

Another reason why Nova Scotia needs a new energy strategy

Larry Hughes

MacEachen Institute, Dalhousie University

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In January 1995, I submitted a paper on the benefits of biomass district heating in Nova Scotia to the province's Department of Natural Resources' Electricity Review Panel Hearings. Although there was interest in district heating from groups outside the provincial government, no actions were taken by the province.

Fast forward to February 2020 and the aftermath of the Northern Pulp closure. Nova Scotia's Minister of the Environment is now looking for markets for the biomass the mill formerly used. He is proposing that the biomass be chipped for heating buildings, some for within the province, although most would be shipped overseas.

The minister is not the only one recommending the use biomass for energy.

In late 2018, the Intergovernmental Panel on Climate Change (IPCC) released a report stating that for global temperature rises to be kept under 1.5°C this century, the world's energy systems will need to undergo a radical restructuring so that energy emissions are halved by 2030 and net-zero by 2050.

To meet these targets, the median energy consumption projections examined by the IPCC expect global energy demand to remain constant and the use of emissions-intensive energy sources such as coal, oil products, and natural gas to fall from over 80% today to 33% in 2050.

One of the key components of the IPCC's proposed restructuring is the use of sustainably harvested biomass, with median biomass consumption increasing from about 10% of total energy use today to about 26% in 2050.

Presently, about 10% of Nova Scotia's demand for energy in the residential, commercial, and industrial sectors is met by biomass. This would increase if some of the biomass originally used by Northern Pulp was used for heating in buildings.

When he first raised the prospect of using biomass for heating last year, the minister focussed on individual, provincial buildings. More recently, the minister has mentioned district heating.

In a district heating system, rather than targeting a single building, a central heating plant uses an energy source (such as wood chips) to produce hot water which is transported in a well-insulated network of underground pipes to buildings to meet their space and water-heating demands.

Building a district heating system requires a detailed analysis of the community, measuring the heating load of the buildings, the location of the buildings, the community's geology, and the location of existing underground services. To be cost effective, the area needs a minimum heat density, meaning that communities with closely-spaced buildings (such as row-houses, multi-storey apartments, office blocks, and shopping precincts) are typically the best candidates.

To be sustainable, a biomass district heating system would require a forest that removed the greenhouse gas emissions associated with the combustion. A system burning a volume of biomass each year from a plot of forest would produce a known quantity of emissions. If a harvested plot takes, for example, 50 years to remove its own emissions, then fifty-one such plots would be necessary, with the oldest plot being replanted in the year it was harvested.

Such a forest would require careful stewardship. For example, the ash from the biomass combustion would need to be returned to the forest and supplemented with other nutrients such as nitrogen. Any forest in the province, whether it is used as a source of biomass for heating or left untouched, will be increasingly at risk from climate change: extreme weather events, such as hurricanes, changes in temperature and precipitation, invasive species of flora and fauna, and increased risk of fire.

While district heating systems in the province have the potential to reduce the province's reliance on imported fuel oil, offer employment to some forestry workers, and reduce emissions, the province should have acted long before Northern Pulp was closed. A provincial district heating policy could have avoided some the fallout from the Northern Pulp closure; instead we now have the situation where forestry workers must remain idle as the minister muses about district heating systems and wood chipping facilities.

Nova Scotia needs a new energy strategy, one that recognizes the need to improve the energy security of Nova Scotians, ensuring the availability of affordable supplies of sustainable, preferably Nova Scotian, sources of energy, not only for electricity but also for heating. Biomass district heating could be one component of such a strategy.

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