

CGA By the Numbers: The Renewable Natural Gas Opportunity in Federal Buildings

In this issue of *By the Numbers*, we look at the renewable natural gas (RNG¹) opportunity in federal buildings.

RNG can be produced from organic waste from farms, forests, landfills, and water treatment plants. The methane produced from these sources is captured and blended into the gas utility infrastructure system. As a result, RNG is an emissions-neutral or even emissions-negative energy source. At the molecular level, RNG is identical to natural gas. It can be injected into existing natural gas infrastructure and is used interchangeably with all natural gas equipment and appliances. The first RNG project in Canada came online in 2010 and supply has grown over the years. In 2017, CGA released an aspirational goal for Canada to have 5% RNG in the natural gas system by 2025 and a 10% RNG blend by 2030. With recent policy measures, we are beginning to see meaningful progress on these goals.

Federal leadership can be demonstrated through a number of measures, but one of the most important would be a public commitment to purchase RNG for federal building energy needs. In 2020, the Government of Canada released an updated Greening Government Strategy, with a commitment to reduce its own operational greenhouse gas emissions to net zero by 2050. Across Canada, the federal government owns or occupies approximately 887 buildings, in all 13 provinces and territories and uses 11.2 million GJ of natural gas. To date, several initiatives have been undertaken by federal building operators, including energy efficiency upgrades and a commitment to purchase renewable electricity for all building operations by 2035. Using RNG in federal buildings would be a significant opportunity to support the emission reduction targets the Government of Canada has set for their own operations.

KEY TAKEAWAYS:

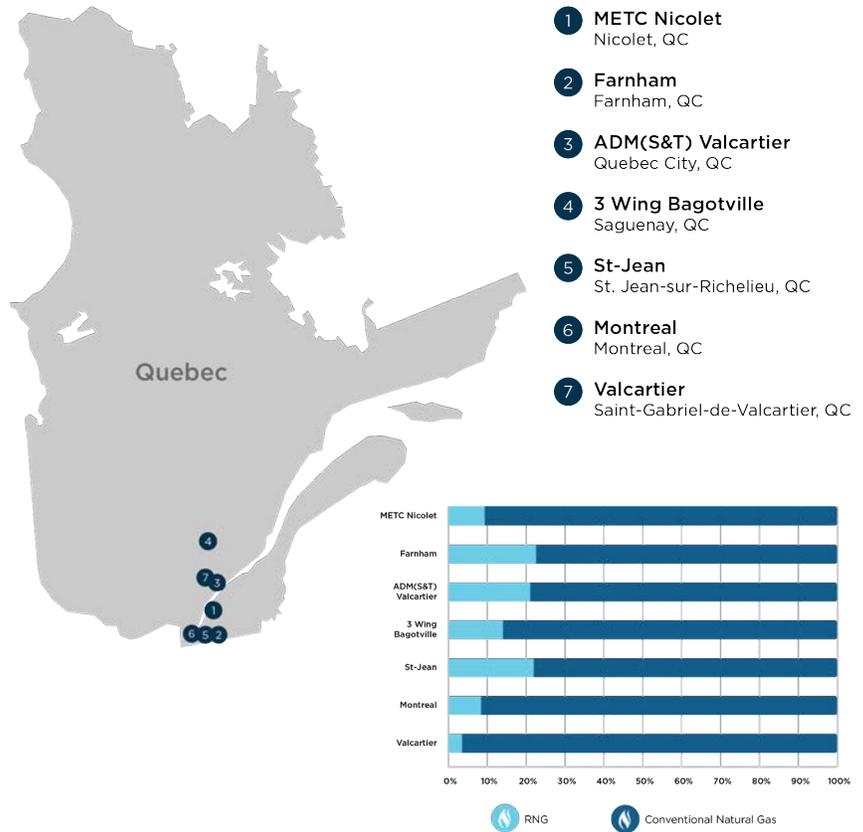
1. The Government of Canada is the single largest building owner/occupant in Canada with 887 buildings and over 18.3 million square meters consuming over 11.2 million GJ of natural gas (equal to 124,500 homes/year).
2. Early leadership has been taken in Quebec where seven federal buildings are purchasing RNG from Énergir. Gas utilities are offering RNG programs in BC, Ontario and Quebec with more expected in future years.
3. CGA is calling on the federal government to demonstrate leadership through its Greening Government Strategy (operated by Treasury Board of Canada) by committing to a 5% and 25% blend of RNG (and/or hydrogen) in the federal building stock by 2025 and 2030, resulting in 22,000 and 110,000 tonnes of GHG emission reductions, respectively.

¹ We note the significant opportunity that hydrogen presents as another renewable/low-emission energy carrier to support federal emission reduction goals across buildings. However, for the purposes of this document we will only focus on RNG.

Today, RNG is being purchased in Quebec where the federal government is the single largest purchaser of RNG in the province. A total of seven federal buildings have committed to RNG and are purchasing more than 103,000 GJ of RNG annually. The RNG volumes range from 3% to 21% of total gas supply in these facilities, operated by the Department of National Defence. On an annual basis, the GHG emission reductions from the purchase of RNG at these facilities amounts to nearly 5,000 tonnes, which is equivalent to removing nearly 2800 passenger cars off the road each year².

RNG can play an even greater role across the government’s building operations. There are currently three jurisdictions offering RNG programs where consumers can elect to purchase RNG: British Columbia, Ontario, and Quebec. The programs in these provinces are summarized in the table below. RNG is an emerging opportunity in a number of other provinces, including Alberta, where ATCO has recently announced project investments. Other utilities are also evaluating RNG investments and agreements directly between producers and end-use consumers.

MAP 1: RNG USE IN FEDERAL BUILDINGS - QUEBEC



Province	Provincial Regulation	Utility Programs
British Columbia	CleanBC - Renewable content of 15% by 2030	Customers may select 5%, 10%, 25%, 50% or 100% blend options
Ontario	No percentage but requires utilities to offer a voluntary RNG option	Enbridge Gas OptUp program - Fixed charge of \$2 per month
Quebec	1% by 2021 5% by 2026 10% by 2030	Customers may select 1%, 5%, 10%, or 100% blend options
Alberta	N/A	RNG investments including a 230,000 GJ/yr project in Two Hills, AB

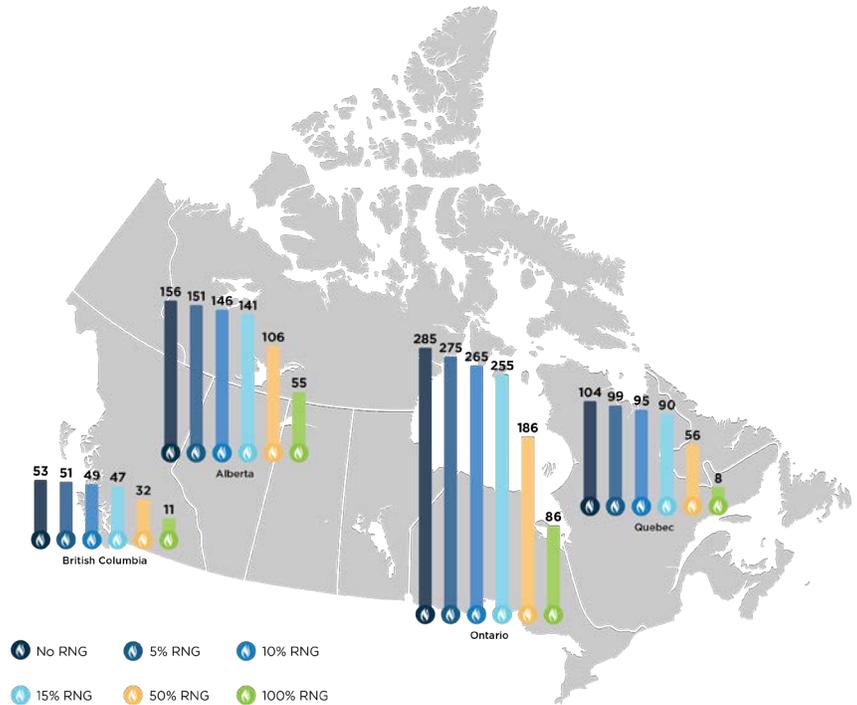
² Per NRCAN End-Use-Database and assumes average kilometers traveled per car is 15,200 km.

In Map 2, we discover a significant opportunity by examining the potential GHG emission reductions available by replacing conventional natural gas with RNG in federal buildings in Alberta, British Columbia, Ontario and Quebec. The total natural gas consumed in these buildings is equal to 9 million GJ and accounts for 600,000 tonnes of GHG emissions. Starting at a 5% RNG blend, GHG emissions from these federal buildings would decline by 22,000 tonnes of CO₂e. At 100% RNG, GHG emissions reduce to 440,000 tonnes of CO₂e or 73% of total emissions from federal buildings across these four provinces.

The cost of RNG is higher than the cost of non-renewable natural gas. To illustrate RNG costs for federal buildings, we provide details in Figure 1 below. We see that the additional cost of RNG blended as a percentage of natural gas, starting at 5% would be about \$8M and at 100%, \$158M. On average, the incremental cost of RNG is assumed to be ~\$18/GJ.

As we've discussed in this issue of *By the Numbers*, the Government of Canada has already recognized that RNG has a role to play in greening its federal buildings. RNG supply in Canada is growing, but there is still work to be done to bring on enough production to meet potential demand in the future.

MAP 2: GHG EMISSIONS IN FEDERAL BUILDINGS AT VARIOUS RNG BLENDS



Note: All units are in 1000's of tonnes CO₂e

FIGURE 1: GHG EMISSIONS AND COST AT VARIOUS RNG BLENDS

