



*2018 SPP Transmission
Investment Analysis*

Transmission Spending in SPP

Are You Obtaining Your Share of Transmission Investment?

April 2018

**Jim Pardikes
Ron Kennedy
Chris Nagle**

Transmission Investing in SPP

Are You Obtaining Your Share of Transmission Investment?

Jim Pardikes, Ron Kennedy, Chris Nagle

In SPP, total transmission investment continues at high levels and is being driven by many factors. However, recent investment by investor-owned utilities (“IOUs”) has been dominated by two IOUs. Many generation and transmission cooperatives (“G&Ts”) in SPP have recently stepped up their investment activity and some are now investing in transmission at a rate equivalent to their load ratio share, providing a means to mitigate the impacts of transmission rate increases and provide value to their members.

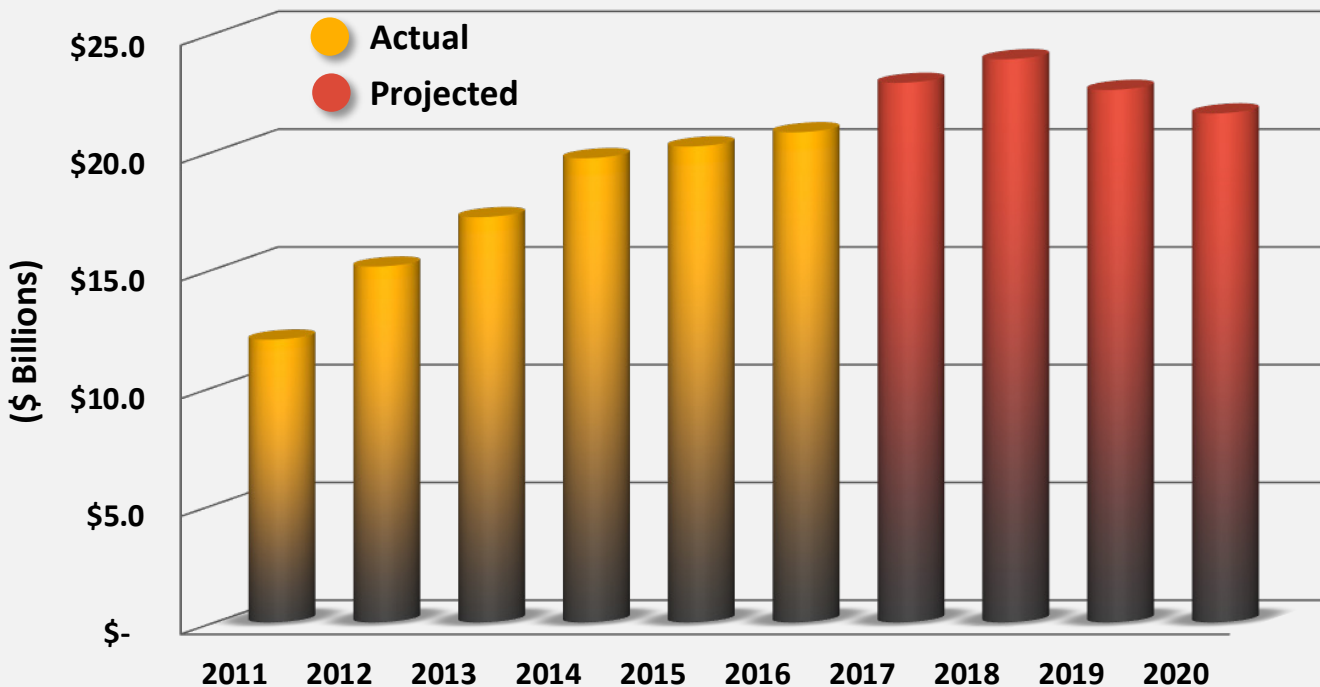
Tailwinds for Continued Nationwide Transmission Investment

Edison Electric Institute (“EEI”) forecasts IOUs and transmission companies (“Transcos”) across the country (excluding public and cooperative power) will double their rate of annual transmission investment from about \$12 billion per year in 2011 to about \$24 billion per year by the end of 2018, an average increase of 10.3% per year¹ (see Figure 1 on the next page). This massive increase in annual transmission investment is 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, the political prominence of “grid resilience” and an overall improved infrastructure have provided regulatory tailwinds for continued investment in transmission. Moreover, the large increase in transmission investment over the last seven years is also part of a “back to basics” infrastructure strategy whereby IOUs invest in the regulated “wires” side of their business in an effort to drive earnings growth with lower risk than many other generation investments.

EEI forecasts annual transmission investment will double from \$12 billion per year in 2011 to about \$24 billion per year by the end of 2018—an increase of over 10.3% annually.

¹ Source: Source: Edison Electric Institute Economics, Statistics and Industry Research Group. Updated September 2017.

Figure 1
Nationwide IOU Transmission Investment (\$ Billions)²



The Financial Attractiveness of Transmission Investment

Investing in transmission is quite attractive from a regulatory standpoint. Transmission is FERC-regulated rather than state-regulated and is thus often subject to formula rates that automatically update each year without a full, time consuming rate case. Although stakeholders can question or challenge costs in the annual formula rate update, the chances of significant costs being excluded is less likely than in a full rate case filing. Moreover, returns for transmission are attractive given today’s relatively low cost of capital and are usually higher than an IOU’s state jurisdiction returns for generation and distribution assets. Once approved by FERC, an established ROE cannot be challenged without a formal Section 206 complaint. In addition, most IOUs and Transcos have a forward-looking (projected) test year, so there is limited or no regulatory lag.

Most IOUs and Transcos in MISO see transmission investment as a major driver of earnings growth with attractive returns. For example, AEP’s CFO, Brian Tierney has highlighted its transmission investment in its earnings calls with investment analysts:

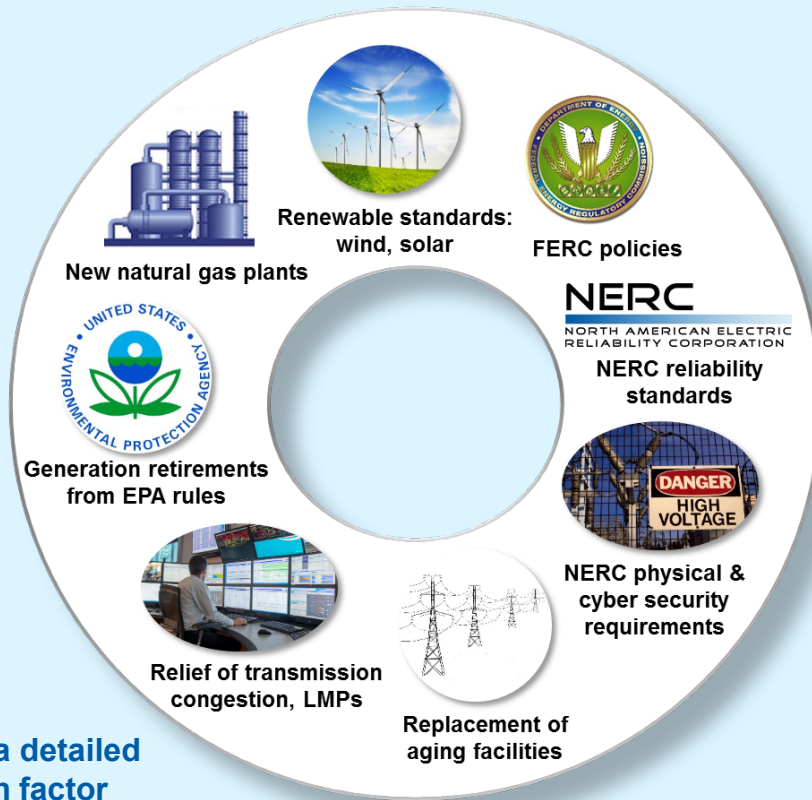
“Transmission is still a preferred place for us to put capital.”³

² Source: *ibid.*

³ Source: AEP 4Q earnings call

Returns for transmission are attractive given today’s low cost of capital and returns are usually higher than an IOU’s state jurisdictions for generation and distribution assets.

Figure 2 Policy and Operational Drivers of Transmission Investment



See Appendix for a detailed discussion of each factor



CEO and Chairman Nickolas Atkins went on to say:

“[Our Wind Catcher project provides] 2,000 MW of high-efficiency and capacity factor wind resources, along with an approximately 350 mile, 765-kV transmission line that serves as a generation interconnect. The estimated cost of the project is approximately \$4.5 billion.”⁴

High Levels of Transmission Investment in SPP

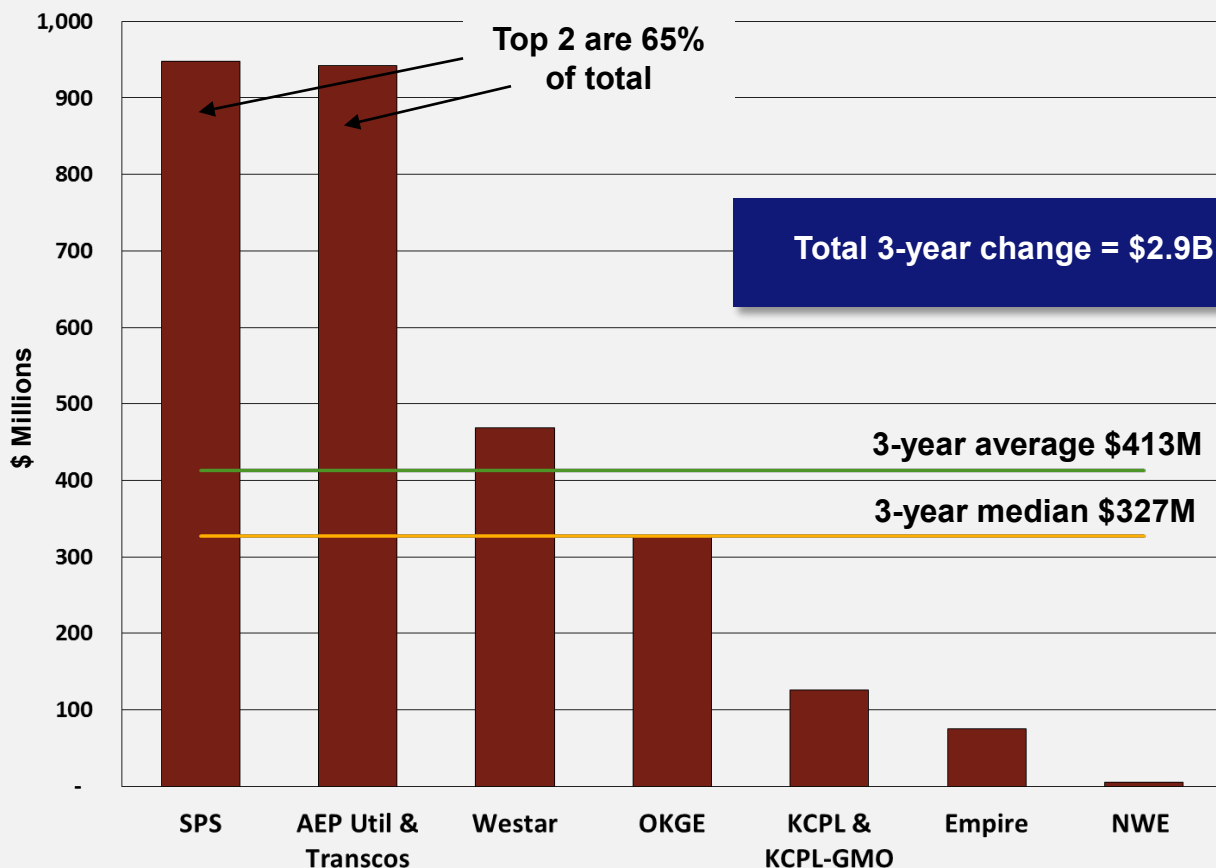
Given the previously mentioned drivers of investment, the financial attractiveness of transmission investment and the regulatory momentum, it is not surprising that transmission investment in SPP is expected to continue at high levels. The 2018 SPP 20-year Transmission Expansion Plan (STEP) consists of 445 upgrades with a total cost of about \$5 billion – of which approximately \$3.3 billion (two thirds) is forecasted to be spent from 2018 through 2024. In addition, the absolute increase in the number of utilities in SPP has driven high levels of investment. In 2011, there were 25 utilities filing a formula or stated rate in SPP for revenue recovery; now there are 49 utilities and there are prospects of that number increasing with the likely addition of the Mountain West Transmission Group (“Mountain West”).⁵ Once new companies

The 2018 SPP 20-year Transmission Expansion Plan consists of 445 upgrades with a total cost of about \$5 billion.

⁴ Source: *ibid*

⁵ Source: *SPP RRR Attachment H files from 2011 and 2018.*

Figure 3
Change in Gross Transmission Plant Balance for SPP IOUs and Transcos (2014-2017)⁸



join an RTO, they tend to increase their transmission investment, particularly if they are part of a joint pricing zone whereby all load in the zone picks up the costs of new transmission investment.

Looking at the change in gross transmission plant over the past three years⁶ provides a good proxy for the levels of transmission capital investment for individual SPP transmission owners.⁷

The analysis in Figure 3 shows the change in gross transmission plant for SPP

⁶ Sources: SPP Member-Related Postings of formula rate templates. Shows the change in the gross transmission plant and CWIP from 2014 to 2017 (three-year change). For example, the 2017 gross transmission plant balance and CWIP in rate base for Empire District was submitted in May, 2017 for the rate year beginning July, 2017 and is based on year-ending 2016 financial data. This data is compared to the previous year's submitted gross transmission plant balance and CWIP in rate base to calculate a proxy for transmission investment for 2017.

⁷ Analysis does not include joint action agencies, public power districts, T&D cooperatives and municipals due to small sample size and/or insufficient number of data years available. In future years, MCR expects to expand the sample to more public power entities.

⁸ IOUs and Transcos are categorized together, because the SPP Transcos are mostly owned by IOUs and/or are profit-making entities. Transmission gross plant compared is rate year 2014 vs. rate year 2017 (i.e., the changes from 2014 to 2015, 2015 to 2016, and 2016 to 2017).



IOUs and Transcos was \$2.9 billion over the last three years.⁹ Xcel-Southwest Public Service (“Xcel-SPS”) and the AEP companies, consisting of Public Service of Oklahoma and the AEP West transmission companies (AEP Oklahoma Transmission Company and AEP Southwestern Transmission Company) had the largest change in gross transmission investment at \$947 million and \$942 million, respectively, or about two-thirds of the change in total investment for all IOU/Transcos in SPP from 2014 to 2017. The average change in gross transmission plant for all seven IOUs/Transcos in SPP over this time period was \$413 million, or about \$138 million per year. The median three-year change in transmission investment is lower at \$327 million, reflecting the dominance of Xcel-SPS and AEP. As way of comparison, this is \$100 million lower than MISO’s IOU/Transco median of \$427 million over the same three years.

The three-year percentage change for IOU/Transco transmission investment in SPP was a strong 31%, demonstrating IOU’s belief that transmission investment continues to be an important driver of earnings growth. There was a 9% overall change in the total transmission gross plant balance for SPP IOUs/Transcos in 2017 compared to 2016 with a median increase for the companies of 7%.

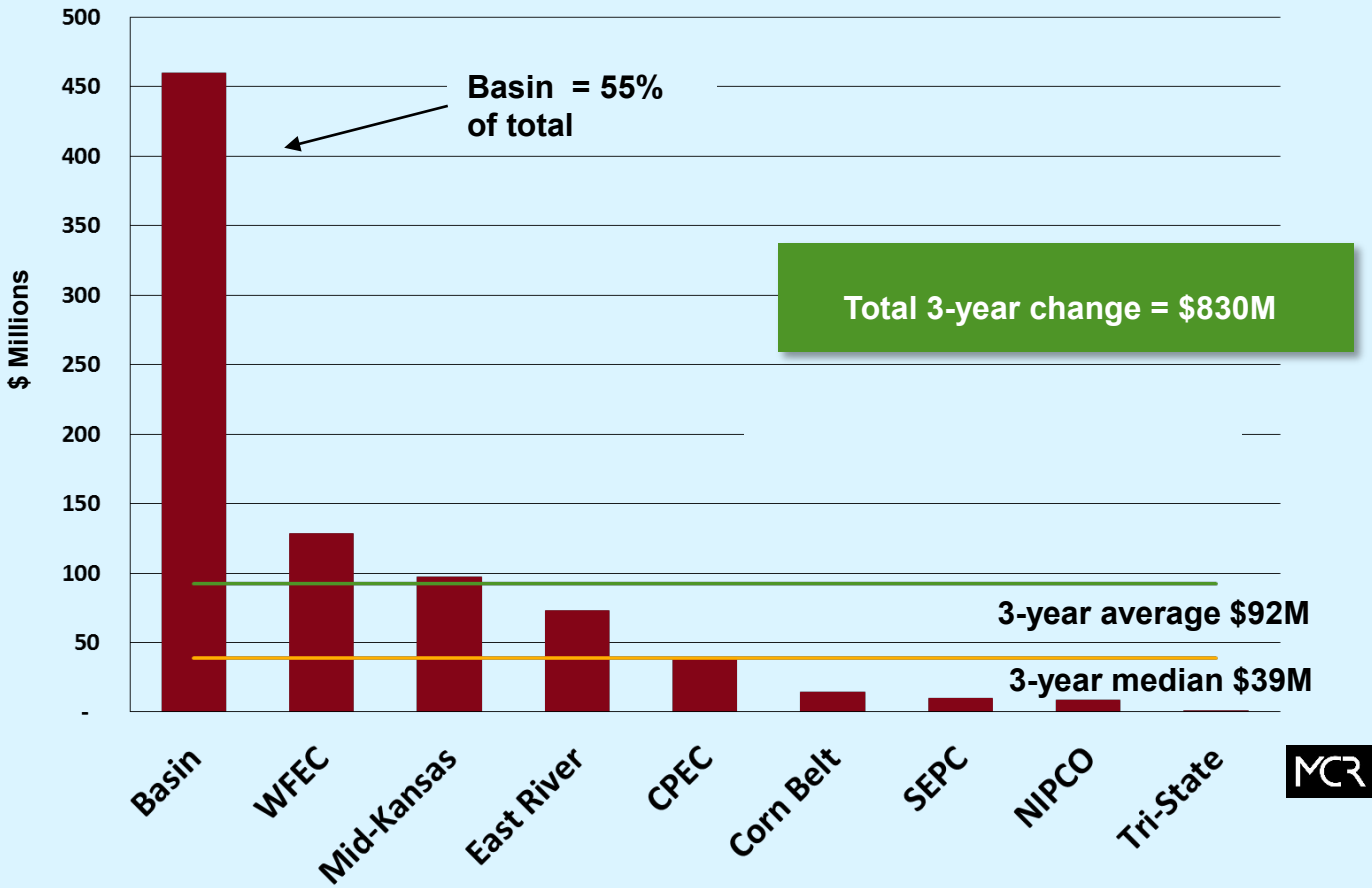
Figure 4 (on the next page) shows that G&Ts had a three-year dollar change in gross transmission plant of \$830 million. Basin Electric Power Cooperative (“Basin”) in the Upper Missouri Zone (“UMZ”) led with \$460 million, or about 55% of the G&T total. The average increase in transmission investment was \$92 million (about \$31 million per year). The three-year median was much lower at \$39 million, reflecting Basin’s concentration. Still, the median three-year percentage increase in investment of all G&Ts in SPP was a very healthy 36%. The dollar change is very close to MISO’s G&T median increase of \$36 million over the same three years, which represented a 20% increase. Looking at 2017 only, the total gross transmission plant for G&Ts in SPP was 23% higher with Basin having a whopping 50% increase over 2016 levels.

Thus, transmission investment for IOU/Transcos and G&Ts in SPP over the last three years shows total IOU and Transco dollar investment of 3.5 times the total G&T investment (\$2.9 billion vs. \$830 million).

The median three-year change in transmission investment is lower at \$327 million reflecting the dominance of Xcel-SPS and AEP.

⁹ Source: SPP Member-related postings of formula rate templates. Does not match annual capital expenditures, because gross plant includes transfers and retirements. Transfers could, for example, include a reclassification of distribution plant as transmission. Only includes changes in CWIP that are in rate base.

Figure 4
Change in Gross Transmission Plant Balance for
SPP G&Ts (2014-2017)¹⁰



G&Ts in SPP had an impressive 55% increase in gross transmission plant since 2014.

Figure 5 (on the next page) shows the comparison of gross transmission plant for IOU/Transcos vs. G&Ts over the three-year period. As a group, G&Ts had an impressive 55% increase in gross transmission plant since 2014 compared to IOUs/Transcos, which had a lower, but still substantial 31% increase. Again, Basin led the way with an astounding three-year increase of 90%. Excluding Basin, the G&T increase was still a notable 37%, higher than the SPP IOU/Transcos and higher than the MISO G&Ts' growth of only 21% over the same three-year period.

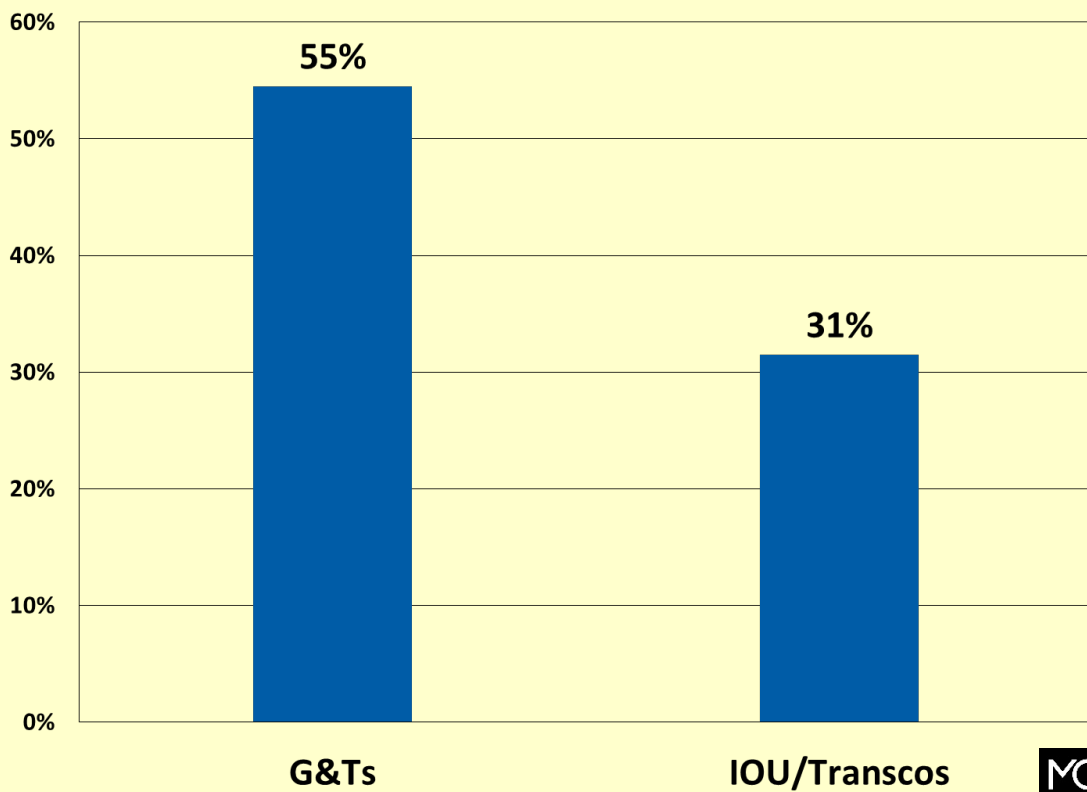
After Basin, Mid-Kansas and Western Farmers had the next largest three-year percentage increases at 21% and 14%, respectively. The median single-year percentage increase in 2017 for G&Ts, however, was much lower at 6%, indicating a bit of a slowdown in transmission investment spending for many G&Ts in the last year of the three-year period.

Varying Levels of Investment Intensity

Looking at these growth rate differences from a different angle, Figure 6 shows

¹⁰ *Ibid*

Figure 5
Cumulative 3-Year Percentage Change Compared to 2014 Ending Balance for SPP Transmission Owners¹¹

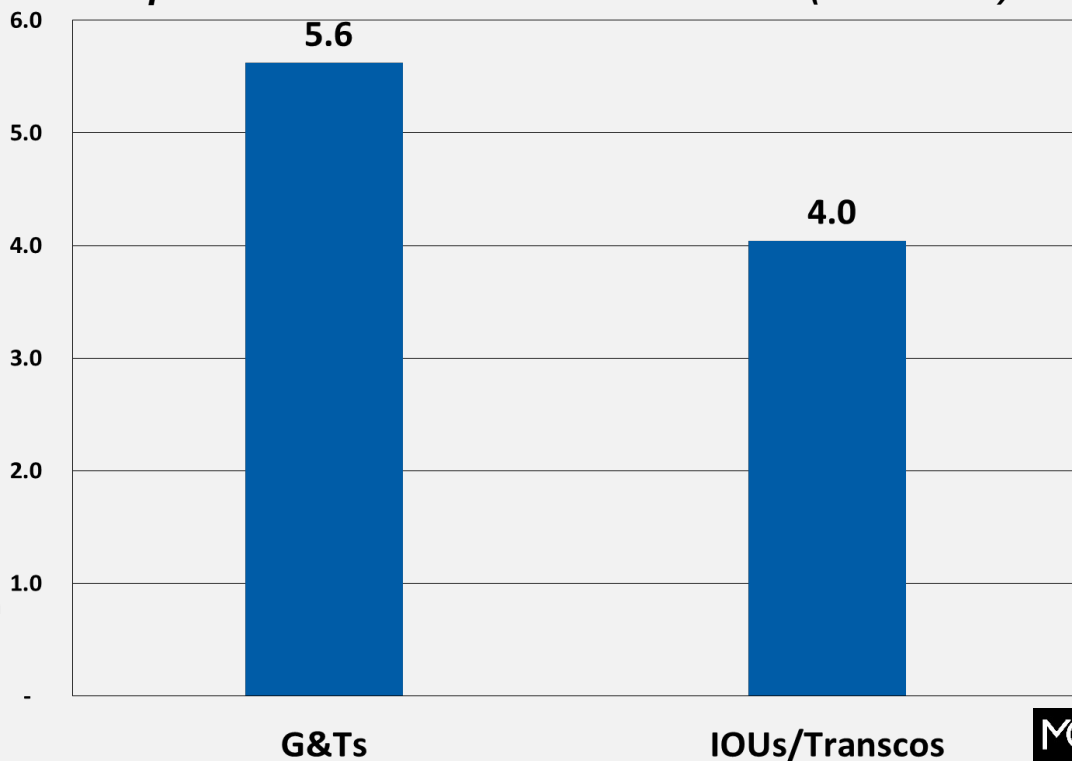


Note: Figures are weighted averages of each group. Simple averages are lower at 39% and 28%.

¹¹ Source: 2014-2017 SPP Formula Rate Templates and annual reports. Based on percentage change in gross transmission plant and CWIP in rate base.



Figure 6
Investment Intensity—Change in Gross Transmission Plant Balance Compared to Depreciation Expense for SPP Transmission Owners (2014-2017)¹²

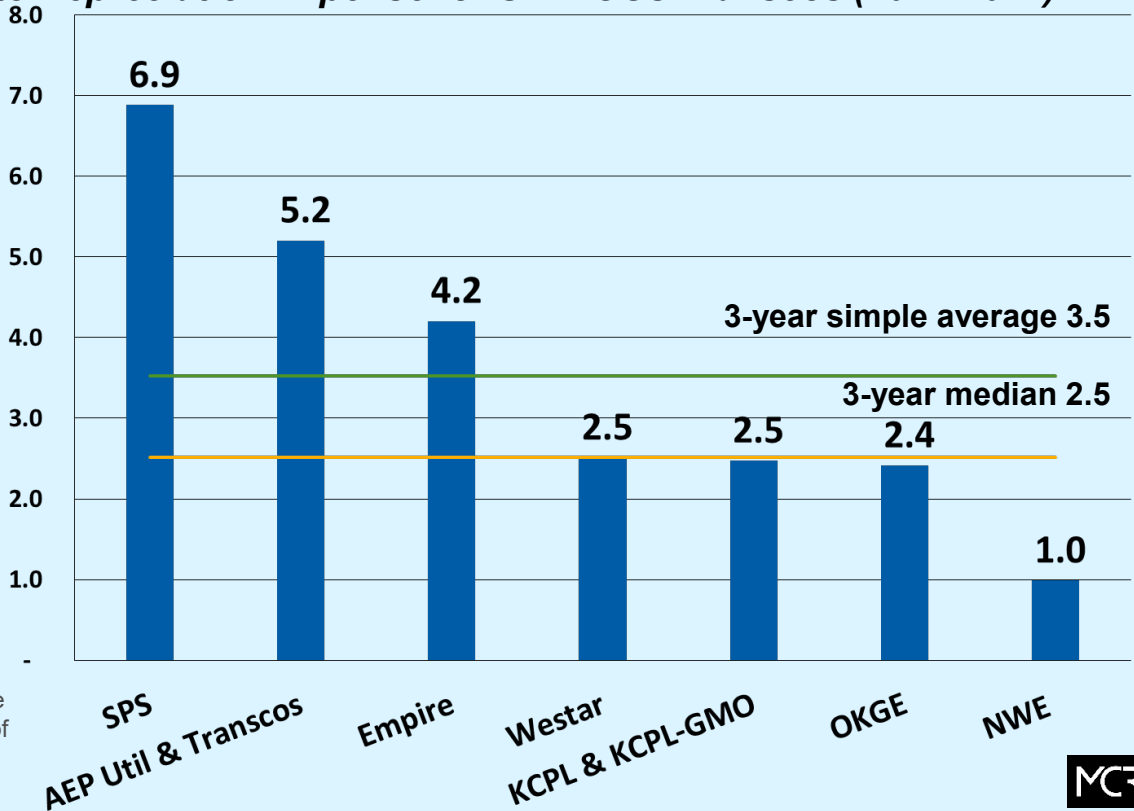


Note: Figures are weighted averages of each group. Simple averages are lower at 4.4 and 3.5.

¹² Source: SPP Formula Rate templates and annual reports. Shows total three-year change in transmission gross plant and CWIP in rate base divided by sum of three years of depreciation expense.



Figure 7
Investment Intensity—Change in Gross Transmission Plant Balance
Compared to Depreciation Expense for SPP IOUs/Transcos (2014-2017)¹³



¹³ Source: 2014-2017 SPP Formula Rate Templates and annual reports. Shows total three-year change in transmission gross plant and CWIP in rate base divided by sum of three years of depreciation expense.



G&Ts as a group are investing at 5.6 times their transmission depreciation expense ... but only five out of the nine companies had ratios greater than 2.0.

the ratio of transmission investment to depreciation expense, or “investment intensity.” A high investment intensity ratio indicates that a transmission owner was building significant new facilities relative to existing net plant, or was replacing fully depreciated facilities.

Figure 6 shows that G&Ts as a group are making investments at 5.6 times their transmission depreciation expense, indicating that current levels of investment are very strong by historical standards. IOU/Transcos are lower with a ratio of 4.0, but still indicative of solid investment levels. By comparison, MISO IOUs/Transcos have a higher ratio of about 4.9, whereas G&Ts in MISO have a much lower ratio at 2.5.

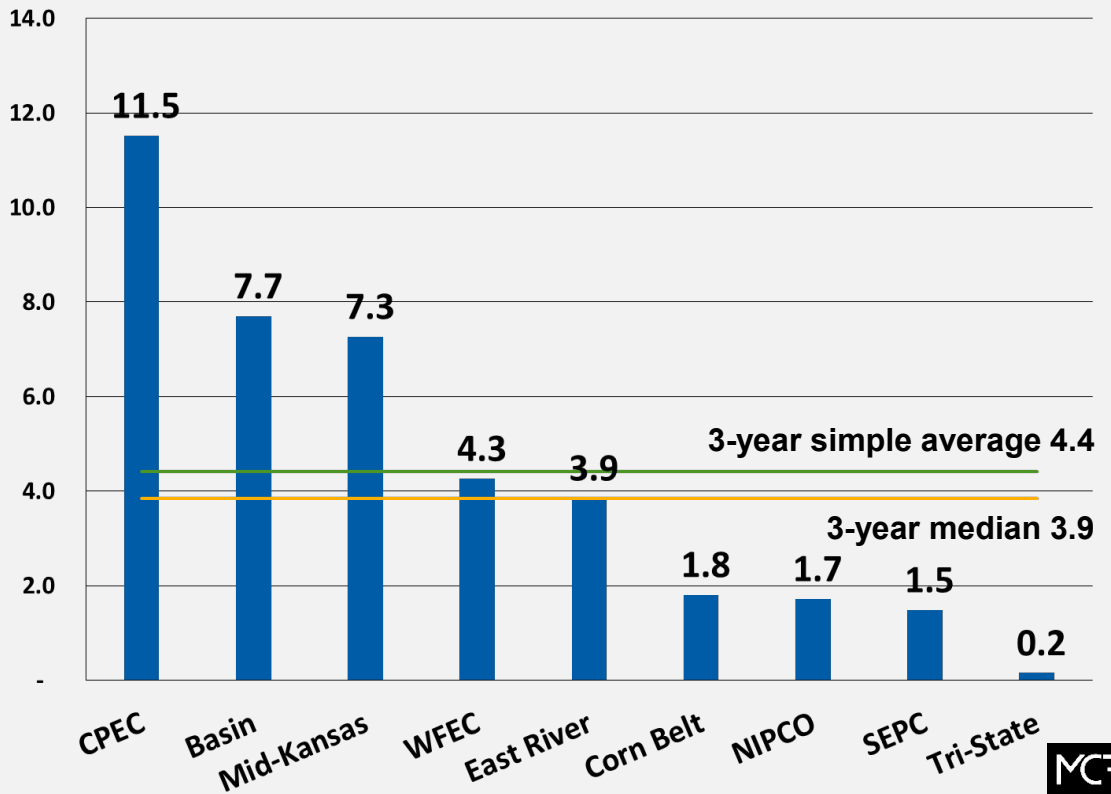
Figures 7 above and Figure 8 (on the next page) show the ratios by each SPP IOU/Transco and G&T, respectively. Six out of the seven IOU/Transcos had an investment to depreciation ratio higher than 2.0 with Xcel-SPS the highest at 6.9. Only five out of the nine G&Ts had ratios greater than 2.0 with Central Power Electric Cooperative having the highest ratio at 11.5.

Significant Age Differences in Transmission Facilities

Figure 9 on the next page shows the ratio of net transmission plant to gross transmission plant and provides an indication of the average age of a utility’s

Figure 8

Investment Intensity—Change in Gross Transmission Plant Balance Compared to Depreciation Expense for SPP G&Ts (2014-2017)¹⁴

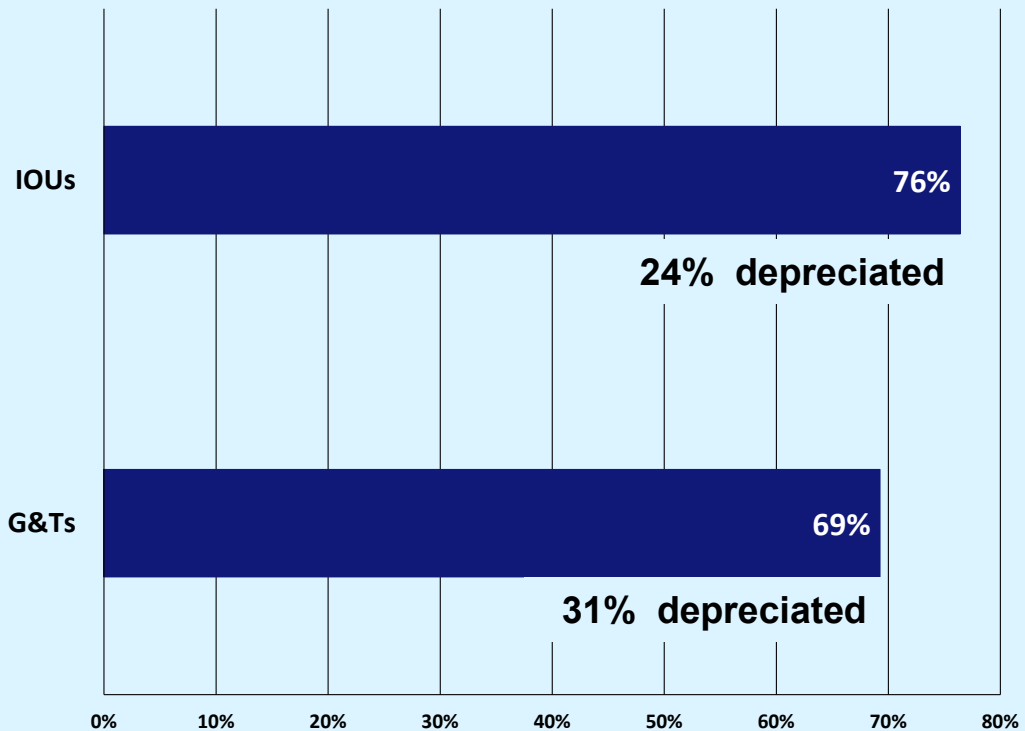


¹⁴ Source: 2014-2017 SPP Formula Rate Templates and annual reports. . Shows total three-year change in transmission gross plant and CWIP in rate base divided by sum of three years of depreciation expense.



Figure 9

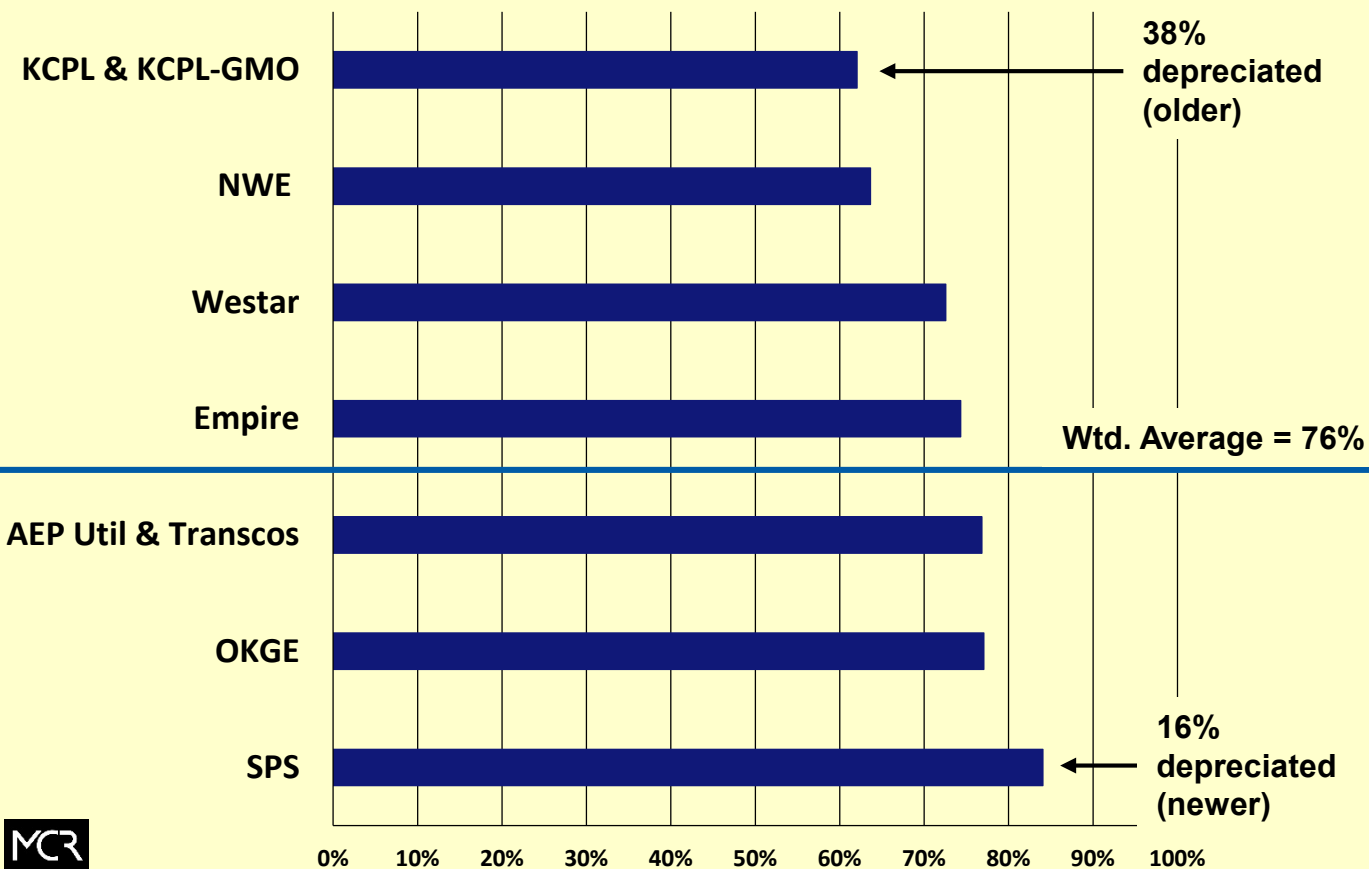
2017 Net Transmission Plant as a Percent of Gross Transmission Plant for SPP Owners of Transmission¹⁵



¹⁵ Source: 2017 SPP Formula Rate Templates.. Represents weighted averages for each group, e.g., total IOU and Transco transmission net plant divided by total IOU and Transco transmission gross plant and CWIP in rate base.



Figure 10
2017 Net Transmission Plant as a Percent of
Gross Transmission Plant for MISO IOUs and Transcos



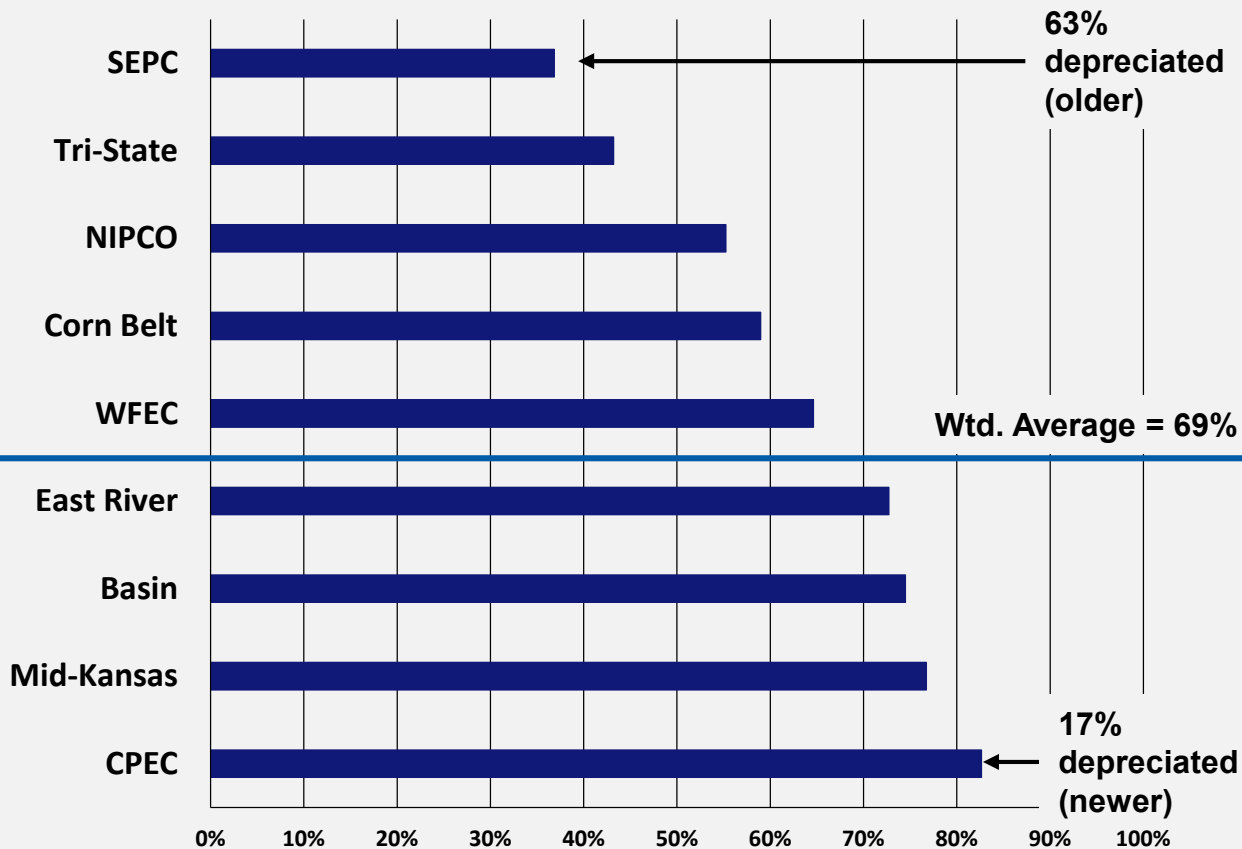
The differing ages of transmission is even more pronounced for G&Ts.

transmission facilities. Figure 9 indicates that G&T plant is more depreciated or “older” than IOU/Transcos. The actual difference in the age of the G&T facilities could be less as G&Ts tend to follow more aggressive depreciation rules based on RUS accounting. Indeed, the age difference becomes more stark when looking at individual companies. For example, Figure 10 shows the KCP&L companies have the oldest transmission plant (38% depreciated) whereas Xcel-SPS has the newest at only 16% depreciated.

Figure 11 (on the next page) shows that the differing ages of transmission is even more pronounced for G&Ts. Sunflower Electric’s transmission plant is the oldest (two-thirds depreciated) whereas Central Electric in South Dakota is only 17% depreciated, consistent with their high investment intensity discussed previously. Sunflower’s relative lack of investment could be partially explained by the fact that Sunflower is the only load in its pricing zone.

That is, generally speaking, a contributing reason to relatively low levels of investment may include receiving little or no “payments from others” for transmission investment and expenses. This contrasts to a utility that has a

Figure 11
2017 Net Transmission Plant as a Percent of
Gross Transmission Plant for SPP G&Ts



significant portion of its load in a joint pricing zone whereby its transmission costs are shared with others. Figure 11 indicates that transmission investment levels are not “saturated” and there is considerable room for many G&Ts in SPP to make additional investment, in the form of upgrades and/or replacement of aging facilities.

Investment Commensurate with Load Ratio Share

G&Ts represent about 22.6% of the 2017 SPP load for IOUs/Transcos and G&Ts (see Table 1 on the next page). G&Ts have correspondingly invested 22.3% of the total investment from IOU/Transcos and G&Ts over the last three years. Many G&Ts have recently stepped up their transmission investments and, as a group, are investing at approximately their load ratio share.

Individually, Mid-Kansas Electric, East River Electric, Central Electric and Basin have exceeded their load ratio share over the last three years. The recent surge in G&T investment (55% increase over the last three years) has brought the group to be on par with IOU/Transcos on a load ratio share basis, providing some of them a means to mitigate (but not eliminate) the impacts of transmission rate increases. It is important to keep in mind that investing at

There is considerable room for many G&Ts in SPP to make additional investment, in the form of upgrades and/or replacement.

Table 1
Comparison of Change in Gross Transmission Plant Balance to Current Load Ratio Share for SPP IOUs/Transcos and G&Ts (2014-2017)¹⁶

	3-Year Change in Trans. Gross Plant Balance (Proxy for Cap Expenditures) (\$ Millions)	% of Total Gross Plant Change	Estimated 12 CP Load (MWs)	Estimated % of Total Load
IOU, Transcos	\$2,891	77.7%	26,686	77.4%
G&Ts	\$830	22.3%	7,804	22.6%
Total	\$3,721	100.0%	34,490	100.0%



load ratio share does not necessarily provide sufficient transmission revenue to offset the substantial transmission zonal rate increases if the G&T resides in a joint pricing zone with an IOU or Transco. That is, IOUs and Transcos have significantly higher revenue requirements than G&Ts, joint action agencies (“JAAs”) and many municipals for the same level of transmission investment. The revenue requirement will be higher for an IOU or Transco as compared to a G&T because:

- IOUs and Transcos pay state or federal income taxes; and those costs are included in the IOU’s cost of service; whereas G&Ts do not pay income taxes.
- The typical equity ratio for an IOU or Transco is much higher than for a G&T, so the IOU or Transco’s weighted average cost of capital, which is also referred to as the overall rate of return, is higher.
- The cost of incremental long-term debt can be higher for an IOU or Transco, particularly if the G&T finances through the RUS.

Thus, for the same investment, and assuming the same ROE, the typical IOU/Transco’s revenue requirement is about 35% to 40% higher than the typical G&T, even with the recent reduction in the corporate tax rate.¹⁷ This means that

¹⁶ Sources: SPP Member-related postings of formula rate templates and annual reports, including 12 CP load supplemented as necessary from other sources.

¹⁷ See for example, MCR Point of View entitled: *The New Tax Law: Will a Lower Tax Rate for IOUs Impact the Advantage Public Power and Cooperatives Have in Transmission Investing?*

Many G&Ts have recently stepped up their transmission investing, and as a group, are making investments at their load ratio share.

even if the G&T has invested at its load ratio share, it still is faced with the higher revenue requirement from the IOU/Transco costs in the pricing zone. That is, the zonal tariff paid by the G&T will exceed the zonal tariff revenue received by the G&T. In order to be in a “neutral investment position,” a G&T residing in a joint pricing zone with an IOU or Transco must therefore invest at a rate higher than its load ratio share.

How Cooperatives and Public Power Can Create Value from Transmission Investment

As discussed previously, IOUs can create value for their shareholders through transmission investments that increase rate base, and in turn, create incremental earnings.

The business model of G&Ts, JAAs and municipals, of course, is much different than IOUs in that G&Ts and JAAs are owned by their members. For example, as discussed previously, generating higher earnings for a G&T does not necessarily create value for a member cooperative if the increased earnings are fully paid by its member owners—this is simply moving money from the “left pocket to the right pocket.” Ultimately, what matters is whether the cooperative or public power entity is creating real value for its members/customers from the investment.

If your utility is still examining whether it makes sense to move forward with transmission projects, it is useful to think about how value can be created for your members. While there is no “one size fits all” answer for all cooperative and public power utilities to create value from transmission investment, there are six common approaches that should be explored to determine the best fit given the utility's unique situation. These are:

1. Optimize and gain revenue from any existing transmission assets
2. Participate in new projects where other customers (beyond the investing utility's customers) also pay a portion of the transmission costs
3. Achieve higher returns from transmission investment vs. current cost of capital, so the difference can be used to help offset transmission rate increases
4. Enhance reliability at the local load level, not just at the regional backbone level
5. Improve access to wholesale markets to reduce power costs and/or to lower congestion costs

Cooperatives and public power can create value from transmission by pursuing the approach(es) that best fit(s) their unique situations.

6. Capitalize on public power and cooperatives having a lower revenue requirement than IOUs and Transcos by being a sole or major investor in all projects affecting their load

Let's take a more detailed look at each of these approaches.

1. Optimize revenue from existing transmission assets—Each G&T or public power entity, regardless if they are currently a transmission owner or contemplating it, should analyze its current distribution and sub-transmission assets to determine if there are investments that can be made to make existing assets eligible for transmission revenue recovery. These projects could include, for example, looping an existing radial line or upgrading a combination T&D substation.

2. Participate in projects where other customers pay a portion of costs—Cost-shared projects (e.g., SPP Balanced Portfolio projects) have been particularly attractive investments, because a large portion of the total costs are paid by other customers. However, these types of regional projects have begun to be competitively bid. Despite this, lower voltage, local reliability projects in a joint pricing zone can still be financially attractive, because the costs are paid by all customers in the pricing zone.¹⁸ The lower the percentage of load a company has of the entire load in the joint pricing zone, the more attractive their investment is, because other customers will pay a portion of the costs. This tends to be a key factor for cooperatives and public power to create value for their members/customers. Nevertheless, even if a utility has a relatively high percentage of the load in their pricing zone, it can still create value by some other ways discussed below.

3. Achieve returns higher than the cost of capital—Because cooperatives and public power currently have a very low incremental cost of capital (e.g., Rural Utilities Service (“RUS”) long-term debt can be less than 2% and public power “A” rated tax-exempt debt is about 3.50%), these utilities can produce substantial margin from a transmission investment. The larger the investment, the larger the dollar margin. The overall return is based on a weighted average of debt and equity. The percentage equity on the balance sheet is combined with the ROE and the percentage long-term debt is combined with the average, historical cost of debt. For example, a municipal with a 50% equity ratio, a 10.1% ROE and a historical average cost of debt of 4.5%, produces an overall municipal rate of return of about 7.3% vs. an incremental market cost of debt of only about 3.50%, resulting in a margin of 3.8%, which is very high in today's

¹⁸ This may not be the case if the participants in the zone have contractual true-up features with payments that equalize investment based on load ratio share or a grandfathered agreement exempts certain customers from charges.

The lower the percentage of load a company has of the entire load in the joint pricing zone, the more attractive their investment is, because other customers will pay a portion of the costs.

low interest rate environment. The margin from transmission investments can be used to help partially offset the rising transmission rates faced by all municipals. The same concept applies to cooperatives.

4. Enhance reliability at the local level—Cooperatives and public power can focus their investment to improve reliability for its members/customers. Although these utilities are paying for large, regional backbone cost-shared projects, these project benefits do not necessarily extend down to the local level to enhance reliability at the lower voltages (e.g., 69 kV, 115 kV or 138 kV). Examples of the types of reliability projects that can be undertaken to improve local reliability include:

- Looping a radial line and connecting to the SPP network
- Adding a substation and lines to create redundancy and mitigate a catastrophic scenario
- Re-conductoring an existing line and/or upgrading its voltage level
- Updating and/or expanding an existing substation
- Replacing poles/structures
- Investing in a new or spare transformer
- Deploying fiber optics for transmission purposes

5. Improve wholesale access and/or lower congestion costs—Cooperatives and public power and can participate in projects in their zone to better interconnect to the SPP network in order to provide a more liquid market that can lower overall power supply costs in the RTO. Providing multiple feeds improves reliability and can reduce congestion on a nearby line or potential overloading of a substation.

6. Lower revenue requirements for the same transmission—As discussed previously, most cooperatives and public power have a significant revenue requirement advantage over IOUs and Transcos when contemplating the same investment. Thus, it nearly always makes sense for the cooperative or public power entity to make the investment serving its load, because it results in lower rates to all customers in the zone—it makes sense to own transmission rather than “rent.”


Moving Forward with Transmission Investment

There has been a significant increase in transmission investment in SPP by G&Ts in the last three years. However, the factors driving transmission investment are not abating and are thus continuing to open up new opportunities for additional investment. Each cooperative or public power entity

The margin from transmission investments can be used to help partially offset rising transmission rates.

**Transmission costs
have become a
more significant
portion of the
customer's total
power bill.**

should determine its “rightful share” of transmission investment and understand the opportunities to create value for its members/customers. Upgrading an aging transmission system and obtaining a rightful share of new transmission has become imperative as industry factors continue to drive increases in transmission rates and transmission costs become a more significant portion of the customer’s total power bill.

Given the potential for many G&Ts and public power entities to have highly depreciated existing transmission investments and lower cost investment opportunities, there exist many reasons for cooperatives and public power entities to continue to expand their transmission investments, particularly for those transmission owners that have lagged behind in investment and are in a joint pricing zone. IOUs and Transcos are continuing to invest at high levels and will therefore persist in creating a need for cooperatives and public power to identify ways to mitigate rate increases and create value for their members and customers through increased transmission investment. 

APPENDIX

Drivers of Transmission Investment

The need for additional transmission investment across the US is being driven by many policy and operational factors, including those listed below.

Renewables Standards: Wind and Solar—The US and individual states have promoted the development of renewable energy, especially wind and solar, through tax credits and renewable energy standards. Wind generation and central solar farms are generally located a considerable distance from population centers where the energy is needed, thus requiring significant transmission capacity.

FERC Policies—The Federal Energy Regulatory Commission (“FERC” or “Commission”) has promoted investment through the development of Regional Transmission Organizations (“RTO”) with coordinated transmission planning, formula rates, postage stamp pricing^{A1} joint pricing zones and the granting of relatively high returns on equity (“ROEs”) in a low interest rate environment. It has been FERC’s general policy to set transmission returns at levels at least as high, if not higher than state levels. In addition, the Commission has granted various rate incentives to encourage new projects and the formation of dedicated Transcos. These incentives have included granting a hypothetical capital structure to increase the level of equity, incentive ROE adders, allowing construction work in progress (“CWIP”) in rate base, recovery of abandoned plant costs, and establishing regulatory assets for new entrants.

NERC Reliability Standards—Utilities must adhere to North American Electric Reliability Corporation (“NERC”) transmission planning reliability standards, which have been reinforced over the last 10 years, thus requiring a continual focus on reliability and ability to manage contingent events. Changes in compliance requirements, revisions to the definition of Bulk Electric System (“BES”) and required upgrades in transmission planning modeling and hardware have increased investment requirements. Significant reinforcement of substation or transmission lines may be required to correct “N-1” contingent conditions (i.e., a sequence of events consisting of the initial loss of a single transmission component, followed by corrective system adjustments).

NERC Physical and Cyber Security Requirements—NERC has become much more stringent in critical infrastructure protection standards. This change has required additional physical investment in substation security and cyber

^{A1} Postage stamp pricing allocates the project costs across all entities; it thus encourages individual utilities to invest, because customers other than their own will pay a portion of the costs.

security. The interdependency of the internet and the constant threat of cyber-attacks have vastly raised the bar for utility's and RTO's computer systems to withstand cyber threats. NERC's Critical Infrastructure Protection Reliability Standards (Version 5) specify, for example: 1) the need to protect certain transmission stations, substations, and their associated primary control centers; 2) consistent and sustainable security management controls to protect BES cyber systems against compromise that could lead to instability in the BES; and 3) special protection systems that support the reliable operation of the BES, such as protective relays and circuit breakers.

Replacement of Aging Facilities—Although load growth has been modest recently, there was a pent-up demand to enhance reliability resulting from an environment of rate freezes and minimal transmission investment in the 1990s. Moreover, there was no regulatory framework for reliable cost recovery until the early 2000s when RTOs began emerging, which led to additional transmission investment through a structured approach to cost recovery. More recently, the emphasis on infrastructure and “upgrading the grid” gives added impetus and political cover to replace or significantly upgrade aging transmission assets.

Relief of Transmission Congestion, LMPs—The onset of RTOs and locational marginal pricing (“LMP”) that charge for transmission congestion provide an economic advantage to expand transmission in order to lower delivered power prices.

EPA Rules on Generation Retirements—Due to more stringent environmental rules from the Environmental Protection Agency (“EPA”), retirements of older coal units have created an additional demand for changes in transmission to help maintain voltage levels and grid stability.

New Natural Gas Plants—Inexpensive natural gas prices combined with the impact environmental rules had on coal plants have contributed to the rise of new natural gas plants as a major power supply source. These new plants may be sited in locations without adequate transmission, thus prompting new transmission investment.

ABOUT THE AUTHORS



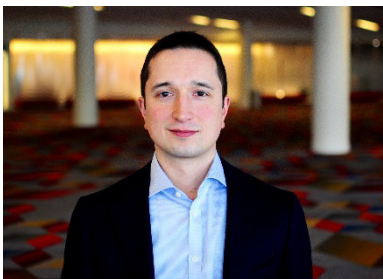
Jim Pardikes is a Vice President at MCR and leads the Transmission Strategy Practice. He has over 30 years of experience consulting to the utility industry, including G&Ts, public power and IOUs. His expertise includes electric transmission cost recovery, public power cost of capital and capital project economic evaluation. Jim has extensive

experience in providing expert transmission testimony for public power utilities and G&Ts, facilitating client working teams and presenting to executive management and Boards of Directors. Jim has written extensively on transmission-related topics, such as factors in RTO membership, the value of transmission investments and making the case for transmission incentives. Jim can be reached at jpardikes@mcr-group.com.



Ron Kennedy is a Director with MCR. He has 18 years of experience in consulting to the utility industry, including G&Ts, public power and IOUs. His expertise includes development and review of formula rate transmission cost data, RTO protocol compliance, FERC filings for Section 205 rate changes and transmission rate incentives, economic evaluation of RTO

membership, and financial and risk evaluation of major transmission projects. Ron is experienced in presenting to executive teams and Boards of Directors. Ron can be reached at rkennedy@mcr-group.com.



Chris Nagle is a Consultant with MCR. He has over a decade of experience in transmission proceedings, rates and regulatory affairs. His expertise includes rate development, cost recovery, cost allocation and the development and review of transmission formula rates. Chris has helped G&Ts and public power entities evaluate the benefits of RTO membership and to determine how

cost recovery will look as a member of an RTO. He has testified as an expert witness before state public service commissions. Prior to joining MCR, Chris held numerous positions in rates and cost allocation at a major electric utility. Chris can be reached at cnagle@mcr-group.com.

ABOUT THE MCR TRANSMISSION STRATEGY PRACTICE

MCR provides strategy support to G&T and T&D cooperatives, joint action agencies and municipals in various RTOs/ISOs with a focus on finding value for our clients. Our services:

Formula Rate and Cost Analysis

- **Development of Annual Transmission Revenue Requirements (ATRR) for New Transmission Owners (TOs).** MCR develops cost data to support full RTO revenue recovery, which involves, for example, developing MISO's Attachment O, and Attachment H in SPP and PJM.
- **Formula Rate Review for Existing TOs.** MCR reviews costs for formula rate filings to optimize revenue, properly record costs and withstand stakeholder scrutiny.
- **Challenge to Incumbent/IOU Formula Rate Costs.** MCR reviews neighboring utility transmission costs to ensure adherence to protocols and formula rates.
- **Staff Education Workshops.** MCR conducts workshops to educate client staff on the development and optimization of transmission formula rates.

FERC Filings

- **Section 205 Rate Filing Support.** MCR provides expert testimony for ATRR filings, including new transmission formula rates or changes to an existing formula rate.
- **Cost of Capital Expert Testimony.** MCR provides expert testimony and analytics to support proposed cost of capital requests of public power and cooperatives.
- **Transmission Incentive Rate Filings.** MCR provides expert testimony and supporting analytics for incentive rate applications, including CWIP, hypothetical capital structure, abandoned plant and regulatory asset.
- **Intervention and Mediation Support.** MCR provides analytical and intervention support during intervention, settlement, mediation and hearing.
- **Reactive Power Revenue Filings.** MCR provides testimony and analysis to support recovery of reactive power costs.

Strategic Analysis

- **Development of Transmission Business Plan.** MCR works with clients to define issues, goals, strategies and project opportunities, providing analytic support.
- **Economic Evaluation of Transmission Investment.** MCR determines economics, risks of new investment, or sale/purchase of existing assets.
- **Evaluation of RTO Membership.** MCR conducts economic and risk analysis to determine the cost-benefit of becoming a TO.
- **Analysis and Development of Negotiating Strategies.** MCR provides analytical support to clients in negotiations with IOUs.

SAMPLING OF MCR TRANSMISSION KNOWLEDGE PIECES



MISO's New Cost Allocation Process How will Public Power and Cooperatives Fare?



Pulling the Transmission Trigger Evaluating MISO Transmission Ownership for Municipal Agencies and G&Ts

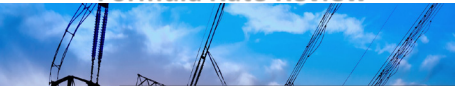


Are You Leaving Transmission Revenue on the Table? A New Form of Migration—Changing from a Stated Transmission Rate to a Formula Rate in SPP



Transmission Strategy
Services

MISO Attachment O Formula Rate Review



Transmission Strategy Services



Helping
transmission
protect the



Helping public power utilities and cooperatives
in MISO realize the **full revenue potential**
from their transmission assets



POINT OF VIEW

Are You Leaving Transmission Formula Rate Money on the Table?

Over the last decade, most public power and cooperative utilities have seen substantial increases in transmission rates.¹ In response, some of these utilities have placed their assets into Regional Transmission Organizations ("RTOs") in order to gain recovery of transmission revenue from RTO ratemakers and to help mitigate these increases. Oftentimes, however, not considered and/or taken a

Through MCR's experience de over 85 transmission formula r Attachment O, SPP Attachment H) for its public power and coo have noticed a recurring theme not taken the time to optimize revenues. The reasons for less typically fall into one or more o

1. Business conditions of the have changed since their originally developed.
2. Business processes and r systems are not conducting separate transmission cost generation costs; and the adequately reported in the

¹ See MCR white paper, Running Tra October 2016.

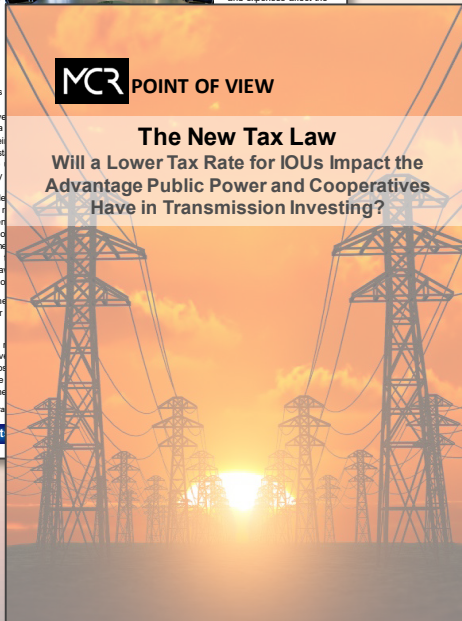
MCR's industry expert



POINT OF VIEW

The New Tax Law Will a Lower Tax Rate for IOUs Impact the Advantage Public Power and Cooperatives Have in Transmission Investing?

3. There is incomplete knowledge of how assets and expenses affect the



MCR PERFORMANCE SOLUTIONS

www.mcr-group.com

Tel: 847.562.0066

Fax: 847.562.0077

155 N. Pfingsten Rd., Suite 155
Deerfield, IL 60015