Grid Strategies

A Case for Interregional Evaluation of the MISO-SPP Northern and Central Seam

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EXECUTIVE SUMMARY

Greater transmission connectivity across the Midwest and Great Plains could improve system reliability and resilience, expand access to lower-cost generation, increase transfer capability, and make more effective use of existing and planned infrastructure. Yet identifying promising interregional transmission solutions is only part of the challenge. Delivering tangible benefits to ratepayers requires planning processes that can rigorously evaluate alternative solutions, quantify a broad set of cross-regional benefits, and advance cost-effective projects all the way through regional approval processes and to construction.

The Midcontinent Independent System Operator (MISO) and Southwest Power Pool (SPP) have made progress toward this goal, moving beyond largely independent regional planning processes to undertake coordinated interregional studies. Over the past two years, MISO and SPP have undertaken a robust 2024–2025 Coordinated System Plan (CSP) focused on the southern portion of their shared boundary, or "seam," spanning Oklahoma, Arkansas, northeastern Texas, and Louisiana. The scope of the study evaluated economic, reliability, and transfer needs and developed proposed "immediately actionable transmission system enhancements" to improve system reliability and resilience.[1] Although the study is still underway and the projects it identified require further evaluation and stakeholder approval, the 2024–2025 CSP represents a meaningful evolution in the Regional Transmission Organizations' (RTO) joint planning capabilities and offers important lessons for future coordinated studies, especially the need for an expanded benefits framework for evaluating interregional transmission solutions.

Beginning in late 2026, MISO and SPP will scope the 2026 CSP, creating an opportunity to apply lessons from the 2024–2025 CSP and ongoing reforms to regional planning frameworks. To inform this effort, this report examines the RTOs' regional transmission expansion plans, emerging system needs across their shared seam, and lessons from recent interregional planning efforts. Key findings include:

1. **MISO and SPP have invested in regional large-scale, high-capacity transmission systems that are geographically proximate.** MISO and SPP have both approved regional 765 kilo-Volt (kV) systems where lower-voltage improvements could no longer cost-effectively meet the need for increased transfer capacity while resolving congestion and reliability issues. In both regions, planners evaluated multiple voltage classes and concluded that 765 kV solutions most effectively addressed the identified transmission needs. Both MISO and SPP's planned high-capacity transmission system expansions are converging geographically along their seam (see Figure ES-1).

1 SPP-MISO Interregional Planning Stakeholder Advisory Committee (IPSAC), "SPP-MISO Coordinated System Plan (CSP) Kick-Off and Discussion," September 9, 2024, p. 7, https://cdn.misoenergy.org/20240909%20MISO-SPP%20IPSAC%20Meeting646409.pdf.

2. **MISO and SPP have a unique opportunity to evaluate high-capacity interregional transmission solutions.** Planning studies identify congestion, thermal violations, low-voltage conditions, and other transmission needs across the northern and central seam. These needs are compounded by substantial anticipated generation and load growth. Together, these conditions create an opportunity for a coordinated evaluation to assess whether interregional extra-high voltage (EHV)[2] transmission could complement both MISO and SPP's regional investments and more effectively address emerging system needs.

3. **MISO and SPP can apply Order No. 1920 regional planning improvements interregionnally.** In the 2024–2025 CSP, SPP and MISO only evaluated and monetized economic benefits associated with Adjusted Production Cost, leaving other potential benefits of the interregional transmission projects unquantified or unmonetized. With MISO and SPP implementing the requirements of Order No. 1920 regionally, the 2026 CSP provides an opportunity to apply a broader interregional benefits framework and evaluate projects using more comprehensive and consistent criteria with a common twenty-year planning horizon.

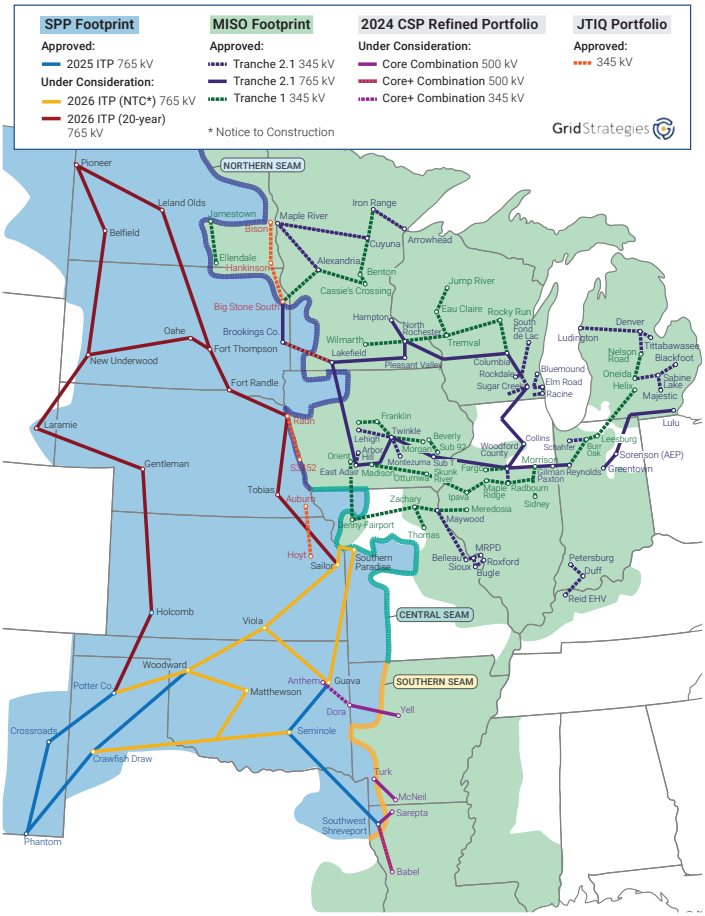


Figure ES-1. EHV and Selected High Voltage Regional and Interregional Projects in MISO and SPP. (Note: Facility locations may change as project development advances. A larger version of this figure is also available on page 9.)

2 SPP defines EHV transmission lines as those operating at or above 345 kV.

The convergence of geographically proximate regional transmission infrastructure, emerging drivers for greater connectivity across the seam, and the opportunity to scope a new interregional study creates a timely opportunity for MISO and SPP to optimize their regional infrastructure and expand its benefits through interregional solutions. This report offers four recommendations to inform the 2026 CSP scoping process.

Recommendation 1: Prioritize the Northern and Central Region of the MISO-SPP Seam

The 2026 CSP should prioritize the northern and central portion of the MISO-SPP seam as the primary study area. As described in Section II, this region is experiencing emerging load and generation growth, persistent transmission constraints, and increasing transfer requirements. At the same time, MISO and SPP are advancing major regional EHV transmission investments geographically proximate to the seam. This creates a unique and timely opportunity to evaluate whether joint interregional solutions could complement or enhance the value of each RTO's regional backbone grid.

Recommendation 2: Assess the Value of Interregional 765 kV and other EHV Solutions

Given the developing regional buildout of 765 kV and other supporting EHV infrastructure, generation expansion, and load growth throughout the northern and central seam, evaluating the potential opportunity to link the two regional 765 kV backbones across the seam is critical. MISO and SPP did not adopt 765 kV facilities as predetermined solutions. In both regions, planners evaluated muliple proposed transmission projects across various voltage classes before determining that 765 kV facilities offered advantages for addressing the identified transfer, reliability, deliverability, and voltage-support needs. The same analytical approach should be applied in the 2026 CSP, evaluating whether higher-capacity interregional solutions provide greater value than lower-voltage alternatives.

Recommendation 3: Leverage MISO and SPP's Regional Planning Process Reforms for Interregional Planning

The 2026 CSP will occur as both MISO and SPP are updating their benefits frameworks to comply with FERC Order No. 1920,[3] presenting an opportunity to use similarly long-range and multi-value planning methods for interregional transmission. The 2026 CSP presents an opportunity to better align interregional planning processes with the benefit metrics each RTO uses in its respective regional planning process. Order No. 1920's requirement to consider a twenty-year planning horizon also provides a basis for aligning the CSP with both RTOs' long-term regional planning processes. Accordingly, we recommend that the

3 FERC, "Order No. 1920 Compliance Filing Schedule," June 16, 2025, https://www.ferc.gov/news-events/news/order-no-1920-compliance-filings-schedule.

2026 CSP develop twenty-year blended models and evaluate candidate projects using the seven Order 1920 benefits.

Recommendation 4: Pursue Joint Operating Agreement (JOA) Revisions in Parallel With 2026 CSP Study

The JOA defines the CSP scope, benefits, and project selection framework. As detailed in Section III, the JOA can constrain the RTOs' ability to evaluate the benefits associated with interregional transmission solutions. MISO and SPP are in the process of updating the JOA, per the requirement of Order No. 1920 that transmission providers "revise their interregional transmission coordination processes to reflect the Long-Term Regional Transmission Planning reforms adopted in this final rule…[and] meet additional information sharing and transparency requirements with respect to their interregional transmission coordination processes."[4] MISO and SPP should pursue JOA revisions in parallel to the 2026 CSP study to allow them to fully assess the value of potential interregional transmission solutions, enable multi-benefit, multi-driver project types, and provide a clear path forward for qualifying projects to move from study to approval. Prioritizing these JOA changes prior to the conclusion of the 2026 CSP would ensure that projects demonstrating interregional value have a clear path from concept to approval.

4 187 FERC ¶ 61,068 at P11.

I. THE STATE OF REGIONAL EHV TRANSMISSION IN MISO AND SPP

Over the past several years, a convergence of issues has led both MISO and SPP to design EHV transmission infrastructure to meet reliability needs, accommodate new generation development, serve rapid load growth, mitigate congestion, and strengthen the reliability of the transmission system in the face of extreme weather events. In this section, we assess common drivers for new regional transmission in SPP and MISO and unpack the specific system conditions and projected changes driving the need for EHV infrastructure in MISO's recent Long-Range Transmission Plans (LRTPs) and SPP's recent Integrated Transmission Plans (ITPs).

The Emerging 765 kV Architectures in MISO and SPP Regional Planning

In both MISO and SPP, recent regional transmission planning studies have moved beyond incremental upgrades of the transmission system and toward large-scale 765 kV backbone infrastructure. These investments respond to a combination of rapidly growing load, geographically dispersed generation, and systemic thermal and voltage reliability violations that cannot be addressed by expansion of the lower voltage system. The resulting transmission expansion plans in both RTOs establish 765 kV backbones capable of supporting large energy transfers over long distances and relieve pressure on the underlying transmission system. Figure 1 is a map of MISO and SPP's recent regional and interregional portfolios.

Regional 765 kV Transmission Expansion in MISO

MISO has partitioned its LRTP process into "Tranches," with Tranches 1 and 2 covering the Midwest subregion. In the 2021 transmission expansion plan, MISO recommended eighteen Tranche 1 projects with in-service dates ranging from 2028 through 2030. The principal driver underlying the Tranche 1 projects was expansion of renewable generation throughout the MISO Midwest region and the need for transfer capacity to allow these generators to serve load. MISO states: "The LRTP Tranche 1 portfolio was developed to ensure that the regional transmission system can meet demand in all hours while supporting the resource plans and renewable energy penetration targets reflective of MISO member utilities' goals and state policies."[5] The key feature of the Tranche 1

5 MISO, "MTEP21 Report Addendum: Long Range Transmission Planning Tranche 1, Executive Summary," (MTEP21 Executive Summary), July 2022, p. 2, https://cdn.misoenergy.org/MTEP21%20Addendum-LRTP%20Tranche%201%20Report%20with%20Executive%20Summary625790.pdf.

projects is an extension of the Midwest region's 345 kV network to relieve loading on the 115 kV and 230 kV systems, resolve voltage and thermal violations, and increase transfer capacity from the west to load centers in the east while maximizing use of existing transmission right-of-way. MISO did not consider 765 kV solutions as part of Tranche 1.

In December 2024, the MISO Board of Directors approved twenty-four Tranche 2.1 projects.[6] Nine of the Tranche 2.1 projects are 765 kV projects that together form dual EHV paths connecting eastern South Dakota through MISO's Midwest region and linking with PJM's existing 765 kV system in Illinois and Indiana.[7] In the MISO West region, Tranche 2.1 was designed to resolve severe overloads, with MISO noting that under expected future conditions : "twenty percent of facilities are overloaded, curtailments exceed 15% and energy losses over transmission lines increase from 2.5% to 11%."[8] MISO's Central and East regions faced similar challenges at a lesser scale. These overloads were driven by the need to increase power transfer capability to load centers in Minnesota and Wisconsin; increased low-cost generation, especially wind, in North Dakota, South Dakota, and Minnesota; eastern Wisconsin congestion relief; and the need to support the network during contingencies.[9] MISO concluded that the (1) large transfer capacity need and (2) widespread voltage and thermal reliability issues can be most efficiently resolved by the EHV facilities in the Tranche 2.1 solution. While the 765 kV projects are the most notable elements of MISO's 2024 transmission plan, they are part of a portfolio of planned 345 kV regional and local projects that collectively address identified transmission needs.

In MISO's 2025 transmission plan, the core drivers evolve to resource adequacy, large load growth, and recent policy changes. MISO is addressing resource adequacy issues through a range of actions, including its Expedited Resource Addition Study (ERAS) process.[10] MISO identifies additions of 2.4 gigawatts (GW) of concentrated load in its West region, 4.3 GW of concentrated load in the Central region, and 4.9 GW of concentrated load in the South region as key drivers of the projects in the recommended 2025 transmission portfolio.[11] Policy changes and other factors have caused adjustments

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6 MISO, "MTEP24 Transmission Portfolio," (MTEP24 Executive Summary), December 2024, 20241212 Board of Directors Item 09a MTEP Executive Summary Appendix A Appendix F665158.pdf

7 MTEP24 Executive Summary, p. 13.

8 MISO, "MTEP 24, Chapter 2: Regional / Long Range Transmission Planning," December 2024, (MTEP24), p. 32, https://cdn.misoenergy.org/MTEP24720395.zip.

9 MTEP24, p. 76–77.

10 MISO, "Generator Interconnection and Retirement," September 2026, https://www.misoenergy.org/planning/resource-utilization/generator-interconnection/.

11 MISO, "MTEP25, Transmission Portfolio: Executive Summary," 2026, p. 8, https://cdn.misoenergy.org/MTEP25731615.zip.

to the projected generation portfolio. Three quarters of the 2025 transmission portfolio addresses load growth and local reliability needs. The 2025 transmission plan builds on the Tranche 2.1 portfolio, which MISO views as a critical component of its long-range transmission plans.[12]

Regional 765 kV Transmission Expansion in SPP

SPP's recent regional transmission planning studies propose adding a large network of 765 kV lines across the RTO's footprint. What began as a targeted response to concentrated load growth in its southern footprint has developed into a plan to design a large-scale, long-term 765 kV backbone network extending from North Dakota to New Mexico and Louisiana.

The 2024 ITP portfolio was the starting point. To serve concentrated load growth from the electrification of oil and gas operations in the Permian Basin, SPP approved its first-ever 765 kV project (Phantom—Potter—Crossroads) in New Mexico and the Texas panhandle. Accompanying 345 kV lines (Potter—Beckham County) provide access to additional sources of power for the new 765 kV corridor. The project resolves risks of voltage collapse in the region that 345 kV and 500 kV solutions could not resolve, and the companion 345 kV from Texas to Oklahoma provides an additional source of power for the 765 kV line.[13] The 2024 ITP also evaluated two extreme winter weather scenarios based on SPP's experience in Winter Storms Uri and Elliott. These models evaluated the effect of extreme winter weather on transmission and generation availability, system load, and import and export requirements.[14]

The 2025 ITP portfolio moved from the targeted 765 kV project of the 2024 ITP to a broader 765 kV overlay across SPP's southern subregion. As part of this planning study, SPP evaluated a 765 kV loop from New Mexico through west Texas and Oklahoma, extending to Louisiana. These projects support growing load, improve the region's ability to access low-cost generation in Kansas, and strengthen grid reliability and resilience. The proposed projects resolve "instability, low voltages, and congestion" in the Louisiana area.[15] Although the full southern overlay was not approved for construction in 2025, the study established a vision for SPP's future grid: a fully-interconnected 765 kV regional backbone, greatly expanding the RTO's regional transfer capability. As part of the 2025

12 MISO, 2026, p. 11.

13 SPP, "2024 Integrated Transmission Planning Assessment Report," Version 1.0, (ITP2024), January 24, 2025, p. 149.

14 ITP2024, pp. 51–56.

15 SPP, "2025 Integrated Transmission Planning: Assessment Report," Version 1.0, (ITP2025), November 25, 2025, p. 178.

ITP analysis, SPP built a "resiliency model" to assess impactful summer and winter weather events on load, the generation fleet, and the transmission system.[16]

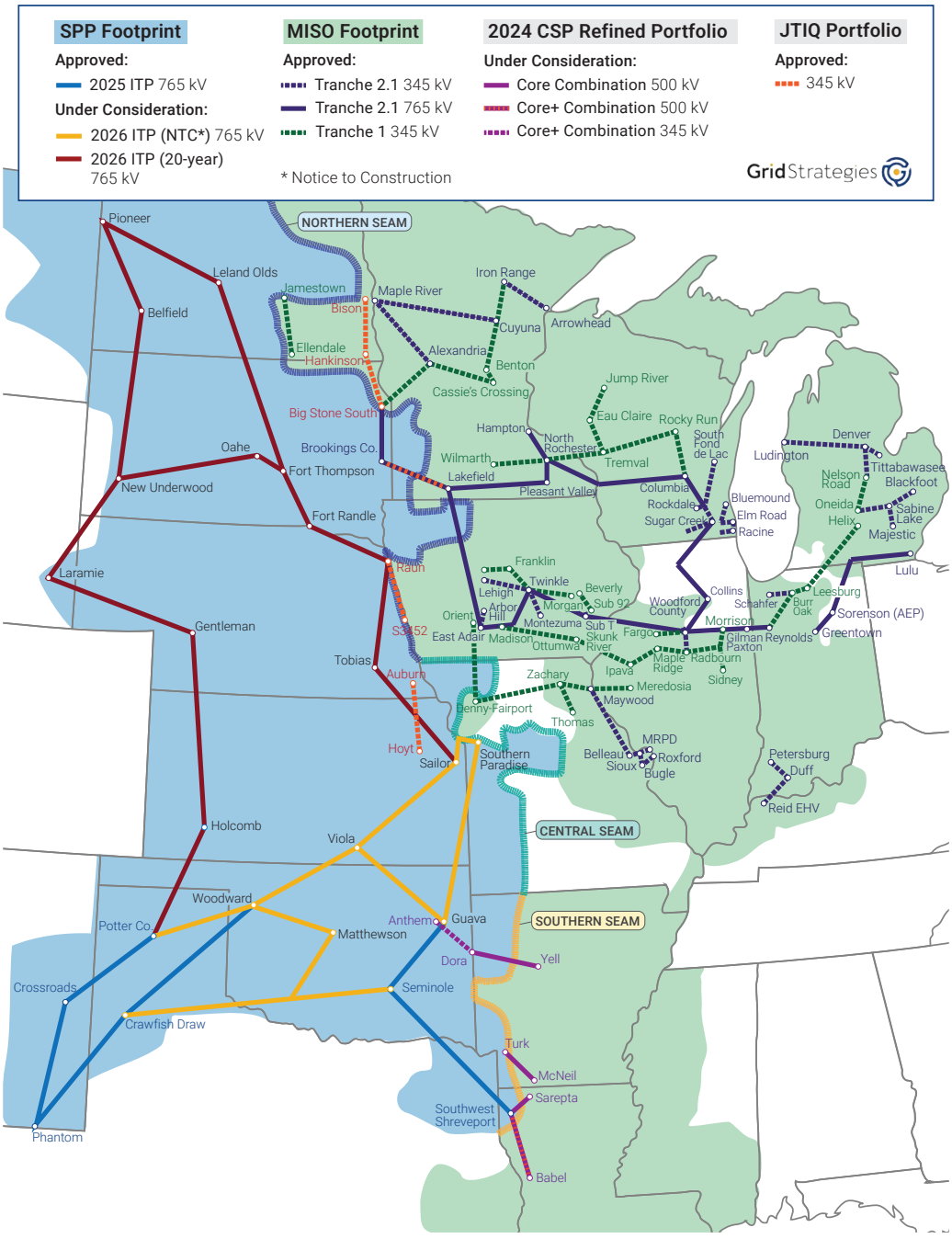
SPP is now in the process of finalizing its 2026 ITP portfolio. Through this twenty-year planning study, SPP envisions a 765 kV architecture extending from its southernmost region to North Dakota. The primary driver of transmission issues over the course of the twenty-year study is load growth. SPP's draft assessment shows that the existing transmission system is already constrained: Congestion has tripled since 2021 and is no longer localized but system wide. As a result, incremental upgrades are unable to accommodate anticipated load growth, and SPP proposes a 765 kV backbone spanning the entirety of its Eastern territory (see Figure 1).[17]

Whether the full portfolio of 2026 ITP transmission projects will be constructed remains uncertain, and their specific design details, routing, and termination points will likely be refined through future planning studies. Nevertheless, the 2026 ITP reveals a clear trajectory toward a regional 765 kV backbone.

16 ITP2025, pp. 78–86.

17 Raheem Sunny and Kirk Hall, "2026 ITP and SPP Transition Study," SPP Markets and Planning Operating Committee, September 11, 2026, pp. 12, 14.

Figure 1. EHV and Selected HV Regional and Interregional Projects in MISO and SPP. (Facility locations may change as project development advances.)[18, 19]



18 MISO and SPP have previously identified and addressed transmission challenges focused on generation interconnection along the northern and central seam through the Joint Transmission Interconnection Queue (JTIQ). Through the JTIQ, MISO and SPP approved four transmission lines and one facility upgrade facilitating the integration of 28.6 GW of generation, resolving reliability violations, and providing economic benefits to both RTOs; see MISO and SPP, "Joint Transmission Interconnection Queue Study: Executive Summary," March 2022.

19 MTEP24, p. 144; ITP2024; ITP2025; Raheem and Kirk, 2026; JTIQ Executive Summary; MISO-SPP IPSAC, "CSP Studies Update," August 14, 2026, p. 8.

A Layered Transmission Strategy: Integrating 765 kV and 345 kV Networks

MISO's and SPP's regional transmission plans illustrate how 765 kV and 345 kV infrastructure work together to meet evolving system needs. The 765 kV projects relieve pressure on the 345 kV and high voltage (HV)[20] network, and the 345 kV and HV network feed (and distribute) power to (from) the 765 kV backbone. Together, the portfolios of investments strengthen the existing network, address specific reliability and congestion challenges, and expand transfer capability.

Like MISO's Tranche 1, the 2024 and 2025 SPP ITPs include several 345 kV lines linking key parts of the region. The 345 kV network enhances west-to-east transfer capacity, helps the region meet energy needs in extreme winter weather, improves voltage stability, and resolves persistent congestion.[21] For example, two 345 kV lines from Kansas to Nebraska in SPP's 2025 ITP increase north-to-south transfer capacity and resolve 92% of the extreme winter weather voltage violations in the area.[22] A new 345 kV line from Laramie River, Wyoming through South Dakota and terminating in Belfield, North Dakota, relieves congestion throughout the region and provides a source of energy to the growing oil and gas industry in North Dakota.[23]

Collectively, the RTOs' development of a portfolio of EHV projects, such as combined 765 kV and 345 kV solutions, illustrates an important theme in MISO and SPP's transmission development strategies. The early response to growing transfers, increasing load, congestion, and voltage and thermal reliability concerns is expansion of the existing 345 kV network, incrementally improving network capacity as illustrated by MISO's Tranche 1. The larger 765 kV architectures emerge when system-wide transfer needs combined with widespread congestion and reliability issues require them, as exemplified by Tranche 2.1's proposed 765 kV projects across MISO West. Finally, 765 kV architectures are a response to rapid concentrated load growth, as exemplified by the emergence of 765 kV facilities in SPP.

20 We define HV transmission lines and facilities as those operating from 100 kV up to 345 kV.

21 ITP2025, p. 122–123.

22 ITP2025, p. 160.

23 ITP2025, p. 163.

II. EMERGING CONDITIONS ON THE MISO-SPP NORTHERN AND CENTRAL SEAM

The conditions that led MISO and SPP to pursue expansive 765 kV transmission architectures through their regional planning processes did not arise in isolation. As discussed in Section I, MISO's LRTP identified significant west-to-east transfer needs, congestion, generation curtailment, and reliability concerns across western portions of its footprint leading it to recommend 765 kV solutions from South Dakota through Minnesota and Iowa. SPP's recent planning studies have identified similar pressures—concentrated load growth, voltage-support limitations, deliverability concerns, and transfer requirements across its footprint—driving the development of a broader region-wide 765 kV overlay.

Many of these same conditions are emerging along the central and northern areas of the MISO-SPP seam. Increasing generation and load coupled with persistent transmission issues are placing greater demands on both regions' transmission systems. At the same time, both RTOs are planning to invest in increasingly capable transmission architectures located near each other. The geographic proximity of these regional systems, and the dynamics emerging along the seam create an opportunity to evaluate how the two systems could be better integrated and optimized.

Characteristics of the Northern and Central Seam

The northern and central portion of the MISO-SPP seam, including North Dakota, South Dakota, Minnesota, Nebraska, Kansas, Missouri and Iowa, connects major generation resources with growing load centers, and provides critical pathways for North–South and East–West power transfers.

Historically, the northernmost areas of the seam, particularly the Dakotas, are characterized by large geographic distances, relatively low population density, significant renewable-generation development, and large West-to-East power transfer needs. Much of North Dakota and South Dakota is physically distant from major population centers, requiring energy produced in these areas to be transported over long distances via large transmission corridors. Development of the Bakken shale region is driving load growth in North Dakota, and planners have repeatedly identified thermal overloads, congestion, and low-voltage concerns under both current and future system conditions, particularly in the Williston and Upper Missouri areas.[24] Many of these issues become more severe following contingencies and during winter weather.[25] In the 2024 and 2025 iterations of

24 ITP2025, pp. 207, 210, 212.

25 ITP2025, pp. 206–207; SPP, ITP2024, p 56.

the ITP, SPP responded to transmission needs in this area by strengthening the existing bulk transmission network through a combination of new 345 kV facilities and supporting 230 kV, 161 kV, and 115 kV reinforcements.

Western Minnesota, Iowa, and northeastern Nebraska host concentrated generation development, and contain critical paths for regional and interregional power transfer. Within SPP, Nebraska serves as an important network path for all North–South transfers. However, transfer limitations, voltage-support concerns, congestion, and extreme-weather reliability issues stress the transmission network in this area. On the MISO side of the seam, generation growth is highly concentrated on the border of Minnesota and the Dakotas (coincident with the planned Big Stone South—Brookings County—Lakefield Junction 765 kV line).[26] MISO's LRTP identified generation curtailment, congestion, transfer constraints, and growing West-to-East transmission requirements associated with large renewable-resource development across the western portion of the footprint.[27] In eastern South Dakota, particularly around the Brookings area, planning studies cite real-time low-voltage concerns.[28] To the East, Iowa provides a major source of renewable generation and a link into MISO's west-to-east transmission backbone.[29]

Closer to the central plains, Kansas and Missouri sit on a densely networked system that serves as an important transmission hub connecting western generation resources with growing regional load centers. Kansas links western generation resources with load centers throughout the region and provides a central connection point for SPP's emerging 765 kV architecture. Western and northwestern Missouri sit at the intersection of multiple transfer corridors and form an important interface between SPP and MISO. Given this area sits along major transmission corridors and, in Missouri's case, at the heart of the MISO-SPP interface, this region also faces persistent transmission issues, including transfer limitations and network congestion. Amidst this, Kansas and Missouri are seeing historic levels of load and generation growth that could increase regional transfer requirements and exacerbate existing transmission issues.[30]

26 See Appendix.

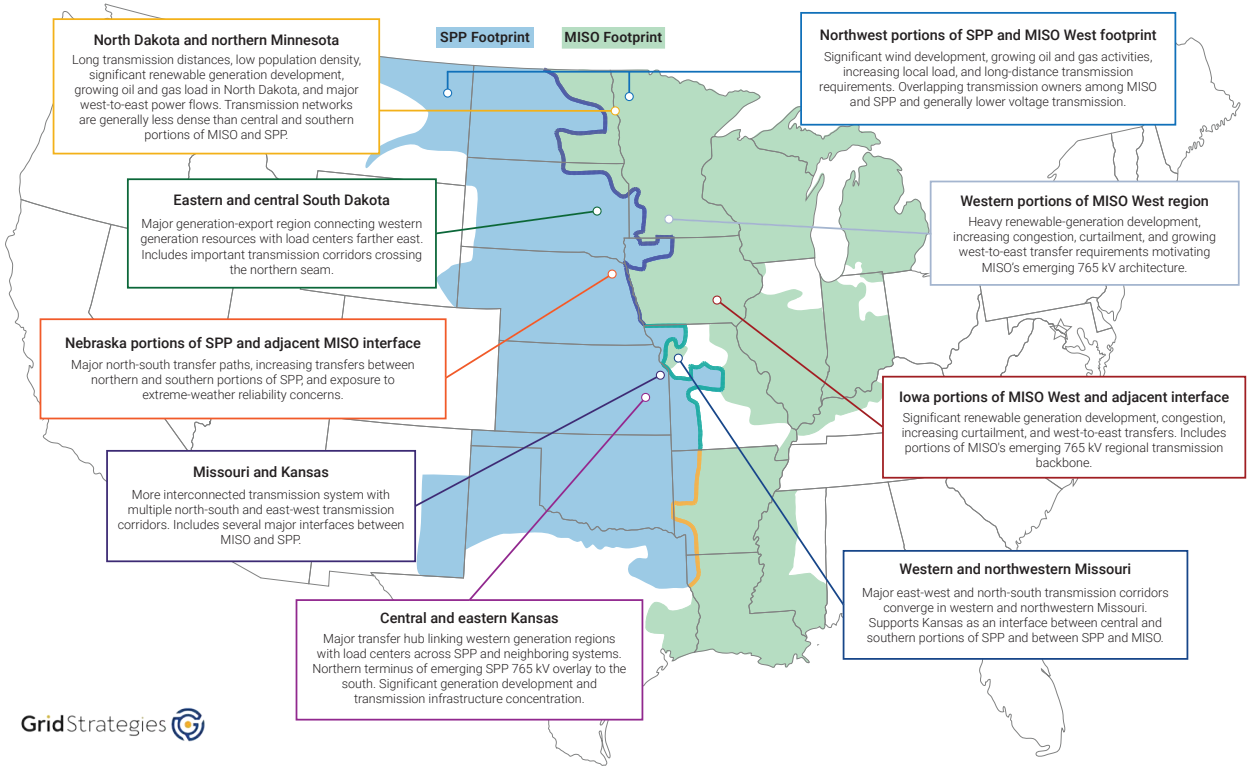
27 MTEP24, pp. 77–79.

28 ITP2025, p. 208.

29 MTEP 24 Executive Summary.

30 See discussion below.

Figure 2. Characteristics of the MISO-SPP Northern and Central Seam



Emerging Issues Along the MISO-SPP Northern and Central Seam

The northern and central MISO-SPP seam is facing a convergence of generation development and rapid load growth, in addition to existing transmission constraints. Together, these trends are likely to increase transfer requirements and place additional pressure on the existing network.

Generation development is reshaping power flows across the seam. An assessment of MISO's and SPP's generation interconnection queues (see Appendix) reveals that SPP dominates generation development in the central portion of the seam, with focused development in southeastern Nebraska and throughout Kansas. MISO dominates generation development in the northern portion of the seam, with much of it concentrated on the border of Minnesota and the Dakotas (proximate to the planned Big Stone South—Brookings County—Lakefield Junction 765 kV line). In addition to this concentrated generation growth, there is a broad geographic spread of active generation development across the region, which could result in increased loading on the existing transmission system.

Rapid load growth will compound these pressures. Both RTOs are forecasting substantial demand increases driven by data centers, industrial expansion, electrification, and energy-intensive oil and gas operations. MISO and SPP anticipate increasing load

growth throughout their regions. MISO's 2026 Long Term Load Forecast, revises upward data center and industrial load, noting that "stakeholders are increasingly modeling concentrated load additions of 100 to 1000+ MW" and "reshoring tariffs and supply chain security driven domestic semiconductor fabs, battery plants, and electrified industrial processes."[31] MISO expects annual energy consumption of data centers alone to grow annually by 18% and to add 32 GW of load by 2046.[32] SPP's 10-year peak load forecast has increased from 59 GW in 2023 to nearly 75 GW in 2026.[33] SPP's 10-year planning estimate also projects 29.7 GW of spot loads associated with data centers, oil and gas, electrification and manufacturing.[34] These projections introduce significant planning uncertainty and could intensify thermal overloads, voltage challenges, and congestion, particularly under extreme weather or generation-shortfall conditions.[35]

Load growth along the seam may increase the need for transfers across regional boundaries. SPP identified North Dakota as an area likely to experience continued load growth over the next ten years due to the electrification of the oil and gas industry and expansion of operations.[36] While data center development plans have the potential to change, MISO documents a seam-located 700 megawatt (MW) data center scheduled to come online in 2024 in Williston, North Dakota.[37] MISO expects over 6,500 MW of new data center load in its North region by 2036 due to "state-level incentives, favorable zoning and cold-climate efficiency advantages."[38] SPP projects ten-year load growth of 25% in Kansas, 20% in Nebraska, and 15% in Missouri, while anticipating additional demand across Oklahoma and its broader southern footprint.[39] SPP expects spot load growth near Fargo, North Dakota; Sioux Falls, South Dakota; Omaha, Nebraska; Kansas City, Missouri; and central Iowa.[40] Data compiled by Pacific Northwest National Laboratory is consistent with SPP's assessment.[41]

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31 MISO, "2026 Long-Term Load Forecasting (LTLF) Results Summary", (LTLF Summary), April 13, 2026, p. 7.

32 LTLF Summary, p. 15–16.

33 ITP2025, p. 94.

34 ITP2025, p. 95.

35 ITP2025, p. 95.

36 ITP2025, p. 87.

37 MISO, "Large Load Facility Additional Information," (Facility Information), December 6, 2024, https://cdn.misoenergy.org/NEW%20LOAD%20ANNOUNCEMENTS%20IN%20MISO%20REGIONS%2012062024684954.pdf.

38 LTLF Summary, p. 21; MISO, "LTLF Workshop Supplemental Materials – Regional.xls," April 13, 2026, https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fcdn.misoenergy.org%2F20260413%2520LTLF%2520Workshop%2520Supplemental%2520Materials%2520-%2520Regional750492.xlsx.

39 ITP2025, p. 93.

40 Raheem and Kirk 2026, p. 19.

41 Pacific Northwest National Laboratory, "Data Center Atlas," 2026, im3.pnnl.gov/datacenter-atlas.

These developments will not affect transmission flows uniformly. Their impact will depend on where generation and load ultimately connect, when projects enter service, and how the regional resource mix evolves. Nevertheless, the combination of concentrated new loads and geographically dispersed generation is likely to increase the importance of transfer capability, voltage performance, and coordinated network planning across the seam.

Regional EHV Buildout Is Converging Along the Seam

As discussed in Section I, MISO and SPP are independently developing increasingly capable EHV transmission backbones that are converging geographically along the northern and central seam. MISO's LRTP Tranche 2.1 portfolio included a 765 kV backbone extending through eastern South Dakota, western and southern Minnesota, and western Iowa, supported by additional 345 kV facilities in eastern North Dakota and western Minnesota. MISO has also approved robust 345 kV infrastructure linking the 765 kV system in Iowa to Missouri. At the same time, SPP is developing a regional 765 kV overlay extending from its southern footprint to the Kansas/Missouri area, and potentially extending through Nebraska, South Dakota, and North Dakota as part of its long-term EHV transmission strategy.

The geographic convergence of each region's EHV infrastructure creates an opportunity to assess whether interregional connections could increase the value of both RTOs' regional transmission plans. MISO's 765 kV projects in eastern South Dakota, western Minnesota, and western Iowa are close to SPP's conceptual 765 kV buildout. Greater connectivity in this area has the potential to bolster MISO's ability to transfer power from West-to-East, towards major load centers. A similar dynamic exists further south, where MISO's existing and planned 345 kV system could be optimized with the 765 kV and 345 kV SPP system.

Interregional transmission, including 765 kV ties, between MISO and SPP can tap into beneficial network effects and economies of scale for each region's planned 765 kV buildout. Interregional 765 kV ties can connect to planned 765 kV substations on both sides of the seam, reducing the need to invest in new 765 kV substation equipment. Interregional 765 kV ties can also help alleviate overloads or stability concerns caused by contingencies on the planned 765 kV network in either region. Both regions will also have to develop the equipment and expertise to build, maintain, and operate 765 kV equipment for their regional networks, reducing the incremental cost of using 765 kV for interregional ties.

III. LESSONS FROM THE 2024-2025 CSP AND CONTEXT FOR THE 2026 CSP

Every two years, MISO and SPP conduct a study called the Coordinated System Plan (CSP) to identify potential transmission system expansions or enhancements needed for reliability, public policy requirements, operational performance, or market efficiency.[42] The CSP provides a forum for the two RTOs to evaluate their systems jointly, using shared models to identify needs, test potential transmission solutions, and assess the benefits of interregional transmission.[43, 44]

Over the past two years, MISO and SPP have undertaken the 2024-2025 CSP focused on their southern seam, spanning Oklahoma, Arkansas, northeastern Texas, and Louisiana. The scope of the study was to evaluate economic, reliability, and transfer needs and develop proposed "immediately actionable transmission system enhancements" to improve system reliability and resilience.[45] Although the study is still underway, and the projects it identified face further evaluation and approval by stakeholders, it represents a meaningful evolution in the RTOs' joint planning capabilities and offers important lessons for future coordinated studies.

The 2026 CSP provides an opportunity to explore the transmission needs previously identified in Section II and to assess whether EHV solutions provide benefits to both regions. In particular, the 2026 CSP occurs as both MISO and SPP are changing their regional planning processes to comply with FERC Order No. 1920, which also directs changes to interregional transmission coordination. MISO and SPP have submitted their regional Order No. 1920 compliance filings, and the current stage of regional compliance provides an opportunity for the Interregional Planning Stakeholder Advisory Committee (IPSAC) to align the 2026 CSP scope and benefits framework with the regions' emerging long-term planning frameworks.

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42 MISO and SPP, "Joint Operating Agreement Between the Midcontinent Independent System Operator, Inc. And Southwest Power Pool, Inc.," (JOA), December 5, 2022, section 9.3. See also Section 4 for a detailed discussion of the JOA's provisions as they relate to the CSP and inform the 2026 CSP process.

43 SPP-MISO IPSAC, "2024–25 CSP Study Results," (CSP24 Study Results), March 6, 2026, p. 3, https://cdn.misoenergy.org/20260306%20MISO-SPP%20IPSAC%202024-25%20CSP%20Study%20Results744716.pdf.

44 Section 9.3 of the MISO-SPP JOA governs the process for conducting the CSP. The Joint Planning Committee oversees the CSP with input from the IPSAC, the scope of which "shall include, but is not limited to: 1) identification of Transmission Issues to be evaluated; 2) description of the respective model(s) that shall be used including assumptions and relevant futures and those futures' weightings; 3) types of analysis, which may include, but is not limited to, congestion analysis, reliability analysis, evaluation of public policy requirements, and stability analysis…(JOA, p. 92)"

45 IPSAC, September 9, 2024, p. 7.

Results of the 2024-2025 CSP

The 2024-2025 CSP explicitly focused on the southern MISO-SPP seam, assessing the border of Arkansas and Oklahoma and extending south to eastern Texas and Louisiana. MISO and SPP developed blended models representing both of their systems and future scenarios looking out ten- and fifteen-years, and evaluated summer and winter peak load scenarios and a light load scenario. The base case incorporated regionally approved transmission projects per the LRTP and ITP processes, generator additions, new large loads, and other system changes.[46]

The study considered seventy projects across three corridors and evaluated their ability to resolve reliability, economic, and transfer capacity issues. The analysis recommended two portfolios—dubbed "Core" and "Core+"—for further consideration (see Figure 1). The Core+ Combination included four 500 kV lines in Louisiana and Arkansas plus a double circuit 345 kV line tying into the SPP 765 kV overlay. The initial findings suggested that both the Core and Core+ projects could provide cross-regional benefits.[47]

However, despite the potential benefits of these candidate projects, because of the RTOs' interpretation of the JOA, the analysis of these projects was limited to Adjusted Production Cost (APC) savings, rather than a broader set of benefit metrics that could capture the full value of interregional transmission. Benefits related to reliability, resilience, transfer capability, and avoided transmission investments may not be fully reflected in production-cost savings alone.

Lessons from the 2024-2025 CSP

The 2024-2025 CSP experience provides important lessons for the next joint interregional study. First, it demonstrated that joint interregional planning can produce robust technical solutions. SPP and MISO's development of a blended model, the ongoing collaboration to integrate model updates, and the evaluation of over 70 candidate solutions enabled the RTOs to develop a broad portfolio of transmission solutions. The process demonstrated that coordinated planning can identify valuable interregional solutions and joint investment opportunities that would not be possible through either RTO's regional assessment alone.

Second, the experience demonstrated that the RTOs' planning framework can be just as important as the analysis itself in determining whether promising interregional solutions can move from concept to construction. The JOA describes the framework for evaluating benefits under the CSP whether the project primarily addresses economic, reliability,

46 SPP and MISO, "SPP-MISO 2024-25 Coordinated System Plan Study Scope," December 2024, p. 6.

47 CSP24 Study Results, p. 18.

or public policy issues.[48] The primary benefit metric is APC, which is well defined with respect to economic benefits. The JOA also defines how to monetize reliability benefits.[49] However, the monetization of reliability benefits is restrictive and limited: (1) the RTOs must have independently identified the reliability issues and selected regional projects to resolve them; and (2) interregional projects must replace those regional projects.

Beyond APC: Expanded Benefits Associated with Interregional Transmission

Interregional transmission provides broader benefits than APC alone, especially when extreme conditions are present. APC does not assess benefits associated with generation and transmission outages nor fuel price volatility. Further, transmission's value is not considered in the real-time market, when conditions are more volatile than in the day-ahead timeframe.[50]

Interregional transmission capability has repeatedly demonstrated value during extreme weather events. For instance, during Winter Storm Uri, power flows from MISO to SPP exceeded 6,000 MW.[51] Grid Strategies estimates that each additional GW of transfer capability between MISO South and SPP South could have provided over $100 million in savings during Uri.[52] Recent analysis estimates that expanding transfer capacity between MISO and SPP by 1,000 MW would have provided $21 million in reduced energy costs to SPP customers and $25 million in reduced energy costs to MISO during Winter Storm Fern in January 2026.[53]

The value of interregional connectivity extends beyond winter emergencies. During a recent heat wave event, MISO imported over 17,000 MW during the 8:00pm hour on July 15, 2026, including 3,600 MW from SPP, demonstrating the value of interregional transmission.[54] These events illustrate how transfer capability enables neighboring

48 JOA, p. 125ff.

49 JOA, p. 127.

50 Hagerty, Michael J., Johannes Pfeifenberger, and Charlotte Ross, "Enhancing MISO-SPP Interregional Transmission Planning", The Brattle Group, September 15, 2026, p. 16.

51 FERC, 2021, p. 96.

52 Goggin, Michael (Grid Strategies LLC), Transmission Makes the Power System Resilient to Extreme Weather, prepared for ACORE, July 2021, p. 11.

53 Goggin, Michael, "Winter Storm Fern Shows the Value of Transmission and Diverse Generation," Grid Strategies LLC, March 25, 2026, p. 9, https://gridstrategiesllc.com/wp-content/uploads/Niskanen-Grid-Strategies-Fern-Report.pdf.

54 Goggin, Michael, "MISO Shows Value of Interregional Transmission with Record Imports during Heat Wave," Grid Strategies LLC, July 21, 2026, https://gridstrategiesllc.com/project/miso-shows-value-of-interregional-transmission/.

systems to share available resources during periods of system stress, thus managing supply shortfalls and reducing energy costs. They also underscore the importance of evaluating interregional transmission not only for routine economic efficiency, but for its contribution to reliability and resilience under extreme conditions.

Opportunities to Leverage Regional Transmission Planning Process Changes under Order No. 1920 in the Interregional Context

Each RTO is concurrently implementing an expanded regional long-term transmission planning framework to comply with FERC Order No. 1920. Order No. 1920 requires each transmission planner to perform long-term regional transmission planning on a twenty-year horizon and to assess portfolios across seven specific benefits.[55, 56]

Order No. 1920 also requires that transmission owners align their interregional processes with their respective regional processes. The fact that both RTOs will be calculating the same seven benefit metrics and developing models with twenty-year planning horizons creates an opportunity to leverage that alignment for interregional planning. When conducting the CSP, it is critical that the RTOs employ scenarios that are sufficiently broad to evaluate fully the benefits of proposed transmission projects or portfolios. Order No. 1920, for example, requires transmission planners to study at least three scenarios over a twenty-year horizon. The scenarios are "futures" representing plausible outcomes for load growth, generation addition, and transmission and generation development.

Table 1 below summarizes the Order No. 1920 benefits, the measurement method for each benefit, the assumptions regarding the condition of the transmission grid, the availability of transmission and generation resources, and the operating hours during which the benefit is measured. For example, to evaluate production cost savings, a planner compares a base case against a change case with proposed transmission and assesses generation production costs over the course of a year. In contrast, quantifying the ability of new transmission to mitigate extreme weather requires the planner to construct a case of extreme stress on the transmission system, including generation

55 See Order No. 1920 Fact Sheet at https://cms.ferc.gov/news-events/news/fact-sheet-building-future-through-electric-regional-transmission-planning-and. The seven benefits are: "(1) avoided or deferred reliability transmission facilities and aging infrastructure replacement; (2) either reduced loss of load probability or reduced planning reserve margin; (3) production cost savings; (4) reduced transmission energy losses; (5) reduced congestion due to transmission outages; (6) mitigation of extreme weather events and unexpected system conditions; and (7) capacity cost benefits from reduced peak energy losses (https://cms.ferc.gov/news-events/news/staff-presentation-building-future-through-electric-regional-transmission-planning.)"

56 MISO and SPP submitted their regional Order No. 1920 compliance filings in June 2026 and have requested effective dates of June 12, 2028 and January 1, 2027 respectively.

outages, and evaluate the difference from the base case over the duration of the event. SPP has implemented such an approach when modeling winter weather.[57]

Table 1. Characteristics of Modeling Cases to Quantify Order No. 1920 Benefits.[58]

Benefit Number	Benefit Name	Measurement	Grid Conditions	Resource Availability	Sampling Fidelity
1	Avoided or deferred reliability transmission facilities and aging infrastructure replacement	Transmission Capacity	Typical	All	Critical stress hours
2	Reduced costs related to resource adequacy	Generation Capacity; Unserved Energy	Typical	Generation Outages	8,760 hours
3	Production cost savings	Generation Production	Typical	All	8,760 hours
4	Reduced transmission energy losses	Generation Production	Typical	All	8,760 hours
5	Reduced congestion due to transmission outages	Generation Production	Typical	Transmission Outages	8,760 hours
6	Mitigation of extreme weather events and unexpected system conditions	Generation Production; Unserved Energy	Stress	Transmission Outages; Generation Outages	Critical stress hours
7	Capacity cost benefits from reduced peak energy losses	Generation Capacity	Typical	All	Peak demand hours; Critical stress hours

57 ITP2025, pp. 78–86.

58 Brooks, Adria, "Modeling the Order 1920 Benefit Metrics: A review of regional transmission planning best practices," Grid Strategies LLC, May 18, 2026, https://gridstrategiesllc.com/wp-content/uploads/O1920-Benefit-Metrics-Report.pdf.

Order No. 1920 requires that transmission providers establish an evaluation process that "measures the benefits of the identified Long-Term Regional Transmission Facilities that address Long-Term Transmission Needs."[59] MISO and SPP will implement methodologies to evaluate the Order No. 1920 benefits through their regional processes. Given that both regions will be adopting the same seven benefits, both regions will have developed their own methodologies for calculating them that can be applied when evaluating interregional transmission solutions. Doing so will streamline regional assessments of interregional projects and ensure they are evaluated comparably to regional projects.

59 187 FERC ¶ 61,068 at P916.

IV. THE 2026 CSP: AN OPPORTUNITY TO EVALUATE THE CENTRAL AND NORTHERN MISO-SPP SEAM

This section synthesizes the analysis of the prior sections and makes findings and recommendations to inform the commencement of the 2026 CSP. Given the emerging 765 kV architectures in both MISO and SPP, the documented and emerging transmission challenges, and the lack of an interregional planning record, the MISO-SPP northern and central seam merits evaluation.

The 2026 CSP is a timely opportunity to test this potential. A coordinated assessment should evaluate potential connections between the regions' EHV backbones alongside lower-voltage and other technically feasible alternatives, quantifying their costs and benefits under consistent assumptions. This would establish where greater interregional connectivity could complement regional investment plans, address shared system needs, and deliver the greatest net benefits to consumers across the regions.

Findings

Finding 1: MISO and SPP Need Higher-Capacity Transmission.

Higher capacity transmission, including 765 kV solutions, emerge as preferred solutions when improvements to the lower-voltage system can no longer cost effectively meet transfer requirements while resolving congestion and reliability issues, especially in the cases of delivering geographically constrained generation or serving concentrated load. Both MISO and SPP have recommended and approved 765 kV systems within their operating regions under these conditions. In MISO, planners identified "congestion across the Midwest, with widespread price separation and generation curtailment, along with significant levels of overload on lower and higher voltage equipment and decreased reactive support across the system," that led to MISO to develop 765 kV transmission.[60] SPP moved from a single proposed 765 kV connection from Oklahoma to southeast New Mexico in 2025 to the development of a 765 kV overlay traversing its southern region with connections north to Kansas to access available generation a year later.[61] The 2026 ITP tentatively identifies stress throughout SPP that could motivate expansion of the 765 kV architecture regionwide. Planners evaluated multiple voltage classes to resolve the identified transmission issues and concluded that 765 kV systems most effectively resolved the transmission issues.

60 MTEP24, p. 21.

61 ITP2025, p 178.

Finding 2: MISO and SPP Should Evaluate Interregional EHV Transmission Solutions

Existing planning studies have identified emerging conditions, including but not limited to, congestion, thermal violations, and low-voltage conditions in the northern and central seam region that have prompted SPP to pursue lower voltage and 345 kV upgrades, whereas MISO has pursued a 765 kV backbone. These existing needs, however, are compounded by substantial anticipated generation and load growth, including 101 GW in the northern and central seam's active interconnection queue, more than 25 GW of which is in Kansas, alongside growing oil and gas demand in North Dakota and data center development in MISO West. Together, these conditions warrant a coordinated assessment via the 2026 CSP to determine whether interregional transmission solutions could more effectively address emerging system needs and complement ongoing regional investments.

Finding 3: MISO and SPP Can Use Order No. 1920 Implementation to Expand and Harmonize CSP Benefits Evaluation

The 2024-2025 CSP assessed a narrow set of avoided reliability, economic, and transfer resilience benefits, limiting the RTOs from taking full advantage of their potential ability to evaluate broadly a full suite of benefits and only assigned a monetary value to the economic benefit of reduced congestion. Both MISO and SPP have made their Order No. 1920 compliance filings regarding long-term regional transmission planning. Thus, the 2026 CSP provides an opportunity to apply a broader interregional benefits framework and evaluate projects using comprehensive and consistent criteria with a common twenty-year planning horizon.

Recommendations

The recommendations below pertain to the 2026 CSP scoping effort, which is currently underway. They are intended to ensure the study is designed to identify and respond to emerging needs, develop robust solutions, fully assess their value, and create a pathway for those solutions to advance from concept to construction.

Recommendation 1: Prioritize the Northern and Central Region of the MISO-SPP Seam

The 2026 CSP should prioritize the northern and central portion of the MISO-SPP seam as the primary study area. As described in Section II, this region is experiencing a convergence of emerging load and generation growth, persistent transmission constraints and increasing transfer requirements. At the same time, MISO and SPP are advancing major regional EHV transmission investments geographically proximate to the

seam. This creates a unique, timely opportunity to evaluate whether joint interregional solutions could complement or enhance the value of each RTO's regional backbone grid.

Recommendation 2: Assess the Value of Interregional 765 kV and other EHV Solutions

Given the developing regional buildout of 765 kV and other supporting EHV infrastructure, growing generation resources, and load growth throughout the northern and central seam, evaluating the potential opportunity to link the two regional 765 kV backbones is timely and critical. MISO and SPP did not adopt 765 kV facilities as predetermined solutions. In both regions, planners evaluated multiple voltage classes and proposed transmission projects before determining that 765 kV facilities offered advantages for addressing the identified transfer, reliability, deliverability, and voltage-support needs. The same analytical approach should be applied in the 2026 CSP. The study should evaluate whether higher-capacity interregional solutions provide greater value than lower-voltage alternatives.

Recommendation 3: Leverage in an Interregional Context MISO and SPP's Regional Planning Process Reforms

The 2026 CSP will occur as both MISO and SPP are updating their benefits frameworks to comply with FERC Order No. 1920,[62] presenting an opportunity to use similarly proactive and multi-value planning methods for interregional transmission. The 2026 CSP presents an opportunity to better align interregional planning processes with the benefit metrics each RTO uses in its respective regional planning process. Order No. 1920's requirement to consider a twenty-year planning horizon also provides a basis for aligning the CSP with both RTOs' long-term regional planning processes. Accordingly, we recommend that the 2026 CSP develop twenty-year blended models and evaluate candidate projects using the seven Order No. 1920 benefits.

Recommendation 4: Pursue JOA Revisions in Parallel With the 2026 CSP Study

The JOA defines the CSP scope, benefits, and project selection framework. As detailed in Section III, the JOA can constrain the RTOs' ability to evaluate the benefits associated with interregional transmission solutions. MISO and SPP are in the process of updating the JOA, per the requirement of Order No. 1920 that transmission providers "revise their interregional transmission coordination processes to reflect the Long-Term Regional Transmission Planning reforms adopted in this final rule…[and] meet additional information sharing and transparency requirements with respect to their interregional

62 FERC, "Order No. 1920 Compliance Filing Schedule," June 16, 2025, https://www.ferc.gov/news-events/news/order-no-1920-compliance-filings-schedule.

transmission coordination processes."[63] MISO and SPP should consider making JOA revisions in parallel to the 2026 CSP study to enable them to fully assess the value of potential interregional transmission solutions, enable multi-benefit, multi-driver project types, and provide a clear path forward for qualifying projects to move from study to approval. Prioritizing these JOA changes prior to the conclusion of the 2026 CSP would ensure that projects demonstrating interregional value have a clear path from concept to approval.

63 187 FERC ¶ 61,068 at P11.

APPENDIX: QUEUE ANALYSIS

We perform here a limited assessment of the current queues in MISO and SPP to illustrate generation growth in the northern and central seam and the potential impacts on the transmission system.[64] Both MISO and SPP incorporate interconnecting generation into their forward-looking models supporting regional and interregional planning, so much of the generation in the queue is accounted for in the 2024 ITP, the 2025 ITP, and the LRTP studies. Our assessment indicates where activity is concentrated and provides insight on where there could be transmission needs and export opportunities.

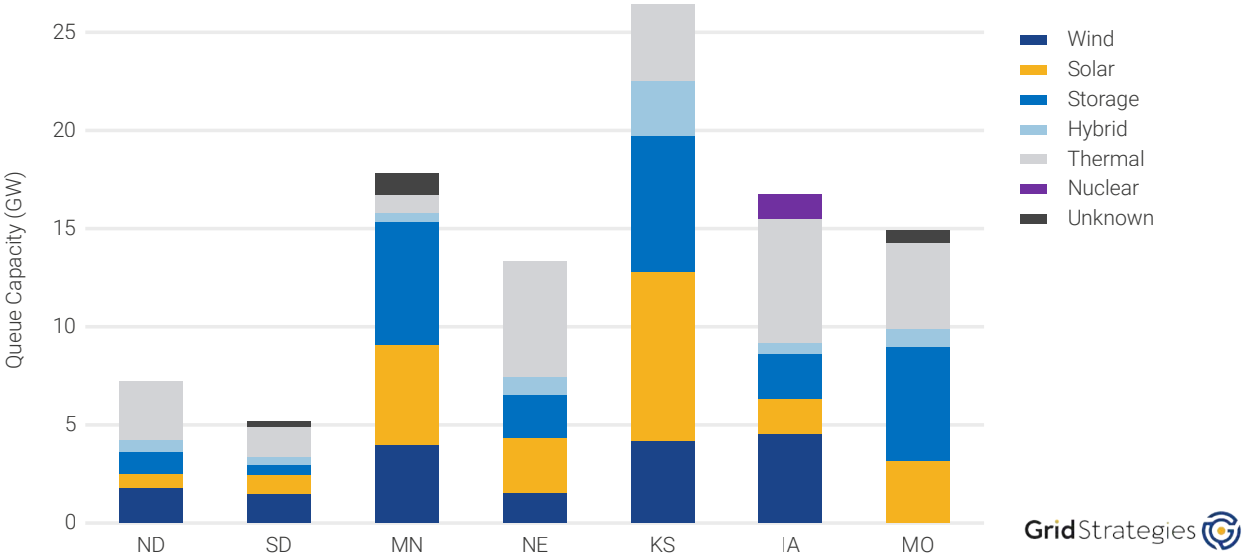
Focusing on the northern and central seam states, MISO has 194 active projects representing 47.8 GW of summer capacity, while SPP has 240 active projects representing 54.0 GW. Although MISO's overall active queue is substantially larger than SPP's (228 GW versus 134 GW), active queue capacity within the seam states is of a comparable magnitude in the two regions. Projects representing 45.2 GW of summer capacity have been tagged with JTIQ participation across both RTOs, including 31.2 GW located within the seam states, although relatively few of these projects have executed generator interconnection agreements. The seam-state development portfolio is diversified across multiple resource types. Within the seam states, MISO's active queue includes approximately 10.6 GW of solar, 10.0 GW of wind, 10.7 GW of storage, and 10.9 GW of thermal capacity, while SPP's active queue includes 12.7 GW of solar, 7.5 GW of wind, 14.4 GW of storage, and 15.1 GW of thermal capacity. Wind, solar, and storage resources collectively account for approximately 65% of active seam-state capacity in MISO and 64% in SPP. These results indicate that development activity in the seam states is substantial, geographically extensive, and distributed across a diverse mix of generation and storage technologies. Table 2 summarizes these data. And Figure 3 illustrates the capacity quantities and technology mixes across states for both RTOs.

64 To perform this analysis, we use the complete queue data (as of August 21, 2026) from MISO (https://www.misoenergy.org/planning/resource-utilization/GI_Queue/https://www.misoenergy.org/planning/resource-utilization/GI_Queue/) and SPP (https://www.spp.org/engineering/generator-interconnection/).https://www.spp.org/engineering/generator-interconnection/). We augment these data with the ERAS queue data and projects from MISO and SPP that are participating in the JTIQ. We filter the data to include only projects that are (1) currently "active", (2) have future commercial operation dates, and (3) are in the northern and central seam regions. We use summer capacity as the interconnecting capacity measure.

Table 2. Characteristics of the Current MISO and SPP Interconnection Queues

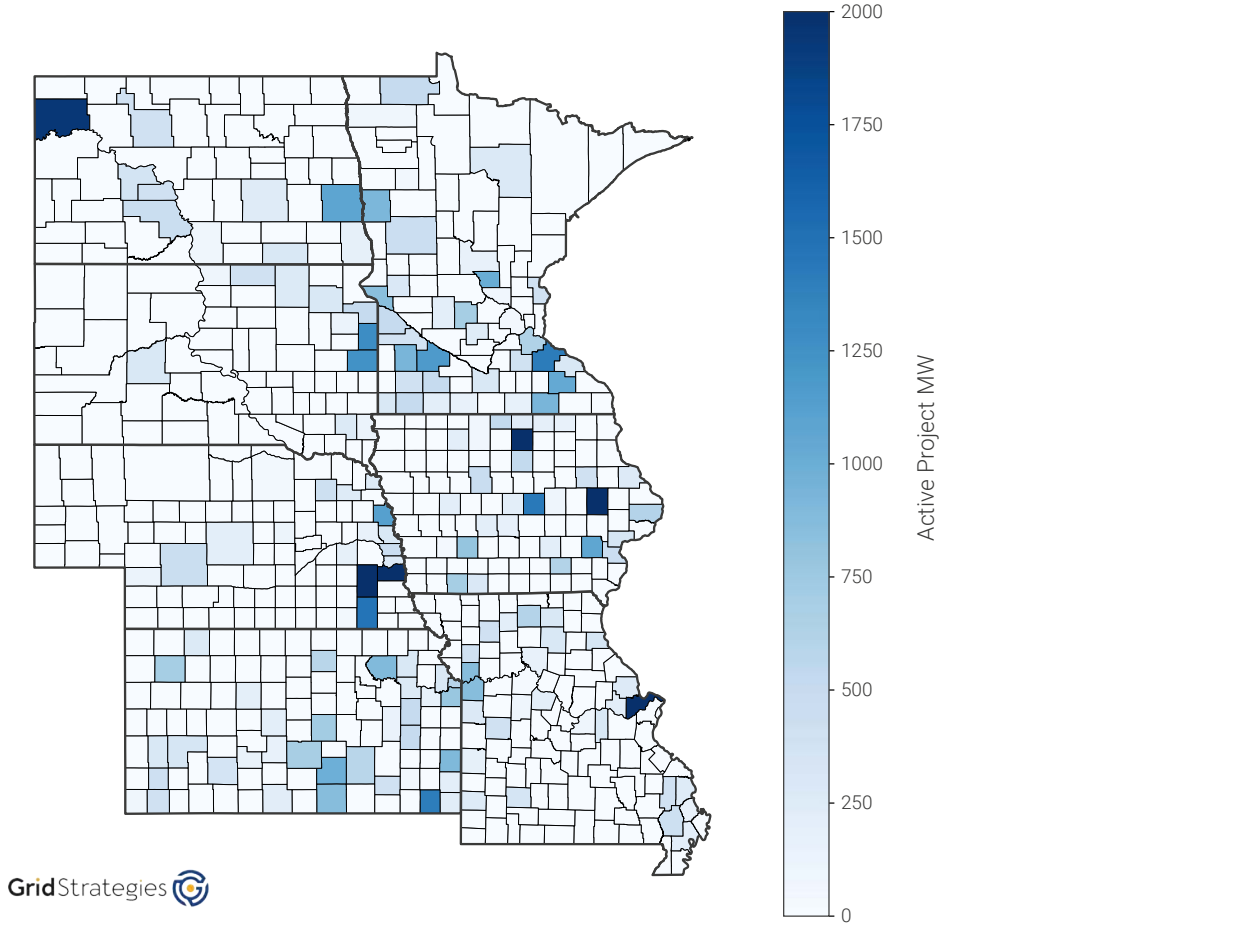
	MISO	SPP
Active Projects (RTO-Wide)	866.00	609.00
Active Capacity (GW)	227.51	134.35
Active Projects (Seam States)	194.00	240.00
Active Capacity (Seam States) (GW)	47.79	53.97
JTIQ Capacity Total (GW)	20.65	24.57
JTIQ Capacity (Seam States) (GW)	15.92	15.28
Solar Capacity (Seam States) (GW)	10.56	12.67
Wind Capacity (Seam States) (GW)	10.03	7.50
Storage Capacity (Seam States) (GW)	10.74	14.37
Hybrid Capacity (Seam States) (GW)	2.27	4.28
Thermal Capacity (Seam States) (GW)	10.91	15.14
Other / Unstated Capacity (Seam States) (GW)	3.27	0.00

Figure 3. Active Queue Capacity in the Northern and Central Seam Region by State and Technology



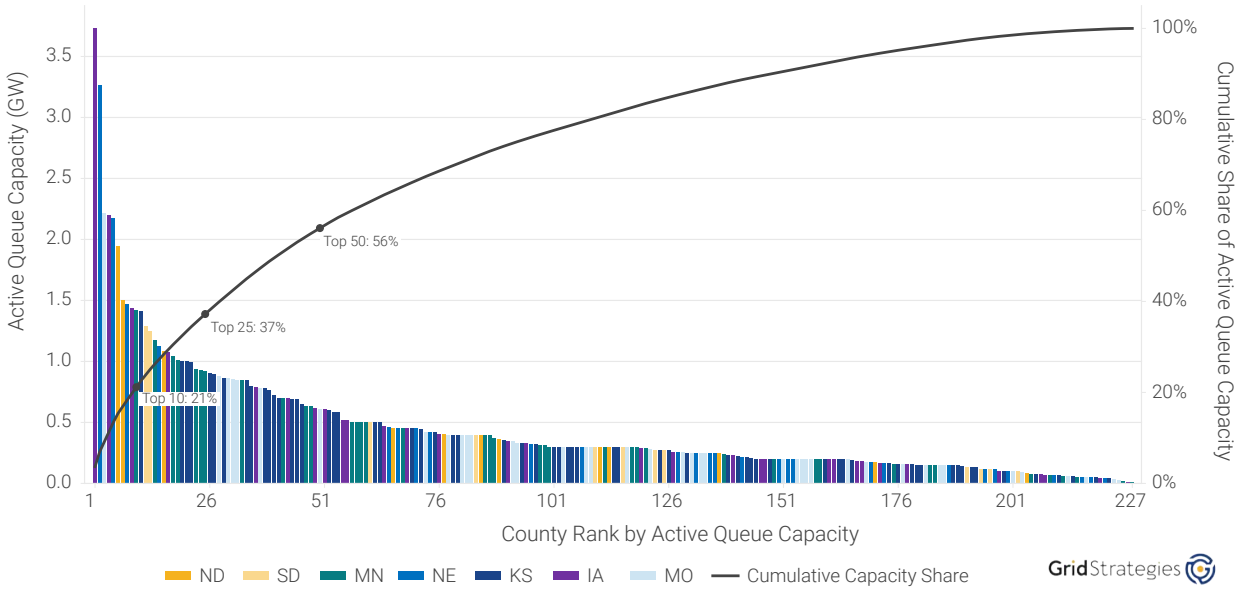
Localizing active projects at the county level helps indicate the concentration of proposed resources in an area.[65] Figure 4 is a heat map of proposed generating resource summer capacity for active projects throughout the northern and central seam regions. Five of the top six counties are in the central portion of the seam: Linn County, Iowa (3.7 GW), Lancaster County, NE (3.3 GW), St. Charles County, MO (2.2 GW), Cerro Gordo County, Iowa (2.2 GW), Cass County, NE (2.2 GW), and Williams County, ND (1.9 GW). Counties with the highest concentration of queue activity are geographically far from each other and load centers, potentially necessitating long-distance transmission. Notably, after the top six counties, the queue is quite dispersed, with the top 50 counties making up only 56% of the active capacity (see Figure 5). Thus, while there are several pockets of active capacity, much of the active capacity in the queue is distributed across the seams. Areas of note are the borders of North Dakota and South Dakota with Minnesota, southeastern Nebraska, northeastern Iowa, and much of Kansas. Table 3 lists the top 10 counties.

Figure 4. County-level Heat Map of the Active Generation Queue in the Northern and Central Seam Regions



65 MISO maintains a heatmap indicating the available interconnection capacity at points of interconnection throughout their systems; see MISO, "Points of Interconnection (POI) Analysis Map," accessed October 23, 2026, https://cloud.cartovista.com/miso/ferc/poi-analysis-map.

Figure 5. Pareto Chart of Active Queue Capacity by County Rank



Overall, our analysis of the queues reveals key insights regarding generation development in the seam regions. First, the central portion region is the dominant growth region with over 70% of the proposed northern and central generation development. Second, MISO dominates generation development in the northern portion of the region, with much of it concentrated on the border of Minnesota and the Dakotas (coincident with the planned Big Stone South—Brookings County—Lakefield Junction 765 kV line). SPP dominates development in the central portion of the region, with focused development throughout Kansas. Third, while the geographic clusters of generation indicate that developers may be availing themselves of existing and planned transmission capacity, the geographic spread of much of the queue could result in increased loading on the lower voltage system throughout the seam region.

Table 3. Top 10 Counties with Active Projects in the northern and central seam Region Interconnection Queues by Summer Capacity

Rank	State	County	Projects	Proposed Summer Capacity (GW)
1	IA	Linn	9	3.7
2	NE	Lancaster	17	3.3
3	MO	St. Charles	1	2.2
4	IA	Cerro Gordo	6	2.2
5	NE	Cass	9	2.2
6	ND	Williams	4	1.9
7	ND	Stanton	2	1.5
8	NE	Gage	6	1.5
9	IA	Marshall	4	1.4
10	MN	Goodhue	5	1.4



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