

February 3, 2014

The Honorable Max Baucus
Chairman
Committee on Finance
United States Senate
Washington, DC 20510

Re: BIO Comments on Finance Chairman's Staff Discussion Draft on Energy
Tax Reform

Dear Chairman Baucus:

On behalf of the Biotechnology Industry Organization (BIO), I hereby submit comments on the Senate Committee on Finance staff discussion draft to reform certain energy tax provisions.

BIO is the world's largest trade association representing biotechnology companies, academic institutions, state biotechnology centers and related organizations across the United States and in more than 30 other nations. BIO members are involved in the research and development of innovative healthcare, agricultural, industrial and environmental biotechnology products. BIO represents nearly 90 companies leading the development of new technologies for producing conventional and advanced biofuels, renewable chemicals, biobased products, and other solutions to energy and manufacturing challenges. Through the application of industrial biotechnology BIO members are improving conventional biofuel processes, enabling advanced and cellulosic biofuel production technologies, delivering a new generation of renewable chemicals and biobased products, and speeding development of new purpose grown energy crops.

BIO greatly appreciates Chairman Baucus' commitment to making energy tax policy more straightforward, fair and effective, and supports the Chairman's vision of focusing energy tax policy on driving innovation and achieving the nation's environmental, economic and energy security goals. The discussion draft is a well-conceived and thoughtful proposal in this direction. To achieve the reform proposal objectives, however, it is imperative that Congress first renew and extend the renewable energy tax incentives that expired December 31.

Need for Extension of Expired Provisions

The expiration December 31st of the suite of incentives for advanced biofuels has, for the second year in a row, left advanced biofuel developers in limbo as Congress debates whether to extend these important provisions retroactively. As the discussion draft recognizes in providing an extension of existing incentives as a transition to reform, reform must begin from a stable foundation. BIO strongly urges the Committee to extend expired renewable energy tax incentives without delay for the maximum achievable period to provide a solid footing for energy tax reform. BIO also urges the



committee to include in this extension package an incentive for renewable chemicals to provide parity with biofuels and biomass power.

Need for Policy Stability

BIO strongly concurs with the discussion draft's assertion that our current energy tax incentives are far less effective than they could be. As BIO and independent observers have previously testified¹, the short-term nature and repeated lapses of the current suite of advanced biofuel incentives greatly diminishes these provisions' effectiveness in stimulating investment and securing the private capital necessary to construct first-of-a-kind biorefineries.²

Effective tax policy requires stable, long-term instruments that are predictable for investors and project developers alike. In proposing to reform the current system of short-term, technology-specific incentives and replace them with stable, long-term, technology-neutral credits, the discussion draft offered by the Committee takes the right approach. With appreciation for the Committee's recognition of this fundamental principle, we offer the following specific comments on the draft.

Renewable Chemicals

The discussion draft appropriately recognizes the importance of developing renewable, low-carbon alternatives for power generation and transportation fuel. We address the transportation fuel portion of the proposal in detail in the following section. To achieve the draft's stated objectives of technology neutrality and economic, environmental and energy security, and to best ensure the economic viability of advanced biofuels into the future, the proposal could be further improved by addressing the third leg of the nation's fossil fuel dependence: chemicals and materials.

The last two decades, competitive advantage for traditional chemicals and plastics manufacturing has shifted towards the Middle East and Asia³, as has the chemical industry. U.S employment in the sector has dropped over the last decade and it's projected to further decrease as capital investment for the petroleum-based industry has shifted away from the United States. There is an opportunity to reverse this trend by replacing fossil sources for fuels and chemicals with renewable chemicals and advanced biofuel derived from biomass, which will promote investment and domestic production, and will provide an opportunity to reduce air pollutants and greenhouse gas emissions. The growth of the biobased economy can enhance national security and strengthen the U.S. economy. The economic impacts will be widespread but especially noticeable in the rural sector. Farmers and suppliers of feedstocks will earn more revenue as the demand

¹ E.g. Senate Finance Committee Hearing on Alternative Energy Tax Incentives: The Effect of Short-Term Extensions on Alternative Technology, Investment, Domestic Manufacturing, and Jobs, December 14, 2011

² ICCT, December 2013, Measuring and Addressing Investment Risk in the Second-Generation Biofuels Industry,

http://www.theicct.org/sites/default/files/publications/ICCT_AdvancedBiofuelsInvestmentRisk_Dec2013.pdf

³ <http://www.bio.org/articles/biobased-chemicals-and-products-new-driver-green-jobs>



for agricultural feedstocks intensifies. As the advanced biofuel industry continues to develop and mature, the concept of biorefineries will be emerging. It is expected that the shift toward greater use of renewable chemicals and advanced biofuels will be strongly linked to the development of biorefineries capable of producing both liquid fuels and renewable chemicals.

A production tax credit/investment tax credit option for renewable chemicals should be awarded on the basis of cradle-to-gate manufacturing process for the renewable chemical showing less process energy consumption and reduced greenhouse gas emissions (GHG) relative to its petrochemical/fossil fuel incumbent. Life cycle assessment (LCA) is the most widely used standardized method for comparing the environmental footprint of renewable chemicals versus petroleum-derived chemicals throughout the entire supply chain. This would be similar to the tax credit received by the various families of biofuels which takes into account the level of GHG required to meet eligibility. It has been shown in the literature by Weis et al.⁴ that renewable chemicals on average consumes up to 40% less energy and reduces greenhouse gas emissions by more than 40% versus petroleum based chemicals. The production tax credit/investment tax credit will promote investment and domestic production of innovative renewable chemicals, strengthen U.S. chemical manufacturing, improve trade balance, maintain U.S. leadership in clean manufacturing, create thousands of high quality U.S. jobs and reduce dependence on volatile petroleum prices.

The value created by conversion technologies from biomass into chemicals commands a higher return compared to commodity applications such as energy. Furthermore, the traditional chemical industry is very energy intensive, according to the U.S. Energy Information Administration.⁵ The largest industrial sector consumer of delivered energy is the chemical industry, which accounted for 19 percent of the global total in 2010. Energy inputs represent a large portion of the petrochemical industry's operating costs and an even higher percentage, up to 85 percent in the petrochemical subsector, which uses large amounts of energy products as feedstocks, such as liquefied petrochemical gas (LPG), naphtha, and natural gas, accounted for roughly 60 percent of the energy consumed in the chemicals sector in 2010. Federal policies that provide production incentives would help this emerging industry expand and grow throughout the country, and secure America's leadership in the important arena of green chemistry.

BIO has a proposal to integrate renewable chemicals seamlessly into the discussion draft framework to extend the proposal's objective of technology across the full range of end uses for biomass. We welcome the opportunity to share further data which demonstrates the lowering of energy and carbon footprint in renewable chemical manufacturing processes, and we are eager to work with the committee to integrate renewable chemicals into the discussion draft. In addition, rather than wait for tax reform

⁴ Special Issue: Meta-Analysis of Life Cycle Assessments; [Volume 16, Issue Supplement s1](#), pages S169–S181, April 2012

⁵ http://www.eia.gov/forecasts/ieo/ref_datasources.cfm#331



legislation, BIO recommends that any tax extenders package include an incentive for renewable chemicals that is equivalent to the incentive for biofuels.

Transportation Fuel

Renewable fuels have a vital role in the nation's economic, energy, and environmental security. Since 2000, increased use of biofuels has reduced dependence on foreign oil by 25 percent. Biofuel production has led to the employment of 380,000 Americans, and is expected to produce up to an additional 800,000 employment opportunities by 2022.⁶

Environmentally, biofuels are subject to strict lifecycle GHG reduction requirements of up to 60 percent compared to traditional petroleum-derived fuel. As a result, in 2012 biofuels slashed greenhouse gas emissions by 33.4 million metric tons.⁷ EPA has estimated that renewable fuels use will reduce greenhouse gas emissions by 138 million metric tons per by 2022.⁸ The reduction would be equivalent to taking about 27 million vehicles off the road.

To realize this potential, advanced biofuels developers must secure the private capital needed to build first-of-a-kind commercial-scale biorefineries. Thanks in large part to the complementary policy mix of tax incentives and the Renewable Fuel Standard (RFS), advanced biofuel developers have invested more than \$5.79 billion in private capital here in the United States.⁹ Twenty-eight states now have at least one biorefinery planned or under development. This includes five cellulosic biofuel facilities projected to produce commercial gallons of cellulosic biofuels in 2014.

But this important progress represents only a small fraction of the development needed to meet the nation's goal of 36 billion gallons of biofuels in 2022. To meet this ambitious goal, an estimated 400 advanced biofuel facilities will be needed at a cumulative investment of \$95 billion.¹⁰

Advanced biofuel tax credits are necessary and useful policy instruments that work in tandem with the RFS to drive investment in commercialization and market growth of these promising technologies. They are especially important now that advanced biofuel producers have reason to doubt the future of the RFS under the recently proposed 2014 EPA rule.

⁶ Bio Economic research Associates, "U.S. Economic Impact of Advanced Biofuels Production: Perspectives to 2030." Washington, DC: February 2009

⁷ Renewable Fuels Association, "Battling for the Barrel: 2013 Ethanol Industry Outlook." Washington, DC: February 2013, p.18.

⁸ US EPA, "Renewable Fuel Standard Program (RFS2) Regulatory Impact Analysis." Washington, DC: EPA-420-R-10-006, February 2010.

⁹ *The Renewable Fuel Standard, Timeline of a Successful Policy*, Biotechnology Industry Organization, Jun. 29, 2012, available at: <http://www.bio.org/articles/renewable-fuel-standard-timeline-successful-policy>

¹⁰ Bio Economic research Associates, "U.S. Economic Impact of Advanced Biofuels Production: Perspectives to 2030." Washington, DC: February 2009



The oil industry has received preferential tax treatment for exploration, drilling and other production activities for many decades. In 2014, U.S. subsidies are expected to total \$3.9 billion, according to the White House's budget request for the year. Tax credits for renewable fuels help provide cost competitiveness with conventional fuels as the renewable fuel industry grows to achieve economies of scale. Advanced biofuel developers have reached a critical stage in their efforts to commercialize new fuels. They've made great strides in developing first-of-a-kind technologies and in reducing the costs of production. They have achieved technology milestones even while facing the challenge of raising capital in the wake of a severe economic downturn. Tax credits will continue to help drive private investment into these new technologies, ensuring that these technologies quickly reach cost-competitive status.

From a global perspective, the United States must compete with other nations in offering investment incentives if it wants U.S. companies to continue developing these home grown technologies here in the United States. The European Union, Canada, Brazil, China and Japan all have highly competitive tax incentives for biofuels and in fact are attracting construction of new facilities – and associated jobs.

The discussion draft takes the right approach in establishing stable, long-term, technology-neutral incentives for renewable fuels that reward environmental performance. The current hodgepodge of biofuels tax incentives has failed to keep pace with rapidly evolving improvements in feedstocks, conversion technologies, and end fuels. The proposal to make credits available to any transportation fuel meeting the program's eligibility criteria will help address many of the inequities in the current regime and allow for development of new fuels and technologies that may not yet be anticipated.

PTC/ITC Option

BIO strongly supports the proposed option to elect either a production tax credit (PTC) or investment tax credit (ITC). The PTC/ITC election has been demonstrated to be highly effective for other renewable energy technologies, and offers the greatest potential to support the widest possible array of technologies and business models. For many advanced biofuel developers, capital formation is the key challenge. For many of these developers, an ITC is the most effective mechanism to leverage private capital investment in first-of-a-kind facilities. For other developers, a PTC will help new technologies move from first-of-a-kind production to rapid market growth, which is key to meeting the nation's goal of 36 billion gallons of renewable fuel by 2022.

Environmental Assessment

BIO supports the draft's proposal to reward environmental performance, including improvements over threshold RFS requirements. Many biofuel technologies today already achieve substantial GHG reductions beyond their RFS category requirement. Rewarding additional reductions will continue to drive investment in improved feedstocks, conversion technologies and fuels. However, the proposed methodology for determining environmental performance does raise some concerns that should be addressed in future iterations of the proposal:



1. Given industry's experience to date with EPA assessment of lifecycle GHG emissions for renewable fuel, BIO is concerned that the proposal's requirement that EPA assess each fuel's lifecycle carbon intensity could lead to substantial delays and uncertainty for project developers. Among the six cellulosic biofuel pathways that have been approved by EPA for the RFS, the average wait time for pathway evaluation was more than two years. At least two companies (BP Biofuels and Terrabon, Inc.) discontinued plans for commercial cellulosic projects while awaiting EPA rulemaking. BIO recommends that environmental performance be based to the maximum extent on existing EPA assessments for the RFS, and, critically, that determinations be made directly by the IRS, in consultation with EPA, and not through rulemaking.
2. Given the substantial uncertainty in lifecycle GHG estimation for renewable fuels, including broad disagreement in the scientific community on the nature and magnitude of indirect emissions, monetizing environmental performance to the level of precision indicated in Table 2 of the JCT explanation is probably not justified. BIO encourages the Committee to only differentiate environmental performance to the degree justified by the uncertainty in the methodology. Indeed, EPA in its pathway assessments to date, has been careful to avoid providing highly specified values for lifecycle GHG performance, and have focused instead on threshold questions of eligibility for specified RFS categories.

Energy Efficiency

In addition, BIO encourages the Committee to carefully consider the appropriateness of using energy density alone as the metric for energy efficiency. The actual amount of mechanical work obtained from a given fuel depends not only on the energy density of the fuel, but on the thermal efficiency of the engine. High compression engines enabled by mid- to high-level biofuel blends are significantly more efficient than standard gasoline internal combustion engines, for example. The Committee should consult with the Department of Energy and other appropriate sources to determine an energy efficiency metric that reflects the actual amount of mechanical work available from a given fuel-engine combination.

Energy Security

In comparing the ITC rates available to renewable electricity relative to transportation fuels, BIO has significant concerns that the substantially higher rates available to electricity projects will put transportation fuel projects at a significant and potentially inhibiting disadvantage in competing for limited private capital for renewable energy projects. This discrepancy arises, at least in part, from the proposal's singular focus on environmental performance. To more fully capture the societal benefits of various alternative energy sources, BIO suggests that the Committee also consider applying an energy security factor to the rate calculation. Such a factor could be based on the percentage of imported fuel for the sector. Such an approach would provide greater equivalency to electricity and transportation fuel rates, and better reflect the vital role renewable transportation fuels play in addressing our dependence on foreign oil



Sunsetting

For any tax incentive to be effective in leveraging private capital, it must provide certainty to investors and project developers alike. To be sure of a return on investment, investors must have confidence that a given credit will be available – upon completion of construction in the case of an ITC, and during the operating lifetime of the project in the case of a PTC. In providing for a 10-year stream of credits under the PTC, the discussion draft proposal provides substantially increased certainty to fuel project developers relative to the current code. BIO supports this proposal. BIO also strongly supports the option to elect an ITC, as discussed previously.

The discussion draft proposal to sunset the credits once the transportation fuel mix achieves a 25 percent reduction in emissions relative to conventional gasoline is a sensible approach. BIO supports targeting incentives to new technologies, especially those entering markets dominated by well-established incumbents. The time horizon in the proposal should be sufficient to allow oil alternatives to make substantial inroads in the transportation fuel market. In the near-term, this threshold should provide project developers with certainty that the credits will be available to any qualifying project for several years to come. However, the large number of variables underlying the calculation of the 25 percent reduction could introduce significant uncertainty for investors as the threshold approaches. BIO encourages the Committee to seek the maximum possible degree of predictability in selecting criteria for sunsetting.

BIO also believes that continued investment in new feedstocks, conversion technologies and fuels will remain important beyond the 25 percent reduction time horizon. The Committee should strongly consider identifying mechanisms to incent such additional investment.

Transition

BIO supports the well-conceived transition proposal in the discussion draft. It is vital that existing incentives for advanced biofuels be maintained until energy tax reform takes effect.

Eligible Fuels

BIO supports the broad definition of “transportation fuel” articulated in the proposal, but would urge the Committee to consider adding marine vessels to the list of eligible uses. A growing number of shipping and other marine vessel operators are exploring renewable fuels. The tax code should encourage biofuel use in the sector, especially given the significant contribution of marine transportation to emissions of GHGs and other pollutants. BIO also encourages the Committee to examine methods to incentivize use of renewable fuels in non-transportation settings, such as home heating oil.



Early-stage Developers

In addition to the previously indicated recommendations, BIO also urges the Committee to seek ways to ensure that the tax code supports the innovative, early-stage companies who are bringing these pioneering technologies to market. Many biotech companies operate without product revenue to fund their scientific and commercial progress, which means they have little or no taxable income in early years. Congress should bear in mind the needs of these pre-revenue innovators, which depend almost entirely on external capital to fund first-of-a-kind biorefineries, by providing targeted provisions that support innovative companies early in their life cycle.

Conclusion

In conclusion, I wish to reiterate BIO's appreciation for the Chairman's commitment to making energy tax policy more straightforward, fair and effective. We ask that you work quickly to establish a solid foundation for reform by extending expired renewable energy tax incentives through at least December 31, 2015. We then ask that you build on the strength of your initial draft by integrating BIO's concerns and recommendations into the next iteration of the proposal, both through the inclusion of incentives for renewable chemicals and through modest changes to the transportation fuel concept. We are eager to work with you and your staff to bring greater predictability, efficiency, and effectiveness to the code.

Sincerely,

A handwritten signature in black ink that reads "Jim Greenwood". The signature is fluid and cursive, with a large loop at the beginning of the word "Jim".

James C. Greenwood
President & CEO
Biotechnology Industry Organization