AFCC News & Reports – October 2019

AFCC RFI Response: Bioeconomy

Office of Science and Technology Policy (OSTP)
Notice of request for information (RFI) for Bioeconomy
FR DOC. 2019-19470

The Alternative Fuels & Chemicals Coalition (AFCC) is pleased to have the opportunity to comment on the Office of Science and Technology Policy (OSTP) notice of request for information (RFI) for the U.S. biobased economy.

Introduction

AFCC is a collaborative government affairs effort organized by the Kilpatrick Townsend & Stockton law firm and American Diversified Energy.

AFCC was created to address policy and advocacy gaps at the federal and state levels in renewable chemicals, bioplastics/biomaterials, cell-cultured food ingredients, single cell protein for food and feed, enzymes, alternative fuels, biobased products and sustainable aviation fuels (SAF) sectors.

AFCC is focused on the uses of tools such as synthetic biology, gene editing, new and conventional processes, and providing sustainable solutions from sustainable sources to energy and climate change challenges for the growth of the sector.

AFCC's intent is to improve the bottom line for companies developing projects and operating in these sectors; protect and advocate for additional funding for federal programs that support innovation, development, validation and commercialization in these sectors; and advocate for public policies favorable to these sectors.

AFCC member companies work on feedstocks, renewable chemicals, food, feed, fiber, and fuel impacting the biobased economy.

1. What specific actions could the U.S. Government take to reinforce a values-based ecosystem that will guide the transformation and expansion of the U.S. Bioeconomy, in both the short- and long-term?

The U.S. Government can start by providing an annual indicators report on the U.S biobased economy, a compilation of activities from all federal agencies as any future federal activities.

These reports would provide data on programs undertaken, progress made, policy and program success, and monetary expenditures for these programs.

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This annual report will provide the public information on short term and long term programs and the role of the bioeconomy in supporting jobs, investments, and measurable environmental benefits.

Data has been generated already showing the biobased economy is creating high-paying jobs, opening new careers, and providing new income streams for American farmers and rural communities.

Furthermore, the U.S biobased economy has revitalized domestic manufacturing jobs in renewable chemicals and biofuels, lessened the nation's dependence on fossil fuels, and reduced greenhouse gas emissions.

A lot of work has been done on ground transportation biofuels and numerous studies have been done successfully on the measurements of its environmental impact, similar work needs to be done on sustainable aviation fuels (SAF).

Developing sustainable alternative fuels for aviation has the potential to be sustainably produced and to generate lower carbon emissions than conventional kerosene from fossil fuels on a life cycle basis and the pre-condition for the use of any SAF as aviation fuel is ASTM certification which has been developed for at least five pathways.

The main challenge the biobased industry faces today is to determine how to continue building public and private investment in the biobased economy.

Over the past decade, federal policies such as the Renewable Fuel Standard (RFS), the USDA Biobased Markets Program, the Navy's Great Green Fleet initiative, the Second Generation Biofuel Producer Tax Credit, and others have created momentum for innovations and investment in biofuels, renewable chemicals, and biobased products, and technologies such as synthetic biology.

There needs to a continuum by industry, policy advocates, legislators, and regulators towards this trend. Perhaps creating a taskforce in analyzing and creating new initiatives may be necessary now to ensure U.S. has continued leadership in innovative technologies impacting the biobased economy.

Typically small biotech companies are faced early on with the concept of "valley of death" and the challenges associated with surviving and these companies are always vulnerable in their formative years. The federal government can support them through grant schemes, loan guarantees, R&D tax credits, advanced manufacturing tax credits and public procurement. And, the federal government may want to develop ways to overcome barriers to venture capital investment raised by the lengthy innovation cycle in the life sciences.

Innovative tools for decreasing private investment risk could reap rewards, and public private partnerships may help reduce risk for vulnerable small companies.

Additionally, the recent document, "Advanced Manufacturing: A Snapshot of Priority Technical Areas Across the Federal Government" published in April 2016 by the National Science and Technology Council determined that a "foundation of priority technology areas is needed to secure U.S. competitiveness in the advanced manufacturing sector" and identifies "current priorities….and strong candidates for focused federal investment and public private partnership" as including "engineering biology to advance biomanufacturing, biomanufacturing for regenerative medicine and advanced bioproducts manufacturing."

It also proposes investing in the creation of Synthetic Biology Foundries for early stage research.

2. In what ways can the U.S. Government partner with the private sector, industry, professional organizations, and academia to ensure the training and continued development of a skilled workforce to support the growth of the Bioeconomy?

Education, especially in synthetic biology is particularly challenging owing to its multidisciplinary and the need for business and entrepreneurial skills, such as change management.

The pathway from the laboratory to the market is complex and the need for strong suitably trained scientists is a requirement. Synthetic biology companies engaged in manufacture of advanced biofuels, renewable chemicals, bioplastics, are finding the transition to full-scale production still challenging.

In addition, in the U.S. now more than ever before, there is a huge shortage of biochemical engineers, chemists, chemical engineers, manufacturing plant engineers. Education and training policy will have to evolve to meet these challenges.

There needs to be an early education in high schools and colleges about the location of biorefineries, which will be built in rural areas near the feedstocks, and jobs will thus be in these rural areas. Educators need to be provided guidelines for these rural areas. Having school projects in these remote areas early on in one's career will promote education and prepare for employment there.

The industrial biotechnology companies should strengthen their relationships through partnerships with academic institutions at all levels, and the earlier in a student's career the better, providing guidance and opportunities in the industrial biotechnology sector impacting renewable chemicals, biobased products and biofuels, its societal / environmental importance needs to be emphasized in all educational programs.

This early communication and partnership with academic institutions and industry will provide the platform for training students with the appropriate skillsets – and employing these students at the industrial sites will provide beneficial outcomes in career development.

Most chemical companies are set up to do chemical-biological processes and opening their doors for students to conduct projects at their facilities under industrial safety guidance would encourage the development of the next generation of scientists in the U.S.

The federal government labs in combination with industry and academia should develop federal funded programs for students to learn hands-on the large scale automation at production scale which is not observed at academic institutions, this would provide exposure and learnings of novel techniques at industry scale and will build and educate the workforce in the new biobased economy.

3. In what ways can the U.S. Government partner with the private sector, industry, professional organizations, and academia to establish a more robust and efficient Bioeconomy infrastructure?

The federal agencies such as National Science Foundation (NSF), Department of Energy, National Institute of Standards and Technology, Department of Defense, United States Department of Agriculture, and other significant federal agencies contributing towards the growth of the bioeconomy, **need to support and fund through grants and loan guarantee programs the scientific research and foundational technologies required to advance and to integrate the areas of feedstocks, organismal chassis and pathway development, fermentation, and processing.**

These federal agencies need to support through grant proposals, loan guarantees, and other competitive funding mechanisms: the economical and sustainable supply of feedstocks; lower the regulatory barriers to entry for renewable chemicals (chemical substances, biological proteins) for applications in food ingredients/additives, food substances, bioplastics, beauty products and personal care, ground transportation fuels and sustainable aviation fuels, and other consumer biobased products; invest in C-1 feedstocks with the increasing amounts of natural gas in the U.S.; improve the output from fermentation processes through controlled mass balance and heat transfer process improvements and determine end uses for high value byproducts; expand the microbial and cell-free platforms for biomanufacturing; develop stable strains with diverse feedstocks, develop appropriate active enzymes for catalysis, and ensuring controlled conditions for processes are reproducible.

Furthermore, to maintain momentum going forward, the private sector needs policies that are predictable and very stable.

For example, reauthorization of the Farm Bill, Energy Title IX programs, every five years ensures the growth of the biobased economy and establishing the infrastructure for biorefineries; therefore, continued robust funding of the USDA's biorefinery program is extremely important for domestic manufacturing.

The Energy Title IX's core programs create jobs and provides domestic investment opportunities that allow farmers and innovative companies to grow the rural economy, while improving the environment and making U.S. more energy independent.

Support from the Department of Defense and Department of Energy have helped drive the research and investment necessary to produce a range of different, commercially viable biofuels. These are finding significant applications in aviation (both military and civilian), and ground transportation and are increasing U.S. energy security by providing alternatives to foreign oil (imports).

Continued support for the development of the necessary aviation biofuels infrastructure is needed now, just as time and effort went towards building the ground transportation infrastructure, the aviation segment of the biofuels infrastructure needs immediate action by the federal government, and can be done through research and development activities, and better coordination between federal agencies during the policy setting, rule-making and implementation phases are much needed to ensure a joint effort and coordinated approach across the federal government.

4. Across the spectrum, from basic discovery to practical application, what data policies, information-sharing mechanisms, and safeguards will be necessary for a prosperous U.S. Bioeconomy?

The role of federal policy in creating a stable, predictable environment for research and commercial investment that has been and will continue to be critical for the continued maturation of the industries impacting the U.S biobased economy.

The development of a national framework to coordinate federal efforts to incentivize and advance the biobased economy is a requirement.

Increased coordination between federal agencies during the rule-making and implementation phases of policy-making to ensure a joined-up, synergistic approach to regulating and incentivizing the activities within the biobased economy is also a requirement.

The identification of relevant, clearly defined metrics for key performance indicators that correlate with successful growth of the biobased economy, which can inform policy makers and the allocation of resources for research, development, scale-up and market incentives needs to be created.

The collection of accurate data to measure and track these metrics in a transparent, comparable and easily accessible manner would be beneficial for the advancement of the U.S biobased economy.

The publication of an annual biobased economy indicators report by each federal agency influencing the growth of the U.S biobased economy which captures, analyzes, and presents consistent and transparent data on the biobased economy and the key performance indicators they inform will be informative on the progress U.S makes in growing the biobased economy.

Sincerely,
Rina Singh, PhD., Executive Vice President, Policy
Alternative Fuels & Chemicals Coalition