

THE CASE FOR A RENEWABLE BIOCHEMICAL TAX CREDIT

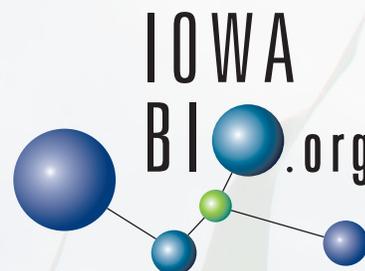
By Brent Willett & Joe Hrdlicka

Executive Summary



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The Case for a Renewable Biochemical Tax Credit

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Iowa's Cultivation Corridor and the Iowa Biotechnology Association partnered in late 2015 to enable the development of a white paper on the opportunity the emerging biorenewable chemical industry holds for Iowa. The paper was researched and written by Dr. Dermot Hayes, the Pioneer Hi-Bred International Chair in Agribusiness, professor of economics and professor of finance at Iowa State University (ISU); Dr. Brent Shanks, an Anson Marston Distinguished Professor in Engineering and the Steffenson Chair in Chemical and Biological Engineering at ISU; and Dr. Jill Euken, Deputy Director of the Bioeconomy Institute at ISU.

The findings are striking. Thanks to the rich supply of Iowa biomass suitable as feedstock for biorenewable chemical production, access to a foundational network of over 50 ethanol and biodiesel production facilities across the state, and nascent biorenewable chemical investment opportunities before us today as outlined by Drs. Hayes, Shanks and Euken in the paper, Iowa is better-positioned than many domestic competitors to capitalize on the next frontier of bioprocessing in the United States.

The findings are striking.

Despite Iowa's obviously discernable advantages, however, the absence of a statewide economic development incentive tailored to address the unique needs of this budding industry stands as a serious impediment to the state's potential to emerge as a center of gravity for biorenewable chemical investment and job creation in the coming years.

The report reminds that the last bioeconomic boom Iowa saw- that of the ethanol industry- did not have to happen here and suggests that it was targeted state incentives which are directly attributable to the decision to choose Iowa over other Midwest states by more than one-third of the ethanol industry. The same dynamic, the report suggests, exists today relative to the biorenewable chemical industry as we stand on the precipice of a tremendous economic opportunity in Iowa.

Among the report's findings...

Iowa is better-positioned than many domestic competitors to capitalize on the next frontier of bioprocessing in the United States.

- First generation biofuels have been important economic drivers for the state of Iowa. Ethanol production alone in Iowa accounts for \$2.23 billion per year in state GDP and supports more than 8,693 jobs. However, due to a new Renewable Fuel Standard which rolls back ethanol blend requirements to pre-2007 levels and ongoing feedstock limitations for biodiesel, alternative value-added bioproducts are critical to the future growth of the biomanufacturing industry in Iowa.
- Project opportunity exists today. At least five potential bio-based chemical production projects were identified through an industry interview process to as part of the report. Representatives of each project indicated a biorenewable chemical production tax credit would be fundamental to the ultimate location decision in or outside Iowa.
- Iowa has competitive advantages in several subfields of the emerging biorenewable chemicals industry. This advantage arises from:
 - The availability of byproducts such as glycerin and distillers oils from first generation biofuels facilities;
 - The existence of several underutilized wet mills in Iowa, or close to Iowa;
 - The fact that first generation biofuels can themselves be upgraded into higher valued chemicals. These alternatives will become more promising if mandates to use these products in transportation fuels are gradually eliminated.

However, the industry needs to attract large sources of capital due to the complexity and scale of the plants and the fact that many bio-based chemical products compete with products derived from crude oil, a highly variable commodity.

- Iowa's research and technological infrastructure in biorenewable chemicals and materials is second to none. The National Science Foundation Engineering Research Center for Biorenewable Chemicals (CBiRC) led by ISU is the only competitively awarded federal research center solely dedicated to the development of biobased chemicals. Key capital infrastructure needed for biobased chemical development exists at ISU through the BioCentury Research Farm and the Bioeconomy Institute and the University of Iowa through the Center for Biocatalysis and Bioprocessing (CBB). The collective capabilities of these entities for enabling biobased chemicals exceeds that available in any other state.
- The U.S. market for chemicals is more than \$250 billion/year; almost all chemicals currently utilize crude oil and natural gas as feedstocks, making many of them target markets for bio-based solutions.
- More than 50,000 jobs in bio-based chemicals and materials are projected to be created in the U.S. by 2020, thanks in part to a projected tripling in worldwide production of bio-based polymers in the next five years.
- Using income tax data alone, the payback period on the \$61,702,387 the state invested in the ethanol industry was just two years. If we use the larger 8% of all economic activity in all taxes (income, property sales, etc.), then the payback period was one year.
- The global petrochemical industry developed in clusters of close proximity to feedstock sources: oil refineries. The bio-based chemicals industry will develop in a similar manner — the economics of agglomeration suggests that industrial biomanufacturing clusters will develop from established biomanufacturing sites rather than from new green field sites. Iowa has more deployed biomanufacturing capital assets than any other state.

“Iowa is a goldmine of starch and biomass; and starch and biomass are the future of the chemical industry.”

– Eric Hakmiller, President, Lincolnway Energy

Iowa state stands to write its next bioeconomic success story. In order to do so, however, a modest tax credit-based incentive is needed to ensure investment flows to Iowa and not another similarly-competitive state.

The case made in the report by Drs. Hayes, Shanks and Euken is compelling. Iowa fully realized its public investment in nearly two years growing its leading position in the biofuels industry. With an abundant supply, access to a processing infrastructure and stronger research assets than any domestic peer, this state stands to write its next bioeconomic success story. In order to do so, however, a modest tax credit-based incentive is needed to ensure investment flows to Iowa and not another similarly-competitive state.



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Ethanol Production



\$2.23 Billion in GDP
8,693 Jobs

Iowa has More
Deployed Biomanufacturing



Capital Assets
Than Any Other State.

The U.S. Market For Chemicals Is More Than
\$250 Billion/year

Almost All Currently Utilize Crude Oil and Natural Gas as Feedstocks,



Making Many of Them Target Markets
for Bio-based Solutions.