

A Smart Gas Strategy for Nova Scotia

September 2009

Overview

Nova Scotia began producing natural gas in December 1999, with the start of the Sable Offshore Energy Project. Almost a decade later, just four per cent of Sable gas production is actually consumed in Nova Scotia; the rest goes to external markets. However, domestic use *is* rising. Heritage Gas, the provincial distributor, now has over 2,100 customers and is forecasting growth of 1,000 new customers a year for the foreseeable future.

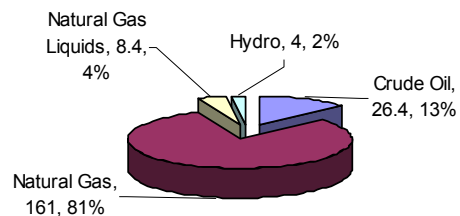
Clearly, however, there is real potential to grow the provincial consumption of natural gas even more – in all sectors. That growth would be enormously beneficial for all Nova Scotians. This document will show why natural gas is the smart choice for Nova Scotia, how it can help the province meet its environmental goals, reduce environmental impacts, save money for consumers, create economic benefits, and ensure a future of sustainable energy for the province.

Nova Scotia's Climate Change Goal

Nova Scotia's Energy Strategy and Climate Change Action Plan were released in 2009. The plans set an aggressive target for reducing greenhouse gas (GHG) emissions to 10% below 1990 levels by 2020. (That is almost 20% below current levels). Under the plans, government committed to meeting that target with a number of tools, including:

- Continuing incentives and encouraging the conversion of homes and businesses to natural gas.
- Improving the energy efficiency of new and existing homes and businesses.
- A declining cap on emissions from Nova Scotia Power Incorporated (NSPI).
- A 25% renewable electricity portfolio by 2020.
- New technologies such as carbon capture and storage for coal-fired plants.

Figure 1: Nova Scotia Primary Energy Production by Type, petajoules 2007



Source: Statistics Canada, Catalogue no. 57-003X, page 34

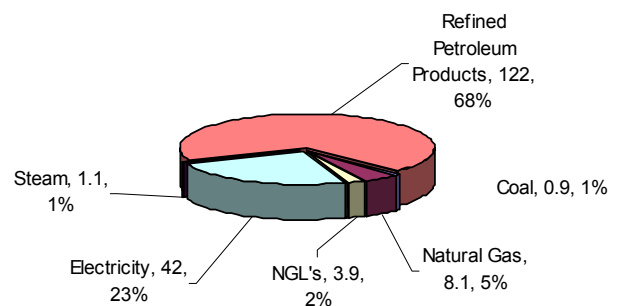
Energy Supply and Demand Mix in Nova Scotia

As illustrated in Figure 1, Nova Scotia produces about 199 petajoules (PJ) of energy a year. Natural gas is by far the largest "homegrown" source of fuel production, with 161 PJ.

Figure 2 illustrates Nova Scotia's total annual energy use is about 174 PJ. Demand is dominated by refined petroleum products at 70% (122 PJ) and electricity at 24% (42 PJ), of which 88% is generated from coal and crude oil.

Total natural gas consumption (excluding gas for power generation) totaled 4 PJ, or 2% of total final energy use. Once power generation gas use is included, gas use rises to 8 PJ. The graphic does not include gas used for power as it represents final energy use and therefore excludes items like gas for power and coal for power generation, which totaled 80 PJ in 2007.

Figure 2: Nova Scotia Energy Use, Final Demand (petajoules)



Source: Statistics Canada, Catalogue no. 57-003X, page 34

Compared to other Canadian markets, Nova Scotian homeowners and businesses consume a small amount of their province's own natural gas. Clearly, Nova Scotians could obtain the full benefits of having a safe, secure, affordable, homegrown, and sustainable source of energy.

Nova Scotia's Natural Gas Advantage

An Affordable Energy Solution for Customers

For the past five years, Heritage Gas customers have been enjoying the advantages of natural gas. On average, they have saved between 20% and 70% compared to Nova Scotians using oil, propane or electricity. Despite volatility in the cost of all fuels, the natural gas price advantage over alternative fuels is expected to continue as oil and solid fuels will likely face increased costs due to world market price volatility and the associated higher costs of their larger carbon footprints.

A Stable Source of Natural Gas

Current natural gas production in Nova Scotia originates solely from the Sable Offshore Energy Project – the largest construction project in the history of the province. A second project, Deep Panuke, is set to begin producing from offshore Nova Scotia in late 2010. In addition, producers are exploring the onshore regions of Nova Scotia for both conventional and non-conventional gas, including both shale gas and coalbed methane. Advances in technology continue to improve both the economic viability of such projects and the estimated resource base. An LNG-receiving terminal is now located in Saint John, N.B., which provides further benefits associated with regional supply and pricing.

Nova Scotia Natural Gas Facts

- Existing production meets current Maritime demand and future demand for the foreseeable future.
- Exports to the US vary from 60-80% of production.
- Sable natural gas provides 13% of the US Northeast's needs.
- The Deep Panuke project will increase production by 0.3 Bcf/d by the 2010-2011 timeframe
- Resource estimates suggest Nova Scotia has over 40 trillion cubic feet of natural gas potential.
- Nova Scotia is connected to the North American natural gas grid, currently with access to over 100 years of reserves.
- In 2008, Nova Scotia's treasury received \$460 million in direct revenues from natural gas -- 5.9% of provincial revenue.

A Clean Source of Energy

Natural gas is a clean burning energy source that has the lowest emissions profile of any fossil fuel, in terms of both air pollutants and GHG emissions. Natural gas has:

- the lowest carbon dioxide (CO₂) and nitrogen oxide (NO_x) emissions of all fossil fuels;
- no sulphur dioxides (SO₂), and;
- a natural gas-fuelled combined heat and power (CHP) system produces 90% less air pollutants and 60% less GHG emissions compared to separate and equally efficient heating and power production systems.

Heritage Gas customers' cumulative CO₂ reductions at the end of 2008 were 40,500 tonnes, the equivalent to removing 8,100 vehicles from Nova Scotia highways.

A Reliable Source of Energy

Natural gas is a reliable, growing energy source in Nova Scotia. While in its infancy, Nova Scotia is benefiting from:

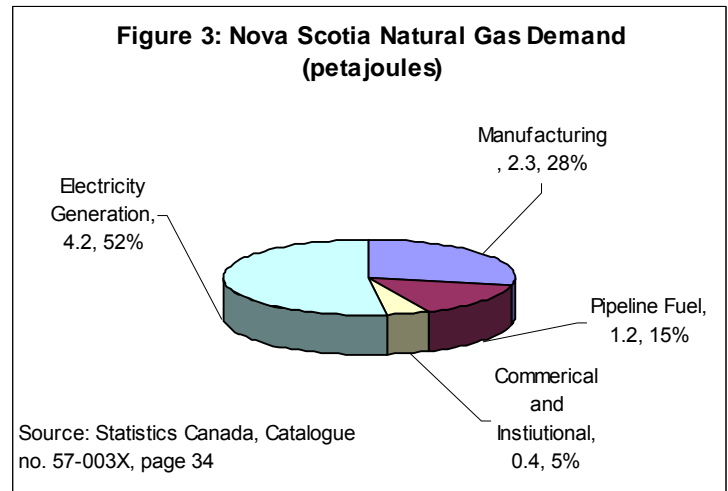
- A growing distribution system providing increased access to natural gas service and the associated economic and environmental benefits.
- Distribution of natural gas is more dependable than other fuels in the market, even in trying weather conditions.

- Safe, reliable production from existing and future producing wells offshore.
- Exploration for new offshore and onshore resources (e.g. conventional, un-conventional- shale gas and coalbed methane).
- A cross-province transmission pipeline that connects many of the most populous regions of the province.

Nova Scotia's Natural Gas Solutions Today

Figure 3 breaks down natural gas demand in Nova Scotia. Most consumption comes in the generation of electric power, manufacturing and as compressor fuel to move natural gas through the Maritimes & Northeast Pipeline. A small portion is used in the institutional and commercial sector. Residential demand is very small and is therefore not shown in Figure 3.

Given the economic and environmental benefits of natural gas, it makes sense for all sectors of Nova Scotia's economy. Increased natural gas consumption in place of oil and coal-based electricity would improve energy end-use efficiency and lower GHG emissions.

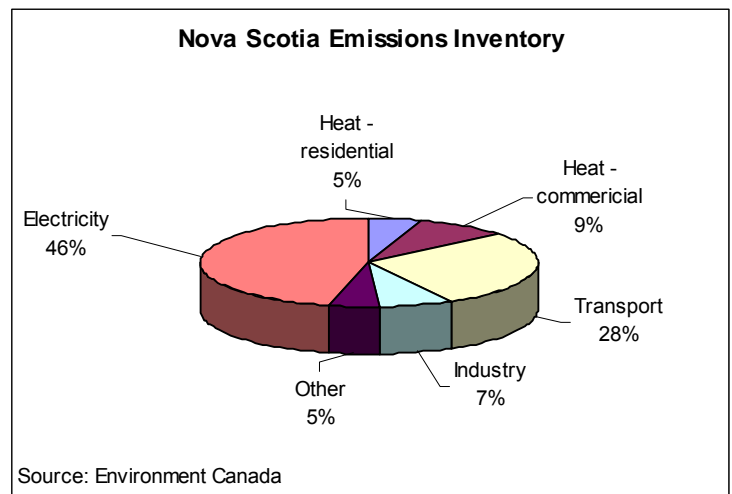


Nova Scotia's Sectoral Emissions and Natural Gas Use Opportunities

Residential Sector

Figure 4 breaks down Nova Scotia's GHG emissions for 2005. The residential sector (heating) accounts for 5% of Nova Scotia's GHG emissions.

- 99% of homes are heated using fuels other than natural gas. Converting to natural gas would reduce GHG emissions by at least 30% per household.
- Natural gas equipment generally has significantly higher efficient technology and choice compared to other fuels, particularly oil.
- Fuel switching to natural gas through electricity Demand Side Management (DSM) and other Federal or Provincial programs would also increase the uptake in the province.



Commercial & Institutional Sector

The commercial and institutional sector accounts for 9% of Nova Scotia's GHG emissions. Currently, most space heating load in this sector is based on oil systems or coal-fired electricity. Switching to natural gas for space heating and process load requirements would lower emissions and at the same time provide the anchor load and infrastructure necessary for Heritage Gas to expand further into the residential sector.

Industrial Sector

Approximately 7% of the province's GHG emissions are produced by the industrial sector. Using natural gas instead of oil in manufacturing plants would reduce the sector's GHG footprint and its emissions, as these companies generally burn fuels with high emissions.

Transportation Sector

Transportation produces 28% of Nova Scotia's GHG emissions. The provincial government has committed to reduce transportation emissions through increased vehicle efficiency, alternative transportation, and better community planning. In addition, the Climate Change Action Plan lists a series of actions to reduce transportation emissions including:

- A 2010 Sustainable Transportation Strategy
- A fund for alternative transportation
- Introduce vehicle emission regulations by 2010
- Develop and support consumer choices to purchase "green" vehicles
- Increase provincial Park and Ride locations

Power Generation Sector

Nova Scotia's power generation sector contributes 46% of the province's GHG emissions. Currently, 88% of Nova Scotia's power is produced from fossil fuels (75% of which is coal at just 30% efficiency). To reduce emissions from power generation, the province introduced increasingly stringent caps on GHG emissions from NSPI. Further, the province created a Renewable Energy Standard which requires NSPI to generate an additional 10% of its electricity from renewable sources by 2020. Although not CO₂ neutral, natural gas' unique attributes make it an ideal partner for intermittent renewable power and helps to create the foundation for other zero GHG technologies.

Natural gas-fired power generation is recognized as a key part of the low-emissions energy solution for North America. For example, combined cycle power generation using natural gas is the cleanest source of power available using fossil fuels. In addition, by increasing the direct use of natural gas for space (over 90% efficiency) and water heating, cooking, clothes drying and certain industrial applications, Nova Scotia would be able to significantly reduce its coal-fired electricity demand.

Moving towards a Carbon-Lean Future in Nova Scotia

Nova Scotia's goal to reduce GHG's by 10% below 1990 levels by 2020 will require a transformation of the economy and the way energy is produced, distributed and consumed. Natural gas will play a significant role in this transition.

- Nova Scotia produces significantly more natural gas than it consumes. Over time, as more natural gas is connected to homes and business, it will result in the displacement of more GHG-intensive energy sources such as oil or electricity generated from coal or oil.
- Natural gas can be used as a platform for onsite renewable energy like wind, solar and geothermal. Intermittent wind, solar, tidal and geothermal energy can be backed-up by natural gas, which is superior to more carbon-intensive electricity.
- Natural gas-powered vehicles significantly reduce emissions. Using natural gas in vehicles such as garbage trucks and public transit buses can reduce GHG emissions by 13%.
- Natural gas can be used as a source of hydrogen used in fuel cell technologies.
- With the smallest carbon footprint of any fossil fuel, and using the latest technology, natural gas provides an immediate solution to Nova Scotia's climate change problem.

Government's Role?

- Government(s) to lead by example with programs to encourage fuel switching to natural gas.
- Government(s) to provide incentives to encourage conversion to natural gas from higher-emitting fuels in all sectors of Nova Scotia's economy.
- Expansion of the natural gas grid. This would require connection of more institutional/commercial anchor loads that support residential sector expansion.



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Putting Our Energy Here. Naturally.

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**Appendix 1.
Nova Scotia Natural Gas Infrastructure**

