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Mr. Jason Hollett
Executive Director of Climate Change
NS Department of Environment
1894 Barrington Street
Halifax, NS
jason.hollett@novascotia.ca

Subject: CO2 Emissions from NSPI Biomass Boiler at Point Tupper, NS

Good morning Mr. Hollett,

I am writing to you today to address a troubling issue which, for years now, has not received nearly the attention it deserves, either from successive environment ministers, or the public service which supports these ministers. I understand and appreciate the fact that you seem to bear the significant responsibility of overseeing the implementation of Nova Scotia's pending 'cap and trade' carbon accounting system. As the Environment Department's Executive Director of Climate Change, you may not be the single most direct person to whom I should be addressing my concerns; however, I had to choose someone and you seem to have drawn the short straw.

Please note that I have copied, here, several other responsible and/or interested persons, both inside and outside of government who will, no doubt, wish to engage in this matter, so as not to make you feel too 'singled out'. Nonetheless, I believe the issue of carbon emissions produced by a government-endorsed, 'renewable' energy source certainly lies directly within your purview and responsibility.

As you are no doubt aware, the biomass boiler owned and operated by Nova Scotia Power Incorporated (NSPI), located in Point Tupper, NS and intimately affiliated with the adjacent Port Hawkesbury Paper mill, is a relatively small (60MW), yet key, facility within the utility's electricity generating infrastructure. As this facility has been, and continues to be, sanctioned under legislation enacted by the government of Nova Scotia as supplying 'renewable' energy to the province's electricity grid, this particular generator should be of interest to anyone concerned with climate change mitigation efforts in this province, yourself included.

Before I proceed to the details of the matter at hand, I would first like to address one, important 'housekeeping' issue regarding terminology. In order to engage in a reasoned and intelligent conversation about 'renewable' energy, I believe it needs to be clearly established what the term 'renewable' actually means. For the sake of expediency, I suggest setting the bar very low, in this matter, so that broad consensus may be achieved and so any debate over official syntax, employed in legislation, can be avoided. This may seem pedantic, but I implore you to indulge this exercise, as it is absolutely central to the matter at hand.

It is simple fact that all energy on this planet is, ultimately, derived from the star about which it orbits, the Sun. As such, the only thing which really differentiates renewable energies from non-renewable energies is *time*. To wit, the energy stored in fossil fuels could, indeed, be considered renewable, if one is willing to concede the time scale required to renew this energy, once expended (up to hundreds of millions of years). At first, this may sound farcical, as this is a time scale far beyond the comparatively short time our species has even existed; however, this is, again, simple fact. So, if we are to consider whether, or not, biomass is a renewable energy, we need to ascribe a time scale that is meaningful.

There is overwhelming agreement in the atmospheric science community that, in order to avoid impending catastrophic climate change on this planet, the currently rising emission rate of green house gases (GHGs. of which CO2 is a primary component) needs to cease, and then decline, within the next 20-30 years. The Paris Agreement, to which Canada is a signatory, is predicated on this assertion.

Therefore, as the next 20-30 years is, unequivocally, the most meaningful time scale within which to consider the renew-ability of biomass, I propose the following, very basic definition:

A renewable energy source is one which, when expended, does not create a net increase in the concentration of atmospheric GHGs over the next 30+/- years.

I hope you will agree that this is both a very basic and very accommodating definition. For instance, I believe one could reasonably define a renewable energy, in this context, as one which produces fewer CO₂ emissions than even the worst of fossil fuels, coal, which brings me to the first point I would like to address to you:

it can be easily demonstrated that biomass combustion, as it is practiced at the Point Tupper generating station, is more CO₂-intensive, per kWh of energy produced, than the combustion of coal at a comparably-sized coal-fired facility (see attached document titled Biomass vs. Coal poster).

This document is a simple, yet carefully researched, analysis I performed almost two years ago. It is meant to be visually appealing and easily understood by the average person; hence, its simplistic presentation. The conclusion it reaches, however, is just as compelling as those reached through a more rigorous investigation of available data. To wit, please find attached a 2014 study published by Mary Booth, PhD, Partnership for Policy Integrity, titled *Trees, Trash, and Toxics: How Biomass Energy Has Become the New Coal*.

While this unprecedented study focuses on facilities in the United States and how operators there foil environmental legislation, Dr. Booth's research supports my own finding that, indeed,

"Biomass power plants are also a danger to the climate, emitting nearly 50 percent more CO₂ per megawatt generated than the next biggest carbon polluter, coal. Emissions of CO₂ from biomass burning can theoretically be offset over time, but such offsets typically take decades to fully compensate for the CO₂ rapidly injected into the atmosphere during plant operation."

-from the Executive Summary, page 5

Dr. Booth is one of the foremost experts in her discipline, having researched and published extensively on the topic of biomass as it pertains to the Carbon Cycle, vis a vis atmospheric emissions resulting from its combustion. She was one of 65 scientists to pen a 2016 letter to the United States Senate, lobbying policy makers to understand and accept the fact that biomass is not, in fact, carbon neutral (see: <http://whrc.org/letter-to-the-senate-on-carbon-neutrality/>). She was also a signatory to a March 2017 letter to the UK Secretary of State, urging this country's policy makers to accept the unequivocal science underlying biomass emissions (see attached letter).

My point here is this: it's not just me and my 'back of the envelope' calculations that demonstrate the facts of biomass combustion and emissions. Many of the world's top experts have come together to present peer-reviewed research about biomass-derived energy to law makers of two of the world's most powerful nations, which also happen to be two of the world's biggest consumers of biomass for energy production.

My introduction of Dr. Booth's work leads me to the second point I would like to address to you:

peer-reviewed research has now clearly delineated the real, net implications of CO₂ emissions arising from the combustion of biomass at energy-generating facilities (see attached document, titled Not carbon neutral: Assessing the net emissions impact of residues burned for bioenergy, published in Environmental Research Letters, February 21, 2018).

In this in-depth, peer-reviewed analysis, Dr. Booth demonstrates how, even under ideal conditions, (which is certainly not the case for the Point Tupper boiler), energy-generating facilities using biomass as fuel produce significant and long lasting net increases to atmospheric CO₂ concentrations for up to 50 years

and beyond. She introduces the concept of the Net Emissions Impact (NEI) as a means for accurately measuring the relative carbon intensiveness of energy-generating facilities which use biomass as fuel. Dr. Booth proposes that adoption of the NEI by regulators could actually give a true and clear accounting of just how 'renewable' biomass energy really is.

I am conscious of how long this letter is becoming, so I will try to draw to a close. In fact, it is not as important for you to read and understand what I am saying, as it is to read and understand the research and facts I have gathered here for you. The point is: there is now a significant body of evidence, supported by a large contingent of leading experts, which clearly demonstrates that biomass is not, in fact, the renewable energy source that policy makers in Nova Scotia, and other jurisdictions, have claimed it to be. It may have seemed an intuitive estimation at first; however, this claim has been since falsified.

I don't mean to insult yourself, or any of your colleagues by stating this; indeed, I believe you and your associates have a very important role to play in drafting and enacting good legislation which is informed by rigorously executed science. What I'm saying is that the people who truly are the experts have, as they say, "done the math on this one", and the math clearly demonstrates that, under the definition I presented at the outset, biomass cannot reasonably be considered to be a renewable energy source. As such, I am left with some very important questions for you and everyone else addressed herein:

How can the government of Nova Scotia be justified in sanctioning the Point Tupper biomass facility, or any other such biomass facility, as producing 'renewable' energy?

What are you and your colleagues going to do to rectify the erroneous decision to grant NSPI credit, under renewable energies legislation, for the energy produced by the biomass boiler at Point Tupper?

What steps are you going to take to include the findings of the crucial research, presented here, in your drafting of Nova Scotia's pending cap and trade carbon accounting system?

I very much look forward to your feedback and considered responses to these questions; this applies to all parties addressed herein.

In closing, Mr. Hollett, we simply don't have the time to waste on misinformed assumptions and estimations of the 'carbon neutrality' of biomass. We need to curb emissions now, today, and over the next 20-30 years if we are to have a chance at avoiding environmental catastrophe. This is not hyperbole; this is fact and I implore you to carefully consider the facts I have presented here. As former United States senator Daniel Patrick Moynihan famously proclaimed, "Everyone is entitled to his own opinion, but not his own facts."

The biomass boiler at Point Tupper cannot reasonably be considered a renewable energy source, especially in light of recent media reports (see: <http://thechronicleherald.ca/novascotia/1547900-video-old-growth-crown-hardwood-being-cut-and-burned-harvester-says>), claiming that old growth stands of maple and birch, located on Crown land, are being cut down and chipped as fuel to feed this facility. With everything else I've had to say aside, this action cannot be considered responsible environmental stewardship, lawful forestry management, sound energy policy or even sane for that matter. Again, I ask, how can the government of Nova Scotia not only sanction, but reward this sort of wanton destruction of the very environment it has been sworn to manage and protect?

Thank you for your time and consideration in this matter. I appreciate the fact that you must be a very busy person these days; however, this matter is intrinsic to your ongoing efforts as the Department of Environment's Executive Director of Climate Change.

I look forward to hearing from you, and others, regarding this matter.

Respectfully,



Peter Ritchie
Energy Analyst
Pleasant Valley, NS
pritchie42@gmail.com

Cc.: Minister for the NS Department of Environment,
The Honourable Iain Rankin

Deputy Minister for the NS Department of Environment,
Ms. Frances Martin

Minister for the NS Department of Energy,
The Honourable Geoff MacLellan

Deputy Minister (acting) for the NS Department of Environment,
Mr. Simon D'Entremont

Minister for the NS Department of Natural Resources,
The Honourable Margaret Miller

Deputy Minister for the NS Department of Natural Resources,
Ms. Julie Towers

Premier for the Province of Nova Scotia,
The Honourable Stephen McNeil

Mr. Mark Sidebottom
Chief Operating Officer for Nova Scotia Power Incorporated

Mr. David Landrigan,
Vice President, Commercial for Nova Scotia Power Incorporated