



Fairbanks North Star Borough

Comprehensive Economic Development Strategy (CEDS) Update

IMPLAN Analysis: Interior Gas Utility Phase 2 Buildout

An economic impact analysis of implementing phase 2 of the Interior Gas Utility's natural gas buildout. Phase 2 serves the North Pole area.

Prepared for the Fairbanks North Star Borough

by Northern Economics and Agnew::Beck Consulting



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Key Takeaways

The proposed project will expand the natural gas distribution infrastructure in the FNSB. The project is intended to bring both economic and environmental relief to the residents in the region. Phase 2 of the expansion project will require installation of 87 miles of pipe covering the North Pole area.

This infrastructure project will require a \$30 million investment in today's dollars. This investment is projected to generate economic benefits in the region.

The construction and installation of the natural gas pipeline distribution system will create a short-term economic stimulus by generating a projected 280 direct jobs and 100 additional indirect and induced jobs in the region over the course of the construction phase. These short-term construction phase jobs will generate about \$18.3 million in total labor income and \$45.9 million in total business sales.

In addition to the economic stimulus resulting from the construction activities, the conversion of the customers' heating systems to natural gas would also generate additional economic activity in the Fairbanks region. The spending for conversions would create a stimulus effect in the region over the next several years as homeowners and businesses decide to switch to natural gas systems. It is projected that in Year 1, the spending on conversions would generate \$2 million in total business sales, support nine direct, indirect, and induced jobs, and increase total labor income by \$0.8 million. By year 12, the benefits are projected to amount to \$16 million in total business sales, 58 jobs, and \$5.4 million in labor income.

The proposed project is also expected to improve air quality in the region as users switch to natural gas from other sources of fuel for heating systems.

Project Description

The purpose of the project is to expand the natural gas distribution infrastructure in the Fairbanks North Star Borough (FNSB). The project proponent is the Interior Gas Utility, a public utility that is owned and governed by the FNSB. IGU's mission is to provide low cost, clean burning, natural gas to as many people in the region as possible, as soon as possible. As a public utility, the IGU is focused on bringing down energy costs and improving the quality of life for FNSB residents. The project is intended to bring both economic and environmental relief to the residents in the region.

The proposed project is for Phase 2 of IGU's planned infrastructure build-out, which covers the North Pole area. Construction of the Phase 2 build-out includes 87 miles of 2", 4", and 8" high density polyethylene (HDPE) pipe, 1,250 crossings, and approximately 120 valves.

The estimated capital cost for Phase 2 is approximately \$30 million, which covers materials, installation, and construction engineering. This estimate is based on the Phase 2 project cost estimate developed by Michael Baker International in 2015. The 2015 estimate was adjusted to include additional cost for design engineering, permitting, and design survey, as well as for inflation to reflect 2020\$.

Near-Term Economic Benefits of the Construction Project

The proposed Phase 2 construction and installation of the natural gas pipeline distribution system will create a short-term economic stimulus in the region that will benefit the construction and engineering

services sectors, as well as other sectors that supply goods and services to the construction industry and their workers.

This construction spending stimulus is projected to generate 280 direct jobs and 100 additional indirect and induced jobs in the region over the course of the construction phase. These jobs would be temporary or short-term and are not full-time equivalent jobs. These short-term construction phase jobs will generate about \$18.3 million in total labor income. In terms of economic output or business sales, direct construction spending is estimated to generate an additional \$15.9 million in indirect and induced business sales. Note that not the entire \$30 million in pre-construction and construction costs would be spent locally as most of materials including the pipe and valves will be imported from outside the region.

The proposed construction project’s estimated economic effects are summarized in Table 1.

Table 1. Phase 2 Construction Project Economic Effects

Indicator	Direct ¹	Indirect ²	Induced ³	Total
Direct Spending/Economic Output (2020\$ millions)	\$30.0	\$7.1	\$8.8	\$45.9
Employment (# of Jobs)	180	40	60	280
Labor Income (2020\$ millions)	\$13.6	\$2.0	\$2.7	\$18.3

Source: Northern Economics estimates based on adjusted construction cost estimates developed by Michael Baker and the IMPLAN⁴ input-output model for the Fairbanks North Star Borough.

Long-Term Economic Benefits of the Phase 2 Build-Out

As noted above, the purpose of this project is to provide rapid build-out of natural gas distribution infrastructure to provide access to the largest number of borough residents and businesses as possible.

IGU has been working towards advancing through the different phases of the project. It is completing small main line extensions as part of its program to add new services and this year has allotted about \$1 million in main line extensions to provide increased access to natural gas in the region. Construction of a new 150,000-gallon capacity LNG storage and vaporization facility was completed in February 2021 and is now in full operation serving the North Pole distribution system. The completion of the North Pole facility allowed the gasification of over 70 miles of distribution system in the area (IEP 2021). The Phase 2 build-out would increase access to natural gas to more people in the region.

Previous studies have noted that FNSB residents are strongly interested and supportive of converting to natural gas heating systems. Generally, homeowners believe that bringing natural gas to Fairbanks

¹ Direct effects refer to the new economic activity that can be tied directly to the proposed project. In this table, direct effects include spending for construction of the pipeline distribution system, and the direct jobs and labor income associated with the construction activities.

² Indirect effects are those associated with a change in economic activity due to spending for goods and services tied to the new facility. During construction, these are the changes in the local economy occurring because construction firms purchase goods (e.g., valves, pipes, and other supplies) and related services (e.g., landscaping, accounting, and legal). As construction firms make purchases, this creates an increase in purchases across the supply chain.

³ Induced effects are those associated with a change in economic activity due to spending by the employees of businesses (labor) and by households. These are economic changes related to spending by the workers. Once operations begin, spending by employees of the facility will drive induced effects. Induced effects also include household spending related to indirect effects.

⁴ IMPLAN is a predictive input-output model of local/regional economies and is widely used to measure the economic impact of industries and industrial/commercial development. IMPLAN uses borough level employment and payroll data to define linkages between industries in the local economy and multipliers that predict the total impact of an economic stimulus.

will help the economy, raise property values, and improve air quality. The willingness of residents and businesses to convert to natural gas systems, however, depends on the costs of conversion and the level of savings from using natural gas to heat their facilities (NEI 2013; CardnoEntrix 2014b; IGU 2014; Carlisle 2016; Stantec 2017; IEP 2021).

To this end, there have been some efforts to assist consumers with conversion to natural gas in terms of providing access to favorable financing mechanisms and identification of possible low-cost loan funds, as well as working with furnace and boiler manufacturers regarding new boiler components that may reduce the cost of individual customer conversion to natural gas. On November 14, 2019, the FNSB adopted Ordinance No. 2019-45.2 This ordinance creates a program to help offset the cost of conversion from heating oil to natural gas or propane. The program was highly successful and the initial \$1 million of funding has been fully allocated. IGU is exploring options for additional funding for this program (AIDEA Internal Energy Project 2021).

In addition to the economic stimulus resulting from the construction activities, the conversion of the customers' heating systems to natural gas would also generate additional economic activity in the Fairbanks region. The spending for conversions would create a stimulus effect in the region over the next several years as homeowners and businesses decide to switch to natural gas systems.

To forecast the potential economic effects of these conversions, estimates of conversion rates and conversion costs from the CardnoEntrix study were used. The following figure shows two of the projected conversion tables from the study. The upper table shows projected annual conversion rates by project phase, and the lower table shows the number of conversions projected by type of facility.

Figure 1. CardnoEntrix Projections: Annual Conversion by Project Phase and by Type of Facility

Phase	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12
Phase 1 (Const. Year 0)	810	3,260	4,070	4,860	5,060	5,170	5,270	5,380	5,390	5,390	5,390	5,390	5,390
Phase 2 (Const. Year 1)	0	450	1,740	2,190	2,630	2,760	2,830	2,900	2,970	2,980	2,980	2,980	2,980
Phase 3 (Const. Year 2)	0	0	310	1,210	1,510	1,820	1,910	1,950	2,000	2,050	2,060	2,060	2,060
Phase 4 (Const. Year 3)	0	0	0	340	1,360	1,700	2,040	2,130	2,180	2,230	2,280	2,280	2,280
Phase 5 (Const. Year 4)	0	0	0	0	350	1,380	1,730	2,080	2,180	2,240	2,300	2,350	2,360
Phase 6 (Const. Year 5)	0	0	0	0	0	300	1,160	1,450	1,750	1,830	1,880	1,930	1,980
Total Single-Family	640	2,880	5,010	7,180	9,250	11,320	13,040	13,980	14,550	14,790	14,960	15,070	15,120
<i>Rate of Conversion</i>	3%	14%	25%	36%	46%	56%	65%	70%	72%	74%	74%	75%	75%
Total	810	3,710	6,120	8,590	10,920	13,120	14,930	15,900	16,470	16,720	16,880	17,000	17,050
<i>Rate of Conversion</i>	4%	17%	28%	39%	50%	60%	68%	72%	75%	76%	77%	77%	77%

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12
Phase 2 (Construction Year 1)													
Single-Family (minus single-family rentals)		360	1,450	1,810	2,170	2,230	2,290	2,350	2,410	2,410	2,410	2,410	2,410
Single-Family Rentals		60	190	250	310	370	380	390	400	410	410	410	410
Multi-Family Residential		10	40	50	60	60	60	60	60	60	60	60	60
Commercial		10	70	80	90	100	100	100	100	100	100	100	100
Industrial		0	0	0	0	0	0	0	0	0	0	0	0
Subtotal		440	1,750	2,190	2,630	2,760	2,830	2,900	2,970	2,980	2,980	2,980	2,980

Source: CardnoEntrix (2014a).

The major factors affecting conversion costs are the age of the existing heating system, the type of natural gas heating system, the cost of piping the home for natural gas, and the labor required for installation. Depending on the equipment requirements and the capital cost of converting to natural gas heating, conversion costs are estimated to range between \$4,000 and \$10,000 for residential structures, and \$6,000 and \$15,000 for commercial structures. These estimates include the cost for the heating systems, piping and valves, and labor for full installation. The average conversion costs for each type of facility were used for this analysis—\$7,000 for residential structures and \$10,500 for commercial structures.

Given the projections above, if the conversions occur, there will be significant additional economic stimulus in the region for several years. This stimulus spending would generate direct, indirect, and induced jobs and labor income in the region, and result in additional indirect and induced business sales. The spending would benefit businesses that provide heating and plumbing services in the region and those that provide goods and services to these companies and their workers.

The estimated potential future economic effects of the conversion activities in the region are summarized in Table 2.

Table 2. Economic Effects of Phase 2 Natural Gas Conversion in the FNSB

Type/ Indicator	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12
Direct Effects												
Business Sales (\$ m)	\$1.58	\$6.32	\$7.89	\$9.47	\$9.94	\$10.19	\$10.43	\$10.68	\$10.71	\$10.71	\$10.71	\$10.71
Employment (# of jobs)	4	16	20	24	25	26	27	27	27	27	27	27
Labor Income (\$ m)	\$0.56	\$2.27	\$2.83	\$3.39	\$3.56	\$3.65	\$3.74	\$3.83	\$3.84	\$3.84	\$3.84	\$3.84
Indirect + Induced Effects												
Business Sales (\$ m)	\$0.78	\$3.14	\$3.92	\$4.70	\$4.94	\$5.06	\$5.18	\$5.30	\$5.32	\$5.32	\$5.32	\$5.32
Employment (# of jobs)	4	18	22	27	28	29	30	30	31	31	31	31
Labor Income (\$ m)	\$0.24	\$0.95	\$1.19	\$1.42	\$1.49	\$1.53	\$1.57	\$1.60	\$1.61	\$1.61	\$1.61	\$1.61
Total Economic Effects												
Business Sales (\$ m)	\$2.36	\$9.45	\$11.81	\$14.17	\$14.88	\$15.24	\$15.61	\$15.98	\$16.03	\$16.03	\$16.03	\$16.03
Employment (# of jobs)	9	34	43	51	54	55	56	58	58	58	58	58
Labor Income (\$ m)	\$0.80	\$3.21	\$4.02	\$4.82	\$5.06	\$5.18	\$5.31	\$5.43	\$5.45	\$5.45	\$5.45	\$5.45

Source: Northern Economics estimates using IMPLAN model and data for the Fairbanks North Star Borough.

Air Quality Benefits

The proposed project is also expected to improve air quality in the region. Fairbanks and the Interior suffer from some of the poorest air quality in the nation. The extreme cold temperatures in this region cause increases in energy use, thus generating higher particulate matter (PM_{2.5}) and reducing air quality, which has a direct health impact. Switching to natural gas would improve air quality.

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