

No End in Sight Can Transmission Investment in MISO Continue at this Pace?

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There are many factors driving transmission investment. Just when one factor seems to run its course, another reason for investing in transmission takes over. In MISO, the growth rate of transmission investing over the last year has slowed a bit, but the absolute levels of investment will remain high for at least the next several years as investorowned utilities ("IOUs") and transmission companies ("Transcos") continue to see transmission investment as a major driver of earnings. Although transmission investment is broadening somewhat to more generation and transmission cooperatives ("G&Ts") and municipal utilities, the message for public power and cooperatives in MISO remains clear: Investing in transmission is the most effective way to counter rising transmission rates.

Tailwinds for Continued Nationwide Transmission Investment

Edison Electric Institute ("EEI") expects that IOUs and Transcos across the country (excluding public and cooperative power) will increase their rate of annual transmission investment from about \$15.6 billion per year in 2012 to about \$23.7 billion per year by the end of 2018, an average increase of 7.2% per year (see Figure 1 on the next page). This increase in annual transmission investment has been driven by a range of factors, including reliability standards and the growth of renewables, most notably wind power (see Figure 2 on page 3). In addition, the more recent "Puerto Rico Effect" of avoiding extended outages, a focus on cyber and physical security to counter various forms of potential terrorism, the political prominence of "grid resilience" and an overall theme of improved infrastructure have provided regulatory tailwinds for continued investment in transmission.

EEI forecasts annual transmission investment will increase from \$15.6 billion per year in 2012 to \$23.7 billion per year by the end of 2018—an increase of 7.2% annually.

Figure 1 Nationwide Annual IOU Transmission Investment¹



Moreover, regulators may be more reluctant to challenge transmission plans for fear of being known as the entity that jeopardized grid reliability.

The factors driving transmission investment are growing in number, while existing factors rotate in prominence to provide continued fuel for investment. The factors driving nationwide transmission investment continue to grow in number, while existing factors rotate in prominence to provide continued fuel for investment. The latest driver of new transmission investment is the impact of climate change, which has led to calls for additional transmission line management and to make the grid more resilient. In the western United States, more frequent and larger fire events and the threat of liability is forcing utilities to rethink infrastructure.

According to PG&E Corp. CEO, Geisha Williams, Pacific Gas and Electric Company is planning to invest roughly \$6 billion through 2023 in "de-risking our assets" in highly fire-prone areas of its service territory.² The utility is planning cameras, weather stations and "targeted infrastructure hardening" across 7,000 miles, including installation of insulated power lines and strengthened poles, while increasing clearances between its equipment and vegetation across 25,000 miles of power lines.

¹ Source: Edison Electric Institute Economics, Statistics and Industry Research Group. Updated October 2018. Previous years are revised and rolled forward one year from 2017 version.

² Source: Electric Transmission Week, 11/12/18, pages 1 and 8.

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On the east coast, the threat of more devastating hurricanes is also prompting grid resiliency. As Duke CEO, Lynn Good, stated: "There is a lot of interest to invest in infrastructure and to make smart investments...to position the state [of North Carolina] for the future ... So, I think hardening and resiliency is something that makes a lot of sense."³

Transmission as a Driver of Earnings Growth

This continued national emphasis on transmission investment was also recently highlighted by AEP, which primarily resides in PJM, SPP and ERCOT. In a call with investment analysts, the CEO and Chairman, Nicholas Adkins, reinforced that transmission will continue to be a major driver of

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³ Source: Electric Transmission Week, 11/12/18, pages 1 and 8. Also see Electric Transmission Week, 11/19/18, pages 4-5.

AEP's long-term earnings growth of 5% to 7% per year.⁴ To support this earnings growth, AEP plans to invest \$24 billion from 2018 through 2021 in its regulated businesses (transmission and distribution) and contracted renewables, with 75% (\$18 billion) of its capital plan allocated to grid and electric infrastructure investments.

"We are already tracking over \$3 billion a year in capital investment in transmission ... we have plant retirements that are occurring that will encourage more transmission investment, so we are going to encourage the transmission organization to do as much as we can around capital deployments.

"... Really [there is] no end in sight in terms of our ability to invest in transmission ... and actually, the reasons for transmission investment continue to change all the time ... the 'climate change aspect' and environmental, social and governance activity is helping to drive the push for clean energy resources ... and that means transmission as well."⁵

MISO transmission owners are also touting their transmission investment to investment analysts. NiSource CEO, Joseph Hamrock, discussed his recent T&D replacement/modernization investments under the flag of safety and reliability:

"We continue to execute on our seven-year electric infrastructure modernization program, which includes enhancements to our electric transmission and distribution system designed to further improve system safety and reliability. The IURC-approved program represents approximately \$1.25 billion of electric infrastructure investments expected to be made through 2022."⁶

Warner Baxter, CEO of Ameren, already a heavy investor in transmission, signaled its continued desire to invest in transmission to generate earnings:

"You look at what's going on in MISO with all the renewable energy projects that are coming online ... there could be an opportunity down the road to have more robust transmission planning and investments."⁷

Consistent with Warner Baxter's statement, recent federal policy changes pertaining to MISO generation interconnection investment will also encourage transmission investment by MISO transmission owners. The DC Court of Appeals overruled FERC's previous policy allowing interconnection customers to self-finance their required transmission investments for interconnection.⁸ The Court of Appeals ruled that transmission owners have

AEP says there's "no end in sight" in their interest to invest in transmission.

⁴ Source: Seeking Alpha, AEP 3Q 2018 results earnings call.

⁵ Source: Ibid.

⁶ Source: Seeking Alpha, NiSource Q2 2018 results earnings call.

⁷ Source: Seeking Alpha, Ameren 3Q 2018 results earnings call.

⁸ Ameren Servs. Co. v. FERC, 880 F.3d 571 (D.C. Cir. 2018) (Ameren). *164 FERC* ¶ *61,158, Order on remand and requesting further briefing, August 31, 2018.*

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a right to make the interconnection investment necessary to earn a fair return on their investment and recovery of their investment (depreciation) in order to be compensated for the risks of interconnections. These risks include insurance deductibles and litigation related to environmental and reliability claims. On remand, FERC reversed its policy, thus allowing utilities to selffund the transmission investment to support a generation interconnection.

Fortis CEO, Barry Perry, sees continued opportunities for transmission investment for its ITC subsidiary:

*"(ITC has) done a great job of finding opportunities to invest in their infrastructure … we've increased the (rate base) growth rate annually from about 6% to 7% plus…"*⁹

This statement reinforces that Transcos are in the business of finding transmission investment opportunities on a consistent basis. ITC-Midwest and the two ITC Michigan subsidiaries combined for an eye-popping \$3.0 billion dollar increase in gross transmission plant over the last five years, nearly one-fifth of the MISO IOU/Transco total. A 7% growth in rate base over the next five years on the total combined current ITC net plant of \$5 billion implies about another \$3 billion of investment.¹⁰

High Levels of Transmission Investment in MISO

Given the previously mentioned investment drivers and the desire for earnings growth, transmission investment in MISO for 2018 is expected to continue at high levels, while the overall growth rate will moderate compared to last year. The percentage change in transmission gross plant for all IOUs/Transcos in 2018 compared to 2017 is expected to be 8% compared to about a 11% growth rate in both 2016 and 2017.¹¹ The emphasis has changed from the large cost-shared multi-value projects ("MVPs") planned prior to Order 1000 (which have only a few projects remaining to be completed with much already in rate base) to more local reliability projects that do not have to be competitively bid.

This year's final draft MISO Transmission Expansion Plan ("MTEP") contains 442 newly-approved (Appendix A) projects totaling nearly \$3.3 billion in

The transmission investment in MISO for 2018 is expected to continue at high levels, while the overall growth rate will moderate a bit compared to last year.

⁹ Source: Seeking Alpha, Fortis 3Q 2018 results earnings call.

¹⁰ Source: MCR analysis. Nets accumulated depreciation.

¹¹ Source: MCR analysis of June 2016-2018 MISO Attachment Os. Formula = change in gross plant + change in CWIP in rate base. Does not match annual capital expenditures, because it includes transfers and retirements. Transfers could, for example, include a reclassification of distribution plant as transmission. Does not include any change in CWIP that is not in rate base.

Figure 3 MISO Approved MTEP Projects by Projected in-Service Dates¹²



investment.¹³ This is an increase of about \$600 million compared to the 2017 final MTEP amount, which consisted of 354 new projects.¹⁴ Thus, the slight slowdown in growth for IOU/Transcos in 2018 compared to 2017 (8% vs. 11%) appears to be a temporary respite as the 2018 MTEP shows no let up for MISO transmission investment for the next several years. About \$13 billion of investment is expected to go into service from 2018 to 2023 (see Figure 3), which is above the \$12 billion in last year's MTEP from 2017 to 2022. Despite the appearance of investment tailing off in years four and five, the graphic in Figure 3 is similar to what has been seen in recent MTEPs—most projects take three to five years from planning cycle to in-service date, so the pipeline of investment tends to replenish each year on a rolling basis.

How Long Can Transmission Investment Continue?

The key question is: At what point does this continued heavy transmission investment produce transmission rates that are so high that they begin to encourage new behind the meter generation, such as distributed generation?

¹² Source: MTEP October 2018 Final Draft, Figure 2.1-6.

¹³ Source: MTEP October 2018 Final Draft, page 5.

¹⁴ Source: MTEP December 2017, pages 14 and 18.

Further, does the widespread use of new technologies, such as battery storage combined with renewables, dampen demand for new transmission investment? Despite these cautions, the reality is that traditional load growth is only one of many factors that has been driving new transmission investment in MISO. Further, the projected long-term load growth rates laid out in the MTEP over the last several years have been less than one percent and are projected again at around one percent or less in MTEP18.¹⁵ So, even though it may at times make economic sense to build distributed generation or use new technologies to support new load growth, it will be unlikely that this will significantly affect the underlying growth of the transmission grid in the near term, which has been driven by a multitude of other factors (see Figure 2 on page 3). Just when one factor seems to run its course, another picks up the slack or entirely new factors emerge. Thus, given the multiple transmission investment drivers, what we see in the MTEP pipeline and the fact that transmission investment has become a major driver of earnings for IOUs and Transcos, we believe there will be continued strong investment in transmission in MISO. There is no significant easing in sight for transmission investment within at least the next several years and possibly even longer.

Transmission rates have escalated, but energy rates have generally decreased (due partially to less congestion and more access to less expensive resources). Even though transmission costs have become a bigger portion of the overall rate (it is rising to 20% or more of the total bill for many utilities), the total power bill has been relatively stable. This stability has given regulators political cover to be more accepting of transmission investment (and thus, higher rates). So, unless state regulators or other stakeholders, such as the American Public Power Association or the WIRES Trade Group, begin to heavily influence the review and approval process for new baseline transmission projects in MISO, the financial incentives are too strong for utilities to put the brakes on their transmission investment. This is certainly true for IOUs and Transcos, but it is also is true for cooperatives and public power in joint pricing zones that receive substantial value from the high returns of transmission investment relative to their low cost of capital. Many cooperatives and public power entities receive high overall returns and have customers other than their own share the costs. These high returns, in turn, help offset the escalating transmission rates driven by heavy IOU and Transco investment.

There is no significant easing in sight for transmission investment within at least the next several years and possibly even longer.

The financial incentives are too strong for utilities to put the brakes on their transmission investment.

Figure 4 Change in Gross Transmission Plant Balance for MISO IOUs and Transcos (2014-2018)¹⁶



Which Transmission Owners have been Investing over the Last Five Years?

Looking at the change in gross transmission plant over the past five years provides a good proxy for the absolute levels of transmission capital investment in MISO for IOU/Transcos, G&Ts, joint action agencies ("JAAs") and municipals.

The graph in Figure 4 shows that the change in gross transmission plant for MISO IOUs and Transcos was \$15.8 billion over the last five years.¹⁷ The average annual change was \$686 million with a median of \$702 million or

¹⁷ Source: June 2013-2018 MISO Attachment Os. Formula = change in gross plant + change in CWIP in rate base. Does not match annual capital expenditures, because it includes transfers and retirements. Transfers could, for example, include a reclassification of distribution plant as transmission. Does not include any change in CWIP that is not in rate base.

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¹⁶ Source: June 2013-2018 MISO Attachment Os which shows gross transmission plant Covers Schedule 9, 26 and 26-A investments. For those companies using a projected test year, captures the change in projected data for each year. For those companies using an historical test year, captures the change in previous end-of-year data for each year. IOUs and Transcos are categorized together, because the MISO Transcos are mostly owned by IOUs and/or are profit-making entities. Transmission gross plant compared rate year 2013 vs. rate year 2018, i.e., the changes from 2013 to 2014, 2014 to 2015, 2015 to 2016, 2016 to 2017 and 2017 to 2018.

Figure 5 Percentage Change in Gross Transmission Plant Balance for MISO IOUs and Transcos (2014-2018)



about \$140 million per year. On a percentage change basis, this represented a 66% increase in transmission gross plant over the five years. Ameren Transmission Company of Illinois ("ATXI"), which started from a low base, Entergy-Louisiana, Montana-Dakota, Entergy-Mississippi, Ameren-Illinois and Otter Tail Power all have at least doubled their transmission gross plant over this timeframe (see Figure 5). At the low end of growth were Vectren (14%), Northwest Wisconsin Electric Company ("NWEC") at 27%, Cleco (32%) and American Transmission Company ("ATC System") at 33%. Even though the ATC System grew gross transmission plant by only 33%, this still amounted to nearly a \$1.3 billion increase due to their large base and was the fifth largest dollar increase among the 23 IOUs/Transcos.

Looking at just the percentage change from last year, the percentage change in transmission investment for all IOUs/Transcos was 8.1%. The TOs with the largest percentage change in 2018 compared to 2017 were Minnesota Power ("MP") at 23%, NIPSCO ("NIPS") at 22%, ATXI (22%), and Montana-Dakota Utilities ("MDU") at 21%. On a dollar basis, the large investors in 2018 were ITC-Midwest ("ITCM"), Ameren-Illinois ("AMIL"), NIPSCO and the Entergy operating companies.

Figure 6 Change in Gross Transmission Plant Balance for MISO G&Ts (2014-2018)¹⁸



Figures 6 through 11 show the dollar change and percentage change in gross transmission plant over the last five years for MISO G&T, JAA, and municipal transmission owners ("TO"), respectively. Figure 6 shows that G&Ts had a five-year dollar change of nearly \$1.2 billion. The five-year average for the G&T group was \$97 million with a median of \$76 million (\$15 million per year). Thus the median annual investment for a MISO IOU/Transco of \$140 million is over nine times the G&T median of \$15 million. Great River Energy ("GRE"), Dairyland Power Cooperative ("DPC"), Wolverine Electric Cooperative ("Wolverine") and Wabash Valley Power Association ("WVPA") led the group, comprising 62% of the total transmission spending over the last five years.

¹⁸ Reflects the 11 MISO G&T transmission owners and CIPCO (which files an Attachment O but is not a MISO TO). Does not include Minnkota Power Cooperative (which is not a MISO TO and does not file an Attachment O), nor Central Power, East River and Upper Missouri due to insufficient years of data. Study does not include group of three T&D cooperatives in MISO due to insufficient sample size as a segment. Existing transmission assets for newly added utilities to the sample are not counted as new investment.

Figure 7 Percentage Change in Gross Transmission Plant Balance for MISO G&Ts (2014-2018)



Figure 7 shows the overall five-year percentage change in gross transmission plant for G&Ts was 42%. Prairie Power ("PPI") at 154%, Texas-Louisiana Electric Cooperative ("Tex-La") at 74% and WVPA (70%) led the G&Ts. However, the overall percentage change for G&Ts of 42% is only about 2/3 of the 66% change of IOU/Transcos over the last five years. For 2018, new G&T players emerged in transmission investment with Arkansas Electric Cooperative Corporation ("AECC"), WVPA and Southern Illinois Power Cooperative ("SIPC") having the highest one-year percentage changes at 49%, 23% and 20%, respectively, compared to the overall one-year change for G&Ts of 6.3%. On a dollar basis, the largest G&T investors in 2018 were Arkansas Electric Cooperative ("CIPCO").

Figure 8 Change in Gross Transmission Plant Balance for MISO JAAs (2014-2018)



Figure 8 shows the five-year dollar change in gross transmission plant for joint action agency transmission owners in MISO of \$302 million. Missouri River Energy Services ("MRES"), Southern Minnesota Municipal Power Agency ("SMMPA") and Indiana Municipal Power Agency ("IMPA") comprised about 84% of this investment increase. The five-year median increase was \$15 million for the nine JAAs.

Figure 9 Percentage Change in Gross Transmission Plant Balance for MISO JAAs (2014-2018)



Figure 9 shows the five-year percentage change for JAAs was 92%, led by Minnesota Municipal Power Agency (low base) at 539% and MRES at 151%. When looking at 2018 only, IMPA had a substantial 25% increase in gross transmission plant compared to 2017. All other JAA's had increases of less than 1.5% in 2018, reflecting a major drop off in investment for JAAs as joint projects related to the CapX2020 initiative in the upper Midwest wrap up.

Figure 10 Change in Gross Transmission Plant Balance for MISO Municipals (2014-2018)



Figure 10 shows the total five-year dollar change in gross transmission plant of \$112 million for municipal owners of transmission in MISO.¹⁹ Rochester Public Utilities ("RPU"), City of Ames, Cedar Falls, Lafayette LA, and Traverse City led the group of 31 MISO municipals, accounting for \$91 million (81%) of the dollar change.

The disparity in investment levels among municipals reflects the dominance of larger cities. The disparity is also highlighted with the fact that the average five-year change for each municipal was \$3.6 million compared to a five-year median of only \$550,000 or about \$110,000 per year. This annual median amount, however, is over double the annual median amount calculated last year of only \$52,500. This suggests some broader-based (albeit very modest) increases in transmission investment recently by more municipals.

¹⁹ Note that certain municipals (and G&Ts) began filing Attachment Os after the study period began. Once the base year is set, the increase in investment per the Attachment Os was included. In some cases, for those years without an Attachment O, MCR estimated the gross transmission plant from annual financial reports or filings, where available.

Figure 11 Percentage Change in Gross Transmission Plant Balance for MISO Municipals (2014-2018)



Figure 11 shows the five-year percentage change for MISO municipals was 51%. The municipals with the largest percentage increases over the last five years were Elk River (289%), Ames (161%), Rochester (116%), Cedar Falls (81%), Traverse City (57%), Muscatine (37%) and Detroit Lakes (36%). The largest 2018 one-year percentage increases in transmission gross plant were Elk River (146%), Muscatine (35%), Cedar Falls (32%) and Blue Earth (29%). As a whole, municipal transmission gross plant was up by 6.5% over 2017 with some new municipal players emerging in transmission investment. Despite these notable new players, 19 of the 31 municipals had a 2018 change in gross transmission plant of less than one percent.

What is the Difference in the Growth Rate of the Groups?

Figure 12, 13 and 14 compares the percentage change in gross transmission plant for the various groups over a five-year period, three-year period and most recent year. As a group, JAAs have recently seen a significant deceleration in their rate of spending. Further, in 2018, Figure 14 shows that IOU/Transco gross transmission plant grew 8.1% compared to 6.5% for municipals, 6.3% for G&Ts and only 5.5% for JAAs. By comparison, in 2017, IOU/Transco transmission plant grew by a wider margin of 11.5% compared to JAA's 7.9%, G&T's 6.9% and municipals' 5.1%. Thus, in the last year, the

Figure 12 Cumulative 5-Year Percentage Change Compared to 2013 Ending Balance for MISO Transmission Owner Segments²⁰



G&T and municipal groups have narrowed the spending growth gap with IOUs/Transcos as IOU/Transco growth has slowed a bit from the 11.5% in 2017 to 8.1% in 2018.

G&T and municipal groups have narrowed the spending growth gap with IOUs/Transcos.

In previous years, municipals who are members (owners) of full requirements JAAs who have invested in transmission have also benefited through lower rates from their agency investment and/or a healthier balance sheet of their agency. With the major drop-off in JAA spending, however, these benefits are leveling out. Despite the modest improvements in municipal spending in 2018, the data continues to show that at the local level, municipal transmission investment has been largely concentrated in several utilities, raising the question of whether there is a significant need for more municipals to upgrade the reliability of their system.

Figure 13 Cumulative 3-Year Percentage Change Compared to 2015 Ending Balance for MISO Transmission Owner Segments²¹



Figure 14 One-Year Percentage Change Compared to 2017 Ending Balance for MISO Transmission Owner Segments²²



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Figure 15 Change in Gross Transmission Plant Balance Compared to Depreciation Expense for MISO Transmission Owners (2017-2018)²³

²³ Source: June 2017-2018 MISO Attachment Os. For those TOs using the cash flow template, depreciation expense was estimated based on Attachment O data and the annual Financial Statements. Represents weighted averages for each group. Shows total change in transmission gross plant in last two years divided by two years of depreciation expense.



All 12 G&Ts had investment to depreciation ratios greater than one, indicating broadbased investment over the last two years. Looking at recent growth rate differences from a different angle, Figure 15 shows that over the last two years, MISO IOUs/Transcos are making transmission investments at an average rate of 4.3 times their transmission depreciation expense—a very healthy investment rate, albeit at a slightly lower rate than the 4.8 for the two-year earlier period ending 2016. Further, of the 21 IOUs/Transcos, only Duke-Indiana had a ratio less than one (0.7) over the last two years. Since 2017, JAAs as a group, are investing at 2.7 times their depreciation expense; G&Ts are at 2.4; and municipals are at 2.2. Again, however, the transmission investment by municipals over the last two years is concentrated in several larger utilities with only seven of 31 municipals showing transmission investment greater than their depreciation expense. Similarly, only two of nine JAAs had ratios greater than one. In contrast with JAAs and municipals, all 12 G&Ts had investment to depreciation ratios greater than one, indicating broad-based G&T investment over the last two years.

Figure 16 2018 Net Transmission Plant as a Percent of Gross Transmission Plant for MISO Owners of Transmission ²⁴



Which Transmission Owners have the Newest Plant?

Figure 16 provides an indicator of which segments have the "newest" aggregate transmission facilities. It shows the ratio of net transmission plant to gross transmission plant. IOUs/Transcos, as a group, have the newest transmission assets with their combined net transmission plant equaling 75% of their gross transmission plant. The comparable 2017 figure was 73%, indicating that on average, transmission is getting newer for the IOU/Transco group. Breaking out IOUs and Transcos into separate groups shows the 2018 IOUs have a weighted average ratio of 73% and Transcos 79%.

JAAs and G&Ts on average, are somewhat lower than the IOUs and Transcos at 68% and 66%, respectively, unchanged from 2017. Municipals have the oldest transmission plant with a net plant to gross plant ratio of 54%.

²⁴ Source: June 2018 MISO Attachment Os. Above percentages are weighted averages of utilities in each group, e.g., total IOU and Transco transmission net plant divided by total IOU and Transco transmission gross plant.

Figure 17 2018 Net Transmission Plant as a Percent of Gross Transmission Plant for MISO IOUs and Transcos



There is still considerable room for many IOUs to replace aging infrastructure. Figure 17 shows the detail for each IOU/Transco. Two Transcos, ATXI and ITC-Midwest ("ITCM"), lead the group. This year Ameren-Illinois ("AMIL") joins the top three with a net plant to gross plant ratio of 80%. NIPSCO had the largest increase in its ratio—from 51% last year to 63% this year—as their major infrastructure initiative started to kick in. Despite the recent improvements in this "aging" indicator, Figure 17 indicates that there is still considerable room for many IOUs to replace existing aging infrastructure.

Figure 18 2018 Net Transmission Plant as a Percent of Gross Transmission Plant for MISO G&Ts



For G&Ts, Figure 18 shows that Wolverine, Prairie Power and WVPA have the newest transmission plant, whereas Big Rivers Electric Corporation ("BREC"), Tex-La Electric Cooperative and Hoosier Energy ("HE") have the oldest transmission plant. In 2018, AECC reported a \$65 million increase in gross transmission plant and had the largest increase in their ratio compared to last year (54% to 67%). SIPC, which had the oldest transmission plant last year, also had a large increase from 52% to 59%, followed by WVPA, which increased five percentage points from 68% to 73%. The overall improvement in transmission spending on the part of most G&Ts reflects a strategic focus on increased reliability for its members and a desire to invest in transmission with its high returns. Figure 19 on the next page shows that the JAA group has wide variability in the age of its facilities. Michigan Public Power Agency ("MPPA") has the oldest transmission with a ratio of 33%. Relatively new TOs, Minnesota Municipal Power Agency ("MMPA") and WPPI Energy each have high ratios of about 93%. Indicative of the slowdown in JAA transmission investment, in 2018, IMPA was the only company that increased its net plant to gross plant ratio for transmission—all others had more accumulated depreciation expense added than gross transmission plant added. IMPA's ratio increase from 60% in 2017 to 66% in 2018.

Over half of the municipals have older transmission plant than the "oldest" IOU.

In the municipal segment (see Figure 20), there is extreme variability in the age of transmission facilities. Windom, Grand Haven and Mountain Lake are the oldest with Indianola, Cedar Falls and Eldridge reporting the newest. In 2018, only five of 31 municipals increased their net plant to gross plant ratio. Muscatine was 29th last year and rose this year to have the 19th newest transmission facilities with a ratio of 34%. Elk River's ratio increased from 65% to 70%. Cedar Falls increased two points to 81%. RPU also increased their ratio by two percentage points to 79% and Traverse City by one point to 75%.

Over half of the municipals have older transmission plant than the "oldest" IOU, Indianapolis Power & Light, which has a ratio of 56%. This reinforces that many municipals are facing the possibility of replacing/upgrading their facilities in the near future.

Figure 19 2018 Net Transmission Plant as a Percent of Gross Transmission Plant for MISO JAAs



Figure 20 2018 Net Transmission Plant as a Percent of Gross Transmission Plant for MISO Municipals



Table 1

Comparison of Change in Gross Transmission Plant Balance to Current Load Ratio Share for MISO IOUs/Transcos, G&Ts and Municipals (2016-2018)²⁵

	3-Year Change in Trans. Gross Plant Balance (Proxy for Cap Expenditures) (\$ Millions)	% of Total Gross Plant Change	Estimated 12 CP Load ²⁶ (MWs)	Estimated % of Total Load
IOU, Transcos	\$9,770.0	92.4%	87,125.4	86.5%
G&Ts	\$731.8	6.9%	11,367.9	11.3%
Municipals	\$73.9	0.7%	2,204.5	2.2%
Total	\$10,575.7	100.0%	100,697.8	100.0%

G&Ts and municipals are investing at a lower rate than IOUs/Transcos relative to their load.

Which Groups are Investing Commensurate with their Load?

Although participation in transmission spending has broadened somewhat for G&Ts and municipals, the message continues that overall, G&Ts and municipals in MISO are still investing at a lower rate than IOUs/Transcos, relative to their load. Focusing on investment over the last three years, G&Ts represent about 11% of the 2018 MISO load for IOUs/Transcos, G&Ts and municipals, but only represent about 7% of the new transmission investment (see Table 1).

Similarly, municipals represent 2.2% of the total IOU/Transco, G&T and municipal load in MISO, but represent less than 1% of the new transmission investment over the last three years.

By not investing at higher levels relative to their load ratio share, many G&Ts and municipals have not been producing a sufficient level of transmission

²⁵ Source: June 2016-2018 MISO Attachment Os. Load may be adjusted upward where the G&T's load is in multiple pricing zones, but the reported 12-month coincident peak load only reflects the G&T's load in their own pricing zone. Sources also include MCR estimates based on FERC Form 1, page 400, column e, "firm service for self" and RUS Form 12. Does not include T&D cooperatives and joint action agencies (some JAAs do not have load themselves or their member's load is addressed in the municipal group). The source of load data (12 CP) for most municipals is the Attachment O. In some cases, where a municipal's load is not reported in its Attachment O, the municipals' loads were estimated based on publicly available sources such as the EIA Form 861 peak demand data adjusted with a 75% factor to obtain 12-month coincident peak load. Excludes Minnesota Power DC load.



revenue to mitigate their escalating transmission tariff costs. This discrepancy is amplified in joint pricing zones with IOUs/Transcos having a higher revenue requirement per dollar of investment, thus a level of load ratio share is still an insufficient level of investment for cooperatives and public power. In joint zones with an incumbent IOU/Transco, achieving a load ratio share of investment is a good start, but still inadequate because the tariff paid by the municipal or cooperative will be higher than their tariff revenue received.

Who are the Largest Transmission Owners in MISO?

In each of the three groupings, there are TOs who dominate the pricing zone and thus comprise a large portion of the ATRR. Figures 21-24 show the size of MISO transmission owners ranked by total company gross transmission plant recorded on their 2018 Attachment Os. Figure 21 shows the IOU/Transcos with the largest gross transmission plant are ATC at \$5.4 billion, Xcel/NSP at \$4.7 billion and Entergy-Louisiana²⁶ at \$3.4 billion.

²⁶ Includes the former Gulf States Utilities, now known as Entergy Texas.



For G&Ts, Figure 22 shows the TOs with the largest amounts of gross transmission plant are GRE at \$1.22 billion, DPC at \$592 million, Cooperative Energy at \$408 million and Wolverine at \$321 million. Figure 23 shows that SMMPA, MRES and IMPA are the JAAs with the largest gross transmission plant at \$183 million, \$171 million and \$162 million, respectively. For municipals, Figure 24 shows the largest TOs are the cities of Springfield, Illinois with \$82 million, Lafayette, Louisiana at \$75 million, and Rochester, Minnesota (RPU) with \$72 million.

Many pricing zones had a reduction in rates due to the corporate income tax cuts.

A Welcome Respite from Escalating Transmission Rates

Despite the overall 2018 increase of 7.9% in transmission spending for all four segments of IOU/Transcos, JAAs, G&Ts and municipals, many pricing zones in MISO had a reduction in rates due to the corporate income tax cut from 35% to 21%. Over half of the sampled zones in Table 2 (on page 29) showed network rate decreases in 2018. Keeping all other factors constant, the cut in the income tax rate alone on an ongoing basis (excluding the effect of deferred tax adjustments) can reduce an IOU network rate, such as Xcel/NSP's, by about 8%.







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A Transco, such as ITC-Midwest, with an incentive ROE and a higher equity ratio, would see a higher ongoing rate reduction of about 14%. The reduction percentage of about 8% for Xcel/NSP is moderated when looking at the NSP zone, because 15% of the zonal ATRR is generated by a G&T (GRE) and various public power entities, whose ATRR is unaffected by the tax cut. In addition to cooperatives and public power's lessening the rate reduction impact in the NSP zone, the zonal rate reduction was also offset somewhat by increases in transmission investment. Thus, the actual reduction in the NSP zone was 5.1%.

This reduction in the NSP zonal rate was representative of MISO-wide reductions. Table 2²⁷ (on the next page) shows the average system-wide MISO network (Schedule 9) transmission rate decreased 5.2% from \$3.26 to \$3.09 per kW/month. Nevertheless, the latest systemwide rate of \$3.09 still represents a doubling of transmission rates since 2005 or a 5.7% compound annual growth. This compares with an average annual increase in the Consumer Price Index over the same period of only 2.3% per year. In MISO North, the ITC zone (eastern portion of Michigan) experienced the largest rate reduction of 19.7% due to the tax rate cut and deferred tax adjustments lowering rate base. In MISO South, Entergy-AR experienced a 38.7% rate decrease largely due to the same reasons.

Across the sampled pricing zones, there is a wide range in both the 2018 absolute transmission network rates (\$1.54 to \$9.33) and the related percentage rate increase since 2005 (-15% to 337%). The top three cumulative percentage rate increases in MISO North for the sample were for pricing zones that included Transcos (ITC-Midwest, Michigan Electric Transmission Company ("METC") and Ameren-IL, which includes ATXI). Note that these figures are only for Schedule 9 zonal projects, such as local reliability projects, and do not include cost-shared projects. The largest percentage zonal increases in 2018 compared to last year came from two G&T pricing zones: SIPC (18%) and DPC at 15.2%. The Vectren zone had the largest percentage zonal rate increase among IOU/Transcos at 11.6% followed by Duke-Indiana at 9.4% and Ameren-IL at 7.3%. Additional investment and other factors in these three zones more than offset the effects of the lower income tax rates.

There is an extremely wide range in the 2017 absolute transmission network rates (\$1.54 to \$9.33) and the percentage rate increase since 2005 (-15% to 337%).

²⁷ Source: MCR Analysis based on June 2005, 2010, 2014, 2017 and 2018 Attachment O Files. MEC and DPC began as TOs in 2010. MISO South zones began January 2014 based on 2013 rates and new rates went into effect June 1, 2014. MISO system average includes all zones. 2018 rates include tax cuts but do not include pending MISO ROE rate refund.

Table 2Transmission Schedule 9 Network Rate Increases2005-2018 MISO Average and Select Pricing Zones

Index/Pricing Zone	\$/kW/Month			%	Cumul %	Compound	
	2005	2010, 2014	2017	2018	Change 2017-18	Change thru 2018	Ann % Inc thru 2018
СРІ							2.3%
MISO System Avg	1.51		3.26	3.09	-5.2%	104%	5.7%
Otter Tail	3.39		3.17	2.87	-9.5%	-15%	-1.3%
MDU	3.05		3.14	2.78	-11.5%	-9%	-0.7%
Entergy MS		2.68	3.57	2.84	-20.4%	6%	1.3%
S. IL Power Coop	2.20		2.50	2.95	18.0%	34%	2.3%
MidAmerican		1.82	2.53	2.27	-10.3%	25%	2.8%
ITC	1.61		2.90	2.33	-19.7%	45%	2.9%
NIPSCO	2.20		3.81	3.23	-15.2%	47%	3.0%
Entergy AR		1.85	3.49	2.14	-38.7%	16%	3.3%
Entergy TX		2.33	3.39	2.85	-15.9%	22%	4.6%
Hoosier	3.27		6.06	6.20	2.3%	90%	5.0%
Ameren-MO	0.83		1.61	1.60	-0.6%	92%	5.2%
IP&L	0.79		1.49	1.54	3.4%	95%	5.3%
Duke-Indiana	1.25		2.33	2.55	9.4%	104%	5.6%
ATC	2.27		4.79	4.71	-1.7%	108%	5.8%
Entergy LA		1.81	2.30	2.33	1.3%	29%	5.8%
NSP (Xcel)	1.87		4.15	3.94	-5.1%	111%	5.9%
Cleco		1.92	2.64	2.55	-3.4%	33%	6.5%
MN Power (Allete)	1.61		3.69	3.79	2.7%	135%	6.8%
GRE	2.15		5.12	5.31	3.7%	148%	7.5%
Cooperative Energy		3.94	5.63	5.72	1.6%	45%	8.6%
SIGECO (Vectren)	0.90		2.58	2.88	11.6%	221%	9.4%
Dairyland Power		3.55	6.37	7.34	15.2%	107%	9.5%
Ameren-IL	0.88		2.73	2.93	7.3%	234%	9.7%
METC	0.98		3.47	3.32	-4.3%	239%	9.8%
Entergy NO		1.28	1.33	2.04	53.4%	59%	10.9%
ITC-Midwest	2.13		10.15	9.33	-8.1%	337%	12.0%

Table 3Total Estimated Transmission Rate IncreasesMISO Average and Select Pricing Zones (Schedules 9, 26 and 26-A)2005-2018

	\$/kW/Month				%	Cumul %	Compound
Index/Pricing Zone	2005	2010	2017	2018	2017-18	thru 2018	Ann % Inc thru 2018
СРІ							2.3%
MISO System Avg	1.51		4.32	4.14	-4.2%	174%	8.1%
MDU	3.05		4.19	3.70	-11.7%	21%	1.5%
S. IL Power Coop	2.20		2.54	2.99	17.7%	36%	2.4%
Otter Tail	3.39		5.57	5.05	-9.3%	49%	3.1%
NIPSCO	2.20		4.81	4.26	-11.4%	93%	5.2%
Hoosier	3.27		6.39	6.52	2.0%	100%	5.5%
ITC	1.61		3.88	3.32	-14.4%	107%	5.7%
MidAmerican		1.82	3.25	3.00	-7.7%	65%	6.4%
Duke-Indiana	1.25		3.20	3.45	7.8%	176%	8.1%
ATC	2.27		6.36	6.31	-0.8%	178%	8.2%
NSP (Xcel)	1.87		5.79	5.48	-5.4%	193%	8.6%
IP&L	0.79		2.33	2.42	3.9%	206%	9.0%
Ameren-MO	0.83		2.63	2.64	0.4%	217%	9.3%
GRE	2.15		6.76	7.01	3.7%	227%	9.5%
MN Power (Allete)	1.61		5.62	5.54	-1.4%	244%	10.0%
Dairyland Power		3.55	6.65	7.62	14.6%	115%	10.0%
Ameren-IL	0.88		3.66	3.90	6.6%	345%	12.2%
ITC-Midwest	2.13		11.51	10.60	-7.9%	397%	13.1%
SIGECO (Vectren)	0.90		4.06	4.51	11.1%	403%	13.2%
METC	0.98		5.26	4.94	-6.1%	404%	13.2%



With the impacts of cost-shared regional projects (Schedule 26 and Schedule 26-A²⁸) layered on top of the Schedule 9 costs, the rate increases in MISO North shown in Table 3 become even more substantial. For example, when adding in the rate impact of cost-shared projects, MCR estimates the MISO

²⁸ Applies to MISO North only. Schedule 26 (recovered through Attachment GG) began in 2007 and Schedule 26-A (recovered through Attachment MM) began in 2012. MISO publishes indicative charges for both Schedule 26 and 26-A. Schedule 26 is in \$/kW/month whereas Schedule 26-A is in \$/MWh. Note that MCR converted the MVP (Schedule 26-A) charges to a kW/month basis by taking the total zonal Schedule 26-A charges divided by the zonal 12CP kW/12 to place Schedule 26 and 26-A on an equal basis of \$/kW/month.

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system average rate increase jumps from 5.7% annually to 8.1% annually, or a cumulative percentage rate increase since 2005 of 174% compared to the zonal-only increase of 104%. Schedules 26 and 26-A comprise about 25% of the total transmission rate. Because MVP projects are getting close to running their course (there are a couple still remaining) and there are no cost-shared projects in the 2018 MTEP, this percentage will likely begin to fall in future years as TOs concentrate on reliability projects in their own zone.

For the combined estimated total transmission rate per kW/month for Schedules 9, 26 and 26-A, the ITC-Midwest pricing zone continues to have the highest rate at \$10.60 per kW/month, which is a reduction from last year's \$11.51. The IP&L and Ameren-MO zones continue to have the lowest combined rates of \$2.42 and \$2.64, respectively. These rates compare to an estimated MISO system average of \$4.14 for Schedules 9, 26 and 26-A. The METC, Vectren, ITC-Midwest and Ameren-IL zones had the largest total cumulative percentage rate increases for the combined three schedules since 2005. For 2018, the SIPC zone showed the largest estimated one-year percentage increase (17.7%) followed by the DPC (14.6%) and Vectren (11.1%) zones.

The Otter Tail, Ameren-MO, IP&L, Vectren, METC and Minnesota Power pricing zones attribute large portions of their total transmission rate to Schedules 26 and 26-A charges. For example, for 2018, these cost-shared charges comprise about 43% of the total Schedules 9, 26 and 26-A rates for the Otter Tail pricing zone and 39% for the Ameren-MO pricing zone.

Resumption of Escalating Rates

A slight slowdown of the investment growth rate and the reduction of the corporate tax rate gave a respite to the rapidly escalating transmission rates in recent years. However, this respite will be short-lived, as the pipeline of projects in MISO remains high and the factors driving transmission investment continue to evolve. Since there is no end in sight to transmission investing for IOUs/Transcos, transmission rates will resume their upward march, reinforcing that they are an increasingly significant portion of the total power bill. Despite the recent increases in investments, cooperative and public power transmission owners must continue to actively seek out opportunities to invest in local transmission to help mitigate the transmission rate increases that are sure to follow the continued increases in IOU/Transco transmission investment on the horizon. These investments include consideration of projects IOUs/Transcos are pursuing related to grid resiliency, cyber security and replacement of aging facilities.

When adding in the rate impact of cost-shared projects, the annual average MISO system rate increase jumps from 5.7% to 8.1%.

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