APPENDIX L

Bureau of Business and
Economic Research

Labovitz School
OF BUSINESS AND ECONOMICS

UNIVERSITY OF MINNESOTA DULUTH
Driven to Discover

Consulting Report

July 2013

Minnesota Power/Manitoba Hydro Great Northern Transmission Line Economic Impact on Northern Minnesota

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EXECUTIVE SUMMARY

Minnesota Power, in its efforts to reduce coal-produced energy and integrate more sustainable energy forms into its source platform, is collaborating with Manitoba Hydro on a 500-kilovolt (kV) transmission line. As part of a 15-year power purchase agreement with Manitoba Hydro for carbon free hydroelectric energy, the line is projected to be operational by June 1, 2020.

An approximately 140-mile line will begin near Winnipeg, Manitoba, and continue to the United States border. The line will enter into Minnesota in Roseau or Kittson counties and follow one of many route options. Because the final route is undetermined, this impact study was run in all counties being considered: Beltrami, Clearwater, Itasca, Kittson, Koochiching, Lake of the Woods, Marshall, Roseau, and Pennington. This section of the Great Northern Transmission Line will end near Grand Rapids, Minnesota; in Itasca County, at Blackberry Station.

The study was completed by the University of Minnesota Duluth Labovitz School's Bureau of Business and Economic Research (BBER). The study team used the IMPLAN economic modeling software, which evaluates the direct, indirect, and induced effects of spending on the greater economy.

OVERVIEW OF THE ECONOMIC IMPACT STUDY

The BBER estimated the economic impact of planning and constructing a new hydroelectric transmission line from the Canadian/U.S. border to the Grand Rapids area. The BBER reported impacts for different county groupings in Northern Minnesota.

- This study of the Great Northern Transmission Line begins at the Canadian/U.S border and includes the counties of Beltrami, Clearwater, Itasca, Kittson, Koochiching, Lake of the Woods, Marshall, Roseau, and Pennington.

KEY FINDINGS

- Development-Certification stage of the Great Northern Transmission Line will have an **average total employment impact of almost 22.7 workers** per year.
- Development-Line Construction will have **a total output effect of nearly $11.2 million**.
- In the peak year of Construction employment, the Great Northern Transmission Line will directly employ approximately 213.0 workers during the year with a **total impact of almost 286.2 full- and part-time employees** throughout the region.

- Construction will generate a **total output effect of almost $839.0 million** between 2016 and 2020 and a **value added multiplier of 1.42.**

TAX CONTRIBUTION OF THE PROJECT

The Great Northern Transmission Line will generate, from both Development and Construction, almost $28.9 million in State and Local taxes and just over $30.5 million Federal taxes throughout the course of the project.

Great Northern Transmission Line: Tax Impact

	Employee Compensation	*Proprietor Income*	*Indirect Business Tax*	*Households*	*Corporations*	*Grand Total*
Total State & Local Tax	$94,042	$0	$20,592,757	$7,500,480	$703,816	$28,891,095

Source: IMPLAN

	Employee Compensation	*Proprietor Income*	*Indirect Business Tax*	*Households*	*Corporations*	*Grand Total*
Total Federal Tax	$3,924,727	$1,958,319	$2,993,611	$16,815,960	$4,811,635	$30,504,252

Source: IMPLAN

PROJECT DESCRIPTION

As part of its long-range projections to reduce coal-produced energy and integrate more sustainable energy forms into its source platform, Minnesota Power is partnering with Manitoba Hydro on a 500-kilovolt (kV) transmission line. The line is part of a 15-year power purchase agreement with Manitoba Hydro for carbon free hydroelectric energy. It is scheduled to be operational by June 1, 2020.

The line will begin near Winnipeg, Manitoba, and stretch for approximately 140 miles to the United States border. The line will enter into Minnesota in Roseau or Kittson County and follow one of many route options. Because the final route is undetermined, this impact study was run in all counties being considered: Beltrami, Clearwater, Itasca, Kittson, Koochiching, Lake of the Woods, Marshall, Roseau, and Pennington. This section of the Great Northern Transmission Line will end near Grand Rapids, Minnesota; in Itasca County, at Blackberry Station.

It will be an infrastructure benefit for the needs of the Mesabi Iron Range's growing mining industry.

Additionally, this section is part of a larger project being considered, the line could eventually be extended into the Duluth area and continue into Wisconsin and upper Michigan.

DELIVERABLES

Minnesota Power has asked the University of Minnesota Duluth Labovitz School's Bureau of Business and Economic Research (BBER) to assess the economic impact of the Great Northern Transmission Line on the counties of Beltrami, Clearwater, Itasca, Kittson, Koochiching, Lake of the Woods, Marshall, Roseau, and Pennington during construction; and as a separate study area, St. Louis County, as discussed on page 2, Study Area.

SCOPE OF WORK

The BBER studied and estimated the economic impact of development and construction of the Great Northern Transmission Line. Development will take place in years 2012 through 2015 and includes planning, state and federal review, design, and permitting, with a small portion of line construction. The construction phase will take place in 2016 through 2020. This will include building of the transmission infrastructure and the first six months of operation immediately following completion of construction. The section of the Great Northern Transmission Line in this study includes the approximate stretch from the Canadian/U.S. border to the Iron Range.

The economic modeling data and software used was IMPLAN version 3. The study used IMPLAN's economic multiplier analysis and input/output modeling, created by MIG, Inc.[1.] The data used was the most recent IMPLAN data available, 2011. All data is reported in 2013 dollars. Results of modeling are presented in this written report.

The research objectives of this study included:

1. To study the economic impact of development and construction of a hydroelectric transmission line on Northern Minnesota.
2. To study the direct, indirect, and induced economic impacts from development and construction in the study area identified.
3. To study the tax impacts for peak years.

STUDY AREA

The geographic study area for this economic impact analysis report is the Minnesota counties of Beltrami, Clearwater, Itasca, Kittson, Koochiching, Lake of the Woods, Marshall, Roseau, and Pennington.

Development-Certification for the Great Northern Transmission Line is modeled in St. Louis County only. This accounts for Minnesota Power employees, who are taking part in the planning, designing and certification of the transmission line during development (2012-2015). Development-Line Construction is modeled in the larger study area of Beltrami, Clearwater, Itasca, Kittson, Koochiching, Lake of the Woods, Marshall, Roseau, and Pennington County.

Construction for the Great Northern Transmission Line (2016-2020) was modeled in Beltrami, Clearwater, Itasca, Kittson, Koochiching, Lake of the Woods, Marshall, Roseau, and Pennington counties of Minnesota.

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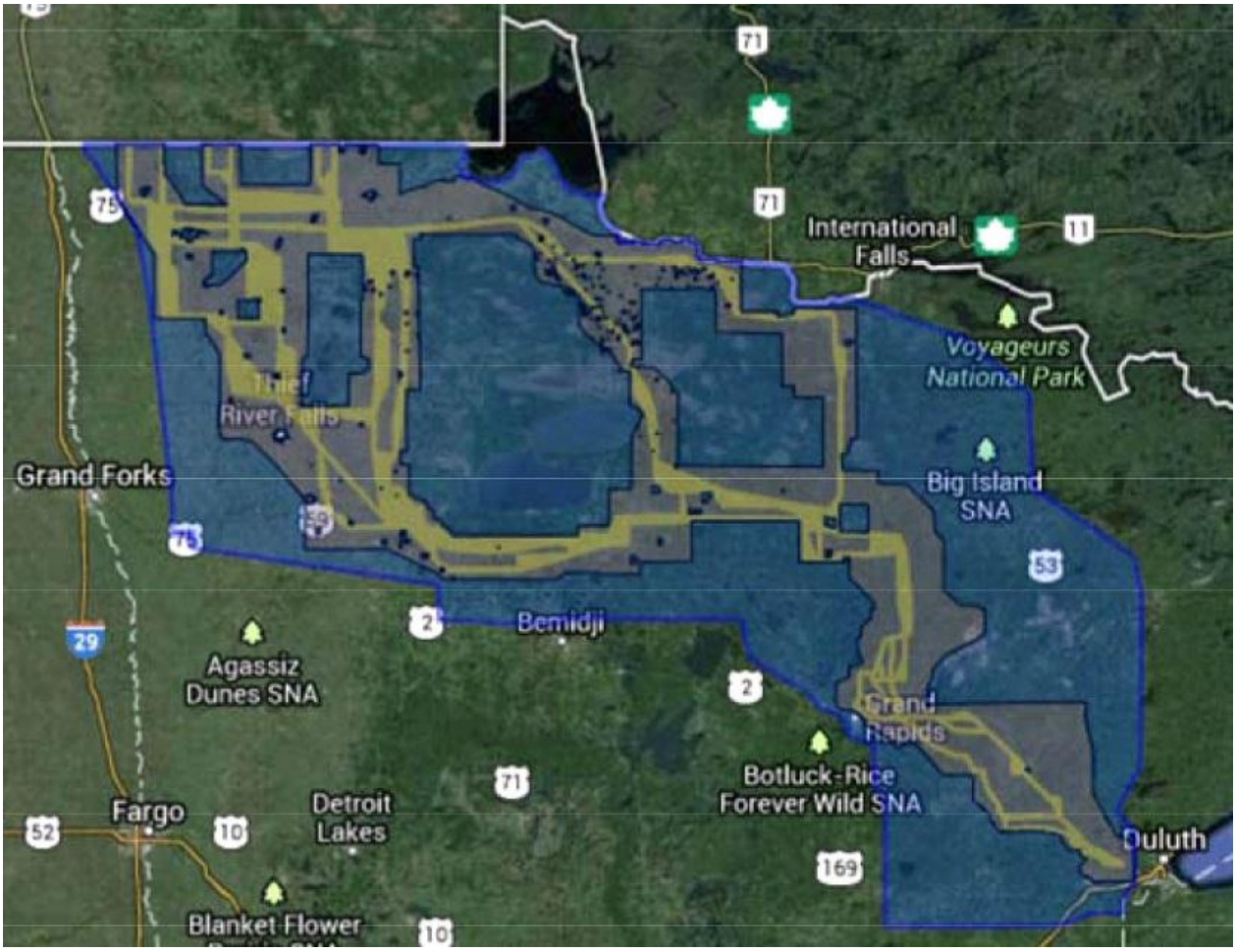
[1] IMPLAN is used by state governments and the USDA Forest Service, among others. IMPLAN Group LLC, IMPLAN System (data and software), IMPLAN Group LLC, 16740 Birkdale Commons Pkwy, Suite 212, Huntersville, NC 28078. www.implan.com

Figure 1: Study Area



IMPACT PROCEDURES AND INPUT ASSUMPTIONS

INPUT OUTPUT ANALYSIS

The mathematical input output model used to estimate impact in this study uses a matrix representation of the region's economy to predict the effect of changes in one industry on the others and by consumers, government, and suppliers on the economy. Input-output depicts inter-industry relations of an economy. It shows how the output of one industry is an input to each other industry. The matrix of the inputs and outputs shows how dependent each industry is on all the others in the economy, both as a consumer of its outputs and as a supplier of its inputs. Input-output economics has been used to study regional economies within a nation and has been used as a tool for national and regional economic planning. In addition, a main use of input-output analysis is to predict the economic impact of events as well as public investments or programs. It is this use of input-output analysis that is enacted in this study.

MIG, Inc. is the corporation that is responsible for the production of IMPLAN (IMpact analysis for PLANning) data and software. Using classic input-output analysis in combination with regional specific Social Accounting Matrices and Multiplier Models, IMPLAN provides a highly accurate and adaptable model for its users. The IMPLAN database contains county, state, zip code, and federal economic statistics, which are specialized by region, not estimated from national averages. These statistics are used to measure the effect of a given change or event on a regional or local economy.

IMPLAN's Social Accounting System describes transactions that occur between producers and intermediate and final consumers using a Social Accounting Matrix. One of the important aspects of Social Accounts is that they also examine non-market transactions, such as transfer payments between institutions. Other examples of these types of transactions would include government to household transfers in the form of unemployment benefits or household to government transfers in the form of taxes. Because Social Accounting Systems examine all the aspects of a local economy, they provide a more complete and accurate “snapshot” of the economy and its spending patterns.

IMPLAN also uses a multiplier model. Multipliers are a numeric way of describing the impact of a change. For example, an employment multiplier of 1.9 would suggest that for every 10 employees hired in the given industry, 9 additional jobs would be added to the given economic region. The Multiplier Model is derived mathematically using the input-output model and Social Accounting formats. Once there is a clear picture of the economy through the Social Accounting Matrix and Multipliers, its behavior can be predicted for a defined event, such as the construction of transmission lines.

MODELS

Models were created to include all impact model years beginning with 2012. BBER used the timeline provided by Minnesota Power.

Regional data for the impact models for value added, employment, and output measures were supplied by IMPLAN for this impact. Employment assumptions were provided to the researchers to enable creation of the impact models. All regional study definitions and impact model assumptions were agreed upon before work with the models began. Inputs required for these models included average employment for each year during any Development and Construction periods and dollar cost on a year-by-year basis for such periods.

The BBER worked closely with the management of the Great Northern Transmission Line project in determining key assumptions for developing IMPLAN models.

IMPLAN MODELS

There are two components to the IMPLAN system, the software and databases. The databases provide all information to create regional IMPLAN models. The software performs the calculations and provides

an interface for the user to make final demand changes. IMPLAN software version 3 was used in this analysis.

Comprehensive and detailed data coverage of the IMPLAN study areas by county, and the ability to incorporate user-supplied data at each stage of the model building process, provides a high degree of flexibility in terms of both geographic coverage and model formulation. In this case, it is the definition of the counties of Minnesota and the definition of specific models for development and construction. Using the IMPLAN software and data, BBER identified the industry's proposed expenditures in terms of the sectoring scheme for the model, in producer prices, and in historical dollars based on the year of the model and applied those dollars spent within the study area definition given for the impact analysis.

DATA

IMPLAN data files use federal government data sources including:

- US Bureau of Economic Analysis Benchmark I/O Accounts of the US
- US Bureau of Economic Analysis Output Estimates
- US Bureau of Economic Analysis REIS Program
- US Bureau of Labor Statistics County Employment and Wages (CEW) Program
- US Bureau of Labor Statistics Consumer Expenditure Survey
- US Census Bureau County Business Patterns
- US Census Bureau Decennial Census and Population Surveys
- US Census Bureau Economic Censuses and Surveys
- US Department of Agriculture Crop and Livestock Statistics

IMPLAN data files consist of the following components: employment, industry output, value added, institutional demands, national structural matrices, and inter-institutional transfers.

Impacts for the Great Northern Transmission Line project models used the most recent IMPLAN data available, which is for the year 2011. All impacts are reported in 2013 dollars.

Economic impacts are made up of direct, indirect, and induced effects. The following are suggested assumptions for accepting the impact model:

- IMPLAN input-output is a production-based model.
- Employment numbers (from U.S. Department of Commerce secondary data) treat both full- and part-time individuals as being employed.
- Assumptions need to be made concerning the nature of the local economy before impacts can be interpreted.
- The IMPLAN model used was constructed for the year 2011 (most recent data available).

DEFINITIONS USED IN THIS REPORT

Measures

- **Gross Output**: The value of local production required to sustain activities.
- **Value Added**: A measure of the impacting industry's contribution to the local community; it includes wages, rents, interest, and profits.
- **Employment**: Estimates are in terms of jobs, not in terms of full-time equivalent employees. Therefore, these jobs may be temporary, part time or short term jobs.

Effects

- **Direct Effect**: Initial new spending in the study area resulting from the project.
- **Indirect Effect**: The additional inter-industry spending from the direct impact.
- **Induced Effect**: The impact of additional household expenditures resulting from the direct and indirect impact.
- **Multiplier Effect:** The idea that an initial amount of spending leads to increased consumption spending elsewhere. For example, an output multiplier of 1.67 means that every dollar directly spent by a particular entity will generate 67 cents in other sectors of the study area. Additionally, showcasing an employment multiplier of 1.26 means that one employee directly employed by a particular entity will generate another 0.26 employees in other sectors of the study area.

INDUSTRY DEFINITIONS

The following industry sectors were used in the IMPLAN model to define the planning and construction activity of the Great Northern Transmission Line.

IMPLAN Sector	***Description***	***NAICS Equivalent***
31	Electric power generation, transmission, and distribution	23
36	Construction of other new nonresidential structures	2211

NAICS Sector: 23 Construction

The Construction sector comprises establishments primarily engaged in the construction of buildings or engineering projects (e.g., highways and utility systems). Establishments that primarily engage in the preparation of sites for new construction and establishments that primarily engage in subdividing land for sale as building sites also are included in this sector. (http://www.census.gov)

- Subsector: 2371 Utility System Construction

  This industry group comprises establishments primarily engaged in the construction of distribution lines and related buildings and structures for utilities (i.e., water, sewer, petroleum, gas, power, and communication). All structures (including buildings) that are integral parts of utility systems (e.g., storage tanks, pumping stations, power plants, and refineries) are included in this industry group.

NAICS Sector: 2211 Electric Power Generation, Transmission and Distribution

This industry group comprises establishments primarily engaged in generating, transmitting, and/or distributing electric power. Establishments in this industry group may perform one or more of the following activities: (1) operate generation facilities that produce electric energy; (2) operate transmission systems that convey the electricity from the generation facility to the distribution system; and (3) operate distribution systems that convey electric power received from the generation facility or the transmission system to the final consumer. (http://www.census.gov)

MODELING POINTS

As noted in the IMPLAN User's Guide, IMPLAN modeling issues associated with small study areas of county-level impacts, like that in this report, include the following:

A small area can have a high level of "leakage." Leakages are any payments made to imports or value added sectors that do not in turn re-spend the dollars within the region.

A study area that is actually part of a larger functional economic region will likely miss important backward linkages. For example, linkages with the labor force may be missing. Workers who live and spend outside the study area may actually hold local jobs.

IMPLAN study areas are typically a collection of counties. A county is one of the smallest standard areas for IMPLAN data sets.

PROJECT SUMMARY

The Great Northern Transmission Line project begins at the Canadian/U.S border in Northeast Minnesota, in Kittson or Roseau County. Because the final route of the line is undetermined at this time, a general study is defined to express the impacts of several different routing options: Beltrami, Clearwater, Itasca, Kittson, Koochiching, Lake of the Woods, Marshall, Roseau, and Pennington County. Table 1 through 3, below, summarize the future total impacts of development and construction for the Minnesota section of the Great Northern Transmission Line.

Table 1: Great Northern Transmission Line: Development-Certification, Impact Summary

	Value Added Totals	*Output Totals*	*Employment Totals*
2012	$1,068,091	$1,798,686	18.1
2013	$3,224,527	$5,430,168	21.2
2014	$4,665,638	$7,857,030	24.2
2015	$5,939,975	$10,003,038	27.2
Total	**$14,898,231**	**$25,088,922**	**N/A**

Source: IMPLAN

Table 2: Great Northern Transmission Line: Development-Line Construction, Impact Summary

	Value Added Totals	*Output Totals*	*Employment Totals*
2014	$321,969	$712,227	20.2
2015	$4,722,207	$10,445,989	20.2
Total	**$5,044,176**	**$11,158,216**	**N/A**

Source: IMPLAN

Table 3: Great Northern Transmission Line: Construction, Impact Summary

	Value Added Totals	*Output Totals*	*Employment Totals*
2016	$39,847,706	$88,147,067	67.2
2017	$94,391,624	$208,803,605	169.3
2018	$123,268,385	$272,681,872	185.5
2019	$90,671,633	$200,574,629	286.2
2020	$31,086,674	$68,766,803	98.1
Total	**$379,266,022**	**$838,973,976**	**N/A**

Source: IMPLAN

The left column of both tables above, labeled "Value Added Totals," shows the economic impact of the money spent on the Great Northern Transmission Line, specifically to pay for wages, rents, interest, and profits related to Development and Construction. During Development-Certification, it was predicted that over $11.7 million would be spent in direct value added expenditures, which will result in a total spending of almost $14.9 million in St. Louis County. During Development-Line Construction, it was forecasted that almost $3.3 million would be spent in direct value added expenditures, which will result in a total spending of just over $5.0 million in Beltrami, Clearwater, Itasca, Kittson, Koochiching, Lake of the Woods, Marshall, Roseau, and Pennington counties. During Construction, it was estimated that almost $246.4 million will be spent in direct value added expenditures, which will result in a total value added impact of almost $379.3 million in Beltrami, Clearwater, Itasca, Kittson, Koochiching, Lake of the Woods, Marshall, Roseau, and Pennington Counties.

The center column of Tables 1 and 2, labeled "Output Totals," displays the economic effect of the total spending on the Great Northern Transmission Line in each part. A total of almost $19.7 million is expected to be directly spent on Certification, creating a total output spending effect of almost $25.1 million in St. Louis County. During Line Construction a total of almost $7.9 million is expected to be directly spent on the project, creating a total of almost $11.2 million in total output spending in the larger study area. In later years, a total of almost $591.7 million is expected to be spent on directly on Construction, creating a total output spending effect of just over $839.0 million.

The right column of the summary table above, labeled "Employment Totals," reports the number of jobs that the Great Northern Transmission Line is likely to create directly and indirectly in each part of the project. Development-Certification will directly employ an average of 7.5 workers per year, with an average total employment effect of almost 22.7 workers throughout St. Louis County. Development-Line Construction will directly employ 15 workers per year, with a total employment effect of 20.2 workers throughout the study area. Construction will directly employ an average of 120.0 workers per year, with an average total employment effect of almost 161.3 workers throughout the region. As you can see above, in Table 1 and 2, "Employment Totals" are not summed to find a total employment effect for all of Development and Construction. This is because we assume that the same employees working in one year will most likely be working the job in the next, and thus, summing the total employment would be double counting many employees.

DEVELOPMENT

Development of the Great Northern Transmission Line was modeled in years 2012 through 2015. Certification was modeled in St. Louis County and Line Construction was modeled in Beltrami, Clearwater, Itasca, Kittson, Koochiching, Lake of the Woods, Marshall, Roseau, and Pennington counties. The impact of Development-Certification includes expenditures on planning and permitting as well as the cost of Minnesota Power employees expected to take part in this phase of the project. Development-Line Construction expenditures represent dollars spent on construction costs.

CERTIFICATION - ST. LOUIS COUNTY

Tables 4 through 6 show the Value Added, Output, and Employment impacts of the Great Northern Transmission Line Development-Certification on St. Louis County.

VALUE ADDED

The table below summarizes the value added impact of Development-Certification. During this portion of the project, direct value added expenditures are expected to increase from almost $841 thousand in 2012 to almost $4.7 million in 2015. As more value added dollars are directly spent throughout the Certification phase, the total value added impact rises from almost $1.1 million in 2012 to almost $5.6 million in 2015, with a total effect throughout the course of Certification of almost $14.9 million value added dollars in St. Louis County. This equates to a total value added multiplier of 1.27.

Table 4: Great Northern Transmission Line: Development-Certification, Value Added Impact

	Direct Effect	*Indirect Effect*	*Induced Effect*	*Total Effect*
2012	$840,902	$116,680	$110,508	$1,068,091
2013	$2,538,653	$352,254	$333,620	$3,224,527
2014	$3,673,233	$509,684	$482,722	$4,665,638
2015	$4,676,512	$648,895	$614,568	$5,939,975
Total	**$11,729,300**	**$1,627,513**	**$1,541,418**	**$14,898,231**

Source: IMPLAN

OUTPUT

As illustrated in Table 5, the Great Northern Transmission Line direct expenditures total almost $19.7 million from the Development-Certification between 2012 and 2015. This resulted in a total of almost $25.1 million in output spending throughout St. Louis County and a total output multiplier of 1.28. Direct spending on Certification increases from just over $1.4 million in 2012 to over $7.8 million in 2015.

Table 5: Great Northern Transmission Line: Development-Certification, Output Impact

	Direct Effect	*Indirect Effect*	*Induced Effect*	*Total Effect*
2012	$1,410,190	$204,468	$184,029	$1,798,686
2013	$4,257,312	$617,280	$555,577	$5,430,168
2014	$6,159,998	$893,156	$803,876	$7,857,030
2015	$7,842,492	$1,137,105	$1,023,441	$10,003,038
Total	**$19,669,992**	**$2,852,009**	**$2,566,923**	**$25,088,922**

Source: IMPLAN

EMPLOYMENT

Table 6 shows the employment impacts of Development-Certification of the Great Northern Transmission Line project. By directly employing an average of 7.5 people per year, an average of 15.2 employees are added to other sectors of the St. Louis County economy, totaling almost 22.7 full-time and part-time jobs on average per year. This equates to an average employment multiplier of 3.03. In the year prior to construction (2015), employment will be at its maximum for Certification, with a predicted employment of 9.0 Minnesota Power employees with a total employment effect of 27.2 workers. Some of the higher impacted sectors include food services and drinking places, private hospitals, and maintenance and repair construction of nonresidential structures.

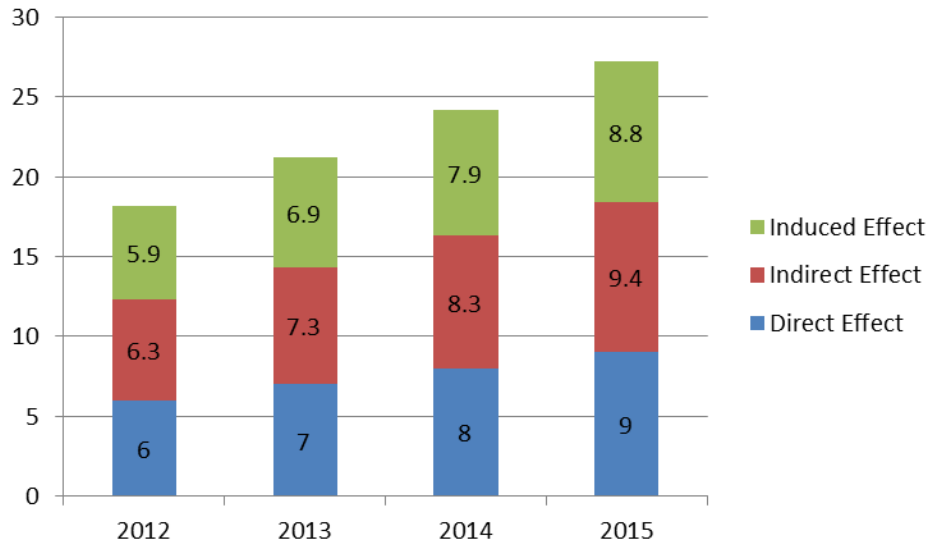
Table 6: Great Northern Transmission Line: Development-Certification, Employment Impact

	Direct Effect	*Indirect Effect*	*Induced Effect*	*Total Effect*
2012	6	6.3	5.9	18.1
2013	7	7.3	6.9	21.2
2014	8	8.3	7.9	24.2
2015	9	9.4	8.8	27.2

Source: IMPLAN

Figure 2 is a visual of the employment that will be created in St. Louis County by Development-Certification of the Great Northern Transmission Line project. The blue section of each bar represents the workers employed in Certification by Minnesota Power. The red is the indirect effect, and the green is the induced effect. The entire bar represents the total employment effect. In each year, the induced effect is approximately equal to the direct effect, with a total effect of more than double the direct employment.

Figure 2: Great Northern Transmission Line: Development-Certification, Employment Impact



Source: IMPLAN

TAX IMPACT

Below, Tables 7 and 8 show the tax dollars Development-Certification in St. Louis County will contribute to the State and Local Government, as well as Federal Government.

Table 7: Great Northern Transmission Line: Development-Certification, Tax Impact, State and Local

	Employee Compensation	*Proprietor Income*	*Indirect Business Tax*	*Households*	*Corporations*
2012	$2,598	$0	$185,571	$8,305	$5,041
2013	$3,031	$0	$560,233	$25,074	$15,217
2014	$3,464	$0	$810,614	$36,280	$22,018
2015	$3,898	$0	$343,424	$15,370	$9,328
Total State & Local Tax	**$12,991**	**$0**	**$1,899,842**	**$85,029**	**$51,604**

Source: IMPLAN

Table 8: Great Northern Transmission Line: Development-Certification, Tax Impact, Federal

	Employee Compensation	*Proprietor Income*	*Indirect Business Tax*	*Households*	*Corporations*
2012	$130,023	$601	$28,711	$18,621	$34,460
2013	$151,693	$1,813	$86,678	$56,215	$104,033
2014	$173,363	$2,624	$125,416	$81,338	$150,527
2015	$195,034	$1,112	$53,134	$34,460	$63,772
Total Federal Tax	**$650,113**	**$6,150**	**$293,939**	**$190,634**	**$352,792**

Source: IMPLAN

LINE CONSTRUCTION – 9-COUNTY REGION

Tables 9 through 11 show the Value Added, Output, and Employment impacts of the Great Northern Transmission Line Development-Line Construction on Beltrami, Clearwater, Itasca, Kittson, Koochiching, Lake of the Woods, Marshall, Roseau, and Pennington County.

VALUE ADDED

The table below summarizes the value added impact of Development-Line Construction. During this portion of the project, direct value added expenditures are expected to increase from over $209 thousand in 2014 to almost $3.1 million in 2015. As more value added dollars are directly spent throughout the Line Construction phase of Development, the total value added impact rises from almost $322 thousand in 2014 to over $4.7 million in 2015, with a total effect throughout the course of Line Construction of over $5.0 million value added dollars in the study area. This equates to a total value added multiplier of 1.54.

Table 9: Great Northern Transmission Line: Development-Line Construction, Value Added Impact

	Direct Effect	*Indirect Effect*	*Induced Effect*	*Total Effect*
2014	$209,173	$45,428	$67,368	$321,969
2015	$3,067,862	$666,278	$988,068	$4,722,207
Total	**$3,277,035**	**$711,706**	**$1,055,436**	**$5,044,176**

Source: IMPLAN

OUTPUT

As illustrated in Table 10, the Great Northern Transmission Line direct expenditures total almost $7.9 million from Line Construction between 2014 and 2015. This resulted in a total of almost $11.2 million in output spending throughout the study area and a total output multiplier of 1.42. Direct spending on Line Construction increases from over $502 thousand in 2014 to almost $7.4 million in 2015. The total effect rises from over $712 thousand in 2014 to over $10.4 million in 2015.

Table 10: Great Northern Transmission Line: Development-Line Construction, Output Impact

	Direct Effect	*Indirect Effect*	*Induced Effect*	*Total Effect*
2014	$502,304	$92,774	$117,149	$712,227
2015	$7,367,120	$1,360,678	$1,718,191	$10,445,989
Total	**$7,869,424**	**$1,453,452**	**$1,835,340**	**$11,158,216**

Source: IMPLAN

EMPLOYMENT

Table 11 shows the employment impacts of Development-Line Construction of the Great Northern Transmission Line project. By directly employing 15.0 people in each year, 5.1 employees are added to other sectors of the study area's economy, totaling 20.2 full-time and part-time jobs per year. This equates to an employment multiplier of 1.35.

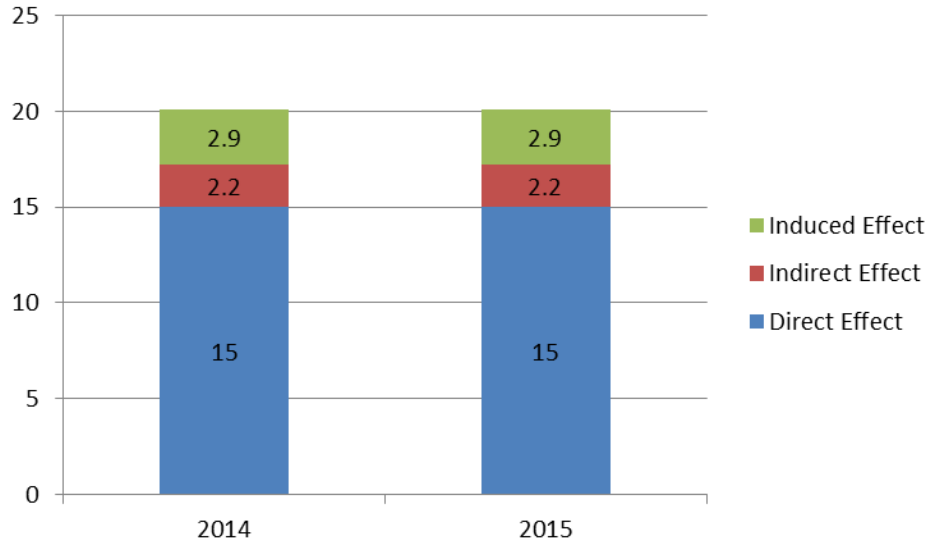
Table 11: Great Northern Transmission Line: Development-Line Construction, Employment Impact

	Direct Effect	*Indirect Effect*	*Induced Effect*	*Total Effect*
2014	15	2.2	2.9	20.2
2015	15	2.2	2.9	20.2

Source: IMPLAN

Figure 3 is a visual of the employment that will be created by Line Construction of the Great Northern Transmission Line project. The blue section of each bar represents the workers employed in Development by Minnesota Power. The red is the indirect effect, and the green is the induced effect. The entire bar represents the total employment effect

Figure 3: Great Northern Transmission Line: Development-Line Construction, Employment Impact



Source: IMPLAN

TAX IMPACT

Below, Tables 12 and 13 show the tax dollars Development-Line Construction in the 9-County Region will contribute to the State and Local Government, as well as Federal Government.

Table 12: Great Northern Transmission Line: Development-Line Construction, Tax Impact, State and Local

	Employee Compensation	*Proprietor Income*	*Indirect Business Tax*	*Households*	*Corporations*
2014	$1,643	$0	$16,186	$6,421	$565
2015	$1,643	$0	$237,399	$94,176	$8,283
Total State & Local Tax	**$3,286**	**$0**	**$253,585**	**$100,597**	**$8,848**

Source: IMPLAN

Table 13: Great Northern Transmission Line: Development-Line Construction, Tax Impact, Federal

	Employee Compensation	*Proprietor Income*	*Indirect Business Tax*	*Households*	*Corporations*
2014	$66,377	$1,690	$2,338	$14,396	$3,861
2015	$66,377	$24,792	$34,286	$211,141	$56,627
Total Federal Tax	**$132,754**	**$26,482**	**$36,624**	**$225,537**	**$60,488**

Source: IMPLAN

CONSTRUCTION – 9-COUNTY REGION

Construction of the Great Northern Transmission Line was modeled in years 2016 through 2020, in Beltrami, Clearwater, Itasca, Kittson, Koochiching, Lake of the Woods, Marshall, Roseau, and Pennington counties.

VALUE ADDED

The table below summarizes the value added impact of Construction of the Great Northern Transmission Line project. In the peak year (2018) of construction, almost $80.1 million is expected to be directly spent on wages, rents, interests, and profits relating to that portion of the Great Northern Transmission Line. This will result in a total value added effect of almost $123.3 million in that year. Construction will have, in total, direct value added expenditures of almost $246.4 million dollars and a total effect of almost $379.3 million on the nine-county area. This equates to a total value added multiplier of 1.54.

Table 14: Great Northern Transmission Line: Construction, Value Added Impact

	Direct Effect	*Indirect Effect*	*Induced Effect*	*Total Effect*
2016	$25,887,738	$5,622,293	$8,337,676	$39,847,706
2017	$61,323,117	$13,318,141	$19,750,366	$94,391,624
2018	$80,083,393	$17,392,495	$25,792,498	$123,268,385
2019	$58,906,360	$12,793,271	$18,972,001	$90,671,633
2020	$20,195,984	$4,386,160	$6,504,531	$31,086,674
Total	**$246,396,592**	**$53,512,360**	**$79,357,072**	**$379,266,022**

Source: IMPLAN

OUTPUT

As illustrated in Table 15, Great Northern Transmission Line direct expenditures totaled almost $591.7 million from its Construction operations between 2016 and 2020. This resulted in a total of almost $839.0 million in output spending throughout the region and a total output multiplier of 1.42. In the peak year (2018), over $192.3 million is expected to be spent on Construction, leading to a peak year impact of almost $272.7 million dollars in various sectors of Beltrami, Clearwater, Itasca, Kittson, Koochiching, Lake of the Woods, Marshall, Roseau, and Pennington counties.

Table 15: Great Northern Transmission Line: Construction, Output Impact

	Direct Effect	*Indirect Effect*	*Induced Effect*	*Total Effect*
2016	$62,166,446	$11,481,896	$14,498,725	$88,147,067
2017	$147,260,463	$27,198,425	$34,344,718	$208,803,605
2018	$192,311,139	$35,519,106	$44,851,627	$272,681,872
2019	$141,456,912	$26,126,531	$32,991,186	$200,574,629
2020	$48,498,355	$8,957,454	$11,310,994	$68,766,803
Total	**$591,693,315**	**$109,283,412**	**$137,997,250**	**$838,973,976**

Source: IMPLAN

EMPLOYMENT

Table 16 shows the employment impacts of Construction of the Great Northern Transmission Line project. In the peak year of construction spending (2018), Great Northern Transmission Line Construction is expected to employ 138 full- and part-time workers, creating a total employment effect of almost 186 workers. By directly employing an average of almost 120 people per year, the project adds an additional average of 41 employees to other sectors of study area's economy, totaling almost 161.3 full-time and part-time jobs on average per year. This equates to an employment multiplier of 1.34. Some of the higher employment impacted sectors include food services and drinking places; architectural, engineering, and related services; and private hospitals.

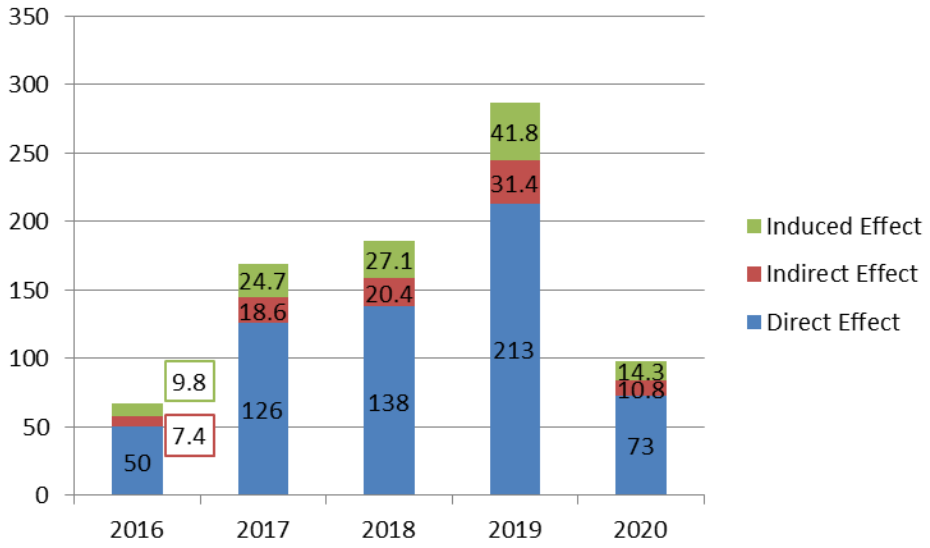
Table 16: Great Northern Transmission Line: Construction, Employment Impact

	Direct Effect	*Indirect Effect*	*Induced Effect*	*Total Effect*
2016	50	7.4	9.8	67.2
2017	126	18.6	24.7	169.3
2018	138	20.4	27.1	185.5
2019	213	31.4	41.8	286.2
2020	73	10.8	14.3	98.1

Source: IMPLAN

The chart below is a visual of the employment that will be created by Construction of the Great Northern Transmission Line project. The blue section of each bar represents the workers directly employed for the construction of the Great Northern Transmission Line. The red portion of the bar is the indirect effect, and the green is the induced effect. The entire bar represents the total employment effect.

Figure 4: Great Northern Transmission Line: Construction, Employment Impact



Source: IMPLAN

9-COUNTY REGION TAX IMPACT

Below, Tables 17 and 18 show the tax dollars Construction will contribute to the state and local government, as well as federal government.

Table 17: Great Northern Transmission Line: Construction, Tax Impact, State and Local

	Employee Compensation	*Proprietor Income*	*Indirect Business Tax*	*Households*	*Corporations*
2016	$7,996	$0	$1,562,816	$619,967	$54,528
2017	$23,329	$0	$4,558,322	$1,808,279	$159,044
2018	$15,115	$0	$6,197,054	$2,458,362	$216,220
2019	$23,329	$0	$4,558,322	$1,808,279	$159,044
2020	$7,996	$0	$1,562,816	$619,967	$54,528
Total State & Local Tax	**$77,765**	**$0**	**$18,439,330**	**$7,314,854**	**$643,364**

Source: IMPLAN

Table 18: Great Northern Transmission Line: Construction, Tax Impact, Federal

	Employee Compensation	*Proprietor Income*	*Indirect Business Tax*	*Households*	*Corporations*
2016	$323,036	$163,211	$225,705	$1,389,956	$372,780
2017	$942,558	$476,042	$658,323	$4,054,134	$1,087,302
2018	$610,672	$647,181	$894,992	$5,511,609	$1,478,191
2019	$942,558	$476,042	$658,323	$4,054,134	$1,087,302
2020	$323,036	$163,211	$225,705	$1,389,956	$372,780
Total Federal Tax	**$3,141,860**	**$1,925,687**	**$2,663,048**	**$16,399,789**	**$4,398,355**

Source: IMPLAN

APPENDIX A

DEVELOPMENT-CERTIFICATION (ST. LOUIS COUNTY)

Table 19: Great Northern Transmission Line: Development, Employment Detail, 2012

Description	Employment
Electric power generation, transmission, and distribution	6.0
Maintenance and repair construction of nonresidential structures	2.1
Food services and drinking places	2.0
Private hospitals	0.4
Monetary authorities and depository credit intermediation activities	0.4
Nursing and residential care facilities	0.3
Retail Stores - General merchandise	0.3
Legal services	0.3
Civic, social, professional, and similar organizations	0.3
Offices of physicians, dentists, and other health practitioners	0.3

Table 20: Great Northern Transmission Line: Development, Employment Detail, 2013

Description	Employment
Electric power generation, transmission, and distribution	7.0
Maintenance and repair construction of nonresidential structures	2.5
Food services and drinking places	2.3
Private hospitals	0.5
Monetary authorities and depository credit intermediation activities	0.5
Nursing and residential care facilities	0.3
Retail Stores - General merchandise	0.3
Legal services	0.3
Civic, social, professional, and similar organizations	0.3
Offices of physicians, dentists, and other health practitioners	0.3

Table 21: Great Northern Transmission Line: Development, Employment Detail, 2014

Description	Employment
Electric power generation, transmission, and distribution	8.0
Maintenance and repair construction of nonresidential structures	2.8
Food services and drinking places	2.7
Private hospitals	0.6
Monetary authorities and depository credit intermediation activities	0.6
Nursing and residential care facilities	0.4
Retail Stores - General merchandise	0.4
Legal services	0.4
Civic, social, professional, and similar organizations	0.4
Offices of physicians, dentists, and other health practitioners	0.4

Table 22: Great Northern Transmission Line: Development, Employment Detail, 2015

Description	Employment
Electric power generation, transmission, and distribution	9.0
Maintenance and repair construction of nonresidential structures	3.2
Food services and drinking places	3.0
Private hospitals	0.6
Monetary authorities and depository credit intermediation activities	0.6
Nursing and residential care facilities	0.4
Retail Stores - General merchandise	0.4
Legal services	0.4
Civic, social, professional, and similar organizations	0.4
Offices of physicians, dentists, and other health practitioners	0.4

DEVELOPMENT-LINE CONSTRUCTION (9-COUNTY REGION)

Table 23: Great Northern Transmission Line: Development, Employment Detail, 2014

Description	Employment
Construction of other new nonresidential structures	15.0
Architectural, engineering, and related services	0.4
Food services and drinking places	0.4
Wholesale trade businesses	0.2
Private hospitals	0.2
Retail Stores - General merchandise	0.2
Civic, social, professional, and similar organizations	0.2

Automotive repair and maintenance, except car washes	0.2
Nursing and residential care facilities	0.2
Retail Stores - Food and beverage	0.2

Table 24: Great Northern Transmission Line: Development, Employment Detail, 2015

Description	Employment
Construction of other new nonresidential structures	15.0
Architectural, engineering, and related services	0.4
Food services and drinking places	0.4
Wholesale trade businesses	0.2
Private hospitals	0.2
Retail Stores - General merchandise	0.2
Civic, social, professional, and similar organizations	0.2
Automotive repair and maintenance, except car washes	0.2
Nursing and residential care facilities	0.2
Retail Stores - Food and beverage	0.2

CONSTRUCTION

Table 25: Great Northern Transmission Line: Construction, Employment Detail, 2016

Description	Employment
Construction of other new nonresidential structures	50.0
Architectural, engineering, and related services	1.3
Food services and drinking places	1.2
Wholesale trade businesses	0.7
Private hospitals	0.7
Retail Stores - General merchandise	0.7
Civic, social, professional, and similar organizations	0.6
Automotive repair and maintenance, except car washes	0.6
Nursing and residential care facilities	0.6
Retail Stores - Food and beverage	0.6

Table 26: Great Northern Transmission Line: Construction, Employment Detail, 2017

Description	Employment
Construction of other new nonresidential structures	126.0
Architectural, engineering, and related services	3.3
Food services and drinking places	3.1
Wholesale trade businesses	1.8
Private hospitals	1.7
Retail Stores - General merchandise	1.7
Civic, social, professional, and similar organizations	1.6
Automotive repair and maintenance, except car washes	1.6
Nursing and residential care facilities	1.5
Retail Stores - Food and beverage	1.4

Table 27: Great Northern Transmission Line: Construction, Employment Detail, 2018

Description	Employment
Construction of other new nonresidential structures	138.0
Architectural, engineering, and related services	3.7
Food services and drinking places	3.4
Wholesale trade businesses	1.9
Private hospitals	1.9
Retail Stores - General merchandise	1.9
Civic, social, professional, and similar organizations	1.8
Automotive repair and maintenance, except car washes	1.7
Nursing and residential care facilities	1.6
Retail Stores - Food and beverage	1.6

Table 28: Great Northern Transmission Line: Construction, Employment Detail, 2019

Description	Employment
Construction of other new nonresidential structures	213.0
Architectural, engineering, and related services	5.7
Food services and drinking places	5.3
Wholesale trade businesses	3.0
Private hospitals	2.9
Retail Stores - General merchandise	2.9
Civic, social, professional, and similar organizations	2.7
Automotive repair and maintenance, except car washes	2.6

Nursing and residential care facilities	2.5
Retail Stores - Food and beverage	2.4

Table 29: Great Northern Transmission Line: Construction, Employment Detail, 2020

Description	Employment
Construction of other new nonresidential structures	73
Architectural, engineering, and related services	1.9
Food services and drinking places	1.8
Wholesale trade businesses	1.0
Private hospitals	1.0
Retail Stores - General merchandise	1.0
Civic, social, professional, and similar organizations	0.9
Automotive repair and maintenance, except car washes	0.9
Nursing and residential care facilities	0.8
Retail Stores - Food and beverage	0.8