Biomass: Every cloud has its silver lining, until it doesn't

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Prior to the pandemic taking hold, two major events occurred that could have affected the province's employment numbers and green electricity targets: the closure of Northern Pulp and the delay of first power from Muskrat Falls.

The closure of Northern Pulp last February threatened Nova Scotia in at least two ways. First, without a buyer of its woodchips and residuals, the province's forest products industries and its several thousand workers were at risk. Second, if the forest products industries had continued to operate and simply discarded their biomass residues, it would have decomposed, with one of the by-products being methane, a greenhouse gas with a 100-year Global Warming Potential (GWP) of 34, compared to an equivalent mass of CO_2 (i.e., it is 34 times more powerful at trapping heat than CO_2).

The seemingly never-ending list of problems affecting Muskrat Falls has threatened Nova Scotia Power's obligation to increase its use of renewables from 25% to 40% in 2020. This clearly was a wake-up call to the company since, as stipulated by the province's Renewable Electricity Regulations, it would have been liable for fines of $500,000 per day to a maximum of $10 million per occurrence and unable to pass these costs on to its customers.

Fortunately for the forest industry, its workers and their families, and Nova Scotia Power, the province found a stopgap solution to the problem. Instead of penalizing Nova Scotia Power, the company and by extension, Emera, were required to purchase some 100,000 tonnes of woodchips and residuals to burn in their biomass plants until Muskrat Falls starts producing first power, sometime in 2021.

The question then becomes, what happens to the biomass residues after 2021?

The province is already in the process of implementing one solution, converting the existing oil-based heating systems in six pilot projects to operate using biomass residues in biomass boilers.

These projects should improve the province's energy security, albeit in a small way, by reducing its reliance on oil imports, lowering energy costs for the participants, and if the residues are harvested in a sustainable manner, reducing greenhouse gas emissions in the buildings sector. If European low-emissions, high-efficiency, biomass-fired technologies are used, combustion will be cleaner, producing far fewer particulate matter (PM) emissions than older biomass technologies and allowing the wood ash to be returned to the forest.

While this is undoubtedly good news for the province's forest products industries and workers, these six projects are expected to consume a total of between 2,000 and 2,500 tonnes of biomass residues per year.

If we assume that each project uses between 300 and 400 tonnes of biomass per year, then when Muskrat Falls comes online, there will be a need for 250 or more such projects to use the 100,000 tonnes of biomass no longer required by Nova Scotia Power.

Last September, the deputy minister of Lands and Forestry, Julie Towers, was quoted in allnovascotia.com last September saying there is a “huge range of demand” under development for the woodchips and residuals and that Nova Scotia Power’s biomass purchases “provides time for some of those other companies… to get in place and start operating”.

What type of companies?

If history is anything to go by, we can expect a substantial portion of the remaining biomass residues to be turned into pellets for export to, for example, European countries to meet their renewable energy and emissions targets.

And about half of Nova Scotian homes will continue using fuel oil to meet their heating demands.