



**THE
ECONOMIC IMPACT
OF
ELECTRIC POWER
TRANSMISSION LINE
CONSTRUCTION
IN THE
MIDWEST**

March 2009



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EXECUTIVE SUMMARY

The construction of power transmission lines generates a significant economic contribution to the economy in the regions where the lines are constructed. American Transmission Company (ATC) constructs power lines ranging from large scale 345-kilovolt lines, like the recently completed Arrowhead-Weston line, as well as smaller capacity, 138-kilovolt lines connecting local substations, such as the recently constructed Femrite-Sprecher line. NorthStar Economics, Inc. was retained by ATC to calculate the economic impact of constructing power transmission lines of each type. For purposes of this study, it is assumed that Arrowhead-Weston and Femrite-Sprecher represent a typical large-scale 345-kV project and a typical small-scale 138-kV project, respectively.

Both large scale projects like the Arrowhead-Weston line and projects on a smaller scale like the Femrite-Sprecher line produce significant economic impacts. Projects of this nature create and support jobs, generate significant tax revenue, and produce total economic impacts well in excess of the costs attendant to constructing the transmission lines. Regardless of the scale of the project, construction of power transmission lines yields a return on investment of approximately \$1.50 for each dollar spent.

Applying economic multipliers to determine the indirect and induced effects of every dollar spent directly on the project, we are able to calculate the total economic impact of these projects, the number of jobs created and supported, and the amount of tax revenue generated. Based on our analysis, the following represent our conclusions with respect to the economic impact of the construction of power transmission lines in the Midwest.

ECONOMIC IMPACTS OF POWER TRANSMISSION LINE CONSTRUCTION

| | Femrite-Sprecher | Arrowhead-Weston |
|--|---------------------|----------------------|
| Jobs Generated / Supported | 170 | 2,560 |
| Tax Revenue Generated | \$634,812 | \$9,542,256 |
| Total Economic Impact | \$24,526,336 | \$464,402,302 |
| Return on Investment (Per \$1.00 spent) | \$1.53 | \$1.45 |

We have adopted "rules of thumb" to facilitate understanding of how these data may be extrapolated to other projects throughout the Midwest. While the two lines studied represent the two extremes in terms of size, ATC constructs lines of all different sizes. One way to appreciate the economic impact of line construction is to express the calculated impact in terms of the benefits realized for every mile of transmission line constructed. These rules of thumb appear below.

As there are significant economies of scale achieved on a larger project, the smaller project actually generates a greater impact per mile. However, a larger scale project will ultimately have a greater economic impact, as those impacts are multiplied across a greater number of miles. In this instance, it should be noted that only the impact of the Arrowhead-Weston line in Wisconsin has been measured. While the bulk of the line was constructed in Wisconsin, a portion of the line is in Minnesota, and there was significant spending outside of Wisconsin, so the actual impact is greater than the stated impact on the Wisconsin economy.

ECONOMIC BENEFITS REALIZED PER MILE OF LINE CONSTRUCTED

| | SMALL (138-kV line) | LARGE (345-kV line) |
|-----------------------------------|----------------------------------|------------------------------------|
| Direct Economic Impact | > \$4 million | \$1.5 million |
| Jobs Generated / Supported | 42.5 | 11.6 |
| Tax Revenue Generated | \$159,000 | > \$43,000 |
| Total Economic Impact | > \$6 million per mile | > \$2.1 million per mile |

Each particular project comes with its own set of challenges and variables affecting the cost of the project, including the length of the line, the amount of the line that must be routed underground, and the number of property owners who must be compensated when the line encroaches on their property. However, based upon the assumption that Arrowhead-Weston and Femrite-Sprecher represent typical projects for each size of line, these rules of thumb represent a reliable means to estimate the anticipated impact of future projects.

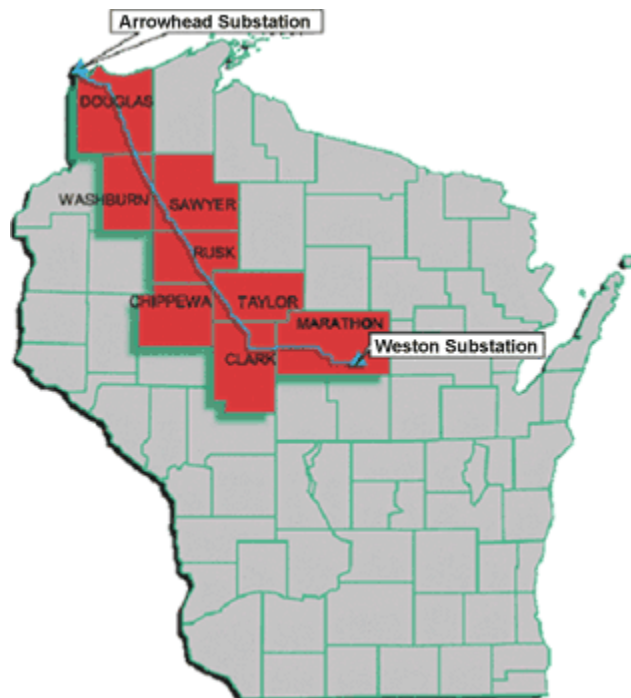
It should be noted that these calculations represent a conservative estimate of the true economic impact of power transmission line construction, as there will be further economic activity related to maintaining the lines, to say nothing of the revenue generated by the businesses whose power is supplied by the completed lines. Construction of power transmission lines in the Midwest contributes substantially to the regional economy - a contribution that continues well beyond completion of construction.

CHAPTER I: INTRODUCTION

American Transmission Company (ATC) is the first multi-state transmission-only company in the United States, providing electric transmission service from the Upper Peninsula of Michigan, throughout the eastern half of Wisconsin and into portions of Illinois. ATC services over 9,400 miles of high-voltage transmission lines and 500 substations, providing communities with access to local and regional energy sources.

Transporting electricity from where it's generated to where it's needed is accomplished through a network of transmission lines, both within states and throughout a region. Transmission lines bring immediate and direct economic benefits to those who own the land on which they're built, significant economic benefits to the communities through which they pass, and essential long-term benefits to the consumers who use the power transmitted on the lines. NorthStar Economics was retained by ATC to calculate the economic impact of construction of two transmission lines: the Arrowhead-Weston line and the Femrite-Sprecher line.

Figure I-1: Arrowhead-Weston Map



Source: www.arrowhead-weston.com



NorthStar Economics is a private economic consulting and research firm dedicated to the development and implementation of New Economy economic development strategies.

NorthStar was founded by Dr. David J. Ward in May of 2000 and has served a wide variety of clients in both the public and private sectors.

Areas of expertise include economic impact studies, strategic economic development, angel investing, workforce development, rural economic development, feasibility studies, and forensic economics.

Several NorthStar consultants contributed to this project, including NorthStar President and founder, David J. Ward, Ph.D., Interim President and Senior Consultant Bruce E. Siebold, Ed.D., Vice President and Director of Operations Alan J. Hart, and former Vice President and Director of Research Dennis K. Winters.

Dr. Ward had a distinguished career spanning more than thirty years with the University of Wisconsin System as both an educator and an administrator before retiring in 2000. He has acted as the principal investigator and primary author of numerous NorthStar projects, including *The Impact of Wisconsin Public Libraries on the Economy of Wisconsin*; *The Whitewater University Technology Park Feasibility Study*, *A Systematic Evaluation Process for a Science and Technology Strategy in New Hampshire*; *An Economic Development Adjustment Plan for Door County, Wisconsin*; and the 2005 *NorthStar Guide to Growth and Venture Capital for Wisconsin companies*.

Dr. Siebold has made significant contributions to several NorthStar projects, including our strategic economic development plan for the Michigan Upper Peninsula and Wisconsin Border region, our feasibility study for the Wisconsin Institute for Sustainable Technology at the University of Wisconsin-Stevens Point, and a project for the Wisconsin Security Research Consortium.

Mr. Hart has worked in some capacity on almost every NorthStar project, including numerous economic impact and feasibility studies and strategic development plans. He was the principal investigator and author of an economic impact study for Trout Unlimited, measuring the economic impact of recreational trout angling in the Driftless Area.

Mr. Winters has over twenty-five years of experience in economic analysis, modeling and forecasting. He has been the principal investigator and author of many economic impact studies, including studies for the University of Wisconsin-Madison, the University of Wisconsin System, the Wisconsin Health Care Association, and the 2004 PGA Championship.

CHAPTER II: THE FEMRITE-SPRECHER LINE

BACKGROUND

The Femrite-Sprecher transmission line was placed in service in spring of 2007. ATC completed construction of approximately four miles of new 138-kilovolt transmission line in Dane County, Wisconsin, to connect the Sprecher Substation, located near the Sprecher Road / County Trunk Highway BB intersection, with Femrite Substation, located on Femrite Road near the I-90 / U.S. Highway 12/18 interchange near Madison, Wisconsin.

ECONOMIC IMPACT

Direct Effect

In the process of completing the Femrite-Sprecher line, payments were made to 95 separate entities. Entities paid include vendors from whom services and materials were purchased, as well government agencies who collected fees, and real estate owners who were compensated for the use of their property. 66 of these entities are located in Wisconsin, while the remaining 29 are located in other states. Total expenditures amounted to more than \$16 million. More than \$7.3 million of that total (approximately 45.8%) was spent in the state of Wisconsin. This direct spending is summarized in Figure II-1 below. Note that in some instances, vendors may have provided both materials and services. All expenditures to each vendor were placed in one of the categories listed below. See Appendix 1 for a complete list of paid entities and the amounts paid to each.

Figure II-1: Total Direct Spending on the Femrite-Sprecher Line

| | In Wisconsin | Outside Wisconsin | Total |
|--|---------------------|--------------------------|---------------------|
| Materials and Equipment | \$1,227,723 | \$4,021,237 | \$5,248,960 |
| Construction and Other Services | \$5,934,875 | \$4,678,414 | \$10,613,289 |
| Real Estate Payments and Fees | \$97,245 | 0 | \$97,245 |
| Government Payments and Fees | \$102,123 | 0 | \$102,123 |
| TOTAL | \$7,361,966 | \$8,699,651 | \$16,061,617 |

Indirect and Induced Effects

Spending produces not only a direct economic effect, but indirect and induced effects as well, as those dollars continue to flow through the regional economy. These indirect and induced effects are determined by applying economic output multipliers, which vary according to industry category and geographic location. Economic multipliers were purchased from the Minnesota IMPLAN Group, which assembles appropriate multipliers for any geographic area. In this particular instance, multipliers for the State of Wisconsin were used for all calculations.



The Minnesota IMPLAN Group (MIG) are the developers of the IMPLAN® economic impact modeling system. IMPLAN® is used to create complete, extremely detailed Multiplier Models of local economies. MIG provides economic multiplier reports that enable users to make in-depth examinations of state, multi-county, county or sub-county, and metropolitan regional economies. NorthStar Economics has used IMPLAN multiplier reports to calculate job creation and economic impact related to a variety of different enterprises and initiatives. MIG tools are in use by more than 1,000 public and private institutions. MIG has been developing complex localized databases, conducting training workshops and distributing IMPLAN® software to public and private organizations since 1993.

The IMPLAN multiplier report contains separate economic multipliers for a variety of industry categories. Each multiplier was selected on the basis of the category that most closely matches each vendor. The selected multipliers were applied to spending in each category, and a weighted average was calculated. For the Femrite-Sprecher line, the total average multiplier is 1.525824. See Appendix 2 for a list of the different multipliers applied and the way they were weighted to arrive at the final proportionally weighted multiplier.

Based on the weighted average multiplier of 1.525824, approximately 52.6 cents in indirect and induced economic benefits are realized for every dollar directly spent. These indirect and induced effects, along with the resulting total economic contribution are summarized in Figure II-2 below. Note that out-of-state vendors may be located in any number of other states, each of which has unique economic multipliers. However, as more specific information regarding the amounts spent in each state, Wisconsin multipliers were used for all calculations. Given that the weighted multiplier was calculated through the proportional application of spending in two dozen different industries (each of which is not expected to vary considerably from state-to-state), we are confident that the use of Wisconsin multipliers provides a reasonable basis for all economic impact calculations.

Figure II-2: Indirect and Induced Economic Effects of the Femrite-Sprecher Line

| | Direct Economic Impact | Indirect/Induced Effects | Total Economic Contribution |
|-------------------------------------|-------------------------------|---------------------------------|------------------------------------|
| In Wisconsin (45.8%) | \$7,361,966 | \$3,871,096 | \$11,233,062 |
| Outside Wisconsin (54.2%) | \$8,699,651 | \$4,593,623 | \$13,293,274 |
| TOTAL | \$16,061,617 | \$8,464,719 | \$24,526,336 |

Return on Investment

As noted in Figure II-2, \$16 million in direct spending on the Femrite-Sprecher line yielded a total economic contribution of more than \$24.5 million. At the state level, \$7 million in direct spending yielded more than \$11 million in total economic benefits. By dividing the total economic contribution by the direct expenditures, we can calculate the return on investment for each dollar spent. In this case, total economic benefits realized are approximately \$1.53 for every dollar spent, which is true for both Wisconsin as well as the project as a whole.

Jobs

Money spent on the Femrite-Sprecher project generates jobs in two ways: the direct employment of vendors paid in connection with the project, as well as jobs that result from the economic activity of people that worked on the project. For a project such as this, payments made to vendors included fees for services, as well as materials and other goods. Accordingly, we do not have specific figures with regard to direct employment. However, multiplier reports purchased from the Minnesota IMPLAN Group include employment multipliers as well as economic multipliers. Accordingly, we have a reasonable basis for calculating the number of jobs created and supported in relation to the amount spent in each of several different industry categories. Applying a weighted multiplier (calculated through the proportional application of multipliers for each industry in which money was spent) results in the findings contained in Figure II-3 below.

Figure 3: Jobs Supported by Construction of the Femrite-Sprecher Line

| | Jobs Created |
|----------------------------------|---------------------|
| In Wisconsin (45.8%) | 92.32 |
| Outside Wisconsin (54.2%) | 78.01 |
| TOTAL | 170.33 |

Taxes

Money spent on the Femrite-Sprecher project also generates tax revenue. State income and sales taxes are calculated based upon a model developed by NorthStar Economics. A portion of spending is subject to the state sales tax at a rate of 5% and the earnings from jobs generated by the economic activity of the Femrite-Sprecher line construction is subject to the state income tax. Property taxes are estimated based upon prior NorthStar studies in Wisconsin that survey employees about home ownership and property taxes paid. As with the previous figures, all calculations are based on Wisconsin multipliers and tax rates. More specific information regarding the out-of-state expenditures may yield different results.

The average Wisconsin worker earns annual wages of \$38,070. Multiplying that figure by the 78 Wisconsin jobs generated by the Femrite-Sprecher project yields a result of \$2,969,085 in total earnings attributable to this project. Multiplying that total by the average Wisconsin income tax rate of 3.34%, those earnings generate \$99,191 in income taxes. Multiplying the total by the average Wisconsin sales tax rate of 2.24% yields an additional \$66,524 in sales taxes. Finally, multiplying the total by the average Wisconsin property tax rate of 4.21% yields \$125,029 in property taxes.

In Wisconsin alone then, the Femrite-Sprecher project produced \$290,744 in state tax revenue. Inasmuch as Wisconsin expenditures represented only 45.8% of total spending on the project, total tax revenue generated - including out-of-state revenue - is estimated at \$634,812, as summarized in Figure II-4 below.

Figure II-4: Tax Revenue Generated by Construction of the Femrite-Sprecher Line

| | Income Tax | Sales Tax | Property Tax | TOTAL |
|-------------------------------------|-------------------|------------------|---------------------|------------------|
| In Wisconsin (45.8%) | \$99,191 | \$66,524 | \$125,029 | \$290,744 |
| Outside Wisconsin (54.2%) | \$117,383 | \$78,725 | \$147,960 | \$344,068 |
| TOTAL | \$216,574 | \$145,249 | \$272,989 | \$634,812 |

Conclusions

Although it was a relatively small project, the construction of the Femrite-Sprecher line produced significant economic impacts. In Wisconsin alone, more than \$7 million was spent on the project, supporting 78 jobs, generating nearly \$300,000 in tax revenue, and making a total economic contribution to the state in excess of \$11 million. The total economic benefit of the project was more than twice that amount, based on extrapolation of the Wisconsin calculations, total economic benefits of the \$16 million spent on the project include support of more than 170 jobs, nearly \$635,000 in tax revenue, and total economic impact of more than \$24.5 million.

| FEMRITE-SPRECHER LINE | WISCONSIN | TOTAL |
|-----------------------------------|------------------|---------------------|
| Jobs Generated / Supported | 78 | 170 |
| Tax Revenue Generated | \$290,744 | \$634,812 |
| Total Economic Impact | \$11,233,062 | \$24,526,336 |

Rules of Thumb

Assuming that the Femrite-Sprecher line represents a typical project connecting two local substations, the following rules of thumb apply.

Each mile of transmission line constructed for a local project results in:

- More than \$4 million in direct economic impact – including \$1.8 in the state
- Approximately \$1.3 million spent on materials – including over \$300,000 in state
- Approximately \$2.65 million spent on construction and other services – including nearly \$1.5 million spent in state
- 42.5 jobs supported – including 23 jobs in the state
- Nearly \$159,000 in tax revenue – including nearly \$73,000 in the state
- More than \$2 million in indirect economic impacts
- Almost \$6.2 million in total economic impact per mile

Each dollar spent directly results in a return on investment of \$1.53 for every dollar spent.

CHAPTER III: THE ARROWHEAD-WESTON LINE

INTRODUCTION

The Arrowhead-Weston line is a 220-mile transmission line connecting Duluth, Minnesota with Wausau, Wisconsin. The new line was designed to accommodate electric load growth in northern Wisconsin and improve reliability of the electric transmission system in the region. The line was constructed primarily along existing railroad, gas-pipeline and highway and transmission rights-of-way. The 220.2 mile line traverses 207.7 miles in Wisconsin, and crosses the property of approximately 800 landowners. Construction of the Arrowhead-Weston line was completed in November 2007, seven months ahead of schedule, and nearly 10 years since the project was submitted to the Wisconsin Public Service Commission for approval. The substantial majority of the Arrowhead-Weston line is located in Wisconsin. As only Wisconsin spending was included in our calculations, and Wisconsin economic multipliers were applied, it should be noted that the following calculations only represent the economic impact on the Wisconsin economy. This is a conservative estimate, as the total economic impact would be significantly greater if out-of-state spending had been taken into account.

ECONOMIC IMPACT

Direct Effect

In the process of completing the Arrowhead-Weston line, payments were made to a number of separate Wisconsin entities, including vendors from whom services and materials were purchased, as well government agencies who collected taxes, and real estate owners who granted right-of-way easements. Some of these entities were located in Wisconsin, while others are in other states. All impact calculations are based on total project expenditures in Wisconsin, which amounted to nearly \$321 million. This direct spending is summarized in Figure III-1 below. Note that in some instances, vendors may have provided both materials and services. All expenditures to each vendor were placed in one of the categories listed below. See Appendix 3 for a complete list of paid entities and the amounts paid to each.

Figure III-1: Total Direct Spending on the Arrowhead-Weston Line

| | Expenditures |
|--|----------------------|
| Materials and Equipment | \$66,635,968 |
| Construction and Other Services | \$179,518,991 |
| Real Estate Payments and Fees | \$19,410,722 |
| Sales and Use Taxes | \$8,107,689 |
| WPSC Costs and ATC Line Costs | \$28,028,291 |
| Environmental Impact Fees | \$19,285,381 |
| TOTAL | \$320,987,041 |

Indirect and Induced Effects

As with the Femrite-Sprecher line, economic multipliers for the State of Wisconsin purchased from the Minnesota IMPLAN Group were used for all calculations. The IMPLAN multiplier report contains separate economic multipliers for a variety of industry categories. Each multiplier was selected on the basis of the category that most closely matches each vendor. The selected multipliers were applied to spending in each category, and the weighted average was calculated. For the Arrowhead-Weston line, the total average multiplier is 1.415912. See Appendix 4 for a list of the different multipliers applied and the way they were weighted to arrive at the final proportionally weighted multiplier.

To calculate the indirect and induced effect of the direct expenditures made, the appropriate multipliers were applied to the spending data for spending in all categories. Based on the weighted multiplier of 1.415912, there are approximately 41.6 cents in indirect and induced economic benefits for every dollar directly spent. These indirect and induced effects, along with the resulting total economic contribution are summarized in Figure III-2 below.

Figure III-2: Indirect and Induced Economic Effects of the Arrowhead-Weston Line

| | Direct Economic Impact | Indirect/Induced Effects | Total Economic Contribution |
|------------------------------|-------------------------------|---------------------------------|------------------------------------|
| Economic Contribution | \$320,987,041 | \$143,415,260 | \$464,402,302 |

Return on Investment

As noted in Figure III-2, \$321 million in direct spending on the Arrowhead-Weston line yielded more than \$464 million in total economic benefits. By dividing the total economic contribution by the direct expenditures, we can calculate the return on investment for each dollar spent. In this case, total economic benefits realized are approximately \$1.45 for every dollar spent.

Jobs

As with the Femrite-Sprecher line, money spent on the Arrowhead-Weston generates jobs in two ways: the direct employment of vendors paid in connection with the project, as well as jobs that result from the economic activity of people that worked on the project. Once again, payments made to vendors included fees for services, as well as materials and other goods. Accordingly, we do not have specific figures with regard to direct employment, so figures were calculated using employment multipliers purchased from the Minnesota IMPLAN Group. Applying a weighted multiplier results in the findings contained in Figure III-3 below.

Figure III-3: WI Jobs Supported by Construction of the Arrowhead-Weston Line

| Spending Source: | Jobs Created |
|----------------------------------|---------------------|
| Vendors and Payees | 2,151.84 |
| WPSC and ATC Costs | 199.67 |
| Environmental Impact Fees | 208.75 |
| TOTAL | 2,560.27 |

Taxes

Money spent on the Arrowhead-Weston project also generates tax revenue. State income and sales taxes are calculated based upon a model developed by NorthStar Economics. A portion of spending is subject to the state sales tax at a rate of 5% and the earnings jobs generated by the economic activity of the Arrowhead-Weston line construction is subject to the state income tax. Property taxes are estimated based upon prior NorthStar studies in Wisconsin that survey employees about homeownership and property taxes paid. As with the previous figures, all calculations are based on Wisconsin multipliers and tax rates. More specific information regarding the out-of-state expenditures may yield different results.

The average Wisconsin worker earns annual wages of \$38,070. Multiplying that figure by the 2,560 Wisconsin jobs generated by the Arrowhead-Weston project yields a result of \$97,469,418 in total earnings attributable to this project. Multiplied by the average Wisconsin income tax rate of 3.34%, those earnings generate \$3,255,479 in income taxes. Multiplying the total by the average Wisconsin sales tax rate of 2.24% yields an additional \$2,183,315 in sales taxes. Finally, multiplying the total by the average Wisconsin property tax rate of 4.21% yields \$4,103,462 in property taxes. Total tax revenue generated is estimated at \$9,542,256.

Figure 4: Tax Revenue Generated by Construction of the Arrowhead-Weston Line

| | Income Tax | Sales Tax | Property Tax | TOTAL |
|---|-------------------|------------------|---------------------|--------------|
| Tax Revenue Based on 2,560 Workers | \$99,191 | \$66,524 | \$125,029 | \$9,542,256 |

Conclusions

Construction of the Arrowhead-Weston transmission line produced significant economic impacts. Nearly \$321 million was spent in Wisconsin on the project, supporting more than 2,500 jobs, generating nearly \$1 billion in tax revenue, and making a total economic contribution to Wisconsin of nearly half a billion dollars.

| | |
|-----------------------------------|----------------------|
| ARROWHEAD-WESTON LINE | TOTAL |
| Jobs Generated / Supported | 2,560 |
| Tax Revenue Generated | \$9,542,256 |
| Total Economic Impact | \$464,402,302 |

Rules of Thumb

Assuming that the Arrowhead-Weston line represents a typical large scale statewide high capacity project, the following rules of thumb apply.

Each mile of transmission line constructed for a local project results in:

- Nearly \$1.5 million in direct economic impact
- Over \$300,000 spent on materials
- Over \$800,000 spent on construction and other services
- 11.6 jobs supported
- Over \$43,000 in tax revenue
- More than \$600,000 in indirect economic impacts
- Over \$2.1 million in total economic impact per mile

Each dollar spent directly results in a return on investment of \$1.45 for every dollar spent.

Summary

| | FEMRITE-SPRECHER | ARROWHEAD-WESTON |
|--|-------------------------|-------------------------|
| Jobs Generated / Supported | 170 | 2,560 |
| Tax Revenue Generated | \$634,812 | \$9,542,256 |
| Total Economic Impact | \$24,526,336 | \$464,402,302 |
| Return on Investment (Per \$1.00 spent) | \$1.53 | \$1.45 |

Both large scale projects like the Arrowhead-Weston line and projects on a smaller scope like the Femrite-Sprecher line produce significant economic impacts. Projects of this nature create and support jobs, generate significant tax revenue, and produce total economic impacts well in excess of the costs attendant to constructing the transmission lines. Regardless of the scale of the project, construction yields a return on investment of approximately \$1.50 for each dollar spent.

Each particular project comes with its own set of challenges and variables affecting the cost of the project, including the length of the line, the amount of the line that must be routed underground, and the number of property owners who must be compensated when the line encroaches on their property. However, based upon the assumption that Arrowhead-Weston and Femrite-Sprecher represent typical projects for each size of line, these rules of thumb represent a reliable means to estimate the anticipated impact of future projects.

It should be noted that these calculations represent a conservative estimate of the true economic impact of power transmission line construction, as there will be further economic activity related to maintaining the lines, to say nothing of the revenue generated by the businesses whose power is supplied by the completed lines. Construction of power transmission lines in the Midwest contributes substantially to the regional economy - a contribution that continues well beyond completion of construction.

**APPENDIX 1:
FEMRITE-SPRECHER LINE – ENTITIES PAID**

| VENDOR | ACTIVITY | COST |
|------------------------------|---------------------------------|-------------|
| ABB Inc. | Circuit Breakers | \$364,000 |
| Action Battery Wholesalers | Substation Batteries | \$13,461 |
| Alliant Energy | Construction Services | \$1,381 |
| Alliant Energy | Construction Services | \$357,723 |
| Apollo Photo Imaging | Photography | \$1,385 |
| Areva T&D | Circuit Breakers | \$41,126 |
| Atlantic Skyline | Trade show booths | \$2,805 |
| Black & Veatch | Engineering Services | \$630,586 |
| Blooming Grove | Permit Fees | \$2,000 |
| Boldt | Construction Management | \$9,785 |
| Border States | Substation & Tline Materials | \$965,714 |
| C&D Techs | Market Systems Power Conversion | \$13,145 |
| Cable Constructor | Fiber Optic Services | \$54,139 |
| Cable com | Fiber Optic Services | \$1,935 |
| Capital City Harley-Davidson | Public Meeting Space | \$2,100 |
| Captial Newspapers | Advertisements | \$103 |
| Century Fence | Fencing | \$16,380 |
| City of Madison | Fees | \$318 |
| Concast | Preformed Concrete | \$3,360 |
| Continental Mapping | Mapping services | \$1,031 |
| Dane County Treasury | Fees | \$211 |
| Diggers Hotline | | \$0 |
| Earth Tech | Geo Technical Services | \$1,615 |
| ECl | Engineering Services | \$175,578 |
| Eilertson | Civil work | \$920,287 |
| Electrical Power Sysems | SS equipment | \$10,071 |
| Endres Mfg. | Material | \$1,741 |
| Galvanizers | Steel structures | \$173,634 |
| Great Lakes Archaeological | Research | \$1,251 |
| Hoppman Graphic Design | Displays | \$2,142 |
| Hooper Corp | Tline & Substation Cnstrctn | \$1,963,978 |
| Hyndai Heavy Industreis | Transformers | \$2,131,695 |
| Inacom Info Systems | Communication Equipment | \$29,643 |
| Intercon Construction | Civil Constructions | \$45,184 |
| Jack Fobes | Real Estate | \$32,000 |
| J Templeton Constulting | IEEE | \$2,583 |
| Jeff Stern Artist | Oil Paintings | \$2,005 |
| Joan Fobes | Real Estate | \$25,000 |
| John Chance Land Surveys | Engineering Services | \$7,831 |
| JP Cullen & Sons | Transformer moving | \$121,159 |
| Kaptian Engineering | Cable Networks | \$535 |
| Key Technical Solutions | Temp hires | \$406 |
| KLC Consulting | Temp hires | \$85,340 |
| Lakeside Photography | Public Relations | \$2,005 |
| Land Service | Real Estate | \$5,245 |
| Lisa Lattin | Damages | \$35 |
| Madison Gas & Electric | Construction | \$674,557 |
| Manpower | Temp hires | \$3,089 |

| VENDOR | ACTIVITY | COST |
|--------------------------------|-----------------------------|--------------------|
| Manpower | Temp hires | \$787 |
| Mark Rausch | ??? | \$725 |
| Mary Fobes-Shipman | Real Estate | \$25,000 |
| Natural Resources Consulting | Environmental Subcontractor | \$6,944 |
| Northern Environmental Tech | Engineering Services | \$61,498 |
| OEI | Construction Services | \$59,620 |
| Pascor | Substation Equipment | \$41,862 |
| Penn Summit Tubular | Steel Poles | \$123,182 |
| Power Engineer4s | Engineering Services | \$747,533 |
| Pro Media | Public Relations | \$1,487 |
| Prof Control Corp | Engineering Power Distrib | \$12,872 |
| Public Service Comm of WI | Regulatory | \$97,880 |
| Putnam Roby Communicatins | Public Relations | \$1,765 |
| Real Time Utility Engineers | Engineering Services | \$62,271 |
| Rental Service Corp | Rental Equipment | \$15,536 |
| RFL Electronics | Electronic Equipment | \$13,237 |
| Richard Hanson | Photography | \$443 |
| Ritz Power Instruments | Equipment | \$20,985 |
| S&C Electric | Equipment | \$36,927 |
| Sabre Tubular Structures | Steel Poles | \$142,072 |
| Siemens Power T&D | Substation Equipment | \$29,186 |
| Siemens Power T&D | Substation Equipment | \$73,970 |
| Skyline | Public Relations materials | \$2,726 |
| Skyline Exhibits | Public Relations materials | \$355 |
| Southern States LLC | Equipment | \$138,398 |
| Southwire | UGT Cable & Installation | \$4,313,425 |
| Spatial Data Surveys | Engineering Services | \$974 |
| Struck & Irwin Fence | Fence repairs | \$3,920 |
| STS Consultants | Engineering Services | \$170,285 |
| Systems Control Inc | Equipment | \$522,137 |
| Tech Management Solutions | Temp hires | \$5,008 |
| The Shop Consulting | Local relations services | \$3,456 |
| The Shop Consulting | Local relations services | \$36,031 |
| the Stark Co Trust Account | Real Estate | \$10,000 |
| The Wackenhut Corp | Temp hires | \$3,013 |
| Thermetric | Business consulting | \$39,500 |
| Trachte | Equipment | \$97,637 |
| Trench | Equipment | \$111,700 |
| Trenwa | Precast concrete | \$16,465 |
| Ulteigh Engineers | Engineering Services | \$37,990 |
| USCO | Equipment | \$59,729 |
| Valmont Industreis | Steel pole accessories | \$4,428 |
| Walworth Cnty Sheriff's Dept. | Traffic control | \$1,452 |
| Wells Print & Digital Services | Reprographic services | \$2,218 |
| WI Dept of Transportation | Fees | \$1,714 |
| Wood Land Contractors | Heavy construction | \$852 |
| Yuhas Graphics | Commercial graphics | \$1,125 |
| Total | | \$16,061,617 |
| Total In-state | | \$7,361,966 |

APPENDIX 2: FEMRITE-SPRECHER LINE – ECONOMIC MULTIPLIERS

A list of IMPLAN multiplier industry codes corresponding to the numbers in the Industry column appears at the end of this appendix. “OS” stands for “out of state”.

| Vendor | Industry | Multiplier | Contribution |
|------------------------------|----------|------------|--------------|
| ABB Inc. | OS | | \$0 |
| Action Battery Wholesalers | 390 | 1.600910 | \$21,550 |
| Alliant Energy | 30 | 1.239661 | \$1,712 |
| Alliant Energy | 30 | 1.239661 | \$443,455 |
| Apollo Photo Imaging | 448 | 1.791538 | \$2,481 |
| Areva T&D | OS | | \$0 |
| Atlantic Skyline | 447 | 1.896880 | \$5,321 |
| Black & Veatch | 439 | 1.907293 | \$1,202,712 |
| Blooming Grove | 499 | 1.666850 | \$3,334 |
| Boldt | 30 | 1.239661 | \$12,130 |
| Border States | 333 | 1.593459 | \$1,538,826 |
| C&D Techs | 333 | 1.593459 | \$20,946 |
| Cable Constructor | OS | | \$0 |
| Cable com | OS | | \$0 |
| Capital city Harley-Davidson | 435 | 1.826997 | \$3,837 |
| Capitla Newspapers | 447 | 1.896880 | \$195 |
| Century Fence | 45 | 1.790217 | \$29,324 |
| City of Madison | 499 | 1.666850 | \$530 |
| Concast | OS | | \$0 |
| Continental Mapping | 445 | 1.809280 | \$1,865 |
| Dane County Treasury | 499 | 1.666850 | \$352 |
| Diggers Hotline | | | \$0 |
| Earth Tech | 445 | 1.801928 | \$2,910 |
| ECI | 439 | 1.907293 | \$334,879 |
| Eilertson | 40 | 1.630360 | \$1,500,399 |
| Electrical Power Sysyems | OS | | \$0 |
| Endres Mfg. | 340 | 1.351769 | \$2,353 |
| Galvanizers | OS | | \$0 |
| Great Lakes Archaeological | 445 | 1.809280 | \$2,263 |
| Hoppman Graphic Design | 447 | 1.896880 | \$4,063 |
| Hooper Corp | 30 | 1.239661 | \$2,434,667 |
| Hyndai Heavy Industreis | OS | | \$0 |
| Inacom Info Systems | 422 | 1.589785 | \$47,126 |
| Intercon Construction | 40 | 1.630360 | \$73,666 |
| Jack Fobes | 431 | 1.429286 | \$45,737 |
| J Templeton Constulting | 439 | 1.907293 | \$4,927 |
| Jeff Stern Artist | 494 | 1.917902 | \$3,845 |
| Joan Fobes | 431 | 1.429286 | \$35,732 |
| John Chance Land Surveys | OS | | \$0 |
| JP Cullen & Sons | 434 | 1.723583 | \$208,828 |
| Kaptian Engineering | 422 | 1.589785 | \$851 |
| Key Technical Solutions | 454 | 1.821896 | \$740 |
| KLC Consulting | OS | | \$0 |
| Lakeside Photography | 447 | 1.896880 | \$3,803 |
| Land Service | 431 | 1.429286 | \$7,497 |

| | | | |
|--------------------------------|-----|----------|-------------|
| Lisa Lattin | 494 | 1.917902 | \$67 |
| Madison Gas & Electric | 30 | 1.239661 | \$836,222 |
| Manpower | 454 | 1.821896 | \$5,628 |
| Manpower | 454 | 1.821896 | \$1,434 |
| Mark Rausch | 494 | 1.917902 | \$1,390 |
| Mary Fobes-Shipman | 431 | 1.429286 | \$35,732 |
| Natural Resources Consulting | 445 | 1.809280 | \$12,564 |
| Norhtern Enviromental Tech | 439 | 1.907293 | \$117,295 |
| OEI | 30 | 1.239661 | \$73,909 |
| Pascor | OS | | \$0 |
| Penn Summit Tubular | OS | | \$0 |
| Power Engineer4s | 439 | 1.907293 | \$1,425,764 |
| Pro Media | OS | | \$0 |
| Prof Control Corp | 333 | 1.593459 | \$20,511 |
| Public Service Comm of WI | 498 | 1.384204 | \$135,486 |
| Putnam Roby Communicatins | 447 | 1.896880 | \$3,348 |
| Real Time Utility Engineers | 439 | 1.907293 | \$118,769 |
| Rental Service Corp | 434 | 1.723583 | \$26,778 |
| RFL Electronics | OS | | \$0 |
| Richard Hanson | 448 | 1.791538 | \$794 |
| Ritz Power Instruments | OS | | \$0 |
| S&C Electric | 333 | 1.593459 | \$58,842 |
| Sabre Tubular Structures | OS | | \$0 |
| Siemens Power T&D | OS | | \$0 |
| Siemens Power T&D | OS | | \$0 |
| Skyline | 447 | 1.896880 | \$5,171 |
| Skyline Exhibits | 447 | 1.896880 | \$673 |
| Southern States LLC | OS | | \$0 |
| Southwire | OS | | \$0 |
| Spatial Data Surveys | OS | | \$0 |
| Struck & Irwin Fence | 45 | 1.790217 | \$7,018 |
| STS Consultants | OS | | \$0 |
| Systems Control Inc | OS | | \$0 |
| Tech Management Solutions | OS | | \$0 |
| The Shop Consulting | 447 | 1.896880 | \$6,556 |
| The Shop Consulting | 447 | 1.896880 | \$68,346 |
| the Stark Co Trust Account | 431 | 1.429286 | \$14,293 |
| The Wackenhut Corp | 454 | 1.821896 | \$5,489 |
| Thermetric | 450 | 1.692032 | \$66,835 |
| Trachte | 434 | 1.723583 | \$168,285 |
| Trench | OS | | \$0 |
| Trenwa | OS | | \$0 |
| Ulteigh Engineers | OS | | \$0 |
| USCO | OS | | \$0 |
| Valmont Industrreis | OS | | \$0 |
| Walworth Cnty Sheriff's Dept. | 499 | 1.666850 | \$2,420 |
| Wells Print & Digital Services | 447 | 1.896880 | \$4,207 |
| WI Dept of Transportation | 499 | 1.666850 | \$2,857 |
| Wood Land Contractors | 40 | 1.630360 | \$1,389 |
| Yuhas Graphics | 447 | 1.896880 | \$2,134 |

IMPLAN Employment Multipliers Used

| Industry Code | Description | Multiplier |
|---------------|--|------------|
| 29 | Support activities for other mining | 19.907225 |
| 30 | Power generation and supply | 4.446292 |
| 40 | Water- sewer- and pipeline construction | 13.856113 |
| 41 | Other new construction | 17.144236 |
| 45 | Other maintenance and repair construction | 21.839935 |
| 205 | Iron- steel pipe and tube from purchased stee | 5.035341 |
| 207 | Steel wire drawing | 5.483586 |
| 217 | Copper wire- except mechanical- drawing | 0.000000 |
| 233 | Fabricated structural metal manufacturing | 6.822252 |
| 333 | Electric power and specialty transformer manufacturing | 8.726004 |
| 340 | Other communication and energy wire manufacturing | 5.235953 |
| 343 | Miscellaneous electrical equipment manufacturing | 9.866837 |
| 390 | Wholesale trade | 12.086134 |
| 392 | Rail transportation | 8.664408 |
| 422 | Telecommunications | 7.774497 |
| 431 | Real estate | 12.495330 |
| 434 | Machinery and equipment rental and leasing | 10.937092 |
| 435 | General and consumer goods rental except vide | 27.187714 |
| 437 | Legal services | 16.009438 |
| 439 | Architectural and engineering services | 18.563599 |
| 440 | Specialized design services | 15.690398 |
| 444 | Management consulting services | 17.948414 |
| 445 | Environmental and other technical consulting | 15.560934 |
| 446 | Scientific research and development services | 17.728760 |
| 447 | Advertising and related services | 17.572956 |
| 448 | Photographic services | 21.618486 |
| 450 | All other miscellaneous professional and tech | 9.326751 |
| 454 | Employment services | 48.784805 |
| 455 | Business support services | 24.700308 |
| 494 | Private households | 138.400024 |
| 498 | State and local government electric utilities | 6.312715 |
| 499 | Other State and local government enterprises | 10.824520 |

**APPENDIX 3:
ARROWHEAD-WESTON LINE – ENTITIES PAID**

| Vendor | Activity | Costs |
|---|--|----------------------|
| WPSC | Project management | \$5,741,088 |
| Power Engineering | Engineering | \$21,789,543 |
| M.J. Electric | Construction | \$135,412,636 |
| MNP Project Management | Project management | \$2,538,226 |
| Thomas & Betts | Structures | \$48,328,401 |
| Hubbell Power Systems | Material- for attaching conductor | \$2,889,427 |
| Alcan Cable | Material - Conductor | \$10,509,263 |
| Border States Electric | Material - Miscellaneous | \$3,980,475 |
| Ellis & Associates | Environmental inspection | \$2,474,744 |
| Material Salvage | | (\$1,049,248) |
| Matting | Environmental protection during construction | \$9,004,779 |
| Foley & Lardner | Legal services | \$1,013,693 |
| STS Consultants | Soil boring- construction related | \$454,434 |
| Twin Ports Testing | Environmental monitoring | \$112,048 |
| Sumitono Electric USA | Electric cable | \$742,944 |
| Steigerwaldt Land Services | ROW acquisitions | \$1,076,850 |
| CC Technologies | Materials engineering and testing | \$150,714 |
| CN Railroad | railroad | \$185,458 |
| ROW Easements | Right of way and costs to acquire | \$18,333,872 |
| Sales & Use Tax | | \$8,107,689 |
| A&G | | \$1,868,375 |
| All Other | | \$462,393 |
| SubTotal | | \$273,673,370 |
| ATC Costs | | \$16,903,558 |
| AFUDC Transferred From WPS | | \$2,859,790 |
| WPS Licensing Costs | | \$8,264,943 |
| WPSC Costs & ATC Line Costs | | \$28,028,291 |
| Environmental Impact Fees (WI Costs) | | \$19,285,381 |

**APPENDIX 4:
ARROWHEAD WESTON LINE – ECONOMIC MULTIPLIERS**

A list of IMPLAN multiplier industry codes corresponding to the numbers in the Industry column appears at the end of Appendix 2.

| Vendor | Industry | \$ Amount | Output Multiplier | Employment Multiplier |
|----------------------------|-----------------|------------------|--------------------------|------------------------------|
| WPSC | 444 | \$5,741,088 | 1.871973 | 17.948414 |
| Power Engineering | 439 | \$21,789,543 | 1.097293 | 18.563599 |
| M.J. Electric | 30 | \$135,412,636 | 1.239661 | 4.446292 |
| MNP Project Management | 444 | \$2,538,226 | 1.871973 | 17.948414 |
| Thomas & Betts | 233 | \$48,328,401 | 1.4109044 | 6.822252 |
| Hubbell Power Systems | 333 | \$2,889,427 | 1.593459 | 8.726004 |
| Alcan Cable | 340 | \$10,509,263 | 1.351769 | 5.235953 |
| Border States Electric | 333 | \$3,980,475 | 1.593459 | 8.726004 |
| Ellis & Associates | 445 | \$2,474,744 | 1.809280 | 15.560934 |
| Material Salvage | | (\$1,049,248) | | |
| Matting | 445 | \$9,004,779 | 1.809280 | 15.560934 |
| Foley & Lardner | 437 | \$1,013,693 | 1.744826 | 16.009438 |
| STS Consultants | 29 | \$454,434 | 1.683797 | |
| Twin Ports Testing | 445 | \$112,048 | 1.809280 | 15.560934 |
| Sumitono Electric USA | 340 | \$742,944 | 1.351769 | 5.235953 |
| Steigerwaldt Land Services | 431 | \$1,076,850 | 1.429286 | 12.49533 |
| CC Technologies | 450 | \$150,714 | 1.692032 | 9.326751 |
| CN Railroad | 392 | \$185,458 | 1.522596 | 8.664408 |
| ROW Easements | 431 | \$18,333,872 | 1.429286 | 12.49533 |
| Sales & Use Tax | 499 | \$8,107,689 | 1.666850 | 10.824520 |
| A&G | | \$1,868,375 | 1.415912 | 7.796412 |
| All Other | | \$462,393 | 1.415912 | 7.796412 |
| ATC Costs | | \$16,903,558 | 1.415912 | |
| AFUDC Transferred From WPS | 444 | \$2,859,790 | 1.871973 | 17.948414 |
| WPS Licensing Costs | 444 | \$8,264,943 | 1.871973 | 17.948414 |
| Environmental Impact Fees | 499 | \$19,285,381 | 1.666850 | 10.824520 |