By Louise Comeau, Director Climate Change and Energy Solution. July 22, 2021

Summary: New Brunswick's claim that it needs to burn coal up to 2040 because all options other than small modular nuclear reactors are affordable is not supported by NB Power's own analysis of the capital, fixed and variable operating costs associated with wind, natural gas or nuclear or analysis by other utilities, associations or research institutions. Estimates for small modular nuclear reactors puts the capital costs to construct a First-of-A-Kind plant much higher than current cost for large wind. Worse, New Brunswick risks paying a higher carbon price to burn fossil fuels and losing export markets in the United States.

On July 21, 2021 New Brunswick's Natural Resources and Energy Development Minister claimed that the province cannot close the Belledune coal-fired power plant as required by federal greenhouse gas regulation because doing so would force the province to build a new, expensive power plant. Instead, the province is asking for an extension up to 2040 to allow small-modular-nuclear reactors to come online.

These claims assume:

1. Emitting carbon has no influence on depleting the global carbon budget. This is an incorrect assumption. There is strong scientific

evidence that the world must quickly phase out fossil fuels to keep global average warming below a risky and life-threatening 1.5 degrees. The pathway to avoid 1.5 degrees warming is further defined in recent modeling by the International Energy Agency. Scientists and energy economists and modellers agree that the next 10 years is crucial to our ability for a safe climate landing.

2. Emitting carbon is cheap. With the scheduled increases in carbon pricing to $170/tonne by 2030 and to more stringent industrial and electricity sector greenhouse gas regulations, ratepayers are at risk of higher costs from burning fossil fuels than not.

3. Natural gas-fired power plants are cheaper to build and operate than wind power.

4. Small modular nuclear reactors will be cheaper to build and operate than wind power.

Let's examine the assumptions about natural gas, small modular nuclear reactors (SMRs), and large wind using NB Power's own 2020 Integrated Resource Plan, as well as the 2018 Regional Electricity Cooperation and Strategic Infrastructure Study.

- In NB Power's 2020 Integrated Resource Plan (Page 90), the utility puts the levelized cost of electricity (LCOE), a measure of the full cost of building and operating a supply option, at:
    - $61.46 a MWh (million watts per hour) for large wind,
    - $116.97 a MWh for large combined cycle natural gas
    - $132.94 a MWh for small combined cycle natural gas at $132.94, and
    - $116.67 a MWh for new nuclear (not SMRs)

- These levelized costs assume in-service capital costs, fuel, variable and fixed operating and maintenance costs

    - **The cost to build and operate large wind projects on a full cost basis is less than fuel costs for large and small combined cycle natural gas ($71.43 and $74.95 MWh respectively) and are half as expensive overall as natural gas powered plants.**

- The 2020 NB Power IRP assumed new nuclear not SMRs. The 2018 Regional Electricity Cooperation and Strategic Infrastructure (RECSI) study estimated that 1200 MW of SMRs in New Brunswick would cost $9 billion (Page 15). The more recent SMR Feasibility study for New Brunswick, Ontario, Saskatchewan and Alberta put the cost of the first 300 MW SMR plant in Ontario at $3 billion or about $100 MWh, significantly more expensive than large wind, which has no fuel and nuclear waste management costs, as well as no First-of-A-Kind (FOAK) risk that could put SMR costs closer to the $9 billion estimate.

- The Canadian Wind Association (now the Canadian Renewable Energy Association) in its detailed wind integration study found in its study by General Electric that 50 per cent wind penetration is within reach in the Atlantic Region, requiring minimal reserve requirements (to manage intermittency) of 62MW to accommodate 3.8 GW of wind. The Regional Electricity Cooperation and Strategic Infrastructure (RECSI) 2018 study completed for the federal and Atlantic Provinces put regional transmission interconnection costs at $900-million. The potential to create an Atlantic Transmission Loop would connect the region to large hydro capacity and balance renewable energy supply. New technical analysis for this group, due in summer 2021, will provide more detail on the costs and savings associated with higher levels of renewable energy supply in an integrated Atlantic network.

- Based on NB Power's, other utilities and electricity modeling experts, **renewable power, especially large wind, is cheaper today than power from natural gas and existing and proposed nuclear technologies.** Regional integration, combined with in-province

renewable energy supply, appears to be the least-cost solution for phasing out fossil fuels from the regional electricity system.

What other risks does New Brunswick face from missing the boat on renewable energy?

- The United States, an important market for electricity exports, is moving to 80 per cent renewables by 2030. A July 2021 analysis by Clean Energy Futures found that "The present value of the estimated climate benefits through 2050 ($637 billion) outweigh the estimated costs ($342 billion). This 80x30 Clean Electricity Standard (CES) would also prevent an estimated 317,500 premature deaths between now and 2050 and generate estimated present value health benefits of $1.13 trillion due to cleaner air, bringing the estimated present value net benefits to $1.43 trillion for 2020 to 2050. The Government of Canada will soon propose a Clean Electricity Standard for Canada.

- The United States is also considering a Carbon Border Adjustment Proposal that would "Levy a fee on imported pollution to address carbon leakage that undermines urgent climate action. The import fee will be based on the domestic environmental cost incurred and will initially cover goods that are both carbon-intensive and exposed to trade competition, including aluminum, cement, iron, steel, natural gas, petroleum, and coal. The list of goods covered by the tariff will expand as the United States improves processes for determining the carbon intensity of different types of goods."