The State of New Hampshire
Department of Environmental Services
Thomas S. Burack, Commissioner

Celebrating 25 years of protecting
New Hampshire's environment.

April 5, 2012

The Honorable James Garrity, Chairman
House Science, Technology, and Energy Committee
Legislative Office Building, Room 304
Concord, NH 03301

Re: SB 218-FN Relative to Renewable Energy Portfolio Standards

Dear Chairman Garrity and Members of the Committee:

The Department of Environmental Services (DES) appreciates the opportunity to comment on SB 218, relative to renewable energy portfolio standards. This bill seeks to revise New Hampshire's renewable portfolio standard (RPS, codified in RSA 362-F *Electric Renewable Portfolio Standard*). In this letter DES provides background information on some of the environmental and economic implications associated with the adoption of several policy revisions embodied in this bill.

New Hampshire is one of twenty-six states to have an RPS. New Hampshire's RPS, adopted in 2007 (House Bill 873, *An Act establishing minimum renewable standards for energy portfolios*), was the result of a thorough and deliberate two year stakeholder effort involving the state's business interests, environmental organizations, utilities, renewable electricity suppliers and developers, and other energy interests. As the discussions proceeded and in the interest of the greater good, nearly every interest involved put aside specific issues and came to support the legislation without seeking to add their particular interest provisions. This widespread support was reflected in bipartisan support in the General Court, including a vote of 253 to 37 in the House of Representatives and a unanimous 24-0 vote in the Senate.

In support of the 2007 legislation, the University of New Hampshire's Whittemore School of Business and Economics conducted an analysis (the UNH study) of the impact of an RPS on New Hampshire ratepayers and the economy. The UNH study concluded that although there would be modest costs incurred in the short term, overall there would be a net positive economic and environmental benefit. The New Hampshire RPS would also provide a hedge against energy price volatility, help diversify the State's power generation, reduce dependency on imported sources of fuel, increase the potential for new renewable energy development within the State, and help facilitate the efficient use of existing renewable energy resources. The UNH study forecast the creation of 1,100 new full-time jobs and the generation of $1 million in state revenue annually in 2025. The UNH model demonstrated that New Hampshire ratepayers would likely see less than a 2% per year

(ranging from 0.5% in 2008 to 1.2% in 2025) increase in rates, or $0.33 to $1.24 per month per household over the same time period. This projection did not account for any potential reduction in regional energy prices as a result of reduced demand (and modulation of price volatility) due to the development of local renewable energy resources.

Implementation of an RPS was and is good energy policy, as it makes sense both economically and environmentally. Renewable resources reduce emissions of numerous forms of air pollution, including particulate matter and sulfur dioxide. An RPS also expands energy sources, creates new energy technology jobs, improves economic development, and creates incentives for renewable energy infrastructure investment, thus helping to promote investment in development of new renewable energy facilities in New Hampshire. The enactment of the RPS in 2007 began the process of creating a long term energy "insurance policy" for New Hampshire energy ratepayers.

Particulate matter (PM) emissions are of growing concern to DES. Emissions from wood stoves in the southwestern portion of the state have contributed to poor air quality, resulting in public alerts being issued by DES. If current trends continue in the coming years, DES will be required to implement a plan to reduce PM emissions to comply with federal standards, and controlling PM emissions from wood-fired power plants may be part of that plan. The bill proposes to amend the definition of "eligible biomass technologies" by providing DES with the authority to approve an alternative to the 0.02 lbs/mmBtu emissions rate specified in the current statute. Under this authority existing plants that are emitting above this rate could obtain reductions from other sources and thereby qualify for the sale of Renewable Energy Certificates (RECs). DES believes that it is reasonable to require facilities to upgrade their technology to meet the 0.02 lbs/mmBtu rate or to provide for PM emissions reductions from other sources (e.g., residential wood stove change-outs), rather than relaxing the requirement. DES has worked with the sponsors and stakeholders and concurs with the amended bill language on this subject.

The addition of provisions related to "*qualifying renewable energy technologies producing useful thermal energy*" could also have beneficial environmental, economic, and social impacts, particularly to the extent that these provisions incent the use of biomass for thermal energy as an alternative to production of electric energy. A recent analysis of New Hampshire's energy consumption and costs relative to the biomass supply indicates that a substantial economic and energy benefit can be realized by providing an expanded market for low-grade timber and clean wood waste[1]. The best and highest use of biomass for energy includes both thermal energy production and combined heat & power generation due to the high efficiencies associated with direct applications of energy. The demand for biomass energy can be met through in-state and regional resources, leading to an economic benefit by reducing the dollars that New Hampshire spends to import fossil fuels, which dollars are then permanently removed from our economy. Energy security will also be enhanced by greater reliance on locally-sourced energy supplies that are less susceptible to

[1] Aber, John and Frades, Matt (2009). *The Wood Biomass Wedge in New Hampshire: Data Sources and Basic Approach.* Carbon Solutions New England, University of New Hampshire http://des.nh.gov/organization/divisions/air/tsb/tps/climate/action_plan/documents/032509_nhccptf_appendix_8.pdf

the dynamics of the global energy market. In doing so, biomass-based thermal applications complement existing energy efficiency and energy conservation programs and the generation of electricity by other forms of renewables.

It is further recognized that the demand for biomass for energy can also play a role in maintaining the high quality of life in New Hampshire by creating an incentive to avoid the permanent conversion of forested lands. It is estimated that, prior to the onset of the recession, nearly 5000 acres of New Hampshire lands were permanently lost to development each year. As a result, the capacity for those lands to provide "ecosystem services" was being lost forever. These services include: abundant supplies of clean water; clean air; wildlife habitat; flood and drought mitigation; as well as a variety of recreational opportunities. Such losses have impacts on local economies and quality of life. The previously cited analysis of forest biomass resources recognized that providing a market for low-grade biomass that had been sourced from well-managed forested lands was a means to preserve the rural character of the state and support the region's timber industry, especially in the regions that were severely impacted by the loss of northern pulp and paper mills. By providing a market for biomass for energy, land owners had an incentive to maintain their ownership and traditional harvest patterns. In doing so, they would maintain the charismatic and iconic working landscape, which is treasured by residents and tourists alike.

To the extent that biomass combustion and/or co-firing of biomass with fossil fuels is incented by this legislation, DES believes that achievable and reasonable emissions limitations are appropriate, and, in consultation with stakeholders from the biomass, thermal energy and electric generation sectors, DES requested and the amended bill includes language to implement these requirements. The rationale for these limitations is explained in the attachment to this letter.

DES also strongly supports the recommendation from the recent PUC RPS study to *"Clarify the extent of the RPS obligations beyond 2025, specifically, whether or not the 2025 obligations continue indefinitely absent further legislative change."* The amendment passed by the Senate also implements this recommendation.

Thank you for your consideration in this matter. Should you have any questions or require further information, please contact Michael Fitzgerald, Administrator, ARD Technical Services Bureau (mfitzgerald@des.nh.gov, 271-6390).

Sincerely,

Thomas S. Burack
Commissioner

cc: SB 218 sponsors
Amy Ignatius, Chair, Public Utilities Commission

The State of New Hampshire
Department of Environmental Services
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Summary of Emissions Requirements for Biomass-fueled Thermal Energy Units
Amendment to SB 218 Proposed by DES

Similar to the provisions in the existing Renewable Portfolio Standards (RPS) statute RSA 362-F for eligible biomass technologies that generate electricity, provisions to limit emissions of both nitrogen oxides (NOx) and particulate matter (PM) from biomass-fueled thermal energy units should be added to any amendment that enables thermal energy to receive renewable energy certificates (RECs). Revenues from the sale of RECs could be significant, and it is appropriate for eligible sources to dedicate a portion of those revenues to minimizing emissions. NOx emissions contribute to smog (ground-level ozone) formation. While exceedances of the ozone National Ambient Air Quality Standard (NAAQS) in New Hampshire have decreased over the years, further reductions of NOx emissions are needed in order to maintain attainment of the ozone NAAQS, and to help achieve attainment of any lower future NAAQS that could be proposed by the United States Environmental Protection Agency (EPA). Similarly, EPA has established a new lower PM NAAQS, and reducing PM emissions is critical for attainment of the PM NAAQS.

Generally, it is more cost effective to add pollution controls to larger, higher-emitting units than smaller ones. From an equity perspective, since eligible biomass technologies that generate electricity are required to meet emissions requirements (0.075 lb/mmBtu for NOx and 0.02 lb/mmBtu for PM) in order to be eligible to generate RECs, similar-sized thermal energy units should also meet these requirements if they are to be eligible for RECs. Thus, thermal energy units equal to or greater than 100 mmBtu/hr should be required to meet the same 0.075 lb/mmBtu NOx requirement as eligible wood-to-electricity units. Regarding PM emissions, there is an existing federal New Source Performance Standard (40 CFR Part 60, Subpart Dc) that requires boilers at or above 30 mmBtu/hr to meet a 0.020 lb/mmBtu limit. Thus, DES believes it is reasonable to require thermal energy units equal to or greater than 30 mmBtu/hr to meet the same 0.02 lb/mmBtu requirement for PM as wood-to-electricity units in order to be eligible to generate RECs.

For smaller units, it may or may not be cost effective to install add-on pollution controls. A May 2010 report titled *"Emission Controls for Small Wood-fired Boilers,"*[1] prepared by Resource Systems Group, found that 10 of 24 (41%) of the units tested could meet a PM limit of 0.10 lb/mmBtu. Those that could not were generally older systems that have no add-on controls. PM add-on control costs ranged from up to $120,000 for 5 mmBtu/hr units to up to $310,000 for 30 mmBtu/hr units. Based on REC prices ranging from $14 to $28 and the conversion factor of 3.412 mmBtu per MWh, 5 mmBtu/hr units would generate REC revenues between $21.50/hr and $41/hr or between $50,000 and $100,000 per year (assuming 2,500 hours of operation out of a maximum of 8,760 hours), and 30 mmBtu/hr units would generate revenues ranging from

[1] Available at http://www.rsginc.com/assets/Reports--Publications/RSG-BERC-Emission-Control-Report-May2010.pdf

$123/hr to $246/hr or between $308,000 and $615,000/year (based on the same hours or operation assumptions). Thus, the payback period for installation of PM controls would be between one year and 2.4 years. Thus, it is reasonable to require units between 3 and 30 mmBtu/hr to meet a PM limit of 0.10 lb/mmBtu.

For NOx emissions from smaller units, the report found that the increased combustion completeness resulting from Best Management Practices (BMPs), also called work practice standards, not only helps reduce PM emissions, but also helps to reduce emissions of other pollutants, including NOx, and helps maximize energy efficiency. BMPs range from physical equipment such as oxygen sensors to operational practices such as recordkeeping. Therefore, it is reasonable to require units less than 100 mmBtu/hr to implement BMPs, including annual tune-ups and combustion efficiency testing and compliance with a minimum combustion efficiency. This would also be the method for controlling PM emissions from units that are less than 3 mmBtu/hr.

Summary Table
Emissions Requirements for Thermal Energy Units under SB 218

POLLUTANT	NITROGEN OXIDES		PARTICULATE MATTER		
UNIT SIZE (mmBtu/hr)	< 100	> 100	< 3	3-30	> 30
REQUIREMENT (lb/mmBtu)	BMP*	0.075	BMP*	0.10	0.02

* BMP = Best Management Practices (as determined by the department)