

Natural Gas in Remote and Northern Communities and Industry

Report Highlights

Securing a reliable, cost-effective, and efficient energy supply for Canada's remote communities is a challenge that is gaining increasing attention. Natural gas and liquefied natural gas (LNG) have emerged as attractive alternative energy sources for remote communities and industry. The Delphi Group developed a study to assess the potential of these energy sources in remote communities and industry through a review of literature on its potential adoption, and on current natural gas and LNG use. The study focused on the potential for electricity generation using LNG, but also sought to examine its potential for heating and other uses.

Key Observations

LNG is likely more viable for larger communities and industrial sites with greater ability to afford high up-front capital costs. However, smaller entities with year-round access should also consider LNG.

- LNG power generation offers fuel cost savings, but requires greater up-front capital.
- LNG is currently only available via tanker trucks that require year-round road access. (About 20% of remote and northern communities and 30% of industrial sites currently have this access).
- LNG-based electrical grids are not ideal for short-term emergencies.

Remote Communities in Canada

Most remote communities in Canada are characterized by a high degree of dependence on imported fossil fuels, which results in high energy costs. The vast majority of remote communities (77%) use diesel to generate electricity, with hydro (13%), and remote electrical grids (9%) also being used. Similarly, most remote industrial sites rely on diesel to generate electricity. These communities share some common challenges such as high costs, cold climate, aging diesel generators, large peaks and troughs in electricity demand, and environmental concerns such as greenhouse gas emissions, air contaminants, and fuel leakage.

LNG vs. Diesel Generation

LNG and natural gas generators have operability and reliability characteristics similar to diesel generators and can be used to meet similar "always on" power requirements that have traditionally met by diesel generators. One shortcoming is that they are not able to restore power as quickly as diesel generators during short-term emergencies. While LNG generators require greater up-front costs for storage tanks and LNG offloading and vaporization facilities, operating costs are typically much lower than diesel generators.

LNG generators have the added benefits of lower carbon pricing costs, and avoided costs of remediating land that could be contaminated by diesel. Lifecycle GHG emissions associated with LNG can be 20% lower than diesel and also reduce other air pollutants. However, community stakeholders often have concerns related to the upstream environmental impacts of extraction.

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Alternative Electricity Supply Options

The report conducted an assessment of the costs, environmental impacts, and socio-economic issues associated with various energy supply options. It found that while LNG results in better environmental performance than diesel, expansion of the hydro-dominant grids in the Northwest Territories would offer greater environmental benefits. Social benefits for diesel and LNG were both found to be low since they rely on imported fuel and only a small opportunity for local job creation and other economic benefits.

Policy and Program Instruments

There are currently many initiatives aimed at shifting away from diesel that are potentially applicable to natural gas and LNG. Some current approaches are:

- Various Governments, Carbon Pricing Policies
- Federal Government, Accelerated Capital Cost Allowance Rules
- Government of Ontario, Ontario Natural Gas Grant Program
- Government of Quebec, Budgets 2016-2018

There is some alignment and collaboration in key policies among federal, provincial and territorial governments regarding the transition from diesel, but there remains significant gaps; especially policies for LNG as well as differing application processes.

There is clear need to simplify and streamline the currently fragmented application process and align funding opportunities. This will allow for greater coordination of comprehensive policies, ensure continuous program engagement, and develop an overall framework to maximize efficiency. The federal government could signal support for provinces and territories pursuing LNG projects, while provinces and territories could ensure that natural gas and LNG projects are part of funding requests.

Topics for Further Consideration

Some topics and questions will need further exploration as the scope of this report did not assess in detail some opportunities for natural gas and LNG in remote markets. Some topics that are worth exploring further are:

- Whether there are economies of scale or benefits to the business case for converting when multiple close communities or communities along the same supply route all convert simultaneously;
- Potential for LNG use in combined heat and power applications. Conversion to natural gas or LNG could reduce GHG and local air pollutants and result in fuel savings which would improve the business case
- The development of local gas resources and new liquefaction facilities including micro-LNG plants located closer to remote markets, and whether this would improve the business case.
- How LNG fits with community desires to reduce reliance on fossil fuels and pathways to increased use of renewables