will fill tenure-track positions in academic departments and will work collaboratively with the proposed Institute and its affiliates to overcome the technical barriers.

- Facilities. The proposed Institute will be housed in the Biorenewables Laboratory Building being planned at ISU with $32 million of state funding. Until the building is completed, the proposed Institute will be housed in Marston Hall. The proposed Institute will also rely on the facilities of the New Century Farm, which will serve as a laboratory for landscape-scale feedstock production studies and pilot-scale processing research.

- Administrative personnel. The proposed Institute will have a director, deputy director, and other programmatic and staff positions needed for the biorenewables program areas.

  - ☑ A Science and Engineering Board will advise the director on new program development, faculty engagement, collaboration with academic units and centers, and budget priorities.
  - ☑ An Executive Advisory Committee will review the accomplishments of the proposed Institute and advise the director on strategic matters.
  - ☑ An Opportunities Response Team will be responsible for industry relations with companies doing business in biorenewable resources and biobased products.

- Equipment. The new building fund includes $4 million to equip the laboratories. Additional resources for equipment will be obtained from industrial sources, such as the $22.5 million ConocoPhillips contract, and federal agencies, such as the U.S. Department of Energy.

- Expected need. The proposed Institute is expected to have at least a ten-year existence. To ensure that the proposed Institute is fulfilling its mission, outcomes are being met, and continued existence is justified, periodic reviews will be conducted.

- Costs. The cost of the proposed Institute is expected to be $1.1 million during the first year and $3 million a year for years 3-7. Funding sources include general university and state funds, including reallocations from the Vice President for Research and Economic Development; the Colleges of Engineering, Agriculture and Life Sciences, and Liberal Arts and Sciences; gifts from the Iowa Farm Bureau and other donors; and the Provost. The proposed Institute will also have other revenue streams, including sponsored funding, such as the Battelle platform and infrastructure funds.

- Link to Strategic Plan. The proposed Institute addresses the University's Strategic Plan vision – "Iowa State University will be the best at advancing the land-grant ideals and putting science and technology to work. Students will become broadly educated, global citizens who are culturally informed, technologically adept, and ready to lead. Faculty and staff will share a passion for creating, sharing, and applying knowledge to improve lives world-wide."

Details about the proposed Institute are available in the Board Office.