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Michigan Unplugged?

The Case for Shared Investment in Regional Transmission Projects.

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I.Executive Summary

INTRODUCTION AND PURPOSE

There is a growing need to invest in our nation's electrical-power transmission system—often referred to as "the grid." With this need comes debate over how to pay for the investment, especially for projects that provide far-reaching benefits over long periods of time.

Electricity transmission facilities are major investments. They have traditionally been funded by local utilities, with costs allocated across the local users. Improving the grid, however, requires more than a patchwork of locally planned and funded improvements. In the Midwest and other areas of the country, states, utilities, and other stakeholders have agreed to pursue a regional approach to plan and build a more robust grid. As a result, many new transmission projects are now designed to benefit large geographic areas.

Midwest Independent Transmission System Operator, Inc. (MISO)—an independent, non-for-profit corporation of grid stakeholders in the Midwest—is responsible for managing and planning this region's grid. As part of this responsibility, MISO follows Federal Energy Regulatory Commission (FERC) guidelines for planning and cost allocation. In early 2009, MISO began developing a new cost allocation method to be used specifically for regionally beneficial transmission projects. Developing and adopting the cost allocation methodology involved multiple committees, transmission and generator owner input, support from the Organization of MISO States and the Midwest Governor's Association, and approval from the MISO board of directors. Ultimately it received FERC approval in December 2010.

The approved cost allocation method assigns costs based on load (actual use of electricity), and applies only to a new category of projects called "Multi-Value Projects" (MVPs). This is consistent with FERC guidelines that hold "those who share in the benefits of transmission projects should also share in their costs."[1] This seemingly straight-forward guideline has grown complex with the introduction of regionally beneficial projects. Beneficiaries are now spread over much larger areas; benefits accrue over longer periods of time; and the types of benefits span many more categories, from improved reliability, to integrating new power sources, to allowing greater access to competitive electricity markets. With this new complexity, FERC and others have recognized that benefits from regional projects do not have to be, and often cannot be, calculated and allocated "to the last penny, or for that matter to the last million or perhaps hundred million dollars."[2]

1. Federal Energy Regulatory Commission, "Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities," June 17, 2010, paragraph 135.
2. *Illinois Commerce Commission, et al., v. FERC*, 576 F.3d at 476 (7th Cir. 2009).

Purpose of the Report

The MISO cost allocation for MVPs, which FERC found to be consistent with the "beneficiary pays" cost allocation principle, is now being challenged by parties that feel it does not assign costs in a way that is commensurate with benefits. Some are also asserting that Michigan's Lower Peninsula might be best treated as its own planning region, threatening the integrity of the entire regional planning effort.

In this report, we assess whether or not the current MVP cost allocation methodology is consistent with the legal principle that costs should be "at least roughly commensurate with benefits."[3] We also consider whether there is any evidence that the approved methodology places an unfair cost burden on Lower Michigan. Finally, we assess the risks and consequences that stem from modifying the structure of the already adopted cost allocation in ways that abandon the load-based charge cost allocation or segregate the Lower Peninsula of Michigan from the rest of the MISO region.

FINDINGS

1. The electrical grid is a backbone of our economy, and it requires upgrades to remain reliable.

a. The grid today is a complex system of interconnected and interdependent components that, with regional integration, provide greater value as a whole than they do as individual parts. The grid's main components are electricity generating plants, high-voltage electrical transmission facilities, local power distribution facilities and lines, and end-user facilities.

b. Despite improvements in recent years, the grid remains insufficient to meet projected demands for reliable, economical, and cleaner energy.

c. Despite being a state of two peninsulas, Michigan is highly connected to the grid, both physically and economically. Multiple transmission lines connect Michigan with Indiana, Ohio, Wisconsin, Ontario, and the rest of the region. Further, the state's manufacturing-intensive economy is dependent on the interstate import and export of finished and unfinished goods, often on a just-in-time basis. Interruptions anywhere on the region's electricity grid can therefore have costly impacts on Michigan.

d. Transmission of power across the grid is done very economically, accounting for just 7% of the total cost of electricity nationally in 2008.

e. The majority of the cost of electricity is driven by generating costs and local distribution costs—68% of the cost per kilowatt hour (kWh) was from the electrical generation, and another 24% was from local distribution, in 2008.

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3. In *Illinois Commerce Commission v. FERC,* the Seventh Circuit Court of Appeals ruled in 2009 that FERC must state an "articulable and plausible reason to believe the benefits are at least roughly commensurate with the utilities' share of total electrical sales [in the region]." The Court also cited the precedent of *MISO v FERC,* 373 F.3d 1361 (DC Circuit, 2004): "we have never required a ratemaking agency to allocate costs with exacting precision."

f. Electricity prices are higher, on average, in Michigan than in other Midwest states. The lowest electricity prices in the MISO region are found in western states like South Dakota and Iowa.

See "The Electrical Grid and our Economy" on page 9 for our presentation of this material, including specifics about the grid in and around Michigan.

2. The grid began as a disparate collection of local electrical utilities. Over time it has developed into a networked collection of facilities that, with the coordination of regional stakeholders, provides greater reliability, efficiency, and value.

a. FERC and industry stakeholders have developed the Regional Transmission Organization (RTO) framework to maintain and expand the grid. MISO is the RTO that coordinates planning and investment for most transmission infrastructure in the Midwest, including Michigan.

b. Planning transmission projects to expand and strengthen the grid is one of the primary functions of RTOs, and FERC strongly encourages RTOs to determine cost allocation in tandem with transmission planning.[4]

c. MISO's governance structure includes representatives from generator owners like Detroit Edison, Consumers Energy, municipal and cooperative utilities; transmission owners like ITC; end users; and other stakeholder groups. This membership elects the MISO board of directors and participates in committees that set standards, identify grid improvement projects, and develop cost allocation methodologies.

d. MISO's MVP cost allocation methodology was developed over a multi-year period with broad membership involvement and input from non-member stakeholder groups like the Organization of MISO States and the Midwestern Governors Association. The methodology was then approved by MISO's membership-elected board of directors, and found by FERC to align with federal guidelines for assigning costs in a manner commensurate with benefits.

See "Stakeholder-led Management" on page 17 and "Planning Grid Improvements" on page 18.

4. FERC's Order 890, along with a June 2010 Notice of Proposed Rulemaking (NOPR) that is currently under review, ties cost allocation to regional transmission planning to facilitate the development of new projects.

3.The cost allocation method adopted by MISO and approved by FERC provides a straight-forward model for distributing costs; assigns costs proportionate to use; and is consistent with the cost allocation methodologies used for other complex infrastructures.

a. Transmission project costs have traditionally been assigned directly to the requesting utilities. This has worked well for single-utility, single-state projects built for defined market areas.

b. Regional transmission projects, like MVPs, provide both quantifiable and non-quantifiable benefits. It is not possible to precisely allocate the benefits to individual consumers. This highlights the value of allowing MISO and other RTOs to transparently, and with broad stakeholder involvement, adopt reasonable and fair cost allocation methods that impose costs at least roughly commensurate with benefits. The MISO organization itself, a nine-state majority of the MISO states, and FERC all determined that the methodology satisfied this test.[5]

c. Other regional infrastructures with wide-reaching benefits are supported using a "postage stamp," or "load-based" cost allocation similar to that adopted by MISO, in which a standard charge is applied to each unit used. Gas taxes, toll roads, per-gallon water and sewer charges, and first-class postage stamps are examples.

d. To illustrate the complexity of a formulaic cost allocation, consider having to devise a formula that precisely allocates the costs of the U.S. Postal Service based on the benefit being received by any given customer. Instead of flat-rate postage based on package weight or letter type, a user's cost would have to be determined using a complex formula accounting for variables like distance, speed, transport method, route traveled, importance of package, value of contents, delivery time, current gas price, etc.

e. The Federal Power Act provides recourse to utility companies in the unlikely event that they are unreasonably charged for electricity. Thus, in the unlikely event that MVP projects are found not to generate benefits that are at least roughly commensurate with costs paid, FERC could at that time order corrective action to be taken.

See "Allocating the Costs of New Transmission Projects" on page 20.

5. The stakeholder process followed by MISO is detailed in their July 2010 filling with FERC, and summarized in the FERC Order accepting the tariff in December 2010 (both at FERC docket ER10-1791-000); the Organization of MISO States confirmed in their January 2011 request for rehearing that "There was a nine-state majority that generally supported the Midwest ISO's MVP Proposal," and also that "OMS submitted Comments on the Midwest ISO's July 15 Filing that were described as "generally supported" by nine of the fourteen OMS members."

4.Michigan will receive many benefits from the proposed MVP projects in return for sharing in the costs.

a. Electricity prices in Michigan are, on average, the highest in the Midwest, and are 20 to 30 percent above rates in western MISO states (see Table 1 on page 12). This cost differential amounts to 2 cents or more per kilowatt-hour. The identified starter MVPs, which will have an estimated cost of just more than one-tenth of a cent ($0.001) per kilowatt hour, will better connect Michigan consumers to these lower-cost electricity markets.

b. Michigan will be the site of the first MVP project in the MISO region. The $510 million Thumb Loop Extension will provide users with access to electricity generated on windfarms in the Thumb, and increase the reliability of the grid throughout the region.

c. MISO has estimated that quantifiable benefits attributable to the 18 starter MVP projects will yield annual benefits ranging from $1.28 billion to $2.42 billion. The benefits will come from lower production costs, less transmission loss, and lowered reserved margins. Further, the benefits will be spread across the region, with the eastern area of MISO (comprised primarily of Michigan’s Lower Peninsula, along with Gary, Indiana) benefiting most.[6]

d. The MVPs promise to generate benefits for Michigan in ways that are difficult to quantify, including:

- Reductions in electricity price due to greater access to supplies in MISO states where current electrical prices are notably lower than Michigan prices.
- Access to new markets for Michigan generators to sell power, including wind power that may have to be curtailed should wind generation be high during times of lower demand.
- Improved environmental quality, both in Michigan and “upwind” of Michigan in western MISO states.
- Preparedness for unknown future energy policies or other events that might require greater use of alternative energies, or shifting use of traditional sources.
- Increased opportunities for Michigan businesses, like wind turbine and photovoltaic cell manufacturers that serve the nation’s renewable energy sector.
- Strengthened economic position of the region and state.

e. Michigan's economy, relative to the country as a whole, is more reliant on electricity usage for producing economic output, as measured by GDP. Thus, a reliable energy system and a strong regional grid with access to the most cost-efficient sources of energy are very important to Michigan.

f. Relative to the MISO region, Michigan’s commercial and industrial businesses use less electricity to produce a unit of GDP. As such, the allocation of a fixed charge per unit of electricity used is less burdensome to Michi-

6. MISO Technical Studies Task Force April Meeting, “2011 Candidate MVP Portfolio,” April 25, 2011, Slide 59, MISO Sub-regional Benefit Spread by Future.

gan's productive capacity than it is to states that use more electricity to generate an equal amount of GDP.

See "Benefits to Michigan from MVPs" on page 25 and Figure 2, "Non-Residential Electricity Sales Per Unit of GDP from 1997 to 2009," on page 28.

5. *There is no compelling evidence that Michigan's Lower Peninsula, or Michigan as a whole, will be unfairly burdened by the approved cost allocation method.*

   a. The postage-stamp-to-load cost allocation methodology has a strong practical and theoretical basis, and is widely used in other areas of infrastructure. Furthermore, it was adopted by MISO itself, and approved by an independent federal agency as consistent with the principle that beneficiaries of grid improvements should pay a proportionate share of the costs.

   b. Among the handful of written criticisms either submitted to FERC or publicly circulated, there has been scant evidence of any unfairness to Michigan's Lower Peninsula, or Michigan as a whole, of the approved cost-sharing method. Furthermore, no alternative cost-allocation method has been proposed that would clearly benefit Michigan's Lower Peninsula without adding to the burden of the Upper Peninsula and other states, risking rejection by the other parts of the MISO region.

   c. Our analysis shows that an allocation based on load is fair considering Michigan's overall place in the MISO territory. For example, Michigan is home to about 21.7% of MISO's population, 18.9% of MISO's GDP, and 18.3% of MISO's total electricity sales, the latter being representative of load.[7] If, as stated in Michigan House Resolution No. 9, Michigan bears 20 percent of the load in MISO, then paying approximately 20 percent of costs is not unreasonable considering that MVP benefits accrue across the entire region, including Michigan.

See Table 7, "Michigan's Share of MISO Region in the United States," on page 23.

6. *Modifying the structure of MISO's approved cost allocation methodology for MVPs, by segregating Michigan's Lower Peninsula or by abandoning the agreed-upon load-based charge, threatens to needlessly delay grid improvements and bring about other unintended consequences.*

   a. MISO and other RTOs have developed frameworks for involving all stakeholders in the process of modernizing the grid. If FERC substantially modifies the order approving the structure of the MVP cost allocation

7. Figures are based on January 2011 MISO boundaries. See Table 7, "Michigan's Share of MISO Region in the United States," on page 23

methodology, the integrity of this industry-led governance structure for regional grid management and planning would be threatened.

b. If a new methodology is required and provides separate treatment for Michigan's Lower Peninsula in a way that reduced its share of MVP costs, it is likely that ratepayers in Michigan's Upper Peninsula and other states will see their MVP costs increase as a result.

c. Reopening the discussion on the fundamental structure of the cost allocation methodology does not guarantee a desirable outcome for Michigan. Developing a new methodology could take a year or longer, providing all involved parties the incentive to identify reasons for why they are deserving of a lower cost allocation.

d. There are clear costs associated with a delay. As projects designed to improve reliability and reduce congestion are delayed or foregone, the risks of a blackout or other major disturbance grow. One such disturbance, the 2003 Northeast Blackout, resulted in some $6.4 billion in lost earnings across the economy in just a two-day period.

e. Project delays will also hinder the ability of electricity users to access less costly electricity and more diverse energy sources; the ability of renewable power generators to start their projects; and the ability of states to meet renewable portfolio standards (RPS). All of this could prove costly given the unknown energy future that we face.

See "Risks of Modifying Approved Methodology" on page 31.

7. MISO should improve the information available to ratepayers on the costs and benefits of its MVP portfolio.

a. MISO members, including major utilities and transmission companies, had direct representation in the development of the MVP cost-allocation methodology, and can directly participate in the selection and approval of multi-value projects for which costs will be shared regionally. During this process a set of records on the issue was assembled and made publicly available via the FERC and MISO websites.

b. While MISO has issued information about MVPs and the adopted cost allocation methodology, most of the information has been contained in voluminous records and is quite technical in nature. This opens the door to confusion over the costs and benefits of regionally shared projects, as well as invites ill-informed speculation on whether any one state is unfairly burdened. MISO should remedy this by making more of its cost-benefit analysis broadly available. MISO should also provide explanatory material on cost allocation and transmission planning that presents the information in a straightforward manner.

ABOUT ANDERSON ECONOMIC GROUP

Anderson Economic Group, LLC was founded in 1996 and today has offices in East Lansing, Michigan and Chicago, Illinois. AEG is a research and consulting firm that specializes in economics, public policy, business valuation, and market analysis. See “Appendix C: About AEG” on page C-1 for more information about the firm and biographical information on this report’s authors.

Please visit our website at www.AndersonEconomicGroup.com for more information.

This report was commissioned by ITC Holdings Corp. The findings of this independent study are those of the authors.

II.The Electrical Grid and our Economy

The electrical grid is the system of interconnected facilities and equipment that gets electricity generated in power plants to end users of power. This section briefly describes the basic components of the national electricity grid, and the State of Michigan's connection to and use of the grid.

COMPONENTS OF THE GRID

The two most familiar parts of our electrical grid are the consumer (i.e. ourselves and our employers) and electrical generation facilities (i.e. power plants) that produce our electricity from coal, nuclear, natural gas, wind, or other sources. Some of the transmission and distribution parts of the grid that connect these two ends of the system are also familiar in the form of the power lines we see in our neighborhoods and across our state. What is less familiar is the management of this system. The electrical grid has the awesome task of having electrical supply meet electrical demand at all moments. The management of the grid ensures that when a light switch is flipped there is power instantly available, generated miles away and transported safely and reliably through the grid.

What are the parts of this system, sometimes called "the world's largest machine"?[8] The culmination of thousands of projects built across the country throughout the past century, the grid is made up of generation, transmission, and distribution components to create electricity to meet end-user demands.

- Power generation is mainly made up of large power plants fueled by coal, nuclear, or gas sources which generate the majority of the electricity that is transmitted across the grid.
- Transmission is performed with high voltage (110 kV or more) lines that efficiently transmit power across long distances between generation sites and population centers.
- Distribution to consumers occurs once high-voltage power is distributed to a lower voltage suitable for delivery to end-use facilities.

CHALLENGES FACING OUR GRID

There are currently several challenges and opportunities facing the operators of the electrical grid that require significant investments over the next decade if reliability is to be maintained and requirements by consumers and policy makers met.

The grid's transmission equipment will require significant investment to maintain its current performance. Most of the transmission infrastructure in Michigan's Lower Peninsula is over 25 years old, including 70% of its transmission lines and large power transformers, and 60% of its circuit breakers.[9] According

8. Biello, David, "World's Largest Machine—the Electricity Grid—is Old and Outdated", Scientific American, August 28, 2008.

to a 2005 report from the Global Environment Fund, the North American grid mirrors this reality, with similar percentages of transmission lines, transformers and circuit breakers more than 25 years old.[10]

In order to move beyond simply preserving the existing performance of the grid, many stakeholders in the national system are investigating the ability to design, implement, and fund investment in a setof important upgrades to the grid's core infrastructure. Some of the upgrades include the use of advanced technology to improve the reliability of the grid and improve its efficiency in terms of minimizing transmission losses and spreading the peak demand for power over a longer time at a lower peak. Another significant part of the necessary upgrades to the grid involves building new transmission infrastructure to replace aging systems that do not transfer electricity as efficiently as new systems can, and to broaden the reach of the current grid to allow greater access to energy sources that are beyond the reach of the current grid.

The total estimated cost of these upgrades is difficult to disentangle from other maintenance and upgrades of the system, and can vary widely depending on what specific upgrades are pursued and over what period of time. One investigation by journalists found estimates by authorities ranging from $100 billion to $2 trillion.[11] To name just one factor adding uncertainty to estimates of the required level of investment, widespread vehicle electrification could significantly add to the demand for grid-delivered electricity. Michigan's Public Service Commission Chairman, for one, sees a future in this scenario, stating:

> "I believe Michigan's strength as a manufacturing base gives it a competitive edge, and I see great promise in the electric car. But vehicle electrification on a large scale will require upgrades to our infrastructure, in other words, a smart—or at least smarter—grid."[12]

Nevertheless, it is clear that having a mechanism in place for sharing the cost of grid infrastructure upgrades is an important part of improving the capability of our electricity grid infrastructure.

9. ITC Holdings, "Grid Modernization: Reliability and Efficiency in the Face of Growing Demand", Public Relations Statement, http://www.itctransco.com/images/industry/profile_reliability.pdf, Accessed in 2011.
10. Global Environment Fund and Center for Smart Energy, "The Emerging Smart Grid: Investment and Entrepreneurial Potential in the Electric Power Grid of the Future", Working paper, 2005, http://www.globalenvironmentfund.com.
11. Gold, Jenny, "Putting a Price on Power," National Public Radio, April 27 2009.
12. MPSC Chairman Orjiakor Isiogu, "Technology Driving Transformation To Electric Smart Grid", Michigan Information & Research Service," MIRS Capitol Capsule, May 18, 2011.

GRID COSTS

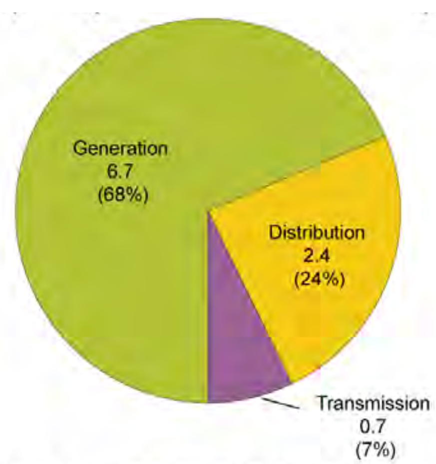
Everybody who pays an electricity bill pays not only for the production of the power that is used, but also for the transmission and distribution systems that move the power from a generator to a user. An examination of a typical electric bill illustrates what each part of the grid costs, at least in relative terms.

There are typically three major cost categories on an electric bill. These are:

1. Supply Charges—In order to supply power, a generator must first produce it. The generation of power is the process of producing electric energy from other sources of energy, such as fossil fuels, wind, and solar. The cost of generating power makes up the majority (about 68% on average) of a monthly electric bill.
2. Delivery and Transmission Charges—After energy is generated, it is then delivered to the customer. This process is two-fold; first, high-voltage electricity is transmitted from the generator to distribution lines and substations, then lower voltage electricity is distributed to end users. Distribution of energy is the second largest component of an electric bill, making up about 24% of the average electric bill in Michigan. Charges for the transmission of energy are a small portion, at about 7% of the bill.
3. Taxes and Fees—Other charges on an electric bill include taxes. These do not directly cover the cost of generating or delivering power, but instead are often used to cover regulatory agency costs or to collect funds as required under varying state laws.

As shown in Figure 1 below, the largest driver of electricity cost is the generation of the power, followed by the local distribution of the power. Costs associated with transmission, the key link between power plants and local networks, is relatively low compared to the role transmission plays in the overall grid.

FIGURE 1. **Major Components of U.S. Average Electricity Price, 2008 (Cents per kWh and Share of Total)**



Source: U.S. Energy Information Administration, *Annual Energy Outlook 2010*, Reference Case, Table A8: Electrical Supply, Disposition, Prices, and Emissions, Prices by Service Category (2009).

Michigan Costs Relative to Others

The final cost of electricity delivered to end users over the grid varies both across states and within states. Factors affecting prices include fuel costs, availability of supply, generator operating expenses, infrastructure repair and construction, extraordinary costs associated with restoring power after storms, natural disasters, and other interferences, and other such factors. The majority of these costs, as shown again in Figure 1 on page 11, stem from the generation and distribution of electricity, with only a small portion attributable to transmission.

Electricity costs in Michigan are typically higher than in other Midwest states, though near the national average. In the latest available monthly cost data, Michigan consumers are shown to have paid the highest rates in the Midwest, and rates above the national average ($0.1018 / kWh in Michigan relative to $0.970 nationally; $0.1001 in Wisconsin, the second most costly Midwest state; and just $0.0686 in Iowa, the lowest cost Midwest state). The data, as shown in Table 1, also shows that the average cost of electricity in Michigan rose at a faster rate during the past year relative to the entire country and most Midwest states.

TABLE 1. Average Retail Price of Electricity to Ultimate Customers, All Sectors, Midwest States (Cents per kWh)

	Feb 2011	Feb 2010	*Percent Change*
Illinois	8.79	8.64	*1.7%*
Indiana	7.99	7.41	*7.8%*
Iowa	7.26	6.62	*9.7%*
Michigan	10.18	9.42	*8.1%*
Minnesota	8.28	8.05	*2.9%*
North Dakota	6.86	6.62	*3.6%*
Ohio	8.74	8.84	*-1.1%*
South Dakota	7.56	7.28	*3.8%*
Wisconsin	10.01	9.46	*5.8%*
memo: United States	*9.70*	*9.52*	*1.9%*

Source: U.S. Energy Information Administration.
Analysis: Anderson Economic Group LLC

MICHIGAN'S PLACE ON THE GRID

Michigan's electric power generators and consumers are connected to an integrated transmission system with many connections across state lines. As shown in "Map of Electric Power Transmission in Michigan Area" on page A-4, Michigan is well connected by high-voltage lines crossing into Ohio, Indiana, Wisconsin, and Canada. These serve the major population centers in the southwest and southeast regions of the Lower Peninsula, as well as the Upper Peninsula.

Electricity Generation

Michigan's electricity is supplied by diverse generation sources connected to the grid. As shown in Table 2, 94% of electricity used by Michigan consumers is generated in the state, with the remainder supplied by net imports from other states and Canada. Over 80% of the power generated in the state is supplied by electric utilities, with the remainder coming from independent power producers and other entities.

As of 2009, 3% of Michigan's electricity generation was supplied by renewable sources such as hydroelectric and wind. This amount is required to rise to 10% by 2015 to comply with a Renewable Energy Standard passed in 2008.[13]

Table 3 below shows Michigan's top five electricity retailers in 2009. These providers combined sold 85% of the state's electricity in 2009. Note that Detroit Edison, Consumers Energy, Indiana Michigan Power, and the City of Lansing exclusively serve Michigan's Lower Peninsula. Michigan's Upper Peninsula is the only area of Michigan served by Wisconsin Electric Power.

Electricity Use

Michigan's electricity usage is split between residential, commercial, and industrial users. As shown Table 4, approximately 30% of Michigan's electricity supply is consumed by the residential sector, with 60% split between commercial and industrial users.

Each of these sectors, from manufacturing and mining in the industrial sector, to tourism and service industries in the commercial sector, depend on reliable access to power through the grid to have predictable operations. The remaining 10% is split between transmission losses and "direct use," which refers to power used on the site where it was generated rather than being transmitted through the grid.

As shown in Table 5, Michigan's average monthly electricity use by sector compares favorably with other MISO member states. In Michigan, residential consumers use less electricity per month than those of any other state, while industrial consumers fall below the median consumption, and commercial consumers rank near the middle (sixth highest out of thirteen states).

"In Michigan, residential consumers use less electricity per month than those of any other state"

13. Clean, Renewable and Efficient Energy Act, PA 295 of 2008

TABLE 2. Sources of Michigan's Electrical Energy Supply, 2009

Source	Total: Amount (GWh)[a]	Total: % of Total Use	*Sources by Entity Type: % from Electric Utilities*	*Sources by Entity Type: % from Independent Power Producers and Combined Heat and Power*
Coal	66,848	62%	*99%*	*1%*
Petroleum	399	0%	*54%*	*46%*
Natural Gas	8,420	8%	*7%*	*93%*
Other Gases[b]	203	0%	*0%*	*100%*
Nuclear	21,851	20%	*72%*	*28%*
Hydroelectric	1,372	1%	*90%*	*10%*
Other Renewables[c]	2,623	2%	*0%*	*100%*
Pumped Storage	-857	-1%	*100%*	*0%*
Other[d]	344	0%	*9%*	*91%*
Subtotal: Total Michigan Electricity Supply	**101,203**	**94%**	82%	18%
Net International Imports	5,637	5%		
Net Interstate Imports	1,357	1%		
Total[e]	**108,197**	**100%**	***77%***	***17%***

Source: U.S. Energy Information Administration; National Energy Board of Canada.

a. GWh statistics do not sum exactly due to rounding.

b. The "Other Gases" category includes blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

c. The "Other Renewables" category includes biogenic municipal solid waste, wood, black liquor, other wood waste, landfill gas, sludge waste, agriculture by-products, other biomass, geothermal, solar thermal, photovoltaic energy, and wind.

d. Other includes non-biogenic municipal solid waste, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, tire-derived fuels and miscellaneous technologies.

e. This number differs from totals listed in US EIA sources due to inclusion of *net international imports* rather than gross imports, as well as inclusion of net interstate trade (imports) in electricity supply, above, rather than consumption, below.

TABLE 3. Electricity Provided by Michigan's Top Five Electricity Retailers, 2009 (MWh)

Entity	Type of Provider	All Sectors	*Residential*	*Commercial*	*Industrial*
Detroit Edison Co	Investor-Owned	42,747,883	*14,625,206*	*18,190,402*	*9,932,275*
Consumers Energy Co	Investor-Owned	33,114,933	*12,385,603*	*11,438,963*	*9,290,367*
Indiana Michigan Power Co	Investor-Owned	2,818,810	*1,218,332*	*815,956*	*784,522*
Wisconsin Electric Power Co	Investor-Owned	2,243,877	*167,887*	*150,279*	*1,925,711*
City of Lansing	Public	2,162,938	*572,786*	*1,222,251*	*367,901*
Total Sales, Top Five Providers		83,088,441	*28,969,814*	*31,817,851*	*22,300,776*
Total Sales in Michigan		98,121,000	*32,854,000*	*37,870,000*	*27,391,000*
Proportion of Total Sales by Top Five		85%	*88%*	*84%*	*81%*

Source: U.S. Energy Information Administration

TABLE 4. Michigan Electricity Consumption by Sector, 2009

User	Amount (GWh)[a]	% of Total Use
Residential	32,854	30%
Commercial	37,870	35%
Industrial	27,391	25%
Transportation	5	0%
Subtotal: Retail Sales	**98,121**	**91%**
Direct Use	1,792	2%
Estimated Losses	8,284	8%
Total Use	**108,197**	**100%**

Source: U.S. Energy Information Administration; National Energy Board of Canada

a. GWh statistics do not sum exactly due to rounding.

TABLE 5. Electricity Consumers and Average Monthly Consumption (kWh) by Sector by MISO State, 2009

	Residential		Commercial		Industrial	
State	**Consumers**	**Consumption**	**Consumers**	**Consumption**	**Consumers**	**Consumption**
Illinois	5,098,579	765	586,611	7,354	6,016	630,308
Indiana	2,733,128	1,036	341,154	6,002	18,099	222,900
Iowa	1,325,990	884	211,241	4,804	6,187	259,106
Kentucky	1,928,082	1,191	296,069	5,536	6,304	610,694
Michigan	4,290,313	666	518,776	6,261	12,776	212,015
Minnesota	2,279,850	817	270,442	6,965	9,097	218,116
Missouri	2,686,746	1,098	371,220	6,985	9,431	157,726
North Dakota	318,760	1,113	56,510	6,577	2,143	143,759
Ohio	4,891,891	910	612,492	6,437	21,201	230,416
South Dakota	363,517	1,010	65,007	5,436	2,984	65,016
Wisconsin	2,579,776	710	333,653	5,863	4,683	439,040
United States	**124,937,469**	**920**	**17,562,726**	**6,339**	**774,713**	**108,567**

Source: U.S. Energy Information Administration.

Analysis: Anderson Economic Group LLC

III.Regional Management of the Grid

The electrical grid in the United States does not have an exclusive governing authority. Each utility company, power generator, and transmission owner operates, builds, and maintains theirportion of the grid. These independent operators are overseen and regulated by authorities and organizations that work collectively to develop and enforce policies and standard practices, and to regulate costs. In the U.S., each state typically has an agency tasked with regulating the public and private groups that own and operate the grid. At the federal level, the U.S. Department of Energy and the Federal Energy Regulatory Commission (FERC) regulate and oversee interstate electricity transmission. This includes providing guidelines for maintaining and building a more robust, reliable grid across the country.[14]

STAKEHOLDER-LED MANAGEMENT

With the encouragement of FERC, many of the grid's owners and operators have formed Regional Transmission Organizations (RTOs).[15] RTOs are voluntary groups of private companies and other stakeholders that coordinate the planning, operation, and improvement of the electric grid. They monitor transmission systems, communicate between all of the participants, and direct the flow of power to meet demand by efficiently using available resources. They also take a central role in planning improvements to the grid so that assets can be strategically and efficiently located to best serve the entire region.

MISO

Nearly all transmission infrastructure in Michigan is owned and operated by companies belonging to the Midwest Independent Transmission System Operator (MISO).[16] MISO became the first RTO in the United States in 2001, and today has approximately 165 members. A summary of the current membership structure is shown in Table 6 on page 18.

MISO's governance structure requires a balance of power between generators, transmission system operators, and other stakeholders to reflect the diversity of parties affected by transmission infrastructure investments. The board of directors is elected by membership, and is typically comprised of individuals with backgrounds in public utility commissions, private power generation, energy trading and risk management, and other corporate sectors.[17]

14. Federal Power Act of 1935 created the Federal Power Commission. The Department of Energy Organization Act of 1977 renamed the commission as the Federal Energy Regulatory Commission, and established it as an independent agency of the U.S. Government.
15. "Regional Transmission Organizations." Code of Federal Regulations Title 18, Pt. 35.34, 1999.
16. A small section of southwest lower Michigan is covered by the PJM RTO.

The composition of MISO's board of directors and officers includes a relatively high proportion of former executives at power generation companies. Two of the seven current directors, and seven of the ten current officers, joined MISO following senior management positions at generation companies.[18]

TABLE 6. MISO Member Classifications

Type	Number	Votes on Board of Director Membership?[a]
Transmission owners	36	Yes
Coordination member	1	Yes
Power marketers and brokers	49	Yes
Independent Power Producers (IPPs) and Electric Wholesale Generators (EWGs)	27	Yes
Municipal, Cooperative, and Transmission and Distribution Utility (TDU)	17	Yes
End-user customers	4	Yes
Environmental and other stakeholder groups	5	No
State regulatory authorities	15	No
Public consumer groups	11	No

Source: Midwest ISO, "Members by Sector" April 2011, Available online: https://www.midwestiso.org/Library/Repository/Communication%20Material/Corporate/Current%20Members%20by%20Sector.pdf, (accessed May 2011).

a. MISO's governance structure is set up such that only "member sectors" vote for board of directors nominees.

PLANNING GRID IMPROVEMENTS

Historically, the grid has been planned, built, and used at the local and state level. This has left little question about who covers the costs of expansion and improvement. Unfortunately, this has also created a fragmented infrastructure with varying levels of technology, compatibilities, and effectiveness. It has further contributed to a localization of resources that can be more efficiently and effectively used on a larger, regional scale. The weaknesses associated with this local approach to managing regional assets are well known, and the impetus for

17. MISO's Principles of Corporate Governance require the following composition of prior experience among its board of directors: "Of the seven Directors, four shall have expertise and experience in corporate leadership at the senior management or board of directors level, or in the professional disciplines of finance, accounting, engineering, or utility laws and regulation. Of the other three Directors, one shall have expertise and experience in the operation of electric transmission systems, one shall have expertise and experience in the planning of electric transmission systems, and one shall have expertise and experience in commercial markets and trading, and associated risk management." Source: MISO website.
18. Source: Biographical information on directors from MISO website, accessed in May 2011.

efforts to regionalize government services, economic development planning, and other programs that grow in value as collaboration and scope increases.

RTOs and Regional Grid Planning

Among the most valuable roles filled by MISO and other RTOs is the provision of independent regional planning for the grid. Planning at the regional level provides real opportunity to design projects that meet multiple needs, serve multiple markets, and efficiently locate new infrastructure based on the most beneficial location.

"Regional planning for large infrastructure projects is not without precedent...Hindsight leaves little question as to the wide-reaching benefits of a regionally planned highway network"

Regional planning for large infrastructure projects is not without precedent. The same practice was applied in developing the interstate highway system. Had our network of expressways been planned, built, and funded only by local and state agencies, we would very likely have a highly fragmented and disjoined highway system. Michigan, especially, would likely have lost under that scenario, as few other states would have viewed the building of interstate I-75 into Northern Michigan as beneficial to their citizens. Hindsight leaves little question as to the wide-reaching benefits of a regionally planned highway network, without which our abilities to conduct interstate commerce would be severely hindered.

MISO's Transmission Planning. MISO's planning processes culminate in annually released Midwest ISO Transmission Expansion Plans (MTEPs). These reports are the road-maps for expanding and improving the transmission grid across the Midwest. The most recently released MTEP (MTEP10), calls for significant regional investment in direct response to FERC encouraged regional planning and cost allocation. Specifically, FERC's Order No. 890 requires transmission providers to undertake planning efforts that are consistent with FERC's planning principals (coordination, openness, transparency, information exchange, comparability, dispute resolution, regional coordination, economic planning studies, and cost allocation).[19] MTEP10 does so, in part, by including a new classification of projects, MVPs, for which costs will be allocated across the region based on electricity use, with each user paying an equal portion towards the regional investments.

Identifying MVPs. For a project to be considered an MVP and become eligible for cost sharing, it must meet one or more specific criteria, including:

19. Order 890, "Final Rule: Preventing Undue Discrimination and Preference in Transmission Services", 18 CFR Parts 35 and 37 (2007).

1. Be developed as part of the regional planning process, and enable the system to better deliver energy from sources in compliance with state or federal requirements governing the amount of energy that must come from specific generator types (i.e., coal, nuclear, wind, renewable, etc.).
2. Provide multiple types of economic value across MISO pricing zones as the result of reduced production costs stemming from transmission congestion relief.
3. Address one or more transmission issues associated with upgrading to meet national or regional standards, and improve system reliability across multiple MISO pricing zones.

MVPs can be built anywhere in the MISO area. However, each project must first be approved by the MISO Board of Directors. At the current time there is only one MVP—The Michigan Thumb Project—that has full approval. The other starter projects are in various stages of review, but far enough along in the planning process that cost estimates are available. There may be additional MVPs proposed in MISO's future transmission plans, but at this time it is speculative to assume cost and location information about any MVPs beyond those in the candidate MVP portfolio.[20]

ALLOCATING THE COSTS OF NEW TRANSMISSION PROJECTS

Large infrastructure projects, like transmission expansions on the grid, are costly and unlikely to be built without clear and predictable terms for allocating costs. Because cost allocation disputes constitute one of the most significant barriers to transmission infrastructure investment, FERC encourages all RTOs to develop cost allocation methodologies in tandem with regional transmission investment planning.[21]

A number of cost allocation methodologies have been developed and used to align who benefits with who pays. Among the most commonly used methods are:

1. Formulaic-based Beneficiary Pays—Formula(s) used to allocate the costs of a project to each transmission owner that benefits from the project, regardless of who owns the project.
2. "Postage Stamp"—Uniform recovery of costs from all beneficiaries in a market area using a per unit charge.
3. "License Plate"—Utility directly recovers costs of their own transmission projects, usually built within their service area.

20. Some have asserted that there will be between $16 billion and $20 billion in total MVP projects. We have not attempted to verify the accuracy of this estimate as concrete information about project scopes, locations, and costs are not available beyond what is contained in MTEP10 and MISO MVP project update presentations.

21. FERC Docket No. RM10-23-000.

4. Direct Assignment—Costs are fully or partially assigned directly to the entity that requests a project.

License plate and direct assignment allocations are straight forward and easily applied with local projects meeting local needs. Postage stamp and formulaic models are better suited for use with larger projects that span utility, local, or state boundaries, but require negotiation and planning among multiple parties. They also require careful thought about benefits so that costs can be distributed in a manner that is at least roughly commensurate with estimated benefits.

Recourse for Improper Allocations

Regardless of the method used for cost allocation, those subject to FERC regulated rates have recourse if they feel they have been charged a rate that is unjust or unreasonable. A motion or complaint before FERC initiates a review hearing to determine whether existing rates or proposed rate changes are in violation of the law, unjust, or unreasonable. Specifically, sections 205 and 206 of the Federal Power Act require FERC approval of all changes to rates and changes. The law also allows FERC to change existing rates and charges—including forcing retroactive repayment of overcharges—to ensure that they are "just and reasonable" in the interstate sale of electricity.[22] Thus, even in the unlikely event that MVP tariffs are set inappropriately, or applied to projects that are later found to not have regional benefits, there is a framework for addressing any unreasonable allocations should they occur.

22. 16 USC § 824d(a) as cited by Seitzeinger et al., *Authority of the Federal Energy Regulatory Commission to Fix Electricity Rates and Charges and to Require Refund Payments by a Public Utility,* Congressional Research Service, Order Code RS20774, January 9, 2001.

IV.Adopted Multi-Value Project Cost Allocation

MISO's transmission plans navigate the challenges associated with developing more regionally beneficial projects and having a fair and transparent cost allocation method in place by 1) establishing a classification of projects know as Multi Value Projects, and 2) proposing a postage-stamp cost allocation for MVP projects to evenly spread costs across all MISO grid users. The candidate MVP portfolio includes 18 specific MVP "starter" projects, one of has received full approval from MISO's board of directors.

POSTAGE-STAMP-TO-LOAD ALLOCATION FOR MVPS

As noted earlier, MISO has adopted and FERC has approved the use of a postage-stamp-to-load cost allocation methodology for qualified MVP projects. Postage-stamp-to-load implies that the project costs will be spread evenly over the entire MISO user base (load), with the amount paid dependent on the amount of electricity used. Not coincidently, this is similar to how the postal service is funded, with customers buying postage stamps to cover the costs for using the system, and each customer's share of the bill being tied directly to their overall use of the system.

The postage stamp cost allocation method provides a clear and straight forward distribution of costs across the entire MISO footprint. It does not provide a defined set of formulas to exactly quantify costs and benefits, as a formulaic type of beneficiary pays model would. This, however, is both by design and out of necessity. The benefits of MVP projects are wide-ranging in scope and geography, the assets have useful lives of 50 to 70 years, there are ever changing flows of electricity across the grid, and fuel costs are prone to significant changes at unknown intervals. All of this makes calculating the exact value of benefit received by users excessively difficult and prohibitive. It also makes agreement on a formula-based model very unlikely, as the parties involved lack proper incentives to fully value benefits that cannot precisely be quantified and allocated. The same lack of incentive would also apply in valuing benefits that would not be fully realized well into a project's lifecycle. The postage stamp method, on the other hand, provides a more appropriate and workable allocation method for projects, like MVPs, that create broad benefits over a very long time span.

ALLOCATING MVP COSTS TO LOAD

The portfolio of MVP starter projects being considered, as listed in "MVP Starter Projects" on page A-1, has a total estimated cost of $4.68 billion. This expense will be recovered by allocating a proportionate amount of annual revenue requirement to each transmission owner (TO) in MISO. This annual revenue requirement will be determined based on each TO's share of the total MWh usage across MISO. The costs will, like most large financing projects, be spread over a period of years. MISO has estimated an average annual revenue requirement of $675 million for the starter projects.[23]

MVP project costs are thus paid uniformly across the region, with users paying on a basis that is determined by use of the grid. A 700 kWh user in Minnesota will pay the same amount as a 700 kWh user anywhere else in MISO. This, along with the broadly distributed benefits stemming from MVPs, makes the postage stamp allocation fair and efficient. For an assessment of Michigan's share of total MISO electricity demand, as well as Michigan's share of other indicators, see Table 7 below.

TABLE 7. Michigan's Share of MISO Region in the United States

	State of Michigan	Portion of Michigan in MISO	MISO's U.S. Market Area	Michigan as a Share of MISO
Population (2010)[a]	9,883,640	9,724,269	44,896,542	21.7%
GDP (2009, $billions)[b]	$361.1	$348.3	$1,845.4	18.9%
Total Electricity Sales (2005, Megawatt-hours)[c]	110,444,563	106,519,655	583,500,842	18.3%
Non-Residential Electricity Sales (2005, Megawatt-hours)	74,349,609	71,707,420	389,041,883	18.4%
Memo: Land Area (sq. miles)[d]	*96,716*	*56,061*	*440,286*	*12.7%*

Source: See table footnotes
Analysis: Anderson Economic Group LLC

a. AEG analysis of data from U.S. Census Bureau. Based on AEG analysis of MISO region using data from ESRI, Inc. and January 2011 MISO territory borders for U.S. (excludes Manitoba, Canada).
b. AEG analysis of data from U.S. Bureau of Economic Analysis. Each state's proportion of GDP included in MISO region estimated based on proportion of population served by MISO (see note a).
c. AEG analysis of data from U.S. Energy Information Administration (EIA). Each state's proportion of electricity sales included in MISO region based on proportion of population served by MISO (see note a). This analysis uses 2005 as a comparison year as representative of a recent year with a "normal" economy, i.e. not at the trough of an economic downturn or the early years of a recovery.
d. AEG analysis of data from U.S. Census Bureau and ESRI, Inc.

MVP COSTS TO CUSTOMERS

The cost of MVPs to customers in Michigan will represent only a small change in the total price of electricity under the approved postage-stamp-to-load cost allocation methodology. Based on MVP cost estimates and electricity usage data from the EIA, we estimate that the portfolio of starter projects will cost only $0.00116 per kilowatt hour to customers in Michigan and across MISO. At just one-tenth of a cent, this is only 1.1% of the total cost residential users pay per kWh in Michigan, or about $0.77 per month for an average residential user.

23. Based on $4.6 billion total cost and a 15% weighted average fixed charge rate over 40 years. Testimony of Jennifer Curran, FERC Docket No. ER10-1791-000, July 15, 2010.

To reach our estimated $0.00116/kWh cost we relied on MISO's $675 million annual revenue requirement for starter MVP projects.[24] We then analyzed population data and EIA data on electricity sales by state in each of the 13 U.S. states that MISO is in. EIA data from 2005 shows that the total electricity sales in those 13 states was 1,053,962,280 MWhs.[25] We then used our Geographic Information System and population data from ESRI, Inc to identify that share of population living within MISO territories. This showed that 55 percent of the combined 13-state population lives in MISO-covered areas. For Michigan specifically, we found 96.4% of the state lives in a MISO territory, with the remaining 3.6% located in the southwest corner of the state covered by PJM.

With population being a good indicator of the level of electricity demanded in an area, we took 55% of the total 1.05 billion megawatt hours across states with any level of MISO coverage to be a reasonable estimate of electricity used by the portions of the states that are directly covered by MISO. This allows us to estimate that the average annual electricity demand within the MISO territory is 583,500,842,000 kWhs (converted from MWhs). To get the product of $0.00116 we divided $675,000,000 in cost by the load base of 583,500,842,000 kWhs.

24. Ms. Jennifer Curran stated $675,000,000 as the estimated annual revenue requirement for the starter MVP portfolio in her testimony on July 15, 2010 that was included in the MISO filing sent to FERC.

25. We used 2005 electricity sales data as it provides an “average” measure of load and does not reflect tempered demand levels that occurred in the peak recessionary periods later in the decade.

V.Benefits to Michigan from MVPs

MISO's portfolio of candidate MVPs has been planned with broad stakeholder input and to meet regional planning and benefit objectives. MISO has, in its MVP Cost Allocation proposal to FERC and in subsequent presentations, quantified some of these benefits at the regional level. It also noted that "given the integrated nature of the Midwest ISO transmission system, the regional benefits that accrue from MVP Network Upgrades impact all users of the Midwest ISO transmission system in some way."[26] Here we assess the ways in which these impact Michigan.

SHARING COSTS OF MVPS IN MICHIGAN

Michigan will be home to the first MVP project in MISO's portfolio. The already approved "Thumb Loop" expansion has an estimated cost of $510 million. It will improve reliability and provide transmission from wind-power generators in the thumb region of Michigan to the rest of the grid. This will help utilities in Michigan, as well as elsewhere, access the renewable supplies that will be needed for reaching state renewable portfolio standards.

Construction of the Thumb Loop project has been fully approved by MISO and the Michigan Public Service Commission. Under the MVP postage-stamp cost allocation plan, it will be paid for by all who use the MISO grid. Should a significant modification to the cost allocation proposal be required, it is possible that the costs will be placed solely on the shoulders of Michigan electric customers even though benefits from the project will flow beyond Michigan's borders.

It is also important to note that the Thumb Loop MVP project, while currently the only one with full approval, may not be the only MVP project built in Michigan. There is certainly regional value to connecting the grid to wind and other renewable reserves throughout Michigan, and to easing congestion in the Upper Peninsula. Without an MVP cost allocation methodology, Michigan ratepayers face the increased likelihood of either facing the costs incurred as a result of not making grid investments throughout Michigan, or not gain from the ability to spread the costs of future regionally-beneficial projects across the entire MISO footprint.

REDUCING ELECTRICITY COSTS

The MVP starter portfolio that was introduced and analyzed by MISO during the cost allocation development and adoption process has been shown to yield significant benefits. These benefits can be measured in terms of:

1. Production Cost Reduction—MISO, in an April 2011 presentation, released findings showing the expected benefits from the starter MVP projects attribut-

26. FERC Docket No. ER10-1791-000, July 15, 2010 MISO Submission, p. 18.

able solely to production cost reductions will range from $996 million to $2.04 billion in aggregate annual cost savings by 2021. MISO's east subregion alone, which consists primarily of just Michigan's Lower Peninsula, is expected to receive between $400 million and $950 million of these benefits. [27]

2. Transmission Loss Reduction—The new transmission investments will also reduce congestion across the grid, allowing more efficient transfers of electricity with less power lost during the process. This is preliminarily estimated to generate $68 million to $104 million in annual savings once the starter projects are all in service.[28]
3. Lowered Reserve Margin—The introduction of a broader network of wind generators will mean a better ability to rely on wind-generated power at all times. This translates to less demand for new plants to maintain an adequate reserve margin, which will save between $217 million and $271 million annually.[29]

The above estimates, when summed, come to a quantifiable annual benefit total ranging from $1.28 billion to $2.42 billion. This averages to $1.85 billion per year. Further, these benefit totals are expected to increase as MISO completes its more detailed analyses of transmission loss reduction benefits and lowered reserve margin benefits to incorporate improvements in project plans that have evolved due to continued work since FERC's December 2010 approval of the MVP cost allocation methodology.

BETTER ACCESS TO LOWER-COST MARKETS

More Supply Reduces Price Pressure

The MVP transmission projects are designed to better connect markets with new electricity generators across, and allow electricity to be more efficiently transmitted throughout the region.

This includes accessing electricity that can be generated by wind farms in western parts of the region where there are steady supplies of wind (see "Average Available Wind Power for U.S. States" on page A-5), as well as lower cost electricity made by traditional generators. MVP projects will facilitate cost effective generation from wind, create new supplies of electricity, and in turn reduce pressures on electricity prices.

"Expanding the grid allows greater access to low-cost energy supplies. Michigan, with high electricity prices and an economy built on large industrial users of electricity, stands to greatly benefit from this."

27. MISO Technical Studies Task Force April Meeting, "2011 Candidate MVP Portfolio," April 25, 2011, Slides 58-59.

28. *Order Conditionally Accepting Tariff Revisions,* 133 FERC ¶ 61,221, at p.34 (2010).

29. Ibid.

The western states in MISO do not just offer valuable wind-energy supplies. They also have some of the lowest prices in the current market, with costs that are 20 to 30 percent lower than Michigan prices. See “Michigan Costs Relative to Others” on page 12. Expanding the grid allows greater access to low-cost energy supplies. Michigan, with high electricity prices and an economy built on large industrial users of electricity, stands to greatly benefit from this.

IMPROVING CONNECTIONS TO POTENTIAL BUYERS OF MICHIGAN-MADE POWER

Companies generating power in Michigan, be it from wind, biomass, coal, or nuclear fuels, can benefit from a grid that better connects them to local distributors across the state and region. As shown in “Map of Electric Power Transmission in Michigan Area” on page A-4, southern Michigan is connected to other electricity demand centers in Ohio, Indiana, Illinois, and Canada. As MVP projects are introduced, Michigan’s power producers will see even stronger connections to these markets, as well as others in Wisconsin and further west. This will be especially valuable at times of peak wind generating capacity, as any electricity produced in excess of demand at those times could be exported to other demand centers. Without a stronger grid, this production would likely be curtailed so as not to flood local markets with excess supply.

STRENGTHENING THE ECONOMIC POSITION OF REGION AND STATE

Michigan Benefits from Regional Strength

The saying “a rising tide lifts all boats” well describes how transmission infrastructure projects across the Midwest will bring economic benefits to Michigan. This is attributable to the production and export oriented activities that are central to Michigan’s economy. Our manufacturers rely on a complex, just-in-time supply chain that spans the entire region, and in many cases the globe, and any disruption to this supply chain is likely to disrupt the Michigan economy in some way.

Consider the recent disruptions to the global supply chain. Events ranging from the earthquake and tsunami in Japan to a fire at an auto supply factory in Howell, Michigan, have had impacts across the Midwest. The plant fire alone, which impacted a single facility that made vehicle-interior parts, resulted in production delays at Mazda and General Motors plants across Michigan, Ohio, and Indiana.[30] Similarly, any delays or shutdowns due to electrical outages in the Midwest can translate into delays and lost productivity to Michigan businesses. Investments in regional coordination and strengthening of the grid is necessary to mitigate such loses.

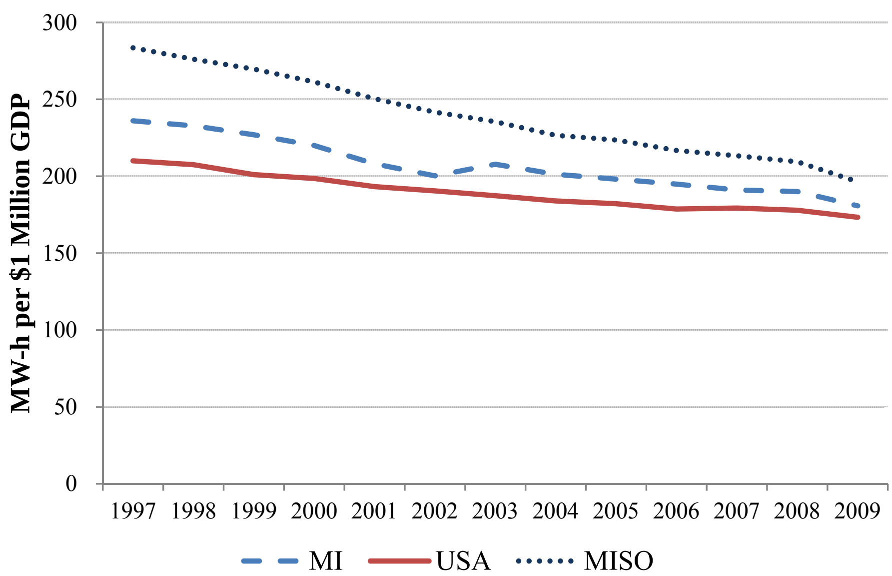
30. “Effects of Magna Fire Ripple Through Auto Supply Chain”, *The Detroit News*, March 3, 2011.

Michigan's Productivity

One measure of the importance of a well-functioning electricity grid to a state's economy is the relative energy intensity of its businesses. Using state-level Gross Domestic Product (GDP) and electricity sales data, we estimated non-residential electricity sales per unit of GDP. In other words, we looked at how much electricity is used by businesses to generate economic value, as measured by GDP.

As shown in Figure 2 below, both the MISO region as a whole and the State of Michigan alone have economies that are more electricity-intensive than the nation as a whole when it comes to producing economic value. This is not surprising considering the production and manufacturing business base that the region's economy is built on, as well as the heating and cooling requirements of most businesses in the region during cold winter and hot summer months.

FIGURE 2. Non-Residential Electricity Sales Per Unit of GDP from 1997 to 2009



Source: Energy Information Administration; Bureau of Economic Analysis; ESRI, Inc.
Analysis: Anderson Economic Group, LLC

This comparison highlights three important factors about the electricity grid and the economies of Michigan and the entire MISO region:

1. Electricity is more important to the productive capacity of both Michigan and the MISO region overall compared to the nation as a whole.
2. Michigan uses less electricity to generate each unit of GDP relative to the MISO territory as a whole. The reasons could include the presence of more value-added manufacturing in Michigan and the use of more natural gas in place of electricity for heating and other such needs.
3. Because Michigan's businesses use *less* electricity per unit of GDP than the rest of MISO, a "postage stamp" cost allocation is advantageous for Michigan. Since the postage stamp amount will be the same per kWh of electricity for every customer across MISO, Michigan businesses will pay a relatively lower price for MVP projects than will businesses in MISO states where more kWh's of electricity are used to generate each unit of GDP.

INCREASING DEMAND FOR MICHIGAN'S MANUFACTURERS OF RENEWABLE ENERGY INFRASTRUCTURE

Many Michigan companies are part of national and global supply chains for renewable energy generation equipment of the type set to be connected to the regional grid with the proposed MVP projects. As such, Michigan's economy stands to benefit from investment in the regional transmission infrastructure needed to develop green energy.

A Brookings Institute study of the Great Lakes region found that the region's cities "...have an outsized ability to lead on wind and solar renewable component manufacturing."[31] This is not merely a story of ability or potential. Nearly 200 Michigan companies currently employ more than 10,000 workers making components for wind turbine and solar cells. For example, Hemlock Semiconductor has committed $2.5 billion in investment in the state over the past five years, creating 1,500 additional jobs.[32] Approximately 2,000 Michigan companies operate in industrial sectors that supply renewable energy generation components for worldwide use.[33] Further, the Michigan Economic Development Corporation and Department of Energy, Labor and Economic Growth have made a concerted effort to assist existing manufacturing companies transitioning to renewable energy supply chain sectors. The state has also recognized the value and importance of growing businesses that innovate

31. Vey, Jennifer and Austin, John et al., "The Next Economy: Economic Recovery and Transformation in the Great Lakes Region," Metropolitan Policy Program at Brookings, September 2010. p. 4.

32. Craig, Ashley, et al., "The Solar and Wind Energy Supply Chain in Michigan," Environmental Law Policy Center, 2011, http://elpc.org/wp-content/uploads/2011/03/ELPCMichigan SolarandWindReport2011.pdf, accessed May 19, 2011.

33. Sterzinger, George and Jerry Stevens. Component Manufacturing: Michigan's Future in the Renewable Energy Industry. Renewable Energy Policy Project, 2006. http://www.repp.org/ articles/static/1/binaries/Final_Michigan_Manufacturing_Report_Long.pdf., accessed May 19, 2011.

and advance in renewable energy sectors. Energetx Composites, a West Michigan company using advanced composite materials to build better windmill blades for use across North America, is one such business, and was recently awarded the first “Reinventing Michigan” award by Michigan Governor Rick Snyder.[34] Another is URV, which is expanding its Eaton Rapids facility to meet growing demand for wind turbine castings

Given that eleven of MISO's thirteen U.S. member states have adopted renewable portfolio standards, regional demand for renewable energy generation inputs will likely continue to rise in the near term, creating new opportunities for Michigan businesses in this sector.[35] The MVP portfolio represents a critical link in the development of renewable projects to meet state Renewable Portfolio Standards and stimulate demand for Michigan-built renewable energy components. Any delay due to uncertain cost allocations will also delay potential demand for manufacturers in Michigan.

HEDGING AGAINST FEDERAL RPS AND OTHER ENERGY STANDARDS

Policy makers at the federal level continue to discuss an energy policy that will move the country towards using more renewable energy sources. Whether this takes the form of a tax on carbon emissions, or a requirement that a certain percentage of all power generation come from a renewable source, Michigan will find itself better prepared to meet the requirement if it is part of a robust grid that has access to efficient and abundant resources from across the region. The planned MVPs will allow Michigan to import renewable energy from beyond its borders, which in turn will reduce the need for renewable projects that may harm other sectors of our economy.

ENVIRONMENTAL BENEFITS OF RENEWABLE INTEGRATION

The current planned MVP projects, including the approved Michigan Thumb project, are designed to connect population centers to regions of wind-power generation. Doing so brings clear, renewable energy to the grid, which will help meet growing demand, and reduce the need to introduce new coal, nuclear, or other nonrenewable generators both in Michigan and in the Midwest states that are “up wind” of Michigan. This can be particularly impactful to Michigan’s industrial economy should a carbon cap be put in place. Having the infrastructure in place to draw on electrical energy that has minimal carbon emissions will help manufacturers avoid potentially costly taxes on their production.

34. State of Michigan Executive Office Press Release, “Snyder presents first ‘Reinventing Michigan’ award to Energetx Composites,” May 22, 2011.

35. EERE Information Center, “States with Renewable Portfolio Standards,” United States Department of Energy, http://apps1.eere.energy.gov/states/maps/renewable_portfolio_states.cfm, accessed May 19, 2011.

VI.Risks of Modifying Approved Methodology

Modifying the structure of MISO's approved cost allocation methodology for MVPs, by segregating Michigan's Lower Peninsula or by abandoning the load-based charge, threatens to needlessly delay grid improvements and bring about other unintended consequences. Further, it is not just Michigan and the MISO region that may be impacted. The issue of cost allocation for regional projects has a federal audience as FERC and some members of congress are currently reviewing a Notice of Proposed Rule Making (NOPR) that FERC has issued to clarify its Order 890.[36] Legislation has also been introduced in the U.S. Senate to prohibit the use of postage-stamp-to-load cost allocations like that agreed to by MISO.[37] Thus, rulings pertaining to the MISO cost allocation methodology will likely have impacts on developing federal rules for modernizing the grid and evolving it as a regionally-managed asset with voluntary, industry-driven planning and oversight.

UPPER PENINSULA AND OTHER STATES PAY MORE

If a new, or modified, methodology is required that provides separate treatment for Michigan's Lower Peninsula in a way that reduces its share of MVP costs, it is likely that ratepayers in Michigan's Upper Peninsula and other states will see their MVP costs increase.

Under the currently approved cost allocation, all customers in the MISO territory pay the same amount for MVP investments in the region. Customers in Michigan's Upper Peninsula, however, could end up paying slightly more for MVPs if Lower Michigan is excluded from the cost sharing, which is what some are lobbying for. This would happen in the U.P. and other MISO areas as the direct result of the MVP costs being distributed amongst fewer users. This would also create imbalance in Michigan's electricity market, with the U.P. being put at a cost disadvantage relative to the Lower Peninsula.

NO GUARANTEES

Reopening the discussion on MVP cost allocations for the purpose of seeking a change to the fundamental structure of the allocation methodology will not guarantee a more desirable outcome for Michigan. All parties involved in the modification process will have the incentive to identify reasons for why they are deserving of a lower cost allocation, and reasons to discount the value of benefits they are assigned under any new formula-based methodology.

36. Federal Energy Regulatory Commission, "Transmission Planning and Cost Allocation By Transmission Owning and Operating Public Utilities," Notice of Proposed Rulemaking. Docket No. RM10-23-000, June 17, 2010.

37. A bill to amend the Federal Power Act to ensure that rates and charges for electric energy are assessed in proportion to measurable reliability or economic benefit, and for other purposes, S. 400. 112t Cong., 2011.

A possible cost allocation that might be considered if the load-based methodology is discouraged is one based on capacity, not use. Under this a region's share of costs would be set based on total generating capacity in the region. This would be favorable to areas where coal or nuclear plants are common, as they operate with minimal variances from peak capacity. Wind generation, on the other hand, has peak capacity that is often not met, as the wind does not always blow at the exact strength needed to maintain peak capacity. As a result, states will see their total capacity significantly increase as wind generators are brought online. If a cost allocation methodology is adopted that levies greater costs to regions as a result of increased capacities there will be a disincentive for investing in wind generators.

INVESTMENT DELAY

Developing a new methodology could take a year or longer. There are clear costs associated with a delay resulting from any need to redevelop a cost allocation methodology that all MISO members can agree to. The delay could stretch from months into years if FERC asks MISO to develop and submit a new proposal. With this delay on a decision there will also be delay in investments, as many of the MVPs are contingent on having a cost allocation plan in place.

As projects designed to improve reliability and reduce congestion are delayed or foregone, the risks of a blackout or other major disturbance grow. One such disturbance, the 2003 Northeast Blackout, left significant portions of Michigan, and about 50 million people total, in the dark for just two days. However, it resulted in some $6.4 billion in lost earnings across the economy. Michigan's share alone was close to $1 billion.[38] Investments in MVPs will help to mitigate the possibility of another costly interruption.

UNKNOWN ENERGY FUTURE

A required development of a new cost allocation methodology, along with related project delays, will ultimately hinder the ability of electricity users to access more competitive prices and diverse energy sources; the ability of renewable power generators to start their projects; and the ability of states to meet RPSs. All of this could prove costly given the unknown energy future that we face.

Delaying MVPs also increases risks to the region that might stem from the adoption of a carbon tax, a federal renewable portfolio standard, or from an unforeseen spike in nuclear, coal, or natural gas. By moving forward with projects that link the grid to areas of strong and steady winds, we diversify the fuel base that feeds our growing demand for electricity. This in turn reduces our exposure to spikes in prices in any one non-renewable fuel source. The projects

38. Anderson, Patrick and Geckil, Ilhan, "Northeast Blackout Likely to Reduce US Earnings by $6.4 Billion," Anderson Economic Group, LLC., August 2003.

will also better position Michigan to have access to additional renewable resources in the event of a federal RPS.

Appendix A. Additional Data and Exhibits

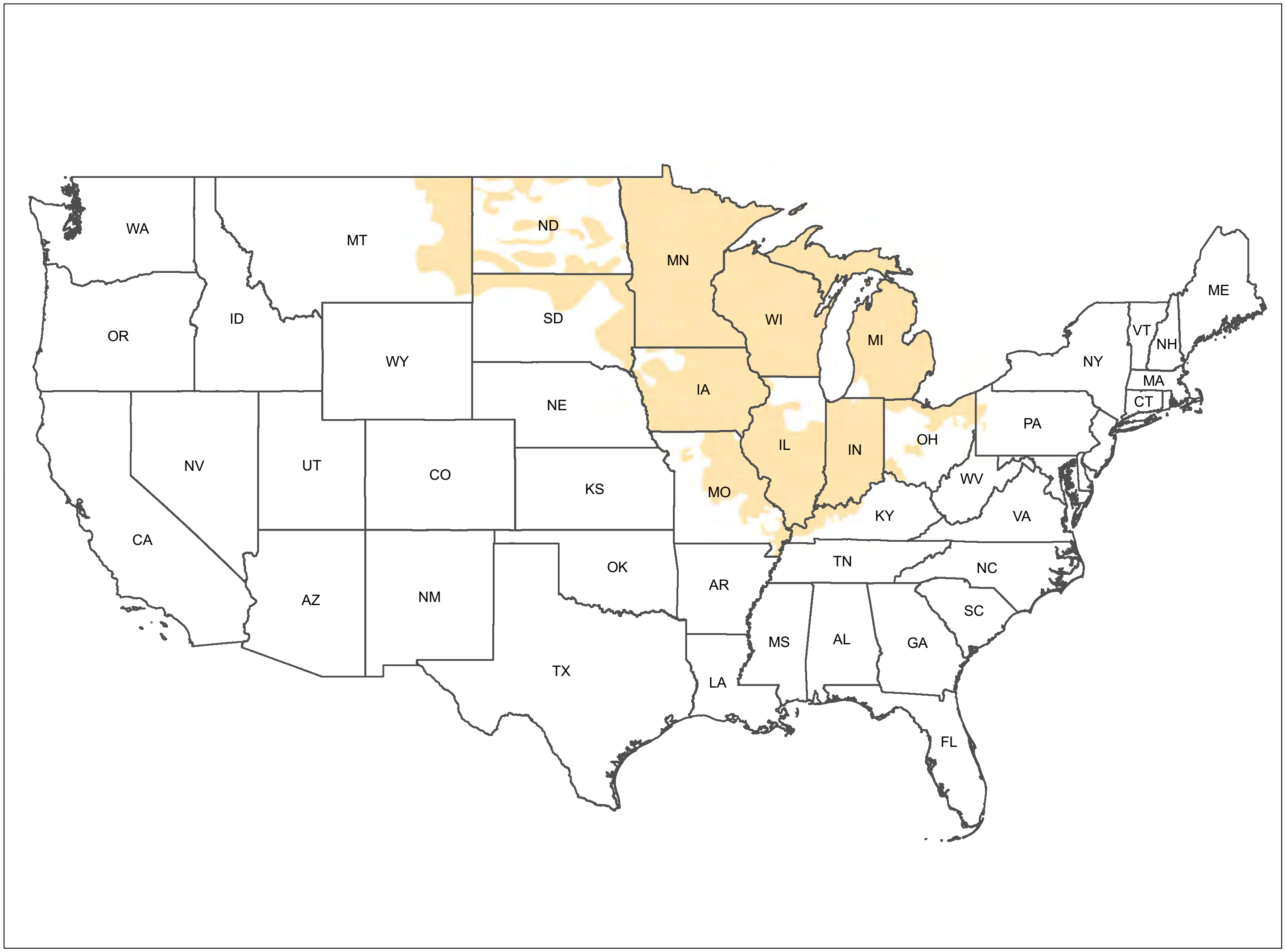
MVP STARTER PROJECTS

TABLE 8. 2011 Candidate Multi-Value Projects

Project Name	Project Summary	Estimated Cost ($)	Location
Big Stone to Brookings	Part of West sub region wind collection and outlet	150,000,000	MN
Brookings to Twin Cities	Part of West sub region wind collection and outlet	767,623,369	MN
Lakefield to Mitchell County	Part of West sub region wind collection and outlet	600,000,000	IA
Sheldon to Webster to Blackhawk to Hazelton	Part of West sub region wind collection and outlet	458,000,000	IA
N. LaCrosse to N. Madison to Cardinal & Dubuque to Spring Green to Cardinal	Part of West sub region wind collection and outlet	384,500,000	WI
Ellendale to Big Stone	Part of West sub region wind collection and outlet	275,000,000	SD
Thomas Hill to Adair to Ottumwa	Outlet path to Central and East sub region load centers	195,000,000	IA/MO
West Adair to Palmyra Tap	Outlet path to Central and East sub region load centers	100,000,000	MO
Palmyra to Quincy to Meredosia to Ipava & Meredosia to Pawnee	Outlet path to Central and East sub region load centers	345,000,000	IL
New Pawnee to Pana	Outlet path to Central and East sub region load centers	76,000,000	IL
Pana to Mt. Zion to Kansas to Sugar Creek	Outlet path to Central and East sub region load centers	250,000,000	IL
Reynolds to E. Winamac to Burr Oak to Hiple	Northern Indian wind outlet, relieves congestion	75,000,000	IN
Davis Besse to Beaver 2nd Circuit	North Ohio wind outlet	71,000,000	OH
Michigan Thumb Loop expansion	Michigan wind outlet (approved)	510,000,000	MI
Sullivan to Meadow Lake to Greentown	Northern Indian wind outlet, relieves congestion	171,875,000	IN
Pleasant Prairie to Zion Energy Center	Congestion relief project	25,000,000	WI/IL
Fargo to Oak Grove	Outlet path to Central and East sub region load centers, part of West sub region wind collection and outlet	146,000,000	IL
Sidney to Rising	Outlet path to Central and East sub region load centers	68,000,000	IL
Total		**4,676,998,369**	

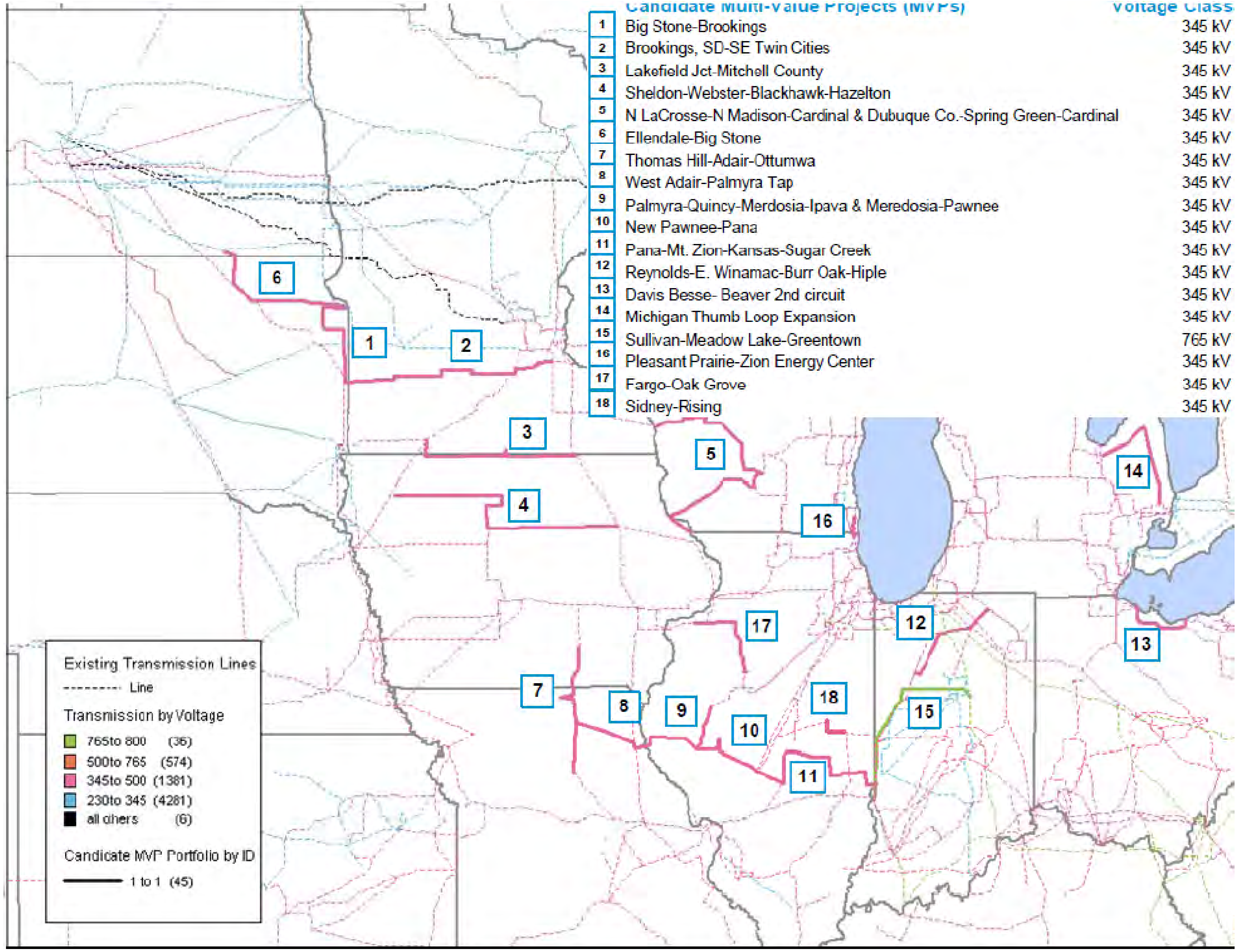
Source: Midwest ISO June 2011 Interim Report; cost estimates provided by ITC (March 2011)
Note: Estimated costs for starter project portfolio are subject to change as detailed plans are develop, project approvals granted, and technical details addressed.

MISO MARKET AREA MAP



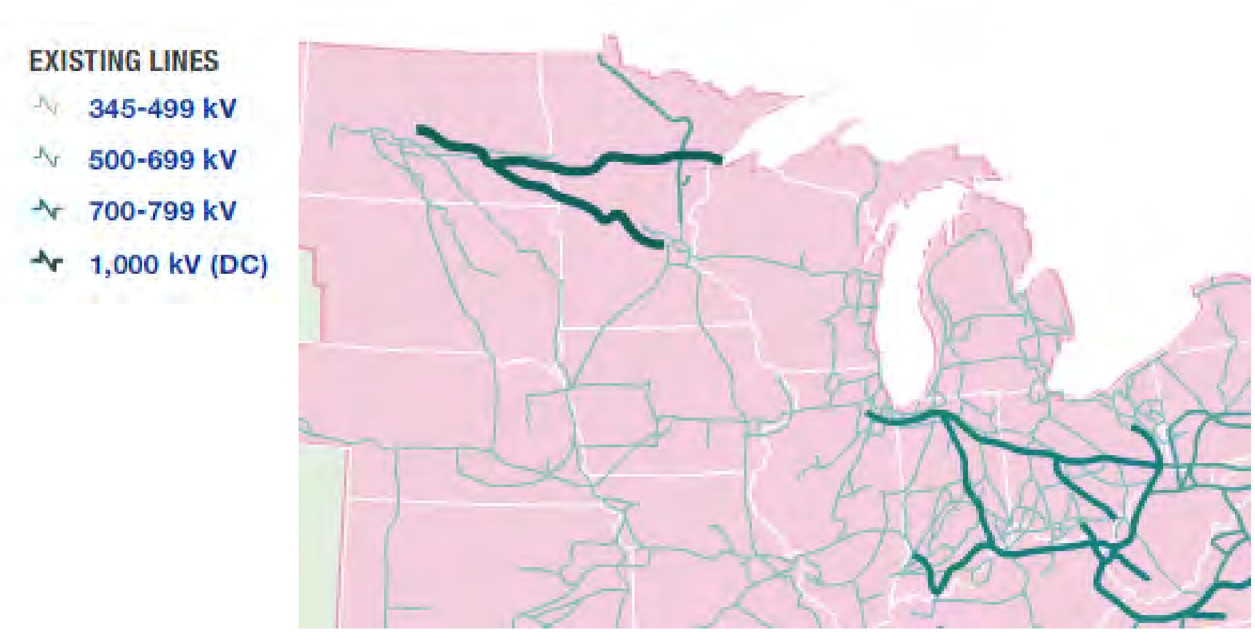
Source: ESRI, Inc.; MidwestISO.
Analysis: Anderson Economic Group, LLC 2011.

CANDIDATE MVP PORTFOLIO



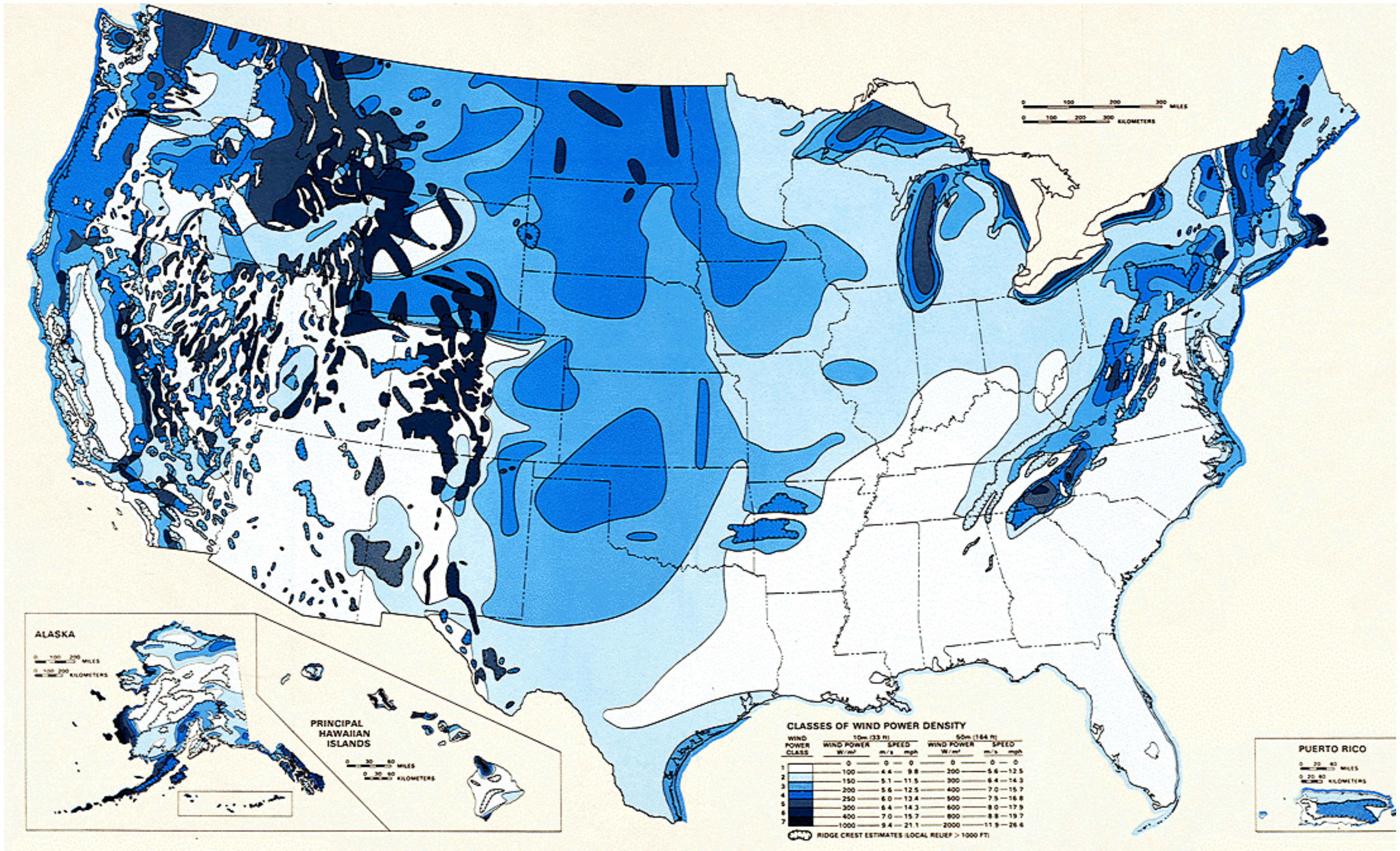
Source: Midwest ISO, "2011 Candidate MVP Portfolio Technical Studies Task Force," February 18, 2011, p. 41.

MAP OF ELECTRIC POWER TRANSMISSION IN MICHIGAN AREA



Source: NPR.org, Producer: Andrew Prince; Designer: Alyson Hurt; Editors: Avie Schneider and Vikki Valentine; Supervising Editors: Anne Gudenkauf and Quinn O'Toole; Additional Research: Jenny Gold; Database and GIS Analysis: Robert Benincasa. Map producers cite data from American Electric Power, American Wind Energy Association, Center for American Progress, Department of Energy, Edison Electric Institute, Energy Information Administration, Electric Power Research Institute, Federal Energy Regulatory Commission, National Renewable Energy Laboratory, U.S. Environmental Protection Agency, Western Resource Advocates.

AVERAGE AVAILABLE WIND POWER FOR U.S. STATES



Source: U.S. National Renewable Energy Laboratory, Renewable Resource Data Center. “United States Annual Average Wind Power.” http://rredc.nrel.gov/wind/pubs/atlas/map_descript.html. Accessed May 2011.

Appendix B: Glossary

GLOSSARY

American Electric Power. Among the largest generators of electricity in the U.S., with nearly 38,000 megawatts of generating capacity. American Electric owns the largest electricity transmission system in the U.S.; close to a 39,000-mile network with more 765 kilovolt extra-high voltage transmission lines than all other U.S. transmission systems combined. The transmission system serves about 10% of the demand in the Eastern Interconnection and 11% of the demand in ERCOT, the transmission system covering a large portion of Texas.

Beneficiary Pays. The industry term of art describing a cost allocation methodology that allocates costs of transmission investments to pricing zones that benefit from a project, even if the project is not owned by transmission owners in these pricing zones.

Congestion. Occurs when transmission capacity is not sufficient to allow for the safe delivery of electricity transfers simultaneously.

Consumers Energy Company. The principal subsidiary of the CMS Energy Corporation and the second largest electric and natural gas utility in Michigan, provides service to more than 6 million of the state's 10 million residents in the 68 counties of the Lower Peninsula. Consumers operates 12 coal-fired and two oil-fired generating plants, 13 hydroelectric plants, a pumped storage generating plant, and a number of combustion-turbine plants, producing electricity as needed during peak demand periods. The utility purchases power from several sources, including Palisades nuclear plant, the gas-fired Midland Cogeneration Venture, which is the first conversion of an idled nuclear plant in the nation.

Cost Allocation Regional Planning Group. A group whose purpose is to review and make recommendations regarding cost allocation methods.

Curtailment. A necessary reduction in service when all demand cannot be served safely.

Detroit Edison Company. The largest electric utility in Michigan and one of the largest in the nation. Detroit Edison generates, transmits, and distributes electricity to 2.1 million consumers in southeastern Michigan with a system capacity of 11,084 megawatts, that uses coal, nuclear fuel, natural gas, hydroelectric pumped storage, and renewable sources to generate electrical output. At 1.1 million kilowatts, the Fermi 2 nuclear power plant represents 30% of the state's total nuclear generation capacity; this plant alone is capable of producing enough electricity to serve a city of one million people.

Direct Assignment. An industry term of art for a cost allocation method under which transmission costs associated with generation interconnection or other transmission service requests are fully or partially assigned to the requesting party.

Eastern Interconnection. One of the major alternating power grids in North America, reaching from Central Canada eastward to the Atlantic coast (excluding Québec), south to Florida and west to the Rockies (excluding most of Texas). The Eastern Interconnection's electric utilities are tied together during normal system conditions and operate at a synchronized frequency operating at an average of 60Hz.

Electric Grid. The electric grid delivers electricity from points of generation to consumers, via the transmission system and the distribution system.

1. Power Generation: The process of creating electricity from other forms of energy, such as steam, nuclear, wind, solar, or hydro.
2. Power Transmission: The delivery of electricity from power plants to distribution substations. Transmission lines move power at high voltage from power plants to transformers. Transformers connect high-voltage lines to the low-voltage distribution lines.
3. Power Distribution: The delivery of electricity from distribution substations to consumers.

Energy Information Administration. Agency within the U.S. Department of Energy that collects, analyzes, and distributes independent and impartial information about energy to promote sound policymaking, efficient markets, and public understanding.

Federal Energy Regulatory Commission. Independent agency that allows for consumers to obtain reliable, efficient, and sustainable energy at reasonable costs. This includes regulating interstate transmission of electricity, natural gas, and oil, as well as reviewing proposals to build liquefied natural gas terminals and interstate natural gas pipelines.

Gigawatt. 1,000,000,000 watts. See Watt.

Independent [Transmission] System Operator. An independent, federally regulated organization that coordinates, controls, and monitors the use of the electrical power system. ISOs combine the transmission facilities of multiple transmission owners into a single transmission system, in order to move energy over long distances at a single price, rather than the combined charge of each utility between the buyer and seller. Performs the same functions as RTOs, but covers a smaller area.

ITC Transmission Co. A subsidiary of ITC Holdings Corp., the only fully independent electric transmission company in the U.S. With headquarters in Novi, Michigan, ITCTransmission owns, operates, and maintains approximately

2,800 circuit miles of transmission lines, 17,000 transmission towers and poles, and 155 stations and substations in southeast Michigan, serving 5.1 million consumers.

Kilovolt (kV). 1,000 volts. See Volt.

Kilowatt (kW). 1,000 watts. See Watt.

kWh. Kilowatt Hours is the amount of power consumed/generated over a period of one hour.

License Plate. Industry term describing a cost allocation methodology in which each utility recovers the costs of its own transmission investments.

Megawatt (MW). 1,000,000 watts. See Watt.

Megawatt Hours (MWh). Energy in watt hours is the multiplication of power in watts and time in hours. A megawatt hour is the amount of power used if 1,000,000 watts are used for 1 hour, or 1 watt is used for 1,000,000 hours. If 100 light bulbs each using 1,000 watts of power are turned on for 10 hours, they will use 100 x 1,000 x 10 watt hours = 1,000,000 watt hours = 1 megawatt hour.

Merchant Cost Recovery. Cost allocation methodology under which project sponsors recover the costs of the investment outside of regulated tariffs (e.g., through negotiated rates with specific customers). This is largely applicable to direct current lines where transmission use can be controlled.

Midwest ISO. An independent, nonprofit corporation that supports the reliable delivery of electricity in 13 Midwest states and the Canadian province Manitoba. MISO is responsible for ensuring reliable operations by the regions's interconnected high-voltage power lines that support the transmission of more than 100,000 MW of energy in the Midwest, by administering one of the largest energy markets in the world, and by forecasting ahead to identify improvements to the wholesale bulk electric infrastructure that will best meet increasing demand for power in an efficient and effective manner. The Midwest ISO became the nation's first approved RTO in 2001.

Michigan Electric Transmission Co. A subsidiary of ITC Holdings Corp., the nation’s only fully independent electric transmission company. Michigan Electric Transmission Company transmits high voltage electricity in the western and northern areas of Michigan’s Lower Peninsula. The company’s operating assets include 5,500 circuit miles of transmission lines, approximately 44,000 transmission towers and poles, and 81 stations, serving approximately 4.9 million consumers.

Michigan Public Power Agency. A non-profit, customer owned, joint action power supply agency providing economic benefits to its 16 municipal members. The agency is involved in the joint ownership of generating plants and transmission facilities, as well as the pooling of utility resources.

MISO Transmission Expansion Plan. Identifies solutions to meet transmission needs and to create opportunities through the implementation of a comprehensive planning approach. The primary purpose is to ensure the reliability of the transmission system; provide economic benefits; facilitate public policy objectives; and address other identified goals and opportunities.

MISO Transmission Owners. Includes 35 members that are investor-owned utilities, public power utilities, and cooperatives with more than $17 billion in transmission assets. Members include Ameren Services Company, as agent for Union Electric Company, Central Illinois Public Service Company, Central Illinois Light Co., and Illinois Power Company; AmericanTransmission Company LLC; Dairyland Power Cooperative; Duke Energy Corporation for Duke Energy Ohio, Inc., Duke Energy Indiana, Inc., and Duke Energy Kentucky, Inc.; Great River Energy; Minnesota Power (and its subsidiary Superior Water, L&P); Montana-Dakota Utilities Co.; Northern Indiana Public Service Company; Northern States Power Company (Minnesota); Northern States Power Company (Wisconsin); Northwestern Wisconsin Electric Company; Otter Tail Power Company; Southern Indiana Gas & Electric Company; and Southern Minnesota Municipal Power Agency.

Midwest Reliability Organization. A non-profit organization that ensures the reliability and security of the bulk power system in the north central region of North America, including parts the United States and Canada. The primary focus is to develop and ensure compliance with regional and international standards and perform assessments of the grid's ability to meet demand.

Multi Value Projects (MVP). Regional transmission expansion projects in MISO that must meet one or more of the following:

1. Developed through the transmission expansion process in order to enable reliable energy delivery in support of mandated public policy.
2. Provide multiple types of economic value across multiple pricing zones.
3. Address one or more transmission issues driven by a compliance requirement with a NERC or regional entity standard and provides economic value to multiple pricing zones.

In addition, the capital cost of the project must exceed the lesser of $20 million or 5% of the net transmission plant of the constructing transmission owner; and the development must include construction or improvement of at least one facility that operates above 100 kV.

North Electric Reliability Corporation. Certified by the Federal Energy Regulatory Commission to establish and enforce reliability standards for the bulk-power system, annually assess adequacy with a 10-year forecast and seasonal forecasts, monitor the bulk power system, and educate, train, and certify industry personnel.

Organization of MISO States. A non-profit, self-governing organization of representatives from each state with regulatory jurisdiction over entities participating in MISO, that coordinates regulatory oversight among the states, including recommendations to MISO, the MISO Board of Directors, the FERC, other relevant government entities, and state commissions as appropriate.

Postage Stamp. Cost allocation method under which transmission costs are recovered uniformly from all parties in a defined market area. Occasionally, the cost of certain project types are allocated uniformly to transmission owners, who then recover these allocated costs in their license plate tariffs.

PJM. The RTO that services parts or all of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and the District of Columbia.

Regional Transmission Organization. An independent, federally regulated organization that is responsible for the coordination of energy transmission over large interstate areas and ensures the safety and reliability of the electric system. RTOs perform the same functions as ISOs, but must meet regulations for transmission planning and expansion for an entire region.

Reliability. Electric system reliability depends on adequacy and security. Adequacy is the ability to meet the demand and energy requirements at all times, taking into account scheduled or unscheduled outages of facilities. Security is the ability to withstand sudden disturbances, including electric short circuits or unanticipated losses of system facilities. The degree of reliability is measured by the frequency, duration, and magnitude of adverse effects on the delivery of electricity to consumers.

Renewable Portfolio Standards. Requires electric utilities and providers to supply a specified amount of total energy from eligible renewable sources, such as wind, solar, biomass, and geothermal. The goal is to stimulate market and technology development so that renewable energy will be economically competitive with conventional forms of electric power.

Rights of Way. A grant that authorizes the rights, privileges, and use of a specific area of land for a certain project, such as roads, pipelines, transmission lines, and communication sites, for a specific amount of time.

Transmission Path. A transmission interface for which transmission constraints and reliability criteria are enforced during the process of scheduling and market-clearing.

Volt. A unit of potential equal to the potential difference between two points on a conductor carrying a current of 1 ampere when the power dissipated between the two points is 1 watt; equivalent to the potential difference across a resistance of 1 ohm when 1 ampere of current flows through it.

Watt. A unit of power equal to 1 joule per second; the power dissipated by a current of 1 ampere flowing across a resistance of 1 ohm.

Wheeling. The transfer of power between utility companies, often through transmission lines of a third party. Oftentimes occurs at state lines.

Wholesale Power Market. The purchase and sale of electricity between generators, traders, and retailers that deliver to end use customers. Electricity is frequently bought and resold numerous times before reaching consumers.

LIST OF ACRONYMS

AEP - American Electric Power

ATC - American Transmission Company, LLC

BRP - Baseline Reliability Project

CARP - Cost Allocation and Regional Planning

DOE - Department of Energy

EHV - Extra High Voltage

EIA - Energy Information Administration

ERAG - Eastern Interconnection Regional Reliability Organization

FERC - Federal Energy Regulatory Commission

GIP - Generator Interconnection Project

GW - Gigawatt = 1,000,000,000 watts

HVDC - High Voltage Direct Current

ISO - Independent System Operator

ITC - ITC Transmission Co. (ITC Holdings)

JEDI - Jobs and Economic Development Impact model

kW - Kilowatt = 1,000 watts

kWh - Kilowatt Hours

LMP - Locational Marginal Pricing

LSE - Load Serving Entities

MAIN - Mid-America Interconnected Network

MAPP - Mid-Continent Area Power Pool

MCC - Marginal Congestion Component

MISO - Midwest ISO

MLC - Marginal Loss Component

MPPA - Michigan Public Power Agency

MPRSG - Midwest Planning Reserve Sharing Group

MRO - Midwest Reliability Organization

MTEP - MISO Transmission Expansion Plan

MVP - Multi-Value Project

MW - Megawatt = 1,000,000 watts

MWh - Megawatt Hour

NOPR - Notice of Proposed Rulemaking

OATT - Open Access Transmission Tariff

OMS - Organization of Midwest ISO States

PRM - Planning Reserve Margin

RAR - Resource Adequacy Requirements

RECB - Regional Expansion and Criteria Benefits

RGOS - Regional Generation Outlet Study

RPS - Renewable Portfolio Standards

RTEP - Regional Transmission Expansion Plan

RTO - Regional Transmission Organization

SNU - Shared Network Upgrades

TO - Transmission Owner

Appendix C: About AEG

COMPANY PROFILE

Anderson Economic Group, LLC was founded in 1996 and today has offices in East Lansing, Michigan and Chicago, Illinois. AEG is a research and consulting firm that specializes in economics, public policy, financial valuation, and market research. AEG's past clients include:

- *Governments* such as the states of Michigan, North Carolina, and Wisconsin; the cities of Detroit, Cincinnati, Norfolk, and Fort Wayne; counties such as Oakland County, Michigan, and Collier County, Florida; and authorities such as the Detroit-Wayne County Port Authority.
- *Corporations* such as GM, Ford, Delphi, Honda, Taubman Centers, The Detroit Lions, PG&E Generating; SBC, Gambrinus, Labatt USA, and InBev USA; Spartan Stores, Nestle, automobile dealers and dealership groups representing Toyota, Honda, Chrysler, Mercedes-Benz, and other brands.
- *Nonprofit organizations* such as Michigan State University, Wayne State University, University of Michigan, Van Andel Institute, the Michigan Manufacturers Association, United Ways of Michigan, Service Employees International Union, Automation Alley, the Michigan Chamber of Commerce, and Detroit Renaissance.

Please visit www.AndersonEconomicGroup.com for more information.

REPORT AUTHORS

Patrick L. Anderson

Mr. Anderson founded Anderson Economic Group in 1996, and serves as a Principal and Chief Executive Officer in the company.

Mr. Anderson has taken a leading role in several major public policy initiatives in his home state; he was the author of the 1992 Term Limit Amendment to the Michigan Constitution, and also the author of the 2006 initiated law that repealed the state's 4-decade-old Single Business Tax. Before founding Anderson Economic Group, Mr. Anderson was the deputy budget director for the State of Michigan under Governor John Engler, and Chief of Staff for the Michigan Department of State.

Mr. Anderson has written over 100 published works, including the book *Business Economics and Finance* and the chapter on business valuation in the book *Litigation Economics*. He is also the executive editor of three editions of the *State Economic Handbook*. His 2004 article "Pocketbook Issues and the Presidency" and his 2009 paper "The Value of Private Businesses in the United States" have each been awarded for outstanding writing from the National Association of Business Economics. Anderson's views on the economy are often cited by national news media including *The Wall Street Journal, New York Times, National Public Radio,* and *Fox Business News.*

Anderson is a graduate of the University of Michigan, where he earned a Master of Public Policy degree and a Bachelor of Arts degree in political science. He is a member of the National Association for Business Economics and the National Association of Forensic Economists. The Michigan Chamber of Commerce awarded Mr. Anderson its 2006 *Leadership Michigan Distinguished Alumni* award for his civic and professional accomplishments.

Scott D. Watkins

Mr. Watkins is a Senior Consultant with Anderson Economic Group, LLC, with expertise in economic, industry, and market analyses, as well as public policy. He manages the firm's market and industry analysis practice area, working with public and private sector clients to deepen understandings of their market and place in the economy, and to develop strategies to strengthen their positions.

Among the clients for whom he has worked are more than 90 automobile dealerships; the Project Management Institute; City of Sandusky, Ohio; City of Hamtramck, Michigan; City of Lansing, Michigan; Oakland County, Michigan; Collier County, Florida; Northern Michigan University; Michigan State University; Ferris State University; Lansing Community College; Michigan Retailers Association; and the West Virginia High Technology Consortium Foundation. Recent publications by Mr. Watkins include: "Land Use and Infrastructure Investments by Olympic Host Cities: Legacy Projects for Long-term Economic Benefits," and *The State Economic Handbook,* as published by Palgrave Macmillan in 2008, 2009, and 2010. Mr. Watkins has made presentations to a number of audiences and media outlets on topics concerning the automotive industry, economics, education finance, and industry trends. He has also provided expert testimony in legislative and legal hearings, including automobile dealership arbitrations.

Prior to joining Anderson Economic Group in 2001, Mr. Watkins was an analyst in the automotive market and planning group at J.D. Power and Associates, and a marketing assistant with Foster, Swift, Collins, and Smith P.C.

Mr. Watkins holds an M.B.A. from the Eli Broad College of Business at Michigan State University. He also has a B.A. in marketing from Eli Broad College of Business and a B.A. in international relations from the James Madison College, both at Michigan State University.

Alexander L. Rosaen

Mr. Rosaen is a Consultant at Anderson Economic Group, working in the Public Policy, Fiscal, and Economic Analysis practice areas. Mr. Rosaen's background is in applied economics and public finance.

Mr. Rosaen's recent work includes several economic and fiscal impact analyses of proposed real estate developments, power plants, and infrastructure projects;

analysis of tax and investment incentives; an analysis of the impact of federal tax incentives on the freight rail industry; and an analysis of the economic contribution that research universities make in the State of Michigan.

Prior to joining Anderson Economic Group, Mr. Rosaen worked for the Office of Retirement Services (part of the Michigan Department of Management and Budget) for the Benefit Plan Design group. He has also worked as a mechanical engineer for Williams International in Walled Lake, Michigan.

Mr. Rosaen holds a Masters in Public Policy from the Gerald R. Ford School of Public Policy at the University of Michigan. He also has a Masters of Science and a Bachelors of Science in mechanical engineering from the University of Michigan.