ECONOMIC ANALYSIS PROGRAM

Retirement of a Coal-Generated Electric Power Plant in Fergus Falls

Otter Tail Power's energy portfolio diversification goals include a shift from coal-generated electricity toward clean energy initiatives. In 2012, a baseline diversification study indicated the need to retire the Hoot Lake coal-fired plant near Fergus Falls.[1] To replace the electricity generated by Hoot Lake, Otter Tail Power announced plans to build a new natural gas plant and invest in wind resources.[2] Otter Tail Power currently employs 35 people at the Hoot Lake facility. Otter Tail Power's headquarters remain in Fergus Falls.

The plant retirement will have implications for Fergus Falls' economy. The plant retirement will affect not only those at the plant but also community members. To respond to this economic change, decision makers in Fergus Falls need information regarding the potential economic impact of the retirement. University of Minnesota Extension prepared this economic analysis report with matching support from the EDA Center at the University of Minnesota-Crookston.[3]

SUMMARY OF FINDINGS

Otter Tail Power has proposed several efforts to moderate the impact of the plant's retirement. They include offering all affected employees opportunities to remain employed with the company. Otter Tail Power headquarters also remain in the county. Thus, spending related to company management will continue in the county. The retirement of the plant, with these moderation efforts, would result in an estimated loss of $5.65 million in output in Otter Tail County. This includes $0.4 million in lost labor income. Fifteen jobs would be affected.

These estimates are based on an average coal-fired electric power plant. Otter Tail Power provided employment figures, Extension's model estimated the impact on output and income.

The data, analysis, and findings described in this report are specific to the geography, period, and project requirements of Otter Tail County. Findings are not transferable to other jurisdictions.

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[1] Suzukamo, L.B. (2012, October 3). *Otter Tail Power wants to delay retirement of coal-fired Hoot Lake plant.* Pioneer Press. Retrieved from https://www.twincities.com/2012/10/03/otter-tail-power-wants-to-delay-retirement-of-coal-fired-hoot-lake-plant/.

[2] Rozens, T. (2016, June 14). *Otter Tail Power to close Hoot Lake coal plant, add wind capacity*. Daily Energy Insider. Retrieved from https://dailyenergyinsider.com/source/887-otter-tail-power-close-hoot-lake-coal-plant-add-wind-capacity/.

[3] The EDA Center at the University of Minnesota Crookston is part of the University Center network. University Centers have the mission of connecting University resources with the economic development community and are funded by the U.S. Economic Development Administration, which is bureau of the U.S. Department of Commerce.

Extension neither approves nor endorses the use or application of findings and other contents in this report by other jurisdictions.

WHAT IS THE ECONOMIC ANALYSIS PROGRAM?

Communities often face a change in their local economy. A major employer announces it is reducing its workforce, a fire destroys an operating facility, or a flood damages downtown. In these situations, community leaders often need to make quick, but important, decisions about how to react. They work closely with the local business(es) affected and work to help the business(es) and community recover. The University of Minnesota Extension's economic analysis program provides community leaders with information to assist in making decisions regarding the community's future.

There are a few important things to note related to this analysis and the tool used. Information from the IMPLAN (MIG, Inc.) model is used in this analysis. In the IMPLAN model, one job is one job, regardless of whether the job is full-time, part-time, or seasonal. This should be considered when interpreting the results related to employment in this report. Further, core IMPLAN data is gathered from a variety of government sources. When data is incomplete or missing, econometric techniques are implemented to fill in gaps.

This analysis relies on the default IMPLAN data for the electric power generation industry in Otter Tail County.

HISTORY OF ELECTRIC POWER GENERATION IN OTTER TAIL COUNTY

Electric power generation has been a component of Fergus Falls' economy for over 100 years. In 1907, Vernon A. Wright and his partners founded Otter Tail Power in Fergus Falls.[4] By 1909, Otter Tail Power began generating power from the Otter Tail River. Within a few years, the company built the hydroelectric plant at Hoot Lake, as part of the company's overall expansion. By 1945, Otter Tail Power had expanded to its current service area. The company is the smallest of Minnesota's investor-owned electric utilities. Its headquarters remain in Fergus Falls. It has operations in Minnesota, North Dakota, and South Dakota.

After establishing hydroelectric facilities, Otter Tail Power continued to expand at Hoot Lake. Steam generating units were added to the plant in the early 1920s. Coal-fired unit two was placed online in 1959 and coal-fired unit three in 1964. At full production, the Hoot Lake facility used 120 train cars of coal per week.[5] Due to recent market impacts, coal deliveries are down to about an average of 50 train car loads per week in 2018 (R. Miller, personal communication, September 21, 2018).

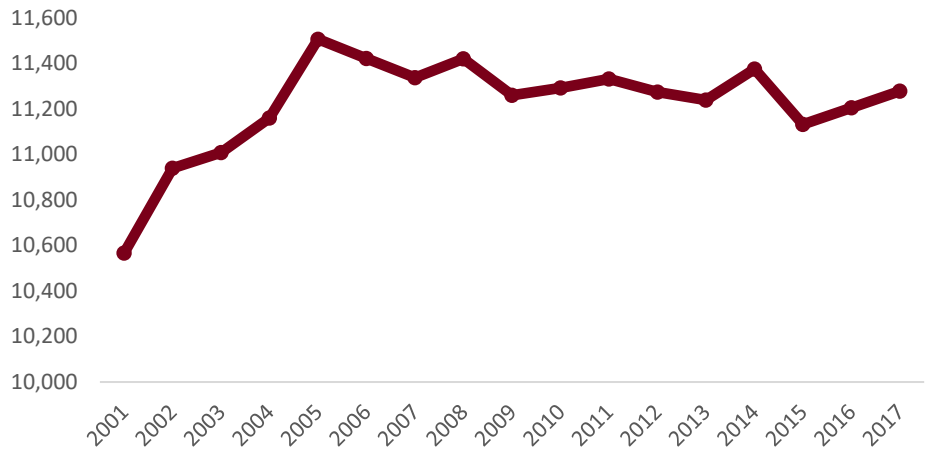
[4] Granger, S. & Kelly, S. (2011). Historic context evaluation of Otter Tail Power Company's hydroelectric plants at Fergus Falls, Otter Tail County, Minnesota. Gemini Research, Morris, MN. Retrieved from https://www.ci.fergus-falls.mn.us/vertical/sites/%7BC83A9759-035D-4EAB-A39F-EA24B2F5336D%7D/uploads/Historic_Context_Evaluation_of_OTP_Co.s_Hydroelectric_Plants_section_1.01_to_5.69(2).pdf.

[5] Retrieved from https://www.otpco.com/media/2088/hoot-lake-plant-fact-sheet_final.pdf.

THE ROLE OF ELECTRIC POWER GENERATION IN FERGUS FALLS' ECONOMY

Overall, the number of jobs in Fergus Falls' zip codes has increased since 2001 (Chart 1). In 2001, Fergus Falls businesses and organizations employed 10,600 workers. By 2017, the number of jobs rose to 11,300, a 6.6 percent increase.[6] The most rapid growth was between 2001 and 2005. Employment held relatively steady during the Great Recession of 2008-2009, which is unusual. Most communities recorded a noticeable drop in employment during this period.

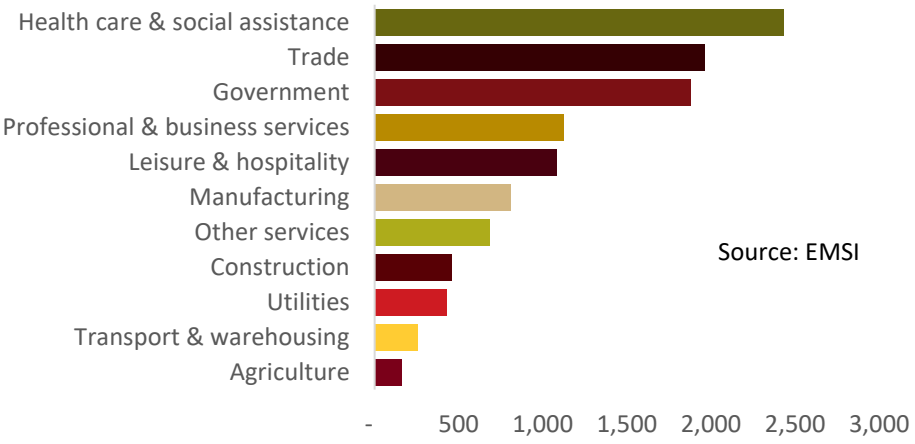
Chart 1: Number of Jobs, Fergus Falls Zip Codes, 2001-2017



Source: EMSI

Fergus Falls has a relatively diverse economy (Chart 2). The largest industry employer is health care and social assistance (2,430 jobs), followed by trade (1,960 jobs), and government (1,880 jobs). Utilities, the industry home for electric power generation, employs slightly over 400 people in the two zip codes.

Chart 2: Employment by Industry, Fergus Falls Zip Codes, 2017



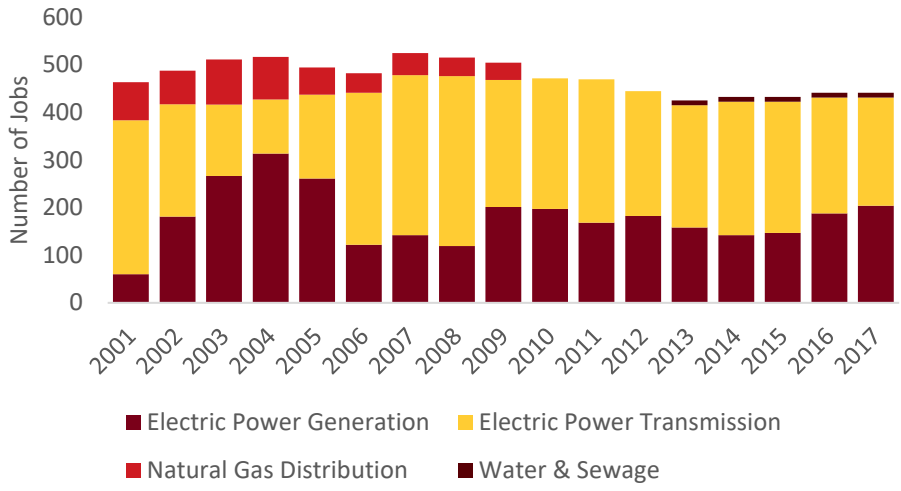
Source: EMSI

[6] For the data provided in this section, Fergus Falls is defined as the two zip codes (56537 and 56538). Data is from the EMSI database, www.economicmodeling.com.

The utility industry contributes to Fergus Falls' economy. It employs 4 percent of the workforce. However, the data shows Fergus Falls has 15 times the number of employees in the electric power generation and transmission sectors as the national average. This high level of concentration indicates this is a relative strength for the city. Total employment in the utility industry has remained relatively steady since 2001 (Chart 3).

Chart 3: Jobs by Utilitiy Sector, Fergus Falls Zip Codes, 2001-200

Source: EMSI



Within the utility sector, electric power generation and transmission employs the highest share of workers. In the early 2000s, it appears the number of jobs in electric power generation decreased, while the number of jobs in electric power transmission increased. This could be the result of changes in job classification by utility companies. However, it may also reflect a shift in labor away from operating the generation facilities toward transmission and distribution. This, in turn, could be the result of changes in technology.

Minnesota's economy has been steadily adding jobs since the end of the 2008-2009 Great Recession. Job growth has led to increasingly lower unemployment rates in the state. The unemployment rate in Fergus Falls is currently 2.6 percent.[7] Unemployment rates in neighboring communities and counties are similar (Table 1). Low unemployment rates suggest any Otter Tail Power employees seeking a new job may find employment with retraining assistance.

Table 1: Unemployment Rates, West Central Minnesota, July 2018

Community	Unemployment Rate
Fergus Falls	2.6%
Otter Tail County	2.6%

[7] Unemployment rates as of July 2018 (not seasonally adjusted). Retrieved from https://mn.gov/deed/data/data-tools/laus/.

Becker County	2.8%
Clay County	2.7%
Douglas County	2.3%
Grant County	3.4%
Todd County	3.0%
Wadena County	4.1%
Wilkin County	3.1%

Source: Department of Employment and Economic Development

ECONOMIC IMPACT OF THE RETIREMENT OF AN ELECTRIC POWER GENERATION PLANT

Economic impact is composed of direct, indirect, and induced effects. Calculating total economic impact begins with quantifying direct effects. Indirect and induced effects are then calculated using input-output models. The direct effect in this analysis is the potential decreased employment, output, and labor income associated with the plant retirement.

Input-output models trace the flow of dollars throughout a local economy and capture the indirect and induced, or secondary, effects of an economic activity. To quantify the indirect and induced effects of the Hoot Lake plant retirement, the direct effects were entered into the input-output model IMPLAN. Otter Tail County is the study area for this analysis.

Indirect effects are those associated with a change in economic activity due to spending for goods and services directly tied to the business. **Induced effects** are those associated with a change in economic activity due to spending by the employees of businesses (labor) and by households.

Retirement of the Hoot Lake plant will create economic shifts within the economy. Sorting out those sifts is complex for a variety of reasons. First, Otter Tail Power Company is working with affected employees to determine if other applicable jobs are available within the company Assuming the employees remain with Otter Tail Power, this will moderate the induced effects. In this report, it is assumed all workers retain employment in the county. Second, Otter Tail Power's headquarters remain in Fergus Falls. Therefore, much of the spending related to the company's management will continue, even with the plant retirement. This will moderate the indirect effects. In this report, it is assumed all spending related to corporate operations (accounting, legal, etc.) remain in the county. **The analysis presented is for an average coal-fired power plant**.[8]

According to the IMPLAN model, a coal-fired power plant in Otter Tail County with 35 employees produces an estimated $44.9 million in output annually. It pays $4.0 million in salaries, wages, and benefits. Total output, in input-output modeling, is equal to all expenditures for inputs,

[8] The IMPLAN model estimates the associated output and labor income losses based on an average coal-fired power plant. The numbers presented here are meant to be instructive for a conversation. They may differ slightly from actual output and labor income for Otter Tail Power.

wages, salaries, and benefits, and taxes (see equation below). However, economic impact within the county is driven by local spending.

TOTAL OUTPUT = INPUTS + EMPLOYMENT COMPENSTATION + TAXES

Of the estimated $44.9 million of output, an estimated $4.15 million is local spending expected to be lost due the plant retirement (Table 2). This is derived from the availability of inputs for local purchase. Based on industry averages, more than half (51.3 percent) of the plant's expenditures are for coal. Of this, none of the coal is being purchased within Otter Tail County. Therefore, the lost coal purchases will not have any impact on the county. Rail transportation, however, is provided locally. Therefore, the lost rail purchases will translate into an estimated loss of $2.4 million in the county. Salaries and benefits are spent locally, but since the assumption is that all employees will retain employment under this scenario, there will be no decrease in wage and salary spending due to the plant retirement.[9]

Table 2: Direct Effects of the Retirement of a Coal-Fired Power Generation Plant With Moderation Efforts, Otter Tail County, Minnesota

Category	Percent of Total Expenditures	Local Spending Lost Due to Retirement
Coal mining	51.3%	$0
Professional & business services	6.8%	$0
Transportation (primarily rail)	6.3%	$2.4
Manufactured goods	3.9%	$0.05
Utilities & other mining	1.1%	$0.2
Maintenance	1.1%	$0.4
Retail, food, & lodging services	0.6%	$0.0
Other inputs	0.2%	$0.1
Salaries, wages, & benefits	9.0%	$0
Property income & taxes	19.7%	$1.0
Total	100%	$4.15

Estimates by the Extension Center for Community Vitality

With the moderation efforts, there will be a direct loss of an estimated $4.15 million in Otter Tail County (Table 3). There will be no direct employment or labor income losses.[10] In total, the retirement of the plant would result in a decrease in $5.65 million in economic activity, including

[9] Percent of expenditures and percent of expenditures made locally based on the IMPLAN model.
[10] Assumes Otter Tail Power retains all 35 employees at their current wages, salaries, and benefits.

$0.4 million in labor income. A total of 15 jobs would be affected. These jobs may not be lost, but might move to part-time from full-time or have fewer shifts or hours.

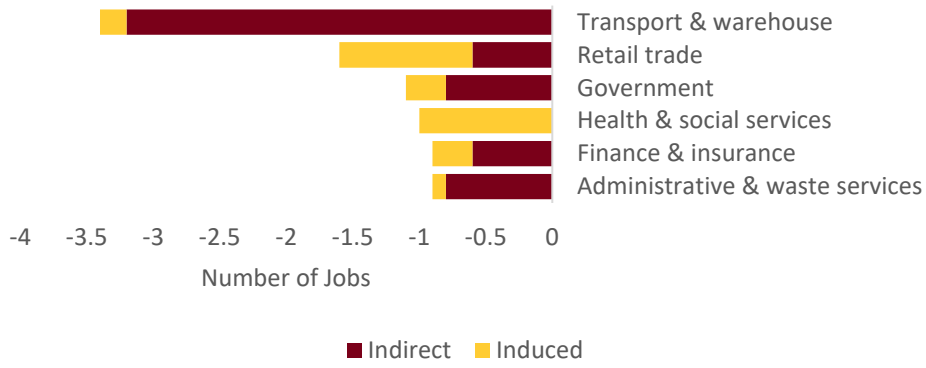
Table 3: Economic Impact of the Retirement of a Coal-Fired Power Generation Plant With Moderation Efforts, Otter Tail County, Minnesota, 35 Employees

	Direct At Power Plant	Indirect Business-Business	Induced Consumer-Business	Total
Output (millions)	-$4.15	-$1.0	-$0.5	-$5.65
Employment	0	-10	-5	-15
Labor Income (millions)	$0	-$0.3	-$0.1	-$0.4

Estimates by the Extension Center for Community Vitality

The 15 jobs affected are across industries in Otter Tail County (Chart 4).

Chart 4: Top Industries Effected, Closure of a Coal-Fired Electric Generation Plant in Otter Tail County, 35 Employees,With Moderating Efffects, Sorted by Employment



The largest impacts will be in the transportation and warehousing industry (related to rail transportation). Other industries being most affected by the retirement include retail trade, government, and health and social services.

FUTURE PLANS

Leaders in Fergus Falls are looking to the future of the area, once the plant is decommissioned. On August 21, the Fergus Falls City Council accepted the Northeast River Reach Small Area plan. Developed, with public input, by Bolton and Menk, the plan breaks the area currently held by Otter Tail Power into five areas. Housing is the focus of three of the areas. The proposed housing developments include moderate income, higher-end, and multifamily housing options. Commercial and industrial options are considered for a fourth area. And finally, the plan considers options, such as an event center or recreational uses, for the areas nearest the current

plant.[11] These developments could potentially bring new tax revenue and economic activity into Fergus Falls.

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[11] Drews, R.C. (2018, August 21). *Planting an idea: Fergus Falls City Council accepts final design plan for Hoot Lake Plant*. Fergus Falls Daily Journal. Retrieved from https://www.fergusfallsjournal.com/2018/08/planting-an-idea-fergus-fall-city-council-accepts-final-design-plan-for-hoot-lake-plant/.

APPENDIX: ASSUMPTIONS AND TERMS

Economic impact analysis is based on several critical assumptions. An understanding of these assumptions ensures the results are interpreted properly. Here are the key assumptions made in the analysis for Otter Tail County.

First, there are assumptions that are standard for all economic impact analyses using the IMPLAN model. They are:

- One job is one job, regardless if the job is full-time, part-time, or seasonal. The jobs considered here are not full-time equivalents. Therefore, it is not unusual for industries with high levels of part-time employment to experience higher employment impacts.
- The model is linear. A one unit change in output or employment will have a fixed unit change in the other measures.
- The model assumes all employees of the facility live in the county. It does make adjustments for where their incomes are spent. If the regional hub is located in a nearby county, it will adjust to assume employees spend some of their wages and salaries in the nearby county. In this analysis, for example, the model estimates 60 percent of incomes are spent in Otter Tail County.
- The database is built on publicly available data. When data is not available for a specific industry, say due to data disclosure issues, econometric models are used to create estimates for the industry.

Second, there is an assumption unique to the analysis in Otter Tail County.

- The number of employees at Otter Tail Power was provided to Extension. The IMPLAN model estimated the amount of output and labor income created by those employees, based on national and state benchmarks for the industry.

The following are a few key terms used in economic impact analysis.

Output

Output is measured in dollars and is equivalent to total sales. The output measure can include significant double counting. For example, think of corn. The value of the corn is counted when it is sold to the mill, again when it is sold to the dairy farmer, again as part of the price of fluid milk, and then yet again when it is sold as cheese. The value of the corn is built into the price of each of these items and then the sales of each of these items are added up to get total sales (or output).

Employment

Employment includes full- and part-time workers and is measured in annual average jobs. Total wage and salaried employees, as well as the self-employed, are included in employment estimates in IMPLAN. Because employment is measured in jobs and not in dollar values, it tends to be a very stable metric.

In the model, one job is one job, regardless if the job is full-time, part-time, and seasonal.

Labor Income

Labor income measures the value that is added to the product by the labor component. For example, in the corn example, when the corn is sold, a certain percentage of the sale goes to the farmer for his/her labor. Then when the mill sells the corn as feed to the dairy farmer, it includes a markup for its labor costs in the price. When the dairy farmer sells the milk to the cheese manufacturer, he/she includes a value for his/her labor. These individual value increments for labor can be measured. This is labor income. Labor income does not include double counting.

Direct Impact

The direct impact is equivalent to the initial change in the economy.

Indirect Impact

The indirect impact is the summation of changes in the local economy that occur due to **spending for inputs** (goods and services) by the industry or industries directly impacted. For instance, if employment in a manufacturing plant increases by 100 jobs, this implies a corresponding increase in output by the plant. As the plant increases output, it must also purchase more of its inputs, such as electricity, steel, and equipment. As it increases its purchase of these items, its suppliers must also increase its production, and so forth. As these ripples move through the economy, they can be captured and measured. Ripples related to the purchase of goods and services are indirect impacts.

Induced Impact

The induced impact is the summation of changes in the local economy that occur due to **spending by labor** by the employees in the industry or industries directly impacted. For instance, if employment in a manufacturing plant increases by 100 jobs, the new employees will have more money to spend to purchase housing, buy groceries, and go out to dinner. As they spend their new income, more activity occurs in the local economy. This can be quantified and is called the induced impact.

Total Impact

The total impact is the summation of the direct, indirect, and induced impacts.