

NORTH SHORE NATURAL GAS DISTRIBUTION PLAN

**Providing significant economic and environmental
benefits for Northern Ontario residents and businesses**



WHY NATURAL GAS?

Natural gas is North America's lowest cost and cleanest fossil fuel. While customers in more urban and more populated parts of Ontario can count on natural gas for heating needs, less than 20% of Ontario's rural and Northern homes and businesses have the same opportunity.

Primary space heating and water heating sources in communities located on the North Shore of Lake Superior are limited to propane, fuel oil, wood and electricity. The high capital cost of constructing pipelines has prevented thousands of homes and businesses from accessing the benefits of natural gas.

The North Shore communities of Marathon, Schreiber, Terrace Bay, Wawa and Manitouwadge (the Municipalities) have partnered with the *Northern Ontario Heritage Fund Corporation (NOHFC)* and *Northeast Midstream* to assess the engineering, environmental and economic feasibility of developing a regional natural gas delivery system.

Cornerstone Engineering Services, Inc., based in Massachusetts, and *Elenchus Research Associates* of Toronto were selected as lead consultants, following a request for proposals. •

WHAT ARE THE BENEFITS?¹

Expanding natural gas service to the North Shore will:

- Mobilize a capital investment of \$65 million in local distribution infrastructure, plus upstream investments to supply natural gas to the Municipalities
- Save Northern residents and businesses \$247 million on energy bills over 40 years (2018 dollars)
- Cut greenhouse gas (GHG) emissions by 17,000 tonnes CO₂e per year, equivalent to removing 3,591 passenger vehicles from the road
- Contribute \$73 million towards the GDP of Ontario, comparable to creating 704 full-time equivalent (FTE) positions

Financial support from the Province of Ontario's Natural Gas Access Loan program is required to provide the lowest possible rates to consumers and maximize energy savings.

Direct-to-consumer incentives from the Natural Gas Economic Development Grant program will accelerate and improve the economic and environmental benefits for North Shore residents and businesses. •

¹All figures are estimates only and correspond to the Reference Case developed by Cornerstone Engineering Services and Elenchus Research Associates. Capital costs do not include the upstream costs to supply natural gas to the Municipalities (i.e., upstream pipeline charges, liquefaction and trucking). Comparative benefits are based on current commodity prices. Forecasted rates are dependent on obtaining financial support from the Province of Ontario and approval from the Ontario Energy Board.

ECONOMIC & ENVIRONMENTAL BENEFITS

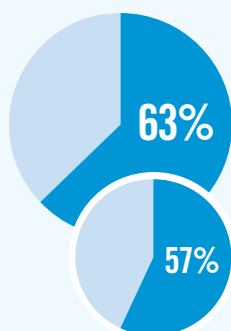
Elenchus Research Associates evaluated the potential for customers in the region to convert to natural gas, determined the potential aggregate demand for the Project, and quantified the economic and environmental feasibility of developing the Project.

Telephone market surveys were completed in April and May 2016, finding widespread support for the Project.

Residential customers are expected to save on average 36% to 61% annually before the cost of converting their space heating and water heating equipment, while commercial and institutional customers are expected to save on average 35% to 50% annually.

The expected savings is \$247 million for residential, commercial and institutional customers over 40 years.² •

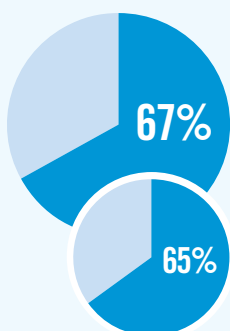
RESIDENTIAL



57%
expected
to convert

63%
expected
to convert
(with grant
available to
assist with
conversion)

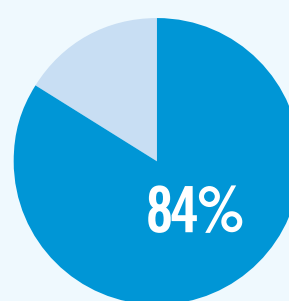
COMMERCIAL



65%
expected
to convert

67%
expected
to convert
(with grant
available to
assist with
conversion)

INSTITUTIONAL






84% expected
to convert

NUMBER OF POTENTIAL CUSTOMERS



AVERAGE EXPECTED SAVINGS PER RESIDENTIAL CUSTOMER

	Propane Users	\$1,023/yr
	Fuel Oil Users	\$827/yr
	Electricity Users	\$2,305/yr

² Energy savings for the one industrial customer are not included in this analysis, and would therefore be incremental to the values stated herein.

EXPECTED ENERGY SAVINGS OVER 40 YEARS³

Expected Energy Savings by Municipality	Savings (\$ Millions)
Manitouwadge	\$34.5
Marathon	\$62.5
Terrace Bay	\$29.4
Schreiber	\$25.4
Wawa	\$29.6
Subtotal (Residential)	\$181.4
Commercial & Institutional	\$65.3
Total	\$246.7

Net savings to the residential customers is estimated to be \$161 million over 40 years, as \$20 million of the \$181 million is expected to be spent locally on contractors and service providers related to energy conversion. Conversion costs for commercial and institutional customers requires further study and would be unique to each customer.

Typical Residential Conversion Costs

Heating Type	\$ Per Customer
Propane	\$500 to \$1,000
Fuel Oil & Electric Forced Air	\$5,000 to \$6,000
Electric Baseboard	\$10,000 to \$15,000
Water Heater	\$2,000 to \$2,500

Conversion to natural gas is expected to reduce overall GHG emissions by 17,000 tonnes of CO₂e per year from the Municipalities. This is equivalent to removing 3,591 passenger vehicles from the road.

Cap and trade legislation recently passed by the Ontario government will impact the price that customers pay for all fossil fuels across the province. As of January 1, 2017, natural gas rates will increase to cover the cost of acquiring emission allowances. However, these increases will be less than the anticipated cost increases for propane and fuel oil because of the lower carbon intensity of natural gas, making natural gas even more economical.

The Project is expected to contribute \$73 million towards the GDP of the Province of Ontario. This is equivalent to 704 full-time equivalent (FTE) positions, with 276 FTEs located within the North Shore region and 428 FTEs located elsewhere in the province.⁴ •

Full-Time Equivalent (FTE) Positions Created by the Project

	North Shore	Ontario	Total
Direct	96	128	224
Indirect	112	190	302
Induced	68	110	178
Total	276	428	704

³ Energy savings are in 2018 dollars and reflect the financial benefit based on the recent price differential between the weighted average cost of alternate fuels and natural gas, assuming the proposed 2018 natural gas distribution rate.

⁴ Direct economic impacts of the Project will come from wages and revenues; indirect impacts will be derived from the economic activity of other industries, such as companies selling materials and equipment used for the Project; and the induced impacts will result from overall increased spending in the Municipalities.

HOW WILL IT WORK?

Cornerstone Engineering Services, Inc. developed the system designs and capital cost estimates for the local natural gas distribution system for each of the Municipalities.

Liquefied natural gas (LNG) was chosen as the optimal gas supply solution for the Municipalities, replacing the need for a costly lateral pipeline from the TransCanada Mainline to the Municipalities. LNG will be sourced from a regional facility that will cool natural gas to -162°C , converting it into a liquid for safe and efficient transportation to the Municipalities by truck.

When there is demand for energy, locally stored LNG will be converted to natural gas and sent through an underground distribution system at a desired pipeline temperature and pressure to homes and businesses within the service area.

The proposed system design is the same for all five Municipalities, and features high-density polyethylene distribution mains, service pipes and customer meters as well as on-system LNG storage tanks and associated vaporization systems.

Gas delivery within the Municipalities will utilize the most modern materials, construction techniques and safety protocols, providing a level of reliable gas service comparable to that of communities supplied by lateral pipelines.

Proposed natural gas delivery model for the Municipalities located on the North Shore of Lake Superior

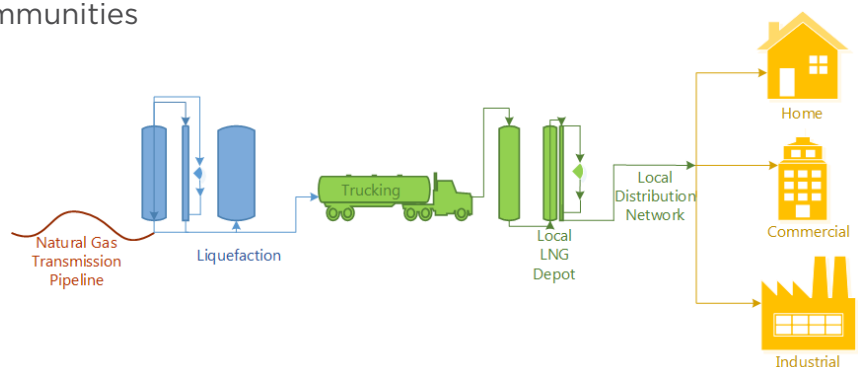
Representatives of the Municipalities were engaged to collect information related to appropriate land use, development patterns, growth projections, traffic concerns, local permitting, and land availability.

A full Environmental Constraints Analysis was completed by *Stantec Consulting Limited* to characterize critical issues associated with the project and to identify potential permitting and authorization requirements.

A First Nations Engagement Background Study was undertaken by *AMICK Consultants Limited* as a preliminary step prior to approaching potentially interested parties.

No engineering, environmental or economic limitations were found that would preclude the development of the Project within the Municipalities.

A preliminary project schedule was established. Residential, commercial and institutional customers in the Municipalities could begin accessing natural gas by the winter heating season of 2018-19. To achieve this in-service date, it is critical that detailed engineering design begin by January 2017 and all necessary permits and approvals, including a leave-to-construct order from the Ontario Energy Board, are received by December 2017. •



NORTH SHORE

NATURAL GAS DISTRIBUTION PLAN

The Northern Ontario municipalities of Marathon, Schreiber, Terrace Bay, Wawa and Manitouwadge have a combined population of 11,000, and are located on the North Shore of Lake Superior, along the Highway 17 corridor between Thunder Bay and Sault Ste. Marie.

ONTARIO

THUNDER BAY
SCHREIBER
TERRACE BAY
MARATHON
WAWA
SAULT STE. MARIE
MANITOUWADGE



Ontario

Northern Ontario Heritage
Fund Corporation
Société de gestion du Fonds
du patrimoine du Nord
de l'Ontario

The Northern Ontario Heritage Fund Corporation (NOHFC) is a crown corporation and development agency of the Ontario government. Since 2003, Ontario has committed nearly \$1.1 billion through the NOHFC to 7,207 projects, leveraging more than \$3.8 billion in direct economic activity and creating or sustaining over 27,600 jobs in Northern Ontario.

Northeast Midstream

Northeast Midstream LP is an Ontario-based energy partnership focused on expanding natural gas service to communities and industries not currently served by the traditional pipeline delivery model.

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