

April 11, 2011

Energy and Natural Resources Committee
304 Dirksen Senate Building
Washington, DC 20510

RE: Comments from the Biomass Thermal Energy Council on the Committee's Clean Energy Standard White Paper Solicitation

Executive Summary

The Biomass Thermal Energy Council (BTEC) appreciates the opportunity to comment on the Senate Energy and Natural Resources Committee's Clean Energy Standard White Paper. BTEC commends Senators Bingaman and Murkowski for again demonstrating their leadership to advance clean renewable energy policy.

BTEC is committed to advancing the use of biomass for highly efficient heating, cooling, and combined heat and power applications. Through utilizing one of America's most abundant renewable resources—biomass—businesses, homeowners, and public facilities can significantly displace fossil fuel-based sources of thermal energy. The Energy Information Administration has reported that roughly *one-third of U.S. energy consumption* is used in thermal applications, such as industrial process heat and residential/commercial space heating. A successful Clean Energy Standard (CES) should not limit its scope to electrical sources only, for doing so overlooks the tremendous opportunity to reduce overall emissions and boost economy-wide growth and technological innovation, and creates unintended technology biases and market distortions by incentivizing one energy pathway while overlooking other equally important pathways. Biomass thermal fuels and technologies can help reach a technology and fuel neutral CES of 80% by 2035, a goal outlined by the President during the State of the Union and welcomed by BTEC.

To support the most efficient use and deployment of clean energy technologies within a potential CES, BTEC is providing the following recommendations. These provisions outline the role and importance of thermal energy in a CES, the associated crediting system for thermal energy, and other policy factors that would either bolster or inhibit clean thermal energy use.

BTEC's CES comments include the following recommendations:

- Energy sources should be eligible as "clean" based upon their generation and contribution of new greenhouse gas emissions;
- A meaningful CES must recognize the role of thermal energy—specifically from biomass—in meeting clean energy demand, with credits distributed upon a kWh-to-Btu conversion;
- CES credits should be awarded to energy generators that produce GHG emissions-free electricity or useful thermal energy, with a credit multiplier tied to increases in system efficiency;
- An effective CES should be structured to advance existing clean energy generation, not simply new clean energy generation;
- Achieving a scaling up of biomass thermal projects may require grant and technical assistance to gain market penetration and remove interconnection impediments;
- Supportive federal policies such as a revised Renewable Fuels Standard, inclusive biomass definition, and practical, science-based emissions regulations will aid in the deployment of biomass clean energy technologies.

Question 2: 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.).

Response: Energy sources should be eligible as “clean” based upon their generation and contribution of new greenhouse gas emissions. Biomass thermal fuels, whether from forest or agricultural sources—can be deemed clean sources of energy as they represent biogenic emissions and as long as these resources are managed sustainably do not contribute net carbon emissions into the atmosphere. State, federal, and international authorities have historically recognized the low net carbon impact of biomass energy conversion.

BTEC supports the cleanest burning and most efficient biomass thermal applications. While it is true that the combustion of solid fuels does create particulate emissions, effective pollution control technologies have been pioneered in Europe and are already in use in the US. BTEC continues to support realistic limits of carbon and particulate emissions and works closely with industry stakeholders to encourage achievable emissions limits with state and federal authorities. However, when operating within these guidelines, non-greenhouse gas emissions resulting from biomass energy use ought not to disqualify an energy source from “clean energy” eligibility. Existing emissions limits for particulates and hazardous air pollutants are already in place. A CES should focus on promoting clean energy sources and not attempt to replace existing regulations.

Question 2 cont’d: 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?

Response: If a CES is to provide meaningful progress towards a cleaner, stronger domestic energy base, it must address thermal energy—particularly from biomass. Thermal energy represents roughly one-third of total U.S. energy consumption. It is used daily by homes, businesses and industrial facilities across the country, most frequently for space heating, water heating or industrial processes. A CES that does not include provisions for renewable thermal energy will miss out on the enormous opportunities in this sector.

Biomass thermal energy is an efficient, low-cost source of renewable energy for these heating needs. The use of biomass for heating achieves many of the goals outlined for a CES. It offsets imported fossil fuels, creates jobs, stimulates rural economies and promotes the sustainable use of our natural resources.

To date, government support for biomass-based electricity generation and transportation fuels has had the effect of steering biomass resources away from heating, their most efficient end-use. Despite best intentions, U.S. energy policy as it relates to biomass has stunted the growth of the biomass heating market and diverted resources to end-uses that return less useful energy per input. A CES should address this critical oversight.

A Clean Energy Standard should focus on solutions that: (1) secure energy independence; (2) reduce fossil fuel consumption; (3) spur domestic job creation; and (4) stimulate local economies. Our recommendation to include thermal energy as part of a Clean Energy Standard is grounded in the fact that renewable thermal energy—particularly from biomass—achieves all four of these objectives.

Put simply, renewable thermal energy should be on equal footing with electricity in a Clean Energy Standard. There is precedent both internationally and here in the U.S. of policies that encourage the adoption of renewable thermal energy technologies. In the United Kingdom, the Renewable Heat Incentive aims to help the country meet its 15% renewable energy target by providing feed-in tariff payments to homeowners and industry for useful heat production.¹ Stateside, recent Senate proposals have incorporated thermal energy production in renewable and

¹ Renewable Heat Incentive Scheme, Department of Energy and Climate Change, United Kingdom, March 2011, http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/renewable/policy/incentive/incentive.aspx

clean energy mandates. And, from a scientific perspective, one of the simplest and most effective ways to reduce reliance on fossil fuel energy sources is through the substitution of biomass for process heat, thereby optimizing both carbon emissions reductions and the need for oil imports.²

BTEC's recommendation is not a special request, preference, or carve-out for thermal energy within a CES. Rather, BTEC encourages the committee to consider that the incentives provided to other clean and renewable energy solutions be equally afforded to renewable thermal energy. By putting thermal energy on level ground with other end-uses, a CES will ensure that decisions about how to utilize resources like biomass will be made based on energy output. Failing to do so can have perverse and damaging side-effects, such as the diversion of biomass resources to less efficient--but incentivized--end-uses. The U.S. should aim for a CES that maximizes the energy returns on investment. Below are two possible policy approaches that would encourage the most efficient production of clean energy.

Btu to kWh Conversion for Clean Energy Credits

Thermal energy could be integrated into a CES by creating a kilowatt-hour (kWh) conversion factor for British thermal units (Btu), the typical unit of measurement for thermal energy. One kWh of electricity is equivalent to 3,412 BTUs. With such a conversion factor in a CES, incentives targeted at increasing clean energy could simultaneously address both electric and thermal production. For example, a facility generating 10 MWh of clean electricity would be eligible for the same distribution of credits as a thermal facility generating 34,120,000 Btu/hr (or 34.12 MMBtu/hr). Similarly, a biomass-fueled CHP facility that creates 10 MWh of electricity *and* 34.12MMBtu/hr would be eligible for the same credit allotment as a 20 MWh clean electricity generator.

Telescoping Clean Energy Credit based on Efficiency

With regard to co-generation applications, appropriate legislation has been introduced, as recently as the 111th Congress. Both S. 20 and S. 1462 incorporated telescoping thermal credits for heat produced from renewable sources like biomass in combined heat and power (CHP) applications. Credit for thermal output—aside from displacing fossil fuel heat sources—incentivizes more efficient uses of biomass resources through processes like CHP.

The thermal credit provisions in past legislation have increased in value with improvements in efficiency, whereby systems that maximize the greatest use of resources receive a credit multiplier as seen below:

“[The appropriate authority will] issue clean energy credits for the useful electric and thermal output from a facility that produces the output from biomass, using a system under which--
`(i) in the case of efficiency that is less than 50 percent, 1 clean energy credit is awarded;
`(ii) in the case of efficiency that is 50 percent or more but less than 70 percent, 1.1 clean energy credits are awarded for the same unit output;
`(iii) in the case of efficiency that is 70 percent or more but less than 90 percent, 1.25 clean energy credits are awarded for the same unit output; and
`(iv) in the case of efficiency that is 90 percent or more, 1.5 clean energy credits are awarded for the same unit output.”³

An assessment of the generator's system efficiency could then add a multiplier (as discussed above) to the credit award, thus incentivizing the cleanest, most efficient energy generation, whether they be electricity, thermal energy, or both. The ease and transparent conversion of electrical and thermal energy to CES credits would permit regulated entities to meet compliance through the acquisition of credits generated from biomass thermal energy. And—given their superior system efficiencies—thermal producers would have a clear, competitive, but fair advantage over other clean energy producers.

² T. Buchholz, et al, *Forest Biomass and Bioenergy: Opportunities and Constraints in the Northeastern United States*, Cary Institute of Ecosystem Studies, 17 Feb. 2011, pg. 41, http://www.caryinstitute.org/report_biomass_2011.pdf

³ S. 20, The Clean Energy Standard Act of 2010, 111th Congress, <http://thomas.gov/cgi-bin/query/z?c111:S.20>:

Question 3: Should partial credits be given for certain technologies, like efficient natural gas and clean coal, as the President has proposed? If partial credits are used, on what basis should the percentage of credit be awarded? Should this be made modifiable over the life of the program?

Response: A CES should award full credits to energy generators that produce GHG emissions-free electricity or useful thermal energy. Partial credit could be awarded to sources that release decreased levels of emissions, with the credit weighted in a manner that does not discourage the adoption of genuinely GHG emissions-free sources, like biomass thermal energy applications.

A telescoping thermal credit tied to increases in system efficiency would encourage the cleanest and most efficient use of biomass fuel resources. As noted in previous response to Question 2, integrating thermal energy into a CES is practical, as it is based on the conversion of British Thermal Units (Btu's) to kilowatt-hours (kWh). One kWh of electricity contains approximately 3,412 BTU's (a similar conversion exists for steam generation); therefore a facility generating 10 MWh of clean electricity would be eligible for the same distribution of credits as a thermal facility generating 34,120,000 Btu/hr (or 34.12 MMBtu/hr). This basic credit assessment could then be increased by a multiplier based on the generator's overall efficiency.

Question 3, cont'd: What are the tradeoffs between crediting all existing clean technologies versus only allowing new and incremental upgrades to qualify for credits? Is one methodology preferable to the other?

Response: Determining whether to recognize new or existing clean energy technologies involves a careful calculation of either's impact on the deployment of new and current clean energy sources. While including all existing clean energy sources in a CES mandate may drive down the price of compliance (associated non-compliance payment), preference for only 'new' clean energy sources may unnecessarily disqualify the nation's strong network of clean energy generators, thermal specifically.

Biomass thermal energy applications—although not as widely adopted domestically compared to Europe—are mature and proven technologies that have played vital roles in powering American industry. An effective CES should be structured to advance clean energy generation, not simply 'new' clean energy generation. According to government estimates, there are over 500 biomass-fueled CHP plants and over 11,400 commercial/industrial biomass boilers in the nation.⁴ Excluding these sources from CES credits is simply inefficient policy; it disregards the billions invested in capital and maintenance costs, prolongs the deployment of clean energy sources, and requires the government to determine a somewhat arbitrary threshold for 'new' generation.

Conversely, BTEC is cognizant of the possible impact of allowing all existing clean energy sources to qualify for credits, which could have the effect of diluting credit value and weakening the incentive to build generation beyond today's capacity. This issue could be solved through increasing the CES mandate to a supply/demand tension that balances the needs of existing sources and incentivizes new sources. Again the policy emphasis is on the promotion of clean energy generation from electrical and thermal sources irrespective of vintage. Existing generators of electrical and thermal energy should not be punished for adopting clean energy pathways prior to Congressional action.

Question 5: Are there any technological impediments to the addition of significantly increased renewable electricity generation into the electrical grid?

⁴ For information regarding CHP: Energy and Environmental Analysis Inc./ICF. 2010. CHP Database. Available at <http://www.eea-inc.com/chpdata/index.html>. The EPA's estimate of Area and Major Source biomass boilers can be found in 75 FR 32010-32023.

Response: As noted previously in BTEC's response to Question 2, thermal energy should be incorporated into the CES discussion. While renewable electricity sources may experience grid intermittency issues, connecting base-load producers of useful thermal energy to end users can encounter unique transmission difficulties, too. Biomass thermal applications boast superior system efficiencies as compared to stand-alone biopower and liquid biofuels generation. However, scaling up biomass thermal projects to meet large scale demands, like district heating systems, requires grant and technical assistance due to the very high capital cost and a current lack of market penetration. Support for district heating infrastructure, like those provisions in S. 3626 (TREEA, 111th Congress), would hasten the deployment of biomass thermal facilities and displacement of fossil-fuel fired facilities.

Question 6: Are there specific supporting policy options that should be considered for coal, nuclear, natural gas, renewable energy, and efficiency?

Response: There are several supportive federal policies and programs that would supplement the goals of an effective CES and increase the successful implementation of biomass thermal fuels and technologies within such as standard. These options would include revising the federal definition biomass, addressing the regulation of biogenic emissions, and amending the Renewable Fuels Standard to recognize and incentivize switching from fossil fuels to renewables.

Inclusive Federal Definition of Biomass

Incorporating clean energy sources (both for electrical and thermal energy) within a CES necessitates that fuel and feedstock regulations be optimized to meet escalating policy goals. Biomass thermal applications of all sizes are dependant on a reliable source of feedstocks. However, competing federal definitions of eligible biomass resources complicates fuel procurement, distorts energy markets, and impedes policy initiatives. A CES biomass fuel provision should strive for a universal and inclusive definition that would promote flexibility in biomass markets without undue market distortions, drive economic development, and encourage forest health and restoration (on both private and federal lands). The biomass definition in the 2008 Farm Bill provides a constructive definition.

Regulation of Biogenic Emissions

The regulation of biogenic emissions should also be addressed if a CES is to fully back the deployment of clean energy technologies. Although the Environmental Protection Agency (EPA) has initiated a three-year deferral of permitting for large stationary biogenic sources, biomass thermal project developers still face regulatory uncertainty. The enactment of a CES ought to resolve the regulation of biogenic sources by qualifying biomass thermal technology as "clean energy" eligible. Additionally, emissions regulations for biomass boiler units should reflect real world operating capabilities and current science as to ensure that biomass technologies are not prevented from helping businesses and utilities meet their compliance requirements.

Revision of Renewable Fuels Standard

BTEC also asks the committee to consider amending the Energy Independence and Security Act of 2007 to establish clear authority for the EPA to amend rules implementing the Renewable Fuel Standard 2 so that solid biomass fuels receive Renewable Identification Number (RIN) credit for displacement of heating oil. This simple revision will help our nation meet the ambitious goals of the RFS2, which currently are restricted to displacement of transportation fuels and entirely overlook heating fuels (even though diesel fuel and #2 heating oil are functionally equivalent). We would welcome the opportunity to work with the committee to develop this concept further.