Submitter's Name/Affiliation: **Biotechnology Industry Organization**
Contact: **Sarah Thornton**
Email: **sthornton@bio.org**
Phone: **202-280-1635**

The Biotechnology Industry Organization ("BIO") is pleased to submit responses to question numbers 1, 2, 4, 5 and 6 of the Senate Energy and Natural Resources Committee's March 21, 2011 Clean Energy Standard ("CES") White Paper. The following are brief summaries of BIO's responses to these questions.

Question One - What should be the threshold for inclusion in the new program? Whatever threshold is established to determine which utilities are subject to a CES, BIO believes it is vital that small clean energy producers have access and opportunity to generate renewable electricity credits, both for clean energy provided to the grid and for clean energy generated and utilized on site.

Question Two - What resources should qualify as "clean energy"? BIO believes that power derived from biomass should qualify as "clean energy," and therefore qualify to generate renewable energy credits under a federal clean energy standard mandate. Biomass power provisions under a CES should be consistent and complementary to other federal programs—particularly the federal Renewable Fuel Standard ("RFS"), 2008 Farm Bill and Biomass Crop Assistance Program ("BCAP")—in terms of definitions, eligibility, and performance characteristics of biomass feedstocks. A federal CES should also be designed to encourage and incentivize industrial energy efficiency, including from industrial biotechnologies, as well as the development and use of "bioenergy buffers."

Question Four - How will a CES affect the deployment of specific technologies? If implemented appropriately, a federal CES could support and accelerate the deployment of highly desirable and efficient integrated biorefineries, and hasten commercialization of a new generation of advanced biofuels and renewable chemicals.

Question Five - How should Alternative Compliance Payments, regional costs, and consumer protection be addressed? BIO and its Members support the development of a federal CES that provides opportunity for flexibility in compliance and which also provides incentive for investment in the development and commercialization of "clean energy" sources, including biomass power.

Question Six - Are there policies that should be considered to complement a CES? A federal CES mandate should complement and not interfere with the existing federal policies, including the RFS and BCAP programs.

BIO is the world's largest biotechnology organization, with more than 1,100 member companies worldwide. BIO represents leading technology companies in the production of conventional and advanced biofuels and other sustainable solutions to energy and climate change. BIO also represents the leaders in developing new crop technologies for food, feed, fiber, and fuel.

Question 1. What should be the threshold for inclusion in the new program?
Submitter's Name/Affiliation: **Biotechnology Industry Organization (BIO)**

Whatever threshold is established to determine which utilities are subject to a CES, BIO believes it is vital that small clean energy producers have access and opportunity to generate renewable electricity credits, both for clean energy provided to the grid and for clean energy generated and utilized on site.

BIO member companies are poised to deploy a new generation of integrated biorefineries, producing fuels, chemicals and power from a variety of biomass feedstocks. These integrated biorefineries will maximize the economic and environmental value of renewable biomass. Renewable electricity generated at these facilities should be eligible for clean energy credits – whether the power is utilized onsite or returned to the grid – and should be considered for bonus credits in recognition of the highly efficient use of renewable resources at such facilities and to drive further investment in integrated biorefineries.

Question 2. What resources should qualify as "clean energy"?
Submitter's Name/Affiliation: **Biotechnology Industry Organization (BIO)**

- *On what basis should qualifying "clean energy" resources be defined? Should the definition of "clean energy" account only for the greenhouse gas emissions of electric generation, or should other environmental issues be accounted for (e.g. particulate matter from biomass combustion, spent fuel from nuclear power, or land use changes for solar panels or wind, etc.)?*

BIO believes that power derived from biomass should qualify as "clean energy," and therefore qualify to generate renewable energy credits ("REC") under a federal clean energy standard ("CES") mandate. Biomass power provisions under a CES should be consistent and complementary to other federal programs, particularly the federal Renewable Fuel Standard, Farm Bill and Biomass Crop Assistance Program, in terms of definitions, eligibility, and performance characteristics of biomass feedstocks.

BIO believes that biomass power should be defined pursuant to the comprehensive definition of "renewable biomass" under Section 9001(12) of the Food, Conservation, and Energy Act of 2008 (the "2008 Farm Bill"). This federal program consistency and interoperability will ensure a level playing field across all end uses of biomass, and will help the development of the most plentiful and efficient power as a result.

Question 2. What resources should qualify as "clean energy"?
Submitter's Name/Affiliation: **Biotechnology Industry Organization (BIO)**

- *What is the role for energy efficiency in the standard? If energy efficiency qualifies, should it be limited to the supply side, the demand side, or both? How should measurement and verification issues be handled?*

A federal CES should also be designed to encourage and incentivize industrial energy efficiency. Industrial biotechnologies in use and development today can greatly reduce the energy intensity of a wide variety of manufacturing processes. Adoption of such technologies should be incentivized under a CES. Other industrial efficiency measures, such as combined heat and power systems should also be rewarded. Integrated biorefineries that use such technologies and processes that help them reduce or avoid greenhouse gas emissions, or lessen their need for and use of energy from the grid should qualify for bonus credits under a federal CES. Integrated biorefineries that use energy efficient technology and processes that enable them to put power onto the grid should similarly qualify to generate bonus credits, as should application of carbon capture and beneficial re-use technologies, including biological carbon sequestration or the production of enduring biorenewable materials. Other industrial biotechnologies, such as the use of industrial enzymes for lower water temperature, should also qualify for bonus energy efficiency credits. This bonus availability will provide a beneficial incentive to integrated biorefineries to utilize the most energy- and carbon-efficient processes possible, thereby helping to make more clean energy available to meet President Obama's goal.

Question 2. What resources should qualify as "clean energy"?
Submitter's Name/Affiliation: **Biotechnology Industry Organization (BIO)**

- *Should the standard be focused solely on electricity generation, or is there a role for other clean energy technologies that could displace electricity, such as biomass-to-thermal energy?*

A federal CES should also encourage and incentivize the development and use of "bioenergy buffers." Bioenergy buffers refer to certain bioenergy crops that are planted and grow on cropland and marginal pastureland in areas of fragmented native grassland, forest and woodland habitats. Bioenergy buffer producers and managers should qualify to generate bonus credits because bioenergy buffers serve multiple environmental purposes at once. Among other benefits, bioenergy buffers: (1) help reduce runoff of water, sediment, nutrients, and crop chemicals; (2) provide potential habitats for beneficial wildlife; (3) provide interconnected corridors for migration; (4) help protect endangered species; and, (5) serve as barriers to crop chemical drift.

Question 4. How will a CES affect the deployment of specific technologies?
Submitter's Name/Affiliation: **Biotechnology Industry Organization (BIO)**

If implemented appropriately, a federal CES could support and accelerate the deployment of highly desirable and efficient integrated biorefineries, and hasten commercialization of a new generation of advanced biofuels and renewable chemicals.

In incentivizing biomass power, a federal CES will help to more quickly establish necessary infrastructure to produce, collect and deliver biomass. The absence of such infrastructure is one of the leading challenges facing biorefinery developers today. Given the relatively low technological hurdle of renewable energy from biomass, BIO believes that the federal government should incentivize and finance the establishment of new supply chains at scale for closed loop biomass systems that the advanced biofuels producers can subsequently tap into for future commercial projects.

As biomass power develops, there could potentially be greater competition for feedstocks for biofuels and renewable chemicals production. For this reason, a federal CES mandate must compliment the already existing federal Renewable Fuel Standard ("RFS") and be developed in a way that ensures a level playing field among various uses of biomass, including making the definition of biomass under the CES consistent with the comprehensive definition of "renewable biomass" under Section 9001(12) of the Food, Conservation, and Energy Act of 2008 (the "2008 Farm Bill").

BIO and its Members would welcome the opportunity to answer any questions and provide any input necessary to ensure that a federal CES provides for this level playing field.

Question 5. How should Alternative Compliance Payments, regional costs, and consumer protection be addressed?
Submitter's Name/Affiliation: **Biotechnology Industry Organization (BIO)**

BIO and its Members support the development of a federal CES that provides opportunity for flexibility in compliance and which also provides incentive for investment in the development and commercialization of "clean energy" sources, including biomass power. BIO believes key considerations for compliance mechanisms, such as ACPs, should include:

- Requirements should be clear, consistent and firm;
- Mechanisms should be properly constructed to allow flexibility while not inadvertently creating disincentives for investment in new technologies;
- Mechanisms should be market-based and performance-based; and,
- New mechanisms should, as much as possible, ensure consistency with other existing national and regional systems.

BIO welcomes the opportunity to work with Committee Members and staff to address Alternative Compliance Payments under a federal CES to achieve this end.

Question 6. Are there policies that should be considered to complement a CES?
Submitter's Name/Affiliation: **Biotechnology Industry Organization (BIO)**

- *Are there specific supporting policy options that should be considered for coal, nuclear, natural gas, renewable energy, and efficiency?*

A federal CES mandate should complement and not interfere with the existing federal renewable fuel standard ("RFS"), which is similarly designed to increase the development and use of certain sources of "clean energy." The CES should make bonus credits available to entities that co-locate biomass power facilities next to biofuels facilities. Such co-location will help achieve mandates under both the RFS and CES, thus further helping to reduce greenhouse gas emissions and increase available U.S. sources of "clean energy."

In addition, the CES should be designed to complement and reinforce the objectives of the Biomass Crop Assistance Program in accelerating grower adoption of purpose-grown energy crops. A CES that includes biomass should not be seen as a replacement to BCAP. BCAP not only serves an important function in terms of increasing the availability of crops that can be used for biomass, but it is necessary to ensure a successful biomass component of a federal CES.

It is important to note that combustion of fossil fuels permanently and irreversibly leads to increased concentrations of carbon dioxide ("CO_2") in the atmosphere. Biomass power and other biogenic energy sources that may qualify as renewable energy sources under the CES recycle CO_2 emissions through renewable biomass feedstocks. If sustainably sourced, such combustion, whether in power plants or in automobiles and trucks, does not result in lasting increases in CO_2 concentrations in the atmosphere, and thus, should be consistently treated as carbon neutral.

Several federal and state regulatory regimes recognize this distinction with respect to biomass used in electricity generation, and it should be the rule for biomass used in liquid biofuels as well. Biomass should be treated consistently across all end uses.