FINAL REPORT

Heritage Gas Economic and Environmental Benefits in Nova Scotia

SUBMITTED TO:
Heritage Gas Limited

SUBMITTED BY:
Gardner Pinfold Consultants Inc.

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Executive Summary

Economy - Since 2003, Heritage Gas has contributed $347 million in added-value (GDP) to the Nova Scotia economy, along with over 2,900 person-years of employment, which generates $76 million in worker income taxes plus taxes on purchased goods and services to the federal government and provincial government.

Environment - The carbon savings from natural gas use in Nova Scotia since 2003 is equivalent to taking 315,000 cars off the road or operating 367 wind turbines for one year. The annual carbon savings based on 2017 is equivalent to taking 48,000 cars off the road or operating 55 wind turbines *every* year. Natural gas is cited in Nova Scotia's Climate Change Action Plan as part of the strategy to reach a 5 megatonne carbon reduction target by 2020.

Energy - In just 15 years Heritage Gas has grown natural gas distribution from a single customer to a scale such that the energy delivered to its customers is equivalent to approximately 22% of the energy delivered by Nova Scotia Power to its customers. Natural gas plays an important role in heating, cooling, transportation, and many specialized industrial applications.

Supply chain - Heritage Gas purchases goods and services from 895 businesses, two-thirds of which are in Nova Scotia and help to build capacity and opportunities across the province.

Competitiveness - Heritage Gas provides energy to some of the largest industries and employers in the province – many of which are located in rural areas. Heritage Gas customers that are large industrial and commercial employers are profiled in this report. Oland Brewery, Oxford Frozen Foods, and CKF Inc. have each benefited from advantages of natural gas supply.

Education sector - Eight universities and colleges served by natural gas have a combined student enrolment of 34,845, representing about 80% of the provincial post-secondary student population.

Health sector - Hospitals in Halifax, Dartmouth, Amherst and Pictou County use natural gas to serve critical systems for emergency and acute care facilities.

Residential customers - Homes using natural gas are contributing to carbon savings. A 2000 square foot home in Nova Scotia with 4 occupants and full natural gas use can reduce carbon emissions by 4 tonnes per year, or the equivalent of every second customer taking a car off the road.

NATURAL GAS IN NOVA SCOTIA

Making Things Happen

Economy

$ 347 Million

Added Value (GDP) since 2003

Environment

Annual Carbon Savings Equals

55 wind turbines or

48,000 cars

off the road every year

Energy

Since 2003, energy delivered by Heritage Gas has grown to be equal to

22%

of that delivered by Nova Scotia Power

Supply Chain

Purchased goods and services purchased from

591 Nova Scotia businesses

Competitiveness

Heritage Gas provides energy to many of the largest industries and employers in the province

saving our customers millions

of dollars relative to other energy choices

Education

Energy for **8** Universities and colleges

with more than **34,000** students, about **80%** of post-secondary students in Nova Scotia

Health

Reliably supplying hospitals

in Halifax, Dartmouth, Amherst and New Glasgow

Customers

Converting a 2000 sq.ft home from heating oil to natural gas, with 4 occupants can reduce carbon emissions by

4 tonnes per year

equals every second customer taking a car off the road

Heritage Gas Economic & Environmental Benefits Report by Gardner Pinfold

heritagegas.com

Heritage Gas

1. Introduction

1.1 Background

Heritage Gas has the exclusive rights to distribute natural gas through its distribution system to all or part of seven counties in Nova Scotia. Heritage Gas operates under cost-of-service regulation and is regulated by the Nova Scotia Utility and Review Board (NSUARB). In 2017, Heritage Gas' customer base grew by 6 percent and ended the year at approximately 6,900 customers. Heritage Gas has a mix of residential, small and large commercial, as well as industrial customers. In addition, Heritage Gas provides energy to some of the largest institutions (e.g. hospitals and universities) in the province. Heritage Gas has identified a need to measure the economic and environmental benefits of the company activity since inception.

1.2 Goal and objectives

The overall goal of this report is to describe and quantify Heritage Gas' contributions to the province arising from increased use of natural gas since its inception. Specifically, this report addresses the following reporting objectives:

- **Economic benefits** – Current and historical impacts of businesses, institutions, hospitals, and residential customers using natural gas;
- **Environmental benefits** – Current and historical greenhouse gas (GHG) emissions avoided for customers switching to natural gas; and
- **Case studies** – Illustrate the experience of commercial, industrial, institutional, and residential customers switching to natural gas in Nova Scotia.

Note: The scope of analysis does not include natural gas volumes used by Nova Scotia Power Inc. for electricity generation.

2. Methodology

2.1 Economic benefits

Economic impact analysis begins with expenditure information. We rely on Heritage Gas for information on capital expenditures and operations for each year of analysis. The values provided are audited figures. The formal economic analysis is then done by economic input-output modeling as outlined below.

Statistics Canada maintains interprovincial economic input-output models that are based on Revenue Canada tax returns and HST reporting. The Heritage Gas expenditures are assigned to industry and commodity categories according to the North American Industry Classification System (NAICS) to generate the analysis.

The economic input-output analysis calculates how the initial spending (output) flows through the economy triggering demand for various goods and services. Following conventional practice, impacts are measured with four main indicators:

- **GDP**: An industry's contribution to Gross Domestic Product represents its broadest measure of economic impact. The domestic product of an industry captures the value it adds to purchased inputs through the application of labour and capital. GDP represents the sum of the value added by each industry. GDP is typically lower than the gross output (spending) since many goods and services are brought in from other parts of the country and abroad. GDP represents the value that stays within each province or region.
- **Income**: This captures payments in the form of wages and salaries earned in the affected industries. Returns to labour in the form of wages, salaries, and earnings form a key component of GDP. Industries paying relatively high average wages and salaries generate a correspondingly higher economic impact than industries paying lower average incomes.
- **Employment**: From an economic impact perspective, the significance lies in the economic impact generated through the spending of employment income. The greater the employment and higher the average income, the more significant the industry in terms of economic impact. Employment is measured in full-time equivalents (FTE).
- **Tax revenues** – The revenues to all three levels of government are calculated by the model. Corporate taxes and property taxes are excluded since these are too diverse to model accurately. Gardner Pinfold provides custom income tax calculations based on industry specific marginal tax rates obtained from the 2017 Statistics Canada Social Policy Simulation Database and Model.

Economic impacts are generated through direct, indirect, and induced demand in the economy expressed in terms of industry and consumer purchases.

- **Direct impact:** refers to impact arising from the expenditures made by firms in the subject industries on the goods and services needed to produce industry outputs. For example, natural gas installation requires purchase of pipe from manufacturers and Heritage Gas purchases tools, vehicles and office supplies from local companies.
- **Indirect impact:** refers to the inter-industry purchases inside and outside the province that are triggered by the direct demand. For example, pipe manufacturers purchase inputs of raw materials from metals or plastic suppliers - these industries in turn buy basic goods and services, and so on.
- **Induced demand:** refers to the demand created in the broader economy through consumer spending of incomes earned by those employed in direct and indirect activities. It may take a year or more for these rounds of consumer spending to work their way through an economy.

2.2 Environmental benefits

Provincial, national, and international commitments to reduce greenhouse gas emissions have been strengthening over the past decade and particularly in the last year. These efforts are aimed at reducing greenhouse gas (GHG) emissions (also referred to as carbon savings). Heritage Gas plays an important role in reducing Nova Scotia's GHG emissions and could contribute more to GHG reductions through expansion of natural gas distribution.

The benefits of carbon savings from natural gas distribution are calculated by comparing carbon from natural gas versus carbon emissions from the energy it replaces. Natural gas primarily replaces heavy fuels and some propane in commercial and industrial facilities. Residential natural gas replaces home heating oil, some electricity and propane in existing homes, and displaces electricity in newly built homes. Heritage Gas estimates the residential mix of energy replaced by natural gas is 80% oil, 10% electricity, and 10% propane.

The efficiency of appliances has improved since 2003 including electric water heaters and oil furnaces. In 2003 most electric water heaters had an 80% efficiency rating and new systems today have a 92% rating so the percentage of old water heaters is assumed to have declined from 100% in 2003 to 35% today (straight-line). Similarly, oil furnaces have improved from an efficiency rating of 59% to 62% with a similar conversion rate over the years.

For each former energy type we determine the equivalent amount of energy as natural gas, with the appliance efficiency factors accounted for. The carbon emissions associated with each energy source, including natural gas is determined using carbon

emissions factors published in the Canada Climate Registry (2017). The difference between carbon emissions from former energy sources and emissions from natural gas represents the carbon savings achieved.

Since electricity in Nova Scotia is generated from a variety of energy sources including heavy oil and coal, additional air emissions are also avoided by using natural gas to replace electric appliances. Nova Scotia Power annually reports the average emissions intensity of electricity generation, in particular for mercury, sulfur oxides, and nitrous oxides. These factors are avoided by residential customers switching their electric water heating to natural gas.

Finally, we express carbon savings in terms that are easier to understand such as the equivalent number of cars taken off the road, the number of 2MW wind turbines in operation, incandescent bulbs replaced by LEDs, or dollar value of carbon. The equivalent number of cars off the road is sourced from Natural Resources Canada, the equivalent wind turbines and LEDs are from the U.S. Environmental Protection Agency.

Carbon emissions are expressed in dollar values as Canada implements a carbon pricing policy. In a 2016 address to Parliament, the Prime Minister set a minimum national carbon price of $10 per tonne starting in 2018, with a rising rate of $10 per year until it reaches a maximum of $50 in 2022. British Columbia is already pricing carbon at $35 per tonne in 2018. In this report we use $30 per tonne as an indication of the forthcoming value of carbon.

2.3 Case studies

Interviews with owners, managers and engineers among some of Heritage Gas' customers, as well as a homeowner, help to illustrate what the adoption of natural gas has meant for their operations. To move beyond the numbers, these case studies help tell the story of natural gas benefits in different industries and locations in the province. Many Nova Scotians may not be aware of how much natural gas is used daily by industry, business, and residences in the province.

3. Results

3.1 Economic benefits

Economic benefits since 2003

Heritage Gas reports combined capital and operational spending since 2003 totaling $364 million in 2017 dollars[1]. This is the starting point for economic analysis and that figure appears as the direct output in the table below. Heritage Gas also provided the number of direct full-time equivalent staff. The remaining indicators are produced by the Statistics Canada's interprovincial input-output model (2014). Since the model does not calculate income taxes (from employees), these were custom tabulated by Gardner Pinfold and included in the provincial and federal income taxes shown.

TABLE 3.1
ECONOMIC IMPACTS OF CAPITAL CONSTRUCTION AND OPERATIONS, 2004 - 2017

($000s)	Direct	Indirect	Induced	Total NS	Total Canada
Output	$364,000	$79,000	$106,000	$549,340	$695,000
GDP	$238,000	$44,000	$65,000	$347,000	$419,000
Wages & Salaries	$214,000	$430	$27,000	$241,000	$278,000
Employment*	1,995	272	665	2,932	3,506
Federal tax	$11,000	$2,000	$21,000	$35,000	$39,000
Provincial tax	$23,000	$47	$18,000	$41,000	$47,000

*Sources: Statistics Canada Interprovincial Input-Output Model, 2014; Gardner Pinfold custom calculations of income tax revenues. *Full-time equivalent (FTE) jobs, directs are company staff.*

The total benefits in Nova Scotia include $347 million in GDP (added-value), of which $241 million represents salaries and wages tied to about 2,900 full-time equivalent jobs over the 14-year period. The total taxes generated from workers paying income taxes and taxes paid on goods and services purchased by Heritage Gas amount to nearly $41 million for the Province and about $35 million for the federal government. Additional impacts occur in other provinces including another $72 million in GDP, $37 million in salaries, and another 574 jobs since elements of the supply-chain extend across Canada.

Capital spending by Heritage Gas is principally for installation of distribution lines and equipment. The operational expenditures include the cost associated with operating and maintaining the existing infrastructure, business development activities and management of natural gas including purchasing, logistics, and account management.

[1] The consumer price index (CPI) for Nova Scotia (all items) is used to convert the spending amount for each year to equivalent 2017 dollars.

The top industries and products in Nova Scotia that assist Heritage Gas are: non-residential repair and construction, service providers, and freight transportation. Heritage Gas reported 895 different businesses in their supply chain for 2017, about two-thirds (67%) of which are in Nova Scotia capturing about two-thirds (62%) of the spending value.

Economic impacts for 2017

Heritage Gas reported a combined 2017 capital and operational spending of $15.4 million, and 66 current direct full-time equivalent staff shown below.

TABLE 3.2
ECONOMIC IMPACTS OF CAPITAL CONSTRUCTION AND OPERATIONS, 2017

($000s)	Direct	Indirect	Induced	Total NS	Total Canada
Output	$15,394	$2,495	$3,194	$21,083	$25,165
GDP	$12,060	$1,348	$1,952	$15,359	$17,403
Wages & Salaries	$6,612	$430	$816	$7,858	$8,352
Employment*	66	9	22	97	116
Federal tax	$547	$61	$673	$1,281	$1,373
Provincial tax	$955	$62	$576	$1,593	$1,780

*Sources: Statistics Canada Interprovincial Input-Output Model, 2014; Gardner Pinfold custom calculations of income tax revenues. *Full-time equivalent (FTE) jobs, directs are company staff.*

The total impacts in Nova Scotia include $15.4 million in GDP (added-value), of which $7.9 million represent salaries and wages tied to 97 full-time equivalent jobs. The total provincial taxes generated in Nova Scotia amount to nearly $1.6 million and about $1.3 million in federal taxes are generated. Additional impacts occur in other provinces including another $2.0 million in GDP, $1.7 million in salaries and wages, and another 19 jobs.

3.2 Environmental benefits

Heritage Gas totals

The primary environmental benefit of switching to natural gas is the avoided emissions from other more carbon-intensive fossil fuels. Mostly heavy fuel and home heating oil is displaced, and the carbon footprint of natural gas is about one-third lower than these fuels.

Natural gas is cited in Nova Scotia's Climate Change Action Plan as part of the strategy to reach a 5 megatonne carbon reduction target by 2020.

The carbon savings from Heritage Gas distribution in 2017 is equivalent to operating 55 wind turbines in the province or taking 48,000 cars off the road every year. The fourteen year cumulative results from 2004 to 2017 are equivalent to the carbon

savings from operating 367 wind turbines in the province for one year or taking 315,000 cars off the road for one year.

Carbon Equivalents[1]	2017	2004 – '17 TOTAL
Tonnes avoided[2]	219,000	1,450,000
Cars off the road	48,000	315,000
LED bulbs installed	7,300,000	48,500,000
2 MW wind turbines	55	367
Carbon value ($30/tonne)	$6,600,000	$43,500,000

1. US EPA Greenhouse Gas Equivalencies Calculator, 2018
2. The Climate Registry Default Emissions Factors, 2017
Note: 2017 values continue annually.

Residential Heritage Gas customers often use natural gas for hot water heating. Most of these customers formerly used oil heated systems, however a portion of these replace electrical hot water heaters. Those replacing electricity help to avoid Nova Scotia Power generation and associated air pollutants such as mercury, sulfur oxide and nitrous oxide.

Below are breakdowns of Heritage Gas total environmental benefits according to four broad sectors: industrial and commercial, post-secondary education, health care sector, and residential.

Industrial and Commercial

There are about 250 industrial customers that include food, forest, and transportation product manufacturing among others. Some of these customers use compressed natural gas that is trucked to locations not yet served directly by pipelines. This group has diverse needs for natural gas, however they generally use natural gas to displace fuel oil.

Heritage Gas has about 2,800 commercial customers including over 150 that use more than 5,000 GJs per year. The average annual consumption for the 150 companies is 25,000 GJs. Since the average household uses 70 GJs per year, the commercial facilities daily consumption is what an average home uses per year. There are a wide range of commercial customers including: manufacturers, multi-unit residential buildings, retail businesses, hotels, recreation and entertainment facilities, transportation fleets, and others. They use natural gas for space and hot water heating, for cooking and clothes drying appliances, operating vehicles, and to provide energy to manufacturing processes.

Carbon Equivalents[1]	2017	2004 – '17 TOTAL
Tonnes avoided[2]	169,000	1,045,000
Cars off the road	37,000	227,000
2 MW wind turbines	43	265
Carbon value ($30/tonne)	$5,100,000	$31,400,000

1. US EPA Greenhouse Gas Equivalencies Calculator, 2018
2. The Climate Registry Default Emissions Factors, 2017
Note: 2017 values continue annually.

Post-secondary education

Universities and colleges primarily use natural gas for space and hot water heating, although some use it for cooling systems. Most of these institutions require underground piping networks to connect many buildings on their campuses. There are currently eight universities and colleges using natural gas with a combined student enrolment of 34,845 according to the Maritime Provinces Higher Education Commission (MPHEC, 2017). The following post-secondary education institutions all use natural gas and account for about 80% of provincial student enrolment:

- Dalhousie University (University of King's College is connected)
- Maritime Business College
- Mount Saint Vincent University
- Nova Scotia College of Art and Design University
- Nova Scotia Community College
- Saint Mary's University
- Acadia University[2]

[2]Acadia University natural gas volumes are not included in the carbon savings results, as they are compressed natural gas customers with another operator.

The carbon savings from Heritage Gas distribution to Nova Scotia post-secondary institutions in 2017 is equivalent to removing 4,000 cars from the road every year. It is also equivalent to the carbon savings by installing 5 wind turbines in the province. These savings are explained in the following table:

Carbon Equivalents[1]	2017	2004 – '17 TOTAL
Tonnes avoided[2]	18,000	130,000
Cars off the road	4,000	28,000
2 MW wind turbines	5	33
Carbon value ($30/tonne)	$500,000	$3,900,000

1. US EPA Greenhouse Gas Equivalencies Calculator, 2018
2. The Climate Registry Default Emissions Factors, 2017
Note: 2017 values continue annually.

Health care sector

Heritage Gas currently serves five hospital complexes including three in the Halifax area, one in Amherst, and one in Pictou County. The case study provides more detail about the significance of natural gas at these facilities. As the Pictou County hospital facility recently joined the Heritage Gas network in 2018 it is not included in the calculations below. Thus, the four locations combined use is the equivalent natural gas volume of approximately 12,700 homes.

Carbon Equivalents[1]	2017	2004 – '17 TOTAL
Tonnes avoided[2]	23,000	217,000
Cars off the road	5,000	47,000
2 MW wind turbines	6	55
Carbon value ($30/tonne)	$700,000	$6,500,000

1. US EPA Greenhouse Gas Equivalencies Calculator, 2018
2. The Climate Registry Default Emissions Factors, 2017
Note: 2017 values continue annually.

Residential sector

There are about 3,800 residential natural gas customers and the average home consumes 70 GJs per year. Most residential customers converting to natural gas are switching over from oil. Many new residential homes are built with natural gas installed instead of oil or electric energy sources. In addition to using natural gas for space heating, residents in many cases use natural gas for hot water heating and cooking.

The carbon savings by switching residential customers to natural gas is equivalent to removing 1,960 cars off the road in one year. As well, further opportunity still exists for natural gas to considerably reduce carbon emissions as residential service expands in the province.

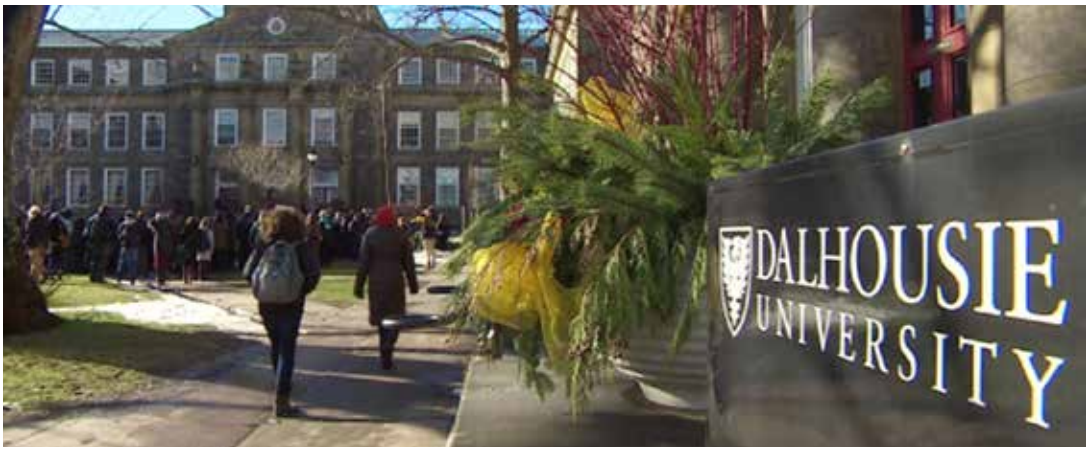
Carbon Equivalents[1]	2017	2004 – '17 TOTAL
Tonnes avoided[2]	8,999	57,000
Cars off the road	1,960	12,400
2 MW wind turbines	2	14
Carbon value ($30/tonne)	$270,000	$1,700,000

1. US EPA Greenhouse Gas Equivalencies Calculator, 2018
2. The Climate Registry Default Emissions Factors, 2017

Note: 2017 values continue annually.

3.3 Case studies

Dalhousie University



In 2009, Dalhousie University signed a *University and College's Climate Change Statement for Canada* requiring comprehensive inventories of GHG emissions and 50% GHG reduction targets for the year 2020.

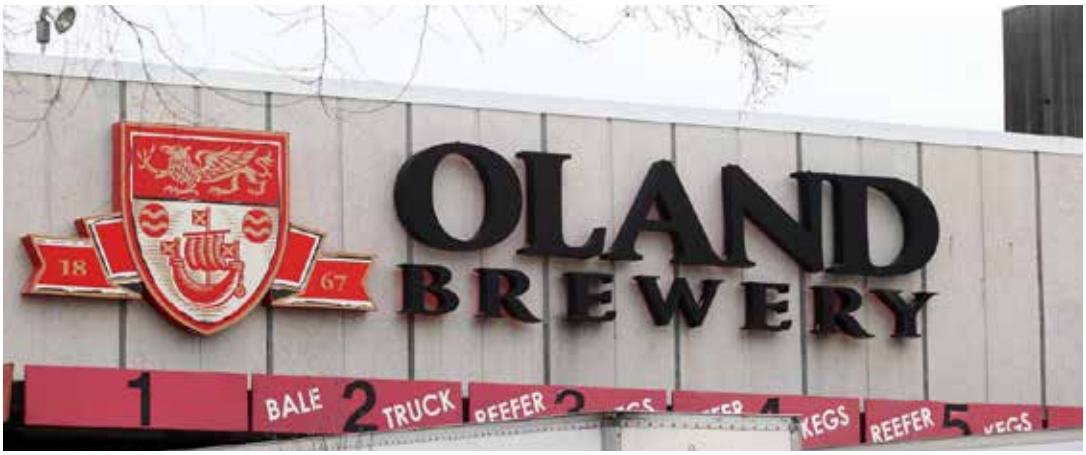
Dalhousie University owns 98 buildings on three campuses in the Halifax area and 95% of these buildings are connected by underground steam pipes to form a district energy system. The system is mainly used for heating and for cooling at some facilities. Until 2010, heavy fuel oil was the primary source of energy, then a transition to natural gas occurred and heavy fuel is now only used as a backup supply.

There are several operational advantages of natural gas, according to Dalhousie engineers. The elimination of fuel truck deliveries alleviates traffic safety concerns for people on campus and for Halifax community members around the Central Plant. The cleaner burning natural gas leads to less maintenance on the steam boilers and longer life-expectancy of the system. Finally, with many research and medical facilities requiring highly dependable and safe energy supply, the switch to natural gas improved risk management by avoiding energy interruptions.

Dalhousie's district energy system also connects with other institutions and businesses at a scale that could work for combined heat and power (CHP), where electricity is produced. The development of CHP has been examined closely and could extend the benefits of natural gas in the future.

Gardner Pinfold estimates the replacement of heavy fuel oil with natural gas avoided 14,000 tonnes of GHG emissions in 2017 and a total of 103,000 tonnes since the transition. At 2017 levels this is equivalent to annually removing 3,000 cars from the road. Fewer emissions also leads to better air quality for students and Halifax area residents, which is another important outcome for Dalhousie University in the transition to natural gas.

Oland Brewery



Oland Brewery, located in Halifax for over 150 years, is the province's largest brewery. Since natural gas helps to reduce greenhouse gas emissions, switching to this fuel fits well with the company's 2010 environmental leadership commitment to a *Better World*.

The company is improving environmental performance across a number of activities with a key aim to reduce carbon emissions. In 2010 Oland installed two natural gas-oil dual-fuel boilers. This immediately reduced 2010 fuel consumption by 6% compared to 2009.

Gardner Pinfold estimates the replacement of fuel oil with natural gas avoided 2,700 tonnes of GHG emissions in 2017 and a total of 23,000 tonnes since the transition. At 2017 levels this is equivalent to annually removing 600 cars from the road.

The decision to go forward with natural gas involved other operational advantages. At the time, the underground fuel oil storage tanks represented a risk that could be avoided with the switch to natural gas supply. The challenges of managing fuel truck traffic around the facility in the busy mid-town area would be eased. Boiler maintenance and cleaning with natural gas is much easier and more economical than with heavy fuels. Finally, natural gas offered flexibility to run lines on-site for other applications such as enhanced space heating systems.

Oxford Frozen Foods

Oxford Frozen Foods is the world's largest supplier of frozen wild blueberries, Canada's largest processor of frozen carrot products and a significant supplier of a variety of battered vegetable appetizer products. In business since 1968, with its primary processing facility located in Oxford, Nova Scotia, Oxford Frozen Foods was an ideal candidate when it came to considering natural gas for its energy needs.

Working with Heritage Gas to secure the extension of the natural gas distribution system into the Town of Oxford, Oxford Frozen Foods was able to convert its processing energy needs from heavy oil to cleaner burning natural gas. As part of the gas distribution system expansion, Oxford Frozen Foods was the anchor customer and further paid to upsize the gas pipeline into the Town of Oxford, in order to allow residents to have domestic access to natural gas.

Utilizing natural gas brings an efficient, more environmentally beneficial energy source to the business and better insights into daily energy needs. Working with Heritage Gas, Oxford Frozen Foods can closely manage the facility's energy requirements and performance.

Gardner Pinfold estimates the replacement of heavy fuel oil with natural gas avoided 3,000 tonnes of GHG emissions in 2017 and a total of 15,000 tonnes since the transition. At 2017 levels this is equivalent to annually removing 650 cars from the road.

Oxford Frozen Foods is concerned about the current domestic natural gas supply issues facing the Province of Nova Scotia and feels that it's important for the region and the Province to have access to a competitively priced and readily available clean energy source, like natural gas.

Hospitals in Nova Scotia

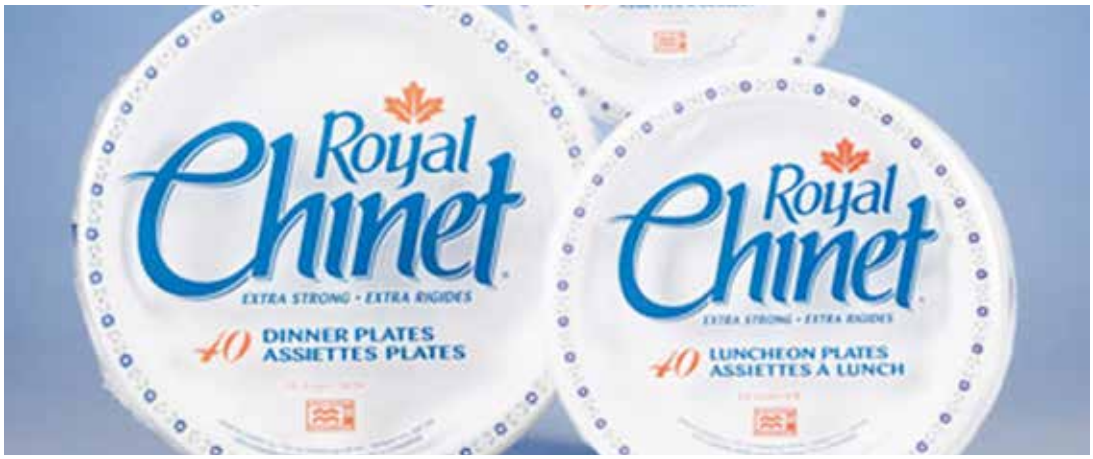
Six hospitals in Nova Scotia are connected to natural gas including Cumberland Regional Health Centre (Amherst), the Dartmouth General Hospital, the Nova Scotia Hospital (Dartmouth), the Aberdeen Hospital in Pictou County, and the QEII Health Sciences Centre (Infirmary and Victoria General in Halifax). This case study focuses on the QEII.

Nova Scotia Health Authority operations engineers work 365 days a year to maintain building air temperatures, hot water systems, refrigeration, and steam supplies to their district energy facilities. The QEII complex is comprised of at least 14 buildings and includes over 3 million square feet of space, supporting critical equipment and services. This is served by one steam boiler plant at the Halifax Infirmary Hospital and one at the Victoria General Hospital producing a combined 125,000 lbs of steam per hour.

The hospitals have found additional advantages with natural gas such as: lower energy costs, reduced annual cleaning and maintenance of equipment, improved occupational health and safety for workers, and cleaner air emissions for the surrounding community. There are opportunities in the future to connect other health care centres to natural gas as distribution lines reach more facilities.

Gardner Pinfold estimates the replacement of fuel oil with natural gas at four hospitals (excluding the Aberdeen Hospital which joined the Heritage Gas system in 2018) avoided 22,700 tonnes of GHG emissions in 2017 and a total of 217,000 tonnes since the transition. At 2017 levels this is equivalent to annually removing 4,900 cars from the road.

CKF Inc.



CKF is a Canadian, family owned company, established in 1933 with a single plant in Hantsport, Nova Scotia. The company now has two plants in Langley, British Columbia, and one in Rexdale, Ontario. These plants offer a wide range of molded pulp and foam food service and packaging products for retail consumers, food service operators, and the packaging industry. CKF also has a plant in Delta, B.C. where RPET products for the food service and packaging industry are manufactured. Their products are widely recognized under brands such as Royal Chinet, Earthcycle, and Dynette.

The Hantsport facility uses steam generation for space heating, process heating, and product drying. Product drying may be achieved with a thermal transfer fluid or may be direct fired with compressed natural gas.

Several reasons converged to launch the transition to natural gas. CKF wanted to reduce its carbon footprint as part of an overall sustainability program. CKF natural gas is delivered by a compressed natural gas (CNG) truck from a CNG compressor station located close to the Halifax International Airport, and this is much closer than sources of heavy fuel from Quebec or Maine.

CKF has found other advantages operating with natural gas including lower maintenance costs compared to heavy fuel. Equipment remains much cleaner with natural gas compared to previous heavy fuel burning that required annual or semiannual cleaning. The boilers can also draw heat from the fuel exhaust to improve energy efficiency, which is not possible using heavy fuel. Natural gas pipeline expansion in Nova Scotia and direct delivery to the plant would further improve business competitiveness. A direct line could support a co-generation facility in the future.

CKF estimates their carbon footprint has been reduced 56% per tonne of finished product through conversion to natural gas. Part of this reduction is due to the lower carbon content of natural gas (20%), and part due to the more efficient natural gas systems installed (36%).

Residential Customer

Peter Kerrin's heritage home in Halifax was originally heated by a standard oil furnace. The oil tank was in an exposed position in the driveway not secure from tampering and was at risk of leaking.

Almost eight years ago, Peter made the switch to natural gas with Heritage Gas. Peter speaks highly of the service he has received, and the focus on safety that Heritage Gas maintains at all times.

Benefits arise from both natural gas equipment and the gas itself. Unlike the large oil burner that was inefficient, natural gas systems make it easy to maintain a comfortably heated home. With natural gas, Peter has instant hot water and he only heats what he needs. Temperature swings between hot and cold are replaced by steady space heating so when you set your home to twenty degrees, it stays twenty degrees.

Every residential customer on natural gas avoids carbon emissions each year. A 2000 square foot home in Nova Scotia with 4 occupants and full natural gas use can reduce carbon emissions by 4 tonnes per year, or the equivalent of every second customer taking a car off the road.