



Planning Advisory Committee

Summary of Review and Advice to Advisory Committee and Board of Directors

MISO Transmission Expansion Plan (MTEP21) Addendum Appendix F

May 20, 2022

The Planning Advisory Committee, through its sector representatives, has reviewed the draft MTEP21 report addendum and invited MISO stakeholders to provide input. The following is a summary of key input from stakeholders to the Advisory Committee and the MISO Board of Directors with respect to the MTEP Long Range Transmission Planning (LRTP) Tranche 1 Portfolio report, as well as brief MISO responses.

Summary of Feedback Received

MISO greatly appreciates the stakeholder feedback received throughout the LRTP Tranche 1 study effort and most recently as part of the formal substantive feedback request, included below in detail with MISO's responses. MISO has long committed to robust and transparent transmission planning processes and the LRTP study effort is no different. Most stakeholders have expressed, either in LRTP Workshops, Planning Advisory Committee meetings, here in these substantive feedback comments, or elsewhere, support for the need for an LRTP initiative as part of MISO's overall Reliability Imperative effort. As MISO has numerous and widely-varied stakeholders who are very engaged in the process, there are also varied opinions on how best to approach the LRTP initiative. MISO has and will continue to take this valuable feedback to help inform the process(s) as the LRTP study efforts continue with future Tranches. The substantive feedback received can be summarized generally in three categories:

- 1) Support for the LRTP study and Tranche 1 Portfolio
- 2) Methodologies used to calculate benefit metrics
- 3) Other items, such as alternatives consideration and modeling accessibility

Category 1 – Several stakeholders have submitted comments expressing support for the LRTP study process, analysis, and results recommending the Tranche 1 Portfolio. MISO values these responses and appreciates the support.

Category 2 - Some stakeholders submitted comments related to concerns about potential overstating of benefits as a result of the methods used to calculate the various benefit metrics. MISO discussed these methodologies extensively in multiple workshops over the last several months explaining the rationale and assumptions used to support the conclusions. MISO's approach to the business case for the LRTP Tranche 1 Portfolio was to quantify the multiple types of benefits the transmission portfolio provides to address the reliability issues and resource expansion needs identified in MISO's Future 1. In developing the methodology for each of the six benefit metrics, MISO was mindful to avoid overstating the value of benefits attributed to each metric, and most stakeholders broadly have agreed this transmission portfolio provides various benefits captured in the metrics.

Category 3 – Stakeholders submitted various comments that are responded to individually, including such items as concerns on alternatives considered, timeliness of making modeling data available, and the challenges with understanding the vast amounts of data produced throughout the study. MISO appreciates the challenges this transmission planning study, which is the most complex MISO has undertaken, has placed on some stakeholders to work through all of the analysis. MISO has and will continue to work on the stakeholder experience going forward with future tranches of the LRTP study effort.



This document includes substantive comments from the following stakeholders:

- MidAmerican Energy Company
- Hoosier Solar, LLC (National Grid Renewables)
- Municipals/Cooperatives/and Transmission Dependent Utilities Sector
- WPPI Energy
- Ameren
- Certain MISO TOs
- Eligible End Use Customers
- Invenergy LLC
- Environmental Sector
- Otter Tail Power Company
- DTE Energy
- Missouri River Energy Services
- Iowa Office of Consumer Advocate
- MISO South TOs
- ITC Companies



Summary of Stakeholder Comments and MISO Responses

Feedback Subject (MidAmerican Energy Company): Comments in support of the Draft MTEP21 Tranche 1 Addendum

Verbatim stakeholder comments:

The benefit-cost analyses completed by MISO reasonably includes appropriate benefit metrics. MidAmerican commends staff for considering additional benefits beyond those identified for the initial Multi Value Projects (MVPs) in 2011. MidAmerican also commends MISO for being proactive by identifying the urgent need for additional transmission in the MISO Midwest subregion several years ago, beginning with the Renewable Integration Impact Assessment to identify risks associated with the energy transition, and following that with the Reliability Imperative where additional regional transmission was identified as a key component to the region's reliability strategy. The following comments pertain to the benefit / cost analysis MISO has presented in stakeholder meetings. These comments can be posted for public review.

Central Iowa Facilities (LRTP 7, 8) - The MISO MTEP report identifies Iowa as a gateway to connecting the western MISO and eastern MISO systems. MidAmerican supports this identification in the interest of the broader benefits for the reasons stated in the Reliability Imperative, but also agrees with the more local benefits for Iowa as also noted by MISO in the MTEP21 Addendum.

Iowa to Michigan (LRTP 12 through 18) and Iowa to Missouri to Illinois (LRTP 9,10,11) -MidAmerican supports these new facilities that contain portions in/near Iowa and bring benefits to both Iowa and the MISO region. The line segments will be key to improving MISO interconnectivity in support of capacity and energy markets and overall reliability of the MISO Midwest system. The lines will also provide local reliability benefits in terms of additional sources of supply to several substations and lines. Adding two additional Mississippi River crossings to link the western and eastern systems within MISO will improve subregional MISO Midwest interconnectivity.

Congestion and Fuel Savings - While there will always be debate as to forecasts of the future, MISO has presented reasonable valuation methods and provided a reasonable set of results with various future outcome sensitivities (e.g., time period for the valuation, emissions, and natural gas prices). The use of a distribution factor cutoff is representative of the issues in the generation queue where significant withdrawals are occurring now due to prohibitive network upgrade costs. The natural gas sensitivity shows the change in valuation that could occur with a higher fuel cost. MidAmerican believes the production cost models used for this analysis provide conservative values for the congestion benefits because the transmission system is, for nearly all periods of time, in a state with more outages than the N-1 conditions assumed in MISO's models (i.e., there is nearly always multiple planned and forced outages at any given point in time which can have significant impacts on congestion).

Avoided capital costs and reduced resource adequacy requirements - Assuming that new Future 1 generation will be enabled by the LRTPs provides a reasonable estimation of LRTP value. Separately identifying local clearing requirement benefits and resource adequacy benefits also provides a reasonable approach to Tranche 1 value. The assessments are only on Future 1 models, and do not contemplate the value of a more robust transmission system for the energy transition contemplated by the Future 2 and Future 3 which have increased retirement and new resource builds relative to Future 1.

Other Benefits - Importantly, MISO states that the adjusted production cost value is understated because the model begins with a system intact state, which seldom is the case in MISO (i.e., there is nearly always multiple planned and forced outages at any given point in time which can have significant impacts on congestion).



Load shed risk – The method developed by MISO provides a pragmatic approach to load shed risk through the identification of lost generation and imports from a high level perspective. While there could be other scenarios developed, the approach is reasonable. Comments that new resources will be built to maintain an LOLE of 1 day / 10 years under any number of transmission expansion scenarios miss the mark by not considering that transmission is the enabler of reserve sharing for the MISO pool so that each load serving entity does not need to cover its own reserves but can share those resources when needed most. MidAmerican agrees that other concerns around quantified frequency of events can be addressed by reviewing benefits from various levels of VOLL, which MISO has provided.

The LRTP effort in conjunction with MISO's resource adequacy and energy market changes currently being reviewed are all important steps for MISO and its members. MISO's LRTP effort will not only enable new resources to be installed, but also mitigate uncertainty as to retirement decisions as the energy transition accelerates. Tranche 1 is an urgently needed first step. Tranche 2 will need to review the additional scenarios contemplated by Future 2 so that MISO stays ahead of transmission and system reliability issues. MidAmerican supports MISO's effort and the sense of urgency for Tranche 1.

MISO response:

MISO staff appreciates MidAmerican Energy Company's comments and support of the MTEP21 Addendum and LRTP process for Tranche 1.

Feedback Subject (National Grid Renewables): Addition of Hazel Creek to Blue Lake 345 kV in Tranche 1 portfolio

Verbatim stakeholder comments:

MISO should reconsider including the Hazel Creek to Blue Lake 345 kV corridor line in the LRTP Tranche #1 portfolio. Based on all the conducted analyses and all the results that have been released for MISO DPP-2017 WEST through MISO DPP-2019 WEST, the Hazel Creek - Blue Lake 345 kV line would provide the required reliability and would assist in relieving the power flow congestions from Brookings, SD towards the Twin Cities, MN area.

MISO response:

MISO staff appreciates the comments from National Grid Renewables to the MTEP21 Addendum and LRTP process for Tranche 1. MISO did consider this project in the LRTP Tranche 1 study effort as an alternative to identified issues in the North Dakota and western Minnesota area. It was not chosen as a solution as it did not perform as well as the chosen project for that area (refer to [LRTP Workshop - February 25, 2022](#)). MISO will be looking at this corridor again in the LRTP Tranche 2 study efforts as we anticipate additional needs in the south and western areas of Minnesota and eastern South Dakota.

Feedback Subject (TDU Sector): Draft MTEP21 LRTP Tranche 1 Portfolio Report

Verbatim stakeholder comments:

1. The TDU Sector recognizes the need for substantial improvements to the MISO transmission system to accommodate the very significant changes in the resource mix that MISO is experiencing now, and that we expect to continue. It is important that MISO and stakeholders plan upgrades to cost-effectively address this need, and we support the LRTP effort.



2. The Tranche 1 portfolio appears to be a reasonable first step at addressing the need. We expect that these projects will provide benefits in excess of costs, consistent with the findings of the consultant for the Organization of MISO States (OMS) as reported at the OMS Board of Directors meeting in April.

MISO response:

MISO staff appreciates the comments from TDU Sector to the MTEP21 Addendum and LRTP process for Tranche 1. The LRTP Tranche 1 portfolio provides cost effective transmission solutions to enable regional delivery of energy to meet future needs.

3. We do not, however, find MISO's own benefit estimates reasonable. MISO's methodology suffers from flaws that render its benefit estimates unreliable. While the TDU Sector and its members have concerns about many elements of MISO's analysis, we believe it suffices to focus on the most significant one: that MISO fails to use consistent reference cases in its evaluation of different benefits. The primary example of this involves the two largest benefit categories that MISO identifies: i) Avoided Capital Cost of Local Resource Investments; and ii) Congestion and Fuel Savings. For the purpose of calculating resource-investment savings, MISO assumes that nearly 40 GW more wind, solar and solar-storage-hybrid generation would be constructed without the Tranche 1 projects relative to the case with Tranche 1 projects. In contrast, for the purpose of calculating production-cost savings (as well as decarbonization benefits), MISO assumes 20 GW less wind, solar and solar-storage-hybrid generation would be constructed without the Tranche 1 projects than with these projects. Thus, logically, there appears to be no plausible non-Tranche 1 future relative to which Tranche 1 would provide the benefits MISO calculates for both of these categories together. The TDU Sector believes that these benefits should be evaluated with respect to consistent reference cases, and that development of appropriate consistent reference cases is required to produce valid benefit estimates.

MISO response:

MISO's approach to the business case for the LRTP Tranche 1 Portfolio was to quantify the multiple types of benefits the transmission provides to address the reliability issues and resource expansion needs identified in MISO's Future 1. In developing the methodology for each of the six benefit metrics, MISO was mindful to avoid overstating the amount of benefits attributed to each metric, and most stakeholders broadly have agreed transmission provides the values being calculated by the various benefit metrics. Within that broad agreement, though, there has been continuing discussion on the details of the calculations used to derive the benefits.

In particular there has been a lot of stakeholder discussion on the cases used to calculate the Congestion and Fuel Savings, Decarbonization, and Avoided Capital Cost of Local Resource Investment benefit metrics. A more detailed explanation of how those benefit metrics are complementary and don't result in overstating of benefits is provided below.

The Congestion and Fuel Savings metric, Carbon Reduction, and the Avoided Capital Cost of Local Resource Investment assume that the Future 1 member plans and goals must be met, and that regional resource expansion requires the LRTP portfolio to be achieved. However, they show different benefits in how the portfolio enables these goals to be achieved.

- *For the Avoided Capital Cost benefit metric, the reference case establishes the fact that without the LRTP Tranche 1 Portfolio, a local resource buildout is required to meet the Future 1 requirements. The benefits focus on costs of the physical construction of resources, without regard to their ability to be delivered to load, and it captures the differences in capital costs in that local versus the Future 1 scenario buildout.*
- *In the Congestion and Fuel Savings benefit analysis, the reference case focuses on a local buildout considering deliverability constraints. To model the potential deliverability limitations, a distribution factor (DFAX) method was used to identify the resources that could be materially attributed to the LRTP Tranche 1 Portfolio, and the modeling assumed those 20 GW of renewable resources would not be available without the LRTP Tranche 1*



Portfolio. The deliverable generation was then used to calculate production and carbon reduction benefits.

4. A related issue concerns robustness testing of the Tranche 1 portfolio. During the Tranche 1 study process, stakeholders including members of the TDU Sector requested that MISO perform robustness testing to assess the sensitivity of MISO's results to different inputs. The primary input of interest is the assumed future generation mix, and stakeholders are interested in evaluating an alternative generation mix that involves generation sited closer to load and—consistent with requests in MISO's interconnection queue—including increased levels of energy-storage resources, relative to Future 1. MISO did not perform such an analysis in the Tranche 1 study process. We continue to believe that such an evaluation is an important part of a complete study and request more attention to this in future tranches. We note that development and analysis of a well-defined more-local resource siting scenario would also be useful in establishing a reference case for the benefit analysis that is central to MISO's business case.

MISO response:

L RTP analysis is based on the Futures scenarios that are collaboratively developed with stakeholders in the Futures development process. These Futures scenarios contain the generation mix and siting based on member plans and generation queue trends. The reliability analysis included additional sensitivity testing in the evaluation of several transfer scenarios to assess L RTP Tranche 1 impacts on transfer capability as resource availability and dispatch varies across the subregion.

5. We note that, at the time these comments were developed for a May 12 submittal deadline, MISO has clearly described one set of Tranche 1 projects. MISO has not, however, described all the projects that will need to be part of Tranche 1, including the rebuilding of lower-voltage circuits where the existing tower lines or rights-of-way are expected to be used to accommodate the primary Tranche 1 projects. In addition, we note that the draft report refers at p. 32 to possible “rebuild” or “uprate[]” of the existing Crandall-Wilmarth 345 kV line, something that we are not aware that MISO has previously described. Information on such projects is not expected to be available until shortly before the May 27 PAC meeting, making it impossible to comment on such projects at this time. Any projects to be included in Tranche 1 need to be fully described, their connection to the Tranche 1 objectives fully explained, and potential alternatives fully explored before PAC can meaningfully pass judgement on them. Accordingly, we urge MISO to make this information available as soon as possible.

MISO response:

The Crandall-Wilmarth upgrade was discussed at the February 25, 2022 L RTP Workshop and its potential economic benefit was noted on slide 12. As discussed at that time, Crandall-Wilmarth provides significant economic benefit if upgraded. Underbuild projects are just as the name implies. These are lower voltage projects that have been identified as being adversely impacted by the larger regional projects proposed. A full list of those projects will be in the final report.

6. MISO should consider near-term congestion as well as post-2030 congestion in determining projects to include in Tranche 1. This includes the scope of lower-voltage or underbuild projects required as part of the primary 345 kV projects in Tranche 1. For example, MISO should consider whether rebuild of some segments of the Wabaco-Alma 161 kV line—required to allow re-use of the line position for a new 345 kV circuit—should extend to other segments of this line that could pose significant market constraints prior to 2030.

MISO response:

The L RTP projects are developed from an initial conceptual roadmap that contains solution ideas that have been guided by past issues, prior studies and trends toward future grid conditions. While L RTP studies assess grid conditions



based on the MISO Futures scenarios, the transmission solutions may incorporate project ideas and associated facility upgrades that address system needs where congestion has previously been identified.

7. Beyond selection of projects in the portfolio, MISO has further work to do in scheduling these projects. In addition, the sequence in which they are constructed may have a significant impact on the congestion experienced in the MISO market over the next several years. We ask that MISO focus on these sequencing issues to avoid adverse congestion impacts during Tranche 1 construction to the extent reasonably achievable.

MISO response:

MISO has been working towards a set of in-service dates for the various LRTP Tranche 1 projects. Several factors are at play in making those determinations and MISO has been working with its member Transmission Owners for those projects in ROFR States in this regard. In-service dates will be included in the final report.

8. The report would benefit from more context around the cost of the Tranche 1 portfolio. MISO should include an estimate of the incremental MVP usage rate for the North-Central Subregion, and an estimate of the expected annual revenue requirement once all projects are in service, e.g., in 2030, along with the estimated revenue requirement for the remainder of the North-Central Subregion transmission revenue requirement in that year.

MISO response:

Additional information on the estimated MVP usage rate and annual revenue requirements of the portfolio will be included in the final report.

9. At p. 10 MISO says the following:

While not having to make a single emergency declaration in the two years preceding 2016, 41 such emergency declarations have been required since 2016. This has been driven predominantly by the combination of increased variable generation coupled with a decline in number of controllable and flexible resources in the footprint, and generation performance has degraded as plants have aged.

In order to address the problem of increasing emergency events that MISO describes; it will be important to understand the causes. We find MISO's proposed explanation deficient. In particular, neither the increase in variable generation, nor displacement of dispatchable capacity with intermittent capacity, appears to be a plausible significant factor in increasing incidence of capacity emergencies. Consider that a disproportionate share of capacity emergencies has occurred in the MISO South region, which has relatively little intermittent generation. Intermittent generation remains, even today, a very small share of MISO capacity—too small to account for an appreciable share of recent increases in Max Gen events. Moreover, it appears that intermittent generation is reasonably accredited to account for its load-carrying capability, and we are not aware that MISO has suggested otherwise. It appears to us that the primary development responsible for an increase in Max Gen occurrences is the retirement of large amounts of conventional generation that provided a large capacity surplus for most of MISO's history, including a significant amount of coal-fired generation that retired by early 2016. Indeed, given the pace of recent retirements, it is not clear to us that the age of generators in aggregate is increasing, which casts some doubt on MISO's description of degraded performance. In addition, the net reduction in capacity provided by Capacity Resources has been accompanied by an increase in the quantity of cleared Load-Modifying Resources—which can only be dispatched in emergencies—a trend that would appear to provide at least a partial further explanation for increasing incidence of capacity emergencies. We suggest that MISO reconsider its description and provide documentation for trends that it identifies as significant causes.



MISO response:

MISO has experienced several operational events that have occurred that weren't previously encountered. The increase in operational events is largely related to the reduction in available generating capacity resulting from the retirement of conventional generation resources that has occurred over the years as the fleet transitioned toward renewable energy and greater reliance on emergency only resources, such as Load Modifying Resources, to meet capacity needs. The report narrative will be revised to better clarify this point.

10. At p. 21 the draft report describes that the Tranche 1 evaluation process iterated between reliability and economic analysis in refining the recommended project set. Members of the TDU Sector are not familiar with such an effort or of significant economic analysis for project alternatives. If such analysis was performed, we would request that MISO identify where the results are posted and provide more detail in the report.

MISO response:

The evaluation of candidate projects was designed to consider both the reliability and economic performance of the proposed solution. Where reliability analysis shows that alternatives deliver the same performance in addressing reliability issues, economic evaluation is used to assess whether a project provides clear economic advantages. If the reliability assessment indicated that the alternative submissions did not perform as well as the primary candidate, then economic analysis was not needed to select the preferred solution. Reference to economic evaluation process was discussed at the October 19, 2021 LRTP workshop and results were referenced and discussed for alternatives in the February 25, 2022 LRTP Workshop materials.

11. At p. 52 MISO describes the calculation of Benefit B—Avoided Capital Costs of Local Resource Investments—and makes the following statement about the calculation adopted by MISO:

After evaluating several different options to link the LRTP Tranche 1 Portfolio to the regional and local expansion, MISO and stakeholders ultimately decided on the calculations shown in equation (1) and (2) below.

Members of the TDU Sector are not aware that stakeholders on the whole provided significant feedback on the proposed calculation or endorsed it. Accordingly, MISO should remove “and stakeholders” from the statement above.

MISO response:

Regarding the statement pertaining to the calculation of Avoided Capital Cost of Local Resource Investment, MISO revised the methodology for calculating the avoided capital cost of local resources and discussed the proposed changes with stakeholders in the LRTP workshops. The report narrative will be revised to clarify this point by stating “MISO proposed revised calculations and reviewed the details of the changes with stakeholders in the LRTP Workshop discussions.”

12. We stress the importance of accounting for upgrades that may be anticipated in adjacent regions, including the northern Illinois portion of PJM that lies near the center of MISO's North-Central Subregion. We recognize the timing considerations that MISO believed posed constraints on the scope of the Tranche 1 study, and that these made it challenging to consider approaches that involved significant modifications to non-MISO facilities, as well as alternative solutions such as flow control. We believe such consideration will be critical to cost-effective upgrades in future tranches, however, and ask that MISO work to integrate this into future study phases.



MISO response:

MISO analysis of LRTP candidates includes consideration of alternatives that are submitted by stakeholders within the alternative solution window. Several alternatives were evaluated as possible solutions in order to determine the most appropriate and cost-effective project and these are documented in the LRTP report. MISO will be engaging other regions as we move into Tranche 2 for needs and impacts on non-MISO facilities. MISO has been in discussions with AECI and PJM. As well, MISO and SPP have been actively engaged in the Joint Transmission Interconnection Queue study and we will continue to engage with SPP on LRTP as we move forward.

13. We encourage MISO to carefully consider both the current broad inflation environment and changes in the cost of transmission-line construction in its economic assessments.

MISO response:

MISO's economic analysis and transmission cost estimation guide is regularly updated to adjust for inflation as well as material costs. Since LRTP considers longer timeframes, the current high inflation rate is not expected to persist but will continue to be monitored as LRTP progresses.

Feedback Subject (WPPI Energy): Comments on the Draft MTEP21 Tranche 1 Portfolio Report

Verbatim stakeholder comments:

WPPI is part of the Muni/Co-op/TDU Sector and joins that sector's comments on the April 12 draft of MISO's LRTP Tranche 1 Report.

In addition, we note that at p. 32 the draft report describes "an approximate increase of 250 MW in the" LRZ2 import level from the west that can be sustained within voltage-stability limits with the addition of the Tranche 1 projects. This appears to be a rather low number, given the scale of the projects at issue, indicating that a MISO review of that analysis may be appropriate. Additionally, we suggest that the new Tremval 345 kV switching station might be a good location for future installation of fast dynamic reactive-power injection to make better use of the new circuits in alleviating voltage-stability limits, that the station be designed to accommodate such a future addition, and that future study phases consider the impact of such a system addition.

MISO response:

MISO staff appreciates the comments from WPPI Energy to the MTEP21 Addendum and LRTP process for Tranche 1. The 250MW increase referred to in the study analysis is one aspect of benefits provided and discussed in the Minnesota-Wisconsin area in Section 6 of the MTEP21 Addendum and not the sole determinant for moving that project forward as a recommended project. MISO agrees that Tremval may serve as a desirable location for reactive support, which is expected to become increasingly important as MISO moves into the LRTP Tranche 2 study analysis.

Feedback Subject (Ameren): Comments on the Draft MTEP21 LRTP Tranche 1 Portfolio

Verbatim stakeholder comments:

Ameren supports MISO's proposal to append MTEP21 to include the Tranche 1 portfolio of eighteen transmission projects. These projects are critical to address the immediate reliability needs evident in the



MISO Midwest Subregion and are critically needed to enhance connectivity and maintain adequate reliability. The changing energy landscape, as evidenced by the recent Planning Resource Auction results, and extreme weather conditions, along with tight operating conditions are further evidence that the Long-Range Transmission Planning (LRTP) projects are crucial to the customers in the Midwest Subregion.

MISO's 2016 Resource Availability and Need (RAN) initiative led to MISO's groundbreaking Renewable Integration Impact Assessment (RIIA) study, which identified challenges to the continued safe and reliable operation of MISO's system resulting from the rapidly increasing proportion of renewable generation powering MISO's grid. These efforts combined with the forward-looking future scenarios utilized in the LRTP and the business case analysis have resulted in the Tranche 1 portfolio.

MISO's LRTP effort will not only enable new resources to be installed, but also mitigate uncertainty as to retirement decisions as the energy transition accelerates. Tranche 1 is an urgently needed first step. Tranche 2 will need to review the additional scenarios contemplated by Future 2 so that MISO stays ahead of transmission and system reliability issues. Additional stressors to the system have occurred since the completion of the future scenario work and exhibits the need for these projects to be approved and assigned quickly. Ameren supports MISO's comprehensive efforts and the sense of urgency for Tranche 1.

MISO's April 12, 2022 MTEP Report Addendum: Long Range Transmission Planning Tranche 1 Portfolio Report provides sufficient support to enable the LRTP Tranche 1 Portfolio to receive required authorizations from relevant MISO entities pursuant to the timeline to ensure that the LRTP Tranche 1 Portfolio may be appended to MISO's MTEP21 regional transmission plan on a timely basis. The foundational LRTP Tranche 1 Portfolio is urgently needed to address the immediate reliability benefits identified in the MISO Tranche 1 report and should be approved without delay.

MISO response:

MISO staff appreciates Ameren's comments and support of the MTEP21 Addendum and LRTP process for Tranche 1.

Feedback Subject (Certain MISO TOs): Comments in support of the Draft MTEP21 Report Addendum -LRTP Tranche 1 Portfolio Report

Verbatim stakeholder comments:

The Certain MISO TOs appreciate the opportunity to comment on MISO's April 12, 2022 MTEP Report Addendum: Long Range Transmission Planning Tranche 1 Portfolio Report.¹ The Certain MISO TOs support MISO's proposal to append to MTEP21 "a Tranche 1 portfolio of eighteen transmission projects... to enhance connectivity and maintain adequate reliability for the Midwest Subregion by 2030."²

As detailed below, MISO's MTEP21 Report Addendum is the result of rigorous and comprehensive regional planning and extensive stakeholder outreach and collaboration, and MISO has demonstrated in its robust business-case analysis that the varied subregional benefits of the Tranche 1 portfolio are wide-spread and exceedingly cost-justified, notwithstanding MISO's intentionally conservative benefits analysis. MISO's MTEP21 Report Addendum provides the support necessary for MISO's Planning Advisory Committee to vote to recommend including the Addendum in MTEP21 on May 27, 2022; for the MISO Board of Directors' System Planning Committee to affirmatively vote to include the Addendum in MTEP21 on June 30, 2022; and ultimately for the full MISO Board of Directors to vote to authorize the inclusion of the Addendum in MTEP21 on July 25, 2022, respectively.

MISO has Methodically Documented the Underlying, Urgent Need for the LRTP Tranche 1 Portfolio



MISO has engaged with stakeholders to provide analysis and recommendations related to the precipitous and simultaneous influx of renewable generation penetration and fossil-fuel fired baseload generation retirements, and the increasing frequency and severity of weather-related events, that together form the need case for MISO's Long Range Transmission Plan dating back to at least 2016. MISO's 2016 Resource Availability and Need (RAN) initiative³ led to MISO's groundbreaking Renewable Integration Impact Assessment (RIIA) study,⁴ which identified the challenges to the continued safe and reliable operation of MISO's system resulting from the rapidly increasing proportion of renewable generation powering MISO's grid. MISO subsequently engaged in collaborative efforts with its stakeholders over an eighteen-month period to update its obsolete Planning Futures in 2019.⁵ The resulting MISO Futures Report incorporates into MISO's regional planning the transformational changes to MISO's generation fleet that have already been underway for years and also acknowledges the impact of customer choice and preference as well as state and utility resource goals. MISO's Futures 1,2, and 3 provide realistic "book-end" projections on a 20-year out basis, with Future 1 being the most conservative projection. These MISO efforts culminated in the issuance by MISO of its comprehensive Response to the Reliability Imperative report in 2020.⁶ The Long-Range Transmission Plan is but one of the four prongs of MISO's overarching Reliability Imperative strategy. MISO's Long Range Transmission Plan recognizes that a substantial amount of new transmission is urgently required for MISO to continue to maintain safe and reliable service to the 42 million people that rely on MISO for 8,760 hours each year.⁷ MISO's Reliability Imperative report was styled as a "living document" and has been periodically refined by MISO since 2020.

MISO has methodically and comprehensively documented the urgent need for the inaugural LRTP Tranche 1 Portfolio through years of study, analysis, and collaborative discussion with its stakeholders. The LRTP Tranche 1 Portfolio has greatly benefited from MISO's methodical analysis and stakeholder engagement. The Certain MISO TOs appreciate these proactive steps toward meeting the immediate reliability challenges before us - from RIIA, the MISO MTEP Futures and the LRTP initiative - that enable consideration of the LRTP Tranche 1 Portfolio at this time.

MISO's LRTP Tranche 1 Portfolio Is the Product of Rigorous, Collaborative Sub-Regional Portfolio Planning

The LRTP Tranche 1 Portfolio is comprised of eighteen foundational "no regrets" projects intended to satisfy the initial, projected needs of MISO's most conservative Future 1. Section 5 of MISO's MTEP21 Report Addendum details MISO's rigorous regional planning efforts that resulted in the development, in collaborative partnership with interested and affected stakeholders, of eighteen transmission projects dispersed across

¹ For purposes of this stakeholder feedback, the Certain MISO TOs are: International Transmission Company d/b/a ITC Transmission, Michigan Electric Transmission Company, LLC, and ITC Midwest LLC; MidAmerican Energy Company; Ameren Services Company, as agent for Union Electric Company d/b/a Ameren Missouri, Ameren Illinois Company d/b/a Ameren Illinois and Ameren Transmission Company of Illinois; Northern States Power Company, a Minnesota corporation, and Northern States Power Company, a Wisconsin corporation, subsidiaries of Xcel Energy Inc.; and Otter Tail Power Company.

² MTPE21 Report Addendum (Addendum) at 3.

³ MISO's Aligning Resource Availability and Need Whitepaper, *available at*: [https://cdn.misoenergy.org/Aligning%20Resource%20Availability%20and%20Need%20\(RAN\)410587.pdf](https://cdn.misoenergy.org/Aligning%20Resource%20Availability%20and%20Need%20(RAN)410587.pdf)

⁴ MISO's Renewable Integration Impact Assessment and supporting materials, *available at*: <https://www.misoenergy.org/planning/policy-studies/Renewable-integration-impact-assessment/#t=10&p=0&s=&sd=>

⁵ MISO's Futures Report, *available at*: <https://cdn.misoenergy.org/MISO%20Futures%20Report538224.pdf>

⁶ MISO's Response to the Reliability Imperative, *available at*: <https://cdn.misoenergy.org/MISO%20Response%20to%20the%20Reliability%20Imperative504018.pdf>

⁷ MISO "About Us," *available at*: <https://www.misoenergy.org/about/>



MISO's Midwest subregion.⁸ MISO's MTEP21 Report Addendum, Section 6, provides a more detailed overview of each of the eighteen projects located in five geographic focus areas, providing an overview of the projects, the planning rationale, the issues addressed, and the alternatives considered.⁹ MISO demonstrates in the Addendum that this initial Tranche 1 Portfolio will materially contribute to MISO's prospective ability to "reliably deliver energy from future resources to future loads under a range of projected load and dispatch patterns associated with the Future 1 scenario in the 10-year and 20-year time horizon."¹⁰ The Certain MISO TOs support MISO's determination in the Addendum that the eighteen projects comprising the Tranche 1 Portfolio are a reasoned and appropriate foundational solution to meet the demonstrated needs of MISO's stakeholders.

MISO's LRTP Tranche 1 Portfolio Provides Robust, Varied, and Subregion-Wide Benefits That Are Far in Excess of LRTP Tranche 1 Portfolio Costs

MISO's business case analysis set forth in the Addendum demonstrates that the Tranche 1 portfolio has an aggregate benefit to cost ratio between 2.6 and 3.8, and a b/c ratio of at least 2.1 for every MISO Cost Allocation Zone in the MISO Midwest subregion.¹¹ MISO provides a detailed overview of its computation of six separate benefit metrics in Section 7 of the MTEP21 Report Addendum over a 20-year and 40-year time horizon.¹²

MISO's Avoided Risk of Load Shedding benefit metric provides MISO's first objective measurement of "resilience" as a transmission benefit. The Congestion and Fuel Cost Savings benefit metric provides a reasonable forecast of the benefit of the LRTP Tranche 1 Portfolio to "not only reduce system congestion but also facilitate access to [MISO's] diverse, ever-changing resource mix."¹³ MISO's Avoided Capital Costs of Local Resources Investments benefits metric "captures the cost savings realized from a more cost-effective regional resource buildout that is enabled by regional transmission investment instead of depending on a more costly local resources buildout that is required due to local transmission limitations."¹⁴ In short, this benefit metric provides a reasonable forecast of regional transmission buildout to that can reduce local area generation for the benefit of the Midwest subregion. MISO's Avoided Risk of Load Shedding benefit metric is MISO's first direct attempt to create an objective measure of "resilience," or the ability of MISO's transmission grid to mitigate the impact of low frequency, high impact events, such as widespread generation or transmission outages or increasingly severe and frequent weather events, on MISO stakeholders. MISO estimates that this benefit metric alone will provide approximately \$1B-10B worth of benefits to MISO stakeholders. 2021 Winter Storm Uri provided a recent reminder to stakeholders of the unique ability of regional transmission to mitigate the impact of severe weather events.¹⁵

⁸ Addendum Section 5 (LRTP Tranche 1 Portfolio Development and Scope) at pp. 17-21.

⁹ Addendum at pp. 21-47.

¹⁰ Addendum at 19.

¹¹ Addendum at 5.

¹² Addendum at pp. 47-64.

¹³ Addendum at 48.

¹⁴ Addendum at 51.

¹⁵ MISO's February Arctic Weather Event Report at 3, *available at:*

<https://cdn.misoenergy.org/2021%20Arctic%20Event%20Report554429.pdf> ("Transmission is vital to moving electricity from where it is generated to where it is needed most. The MISO region had adequate supply during the Arctic Event, but transmission constraints, including overloaded lines and the Regional Dispatch Transfer Limits, hindered the ability to move energy to the specific areas where it was needed. MISO's transmission system also supported our neighbors during the Arctic Event, in particular with substantial power flowing from the east through MISO to support reliable and efficient operations in the Southwest Power Pool (SPP). In addition to new transmission capacity, improved interregional coordination and interconnection will bring significant benefits to facilitate reliability and efficiency.")



MISO has frequently reiterated to stakeholders in LRTP Tranche 1 Portfolio discussions that its suite of LRTP benefit metrics, and MISO's respective computation methodologies to obtain specific benefit measures, are "conservative" measures. Some stakeholders have challenged certain aspects of MISO's benefit metric computations. However, there is little debate in the MISO stakeholder community regarding whether the benefits of LRTP Tranche 1 Portfolio are "roughly commensurate" with its costs, as required by FERC precedent. In addition to demonstrating the aggregate benefits to be provided by the Tranche 1 Portfolio, MISO has also demonstrated in the Addendum that the benefits of the LRTP Tranche 1 Portfolio accrue to each and every individual Cost Allocation Zone in the MISO Midwest Subregion on a roughly equal basis, and that the minimum, conservative estimate of the b/c ratio provided to any individual CAZ is at least 2.1.¹⁶ MISO has demonstrated in the Addendum that the benefits to be provided by the LRTP Tranche 1 Portfolio significantly outweigh the costs, and that there is a broad and equitable sharing of benefits across the MISO Midwest's Cost Allocation Zones.

MISO's Long Range Transmission Plan Leverages the Demonstrated Success of its 2011 Multi-Value Project Portfolio

MISO's LRTP Tranche 1 Portfolio builds off the success of MISO's groundbreaking 2011 Multi-Value Project (MVP) Portfolio, which has consistently overdelivered on expected benefits to stakeholders in the intervening decade, and also delivered quantitative and qualitative benefits not even contemplated at the time that inaugural portfolio was planned (*i.e.*, the massive East-West interregional power flows that significantly ameliorated the impact on MISO of Winter Storm Uri in 2021). MISO's MVP project classification and associated cost allocation methodology is time-tested and FERC-approved. FERC and the courts have consistently upheld MISO's MVP planning and cost allocation approach in the face of challenges from stakeholders, thus creating a strong precedential framework for MISO to leverage for the LRTP Tranche 1 Portfolio. Most recently, FERC has invoked MISO's MVP planning and cost allocation approach as an example for others in the industry to follow for regional planning efforts in its April 21, 2022 "Building for the Future Through Electric Regional Transmission Planning and Cost Allocation and Generator Interconnection" Notice of Proposed Rulemaking. MISO's MVP project classification is the optimal vehicle for MISO to leverage to address, through the LRTP Tranche 1 Portfolio, the urgent regional reliability issues that have arisen since MISO last engaged in regional portfolio planning more than a decade ago. The Certain MISO TOs support MISO's use of the successful, FERC- and Court-supported MVP project classification to advance the LRTP Tranche 1 Portfolio.

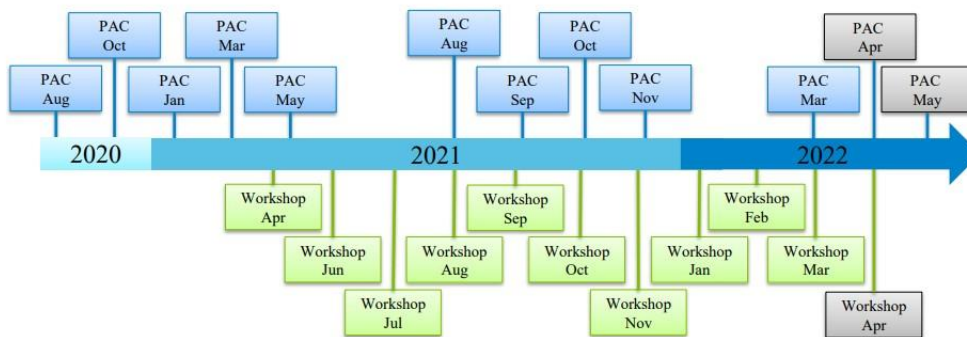
MISO has Collaborated with Stakeholders throughout the LRTP Planning and Cost Allocation Process

As detailed above, MISO has collaborated with its stakeholders since 2016 to put in place the foundational elements that led to MISO's Long Range Transmission Plan and the LRTP Tranche 1 Portfolio. In addition, however, and as detailed, below, MISO has engaged and collaborated with its stakeholders in a nearly two-year effort to comprehensively discuss and support MISO's LRTP Tranche 1 Portfolio.

¹⁶ Addendum at 68-69.



Workshops and Stakeholder feedback is an integral element of the LRTP process and success

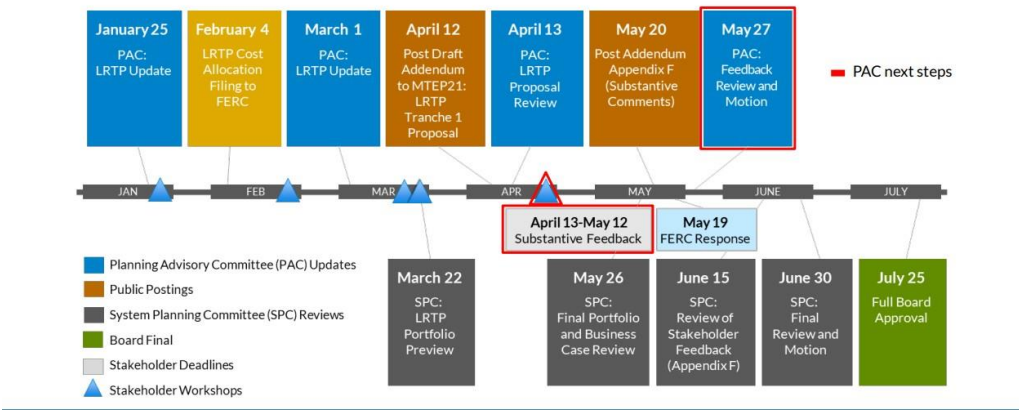


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Source: March 29, 2022 LRTP Workshop Agenda Item 02 Presentation, Slide 6.

LRT Tranche 1 Portfolio approval timeline targeting a July 25th 2022 MISO Board of Directors approval



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Source: April 29, 2022 LRTP Workshop Agenda Item 03 Presentation, Slide 12.

The Certain MISO TOs appreciate MISO’s proactive outreach to, and collaboration with, its stakeholders throughout its Long Range Transmission Planning process over a nearly two-year period.

In conclusion, MISO’s April 12, 2022 MTEP Report Addendum: Long Range Transmission Planning Tranche 1 Portfolio Report provides sufficient support to enable the LRTP Tranche 1 Portfolio to receive required authorizations from relevant MISO entities pursuant to the timeline, above, such that the LRTP Tranche 1 Portfolio may be appended to MISO’s MTEP21 regional transmission plan on a timely basis. The foundational LRTP Tranche 1 Portfolio is urgently needed to address the reliability benefits identified in the MISO Tranche 1 report and should be approved without delay.

MISO response:

MISO staff appreciates the Certain MISO TOs comments and support of the MTEP21 Addendum and LRTP process for Tranche 1.



Feedback Subject (Eligible End Use Customers): Comments on LRTP Tranche 1 Portfolio Benefits

Verbatim stakeholder comments:

Association of Businesses Advocating Tariff Equity, Coalition of MISO Transmission Customers, Illinois Industrial Energy Consumers, Louisiana Energy Users Group, Midwest Industrial Customers, NIPSCO Large Customer Group and Texas Industrial Energy Consumers Position on LRTP Tranche 1 Portfolio Benefits

The Association of Businesses Advocating Tariff Equity (“ABATE”), Coalition of MISO Transmission Customers (“CMTC”), Illinois Industrial Energy Consumers (“IIEC”), Louisiana Energy Users Group (“LEUG”), Midwest Industrial Customers (“MIC”), NIPSCO Large Customer Group (“NLCG”) and Texas Industrial Energy Consumers (“TIEC”) appreciate this opportunity to provide feedback to the Midcontinent Independent Transmission System Operator, Inc. (“MISO”) with respect to MISO April 12, 2022 Draft MTEP21 Report Addendum (“Draft Addendum”) concerning MISO’s proposed Long Range Transmission Planning (“LRTP”) Tranche 1 transmission projects. Collectively, our respective member companies have major industrial facilities located in Illinois, Indiana, Louisiana, Michigan, Texas and Wisconsin, as well as elsewhere within the MISO footprint, and are among the largest direct or indirect employers within the MISO footprint. We are all active participants in the MISO stakeholder process and all of us except NLCG are MISO Members within the MISO End-Use Customer Sector. Our comments focus on Section 7 of the Draft Addendum, which addresses LRTP Tranche 1 Portfolio Benefits.

Our major concern with MISO’s presentation of LRTP Tranche 1 Portfolio Benefits in the Draft Addendum is that MISO’s methodology contains three serious flaws that we believe overstate the forecasted benefit of the LRTP Tranche 1 transmission projects.

We acknowledge, given MISO’s forecasted 20-year net present value revenue benefit to cost ratio of 2.6 for the overall MISO North/Central Subregion (a/k/a MISO Midwest), full correction of these three flaws may not cause the overall 20-year net present value benefit to cost ratio for LRTP Tranche 1 to fall below 1.0 for the overall MISO North/Central Subregion. However, failure to correct the flaws in MISO’s benefits methodology could lead to future proposed LRTP Tranches, such as LRTP Tranches 2, 3 and/or 4, being represented as providing a forecasted benefit to cost ratio in excess of 1.0 even though in fact they do not.

Furthermore, the overstatement of forecasted benefits makes gaining those state regulatory approvals that will be necessary to move forward with the construction of the proposed LRTP Tranche 1 transmission projects unnecessarily vulnerable to complication and delay given the litigious nature of the process to gain such approvals.

Finally, the overstatement of benefits may not be uniformly distributed over the Cost Allocation Zones (“zones”) within the MISO North/Central Subregion. As a result, when the flaws causing the overstatement are fully corrected it may further aggravate concerns with respect to the forecasted zonal distribution of the benefits of LRTP Tranche 1 not being roughly commensurate with the zonal distribution of the costs of LRTP Tranche 1 that will occur if all of the LRTP Tranche 1 projects are approved as a single subregional Multi-Value Project (“MVP”) portfolio. Potentially, this aggravation could be severe enough such that certain zones have a forecasted benefit to cost ratio that is less than 1.0 for the LRTP Tranche 1 projects as whole. In other words, it could result in a forecasted net cost for some zones rather than a forecasted net benefit for those zones. It should be noted that such a revelation would not necessarily mean that a subset of the LRTP Tranche 1 transmission projects could not be approved as part of a subregional MVP portfolio or that the projects that were not included in that subset could not be approved outside that subset. For example, the portion of the transmission projects within LRTP Tranche 1 that were not approved as part of a subregional MVP portfolio could still conceivably be approved as Baseline Reliability Projects (“BRPs”), Market Efficiency Projects (“MEPs”) and/or “Other” Projects in order to ensure the forecasted zonal distribution of the benefits for the



L RTP Tranche 1 transmission projects as a whole is roughly commensurate with the forecasted zonal allocation of the costs for the L RTP Tranche 1 transmission projects as a whole.

The three specific serious flaws we have identified in MISO's proposed L RTP Tranche 1 Portfolio Benefits methodology are as follows:

1. MISO did not use a consistent reference case for forecasting Congestion and Fuel Savings, Decarbonization and Avoided Capital Cost of Local Resources;
2. MISO's calculation of forecasted Resource Adequacy Savings overstates the expected cost difference between capacity resources located within a local zone versus those located elsewhere in the MISO North/Central Subregion; and
3. MISO's calculation of the forecasted Avoided Risk of Load Shedding is greatly overstated by assuming the MISO North/Central Subregion will experience a firm loss of load event every three years and that the L RTP Tranche 1 transmission projects will allow a complete avoidance of such events.

Also, we would caution against putting any significant weight on MISO's informational calculations that either use a 3.0% discount rate, examine benefits and costs out to 40 years or utilize an assumed carbon emissions price in excess of a \$12.55 per metric ton starting point with a 2.5% escalation.

Attachment FF of the MISO Tariff requires the benefit to cost ratio to be calculated on a 20-year net present value basis using a discount rate based on the Weighted Average Cost of Capital ("WACC") for transmission owners. As such, the economic analysis MISO has performed using a 20-year net present value revenue requirement with a discount rate of 6.9% is what is relevant.

It should also be noted that the WACC for transmission owners, which MISO has assumed as 6.9%, is the cost of capital that transmission customers, and ultimately, ratepayers, will pay for the proposed transmission investments. It is not what ratepayers would typically receive on a risk-adjusted investment, which MISO has assumed as 3.0%. Use of a discount rate of 3.0% overstates the value to ratepayers of the investment in the proposed transmission projects as it is less than the assumed 6.9% cost for capital they will incur in rates for those projects and is inconsistent with the common use of utility WACC as the discount rate in economic analysis in state regulatory proceedings.

With respect to using a 40-year study period, while transmission facilities have a long operational life, forecasted benefits 21 to 40 years out into the future are much more speculative than those forecast for the first 20 years and this is not captured in the discount rate, which only accounts for the cost of capital for the transmission investments.

Finally, with respect to decarbonization, while we are not objecting to the inclusion of a limited carbon tax assumption in MISO's benefits analysis, such as \$12.55 per metric ton escalating at 2.5% per year, to reflect that there is some probability of a carbon tax or carbon cap and trade regulation being introduced at some point in the study period, it is important to recognize that currently there is no such tax or cap and trade regulation in place for carbon emissions. As such, at this time very little if any weight should be placed on the net present value calculations that used MISO's high-end \$47.80 per metric ton escalating at 2.5% per year carbon emissions price.

The balance of our comments provides more detail on each of the three specific flaws we have enumerated above along with recommendations to resolve each of them.

[MISO did not use a Consistent Reference Case for Forecasting Congestion and Fuel Savings, Decarbonization and Avoided Capital Cost of Local Resources](#)



For Congestion and Fuel Savings and Decarbonization, the resource change between the reference case and the case with LRTP Tranche 1 added is the addition of the Future Renewable RRF Resources that have greater than or equal to 5% impact on the reliability constraints addressed by LRTP Tranche 1 (“Enabled Regional Renewable RRF Resources”).

For Avoided Capital Cost of Local Resources, the resource change between the reference case and the case with LRTP Tranche 1 added is the addition of the Enabled Regional Renewable Resources and the removal of the Local RRF Resources (both renewable and non-renewable) that would be avoided by the addition of the Enabled Renewable RRF Resources (“Avoided Local RRF Resources”).

The difference between the changes from the reference case to the LRTP Tranche 1 case above is caused by the reference case for Congestion and Fuel Savings and Decarbonization not including the Avoided Local RRF Resources.

The failure to include the Avoided Local RRF Resources in the reference case for Congestion and Fuel Savings will cause the congestion and fuel costs in the Congestion and Fuel Savings reference case to be overstated. As a result, the difference between the congestion and fuel costs in the Congestion and Fuel Savings reference case and the congestion and fuel costs in the case with LRTP Tranche 1 added will also be overstated. MISO should have included the Avoided Local RRF Resources in its Congestion and Fuel Savings reference case.

This same issue exists in MISO’s Decarbonization forecast. Failing to include the Avoided Local RRF Resources in the reference case for Decarbonization will cause the carbon emission cost savings in the Decarbonization reference case to be overstated. As a result, the difference between the carbon emission costs in the Decarbonization reference case and the carbon emission costs in the case with LRTP Tranche 1 added will also be overstated. MISO should have included the Avoided Local RRF Resources in its Decarbonization reference case.

MISO suggested in its April 29, 2022 LRTP Workshop response to this concern that different reference cases can be used for metrics that are quantifying different types of benefits. We agree that can be true if the different types of benefits are fully decoupled from one another. However, that is not the case here. If the Avoided Local RRF Resources have to be constructed because the Enabled Regional Renewable RRF Resources cannot be constructed (due to LRTP Tranche 1 not being constructed), the addition of the Avoided Local RRF Resources will still provide some level of congestion and fuel cost savings and carbon emission savings even if it is not the same level of such savings that would be provided if the Enabled Regional Renewable RRF Resources were instead pursued. As a result, Congestion and Fuel Savings, Decarbonization and Avoided Capital Cost of Local Resources are not full decoupled from each other. Therefore, the reference cases for all three of these benefit analyses need to have the same resources in them and the cases for all three benefit analyses with LRTP Tranche 1 added need to have the same resources in them.

We would also note that we believe this issue would have been entirely avoided if MISO used a software tool for the analysis for all three benefit metrics that includes both resource build out optimization and detailed production cost modeling (e.g., Aurora XMP, EnCompass, PLEXOS, etc.). If MISO had done so, it would have been able to compare, in an integrated fashion, the capital, fuel and congestion costs and carbon emission costs for a single common reference case (with the Avoided Local RRF Resources included) to the capital, fuel and congestion costs and carbon emission costs for the case with LRTP Tranche 1 added (with the Avoided Local RRF Resources removed and the Enabled Regional Renewable RRF Resources added in their place).

To address the foregoing, MISO should rerun its LRTP Tranche 1 production cost analyses for Congestion and Fuel Savings and Decarbonization such that it includes the Avoided Local RRF Resources in the reference case for each of those analyses. This would bring those reference cases in line with MISO’s reference case for its Avoided Capital Cost of Local Resources analysis and eliminate the overstatement of forecasted Congestion and Fuel Savings and Decarbonization that is present in MISO’s current calculations.



In addition, on a going forward basis, MISO should explore migrating to a software tool for the analysis of all three benefit metrics that includes both resource build out optimization and a detailed production cost modeling such that the analyses for Avoided Capital Cost of Local Resources, Congestion and Fuel Savings, and Decarbonization for a LRTP Tranche can be performed in an integrated fashion using common reference and change cases.

MISO response:

MISO staff appreciates the comments from Eligible End Use Customers to the MTEP21 Addendum and LRTP process for Tranche 1. MISO's approach to the business case for the LRTP Tranche 1 Portfolio was to quantify the multiple types of benefits the transmission provides to address the reliability issues and resource expansion needs identified in MISO's Future 1. In developing the methodology for each of the six benefit metrics, MISO was mindful to avoid overstating the amount of benefits attributed to each metric, and most stakeholders broadly have agreed transmission provides the values being calculated by the various benefit metrics. Within that broad agreement, though, there has been continuing discussion on the details of the calculations used to derive the benefits.

In particular there has been a lot of stakeholder discussion on the cases used to calculate the Congestion and Fuel Savings, Decarbonization, and Avoided Capital Cost of Local Resource Investment benefit metrics. A more detailed explanation of how those benefit metrics are complementary and don't result in overstating of benefits is provided below.

The Congestion and Fuel Savings metric, Carbon Reduction, and the Avoided Capital Cost of Local Resource Investment assume that the Future 1 member plans and goals must be met, and that regional resource expansion requires the LRTP portfolio to be achieved. However, they show different benefits in how the portfolio enables these goals to be achieved.

- *For the Avoided Capital Cost benefit metric, the reference case establishes the fact that without the LRTP Tranche 1 Portfolio, a local resource buildout is required to meet the Future 1 requirements. The benefits focus on costs of the physical construction of resources, without regard to their ability to be delivered to load, and it captures the differences in capital costs in that local versus the Future 1 scenario buildout.*
- *In the Congestion and Fuel Savings benefit analysis, the reference case focuses on a local buildout considering deliverability constraints. To model the potential deliverability limitations, a distribution factor (DFAX) method was used to identify the resources that could be materially attributed to the LRTP Tranche 1 Portfolio, and the modeling assumed those 20 GW of renewable resources would not be available without the LRTP Tranche 1 Portfolio. The deliverable generation was then used to calculate production and carbon reduction benefits.*

MISO's Calculation of Forecasted Resource Adequacy Savings Overstates the Expected Cost Difference between Capacity Resources Located within a Local Zone versus those Located Elsewhere in the MISO North/Central Subregion

Under MISO's calculation of forecasted Resource Adequacy Savings, MISO is assuming the local cost for capacity is the MISO Cost of New Entry ("CONE") price for a new frame combustion turbine generation facility. As a result, under its calculation, MISO assumes each MW of local capacity shortfall in its buildout that can be cured with a decrease of the Local Clearing Requirement ("LCR") for the local zone as a result of LRTP Tranche 1 will save the local zone the CONE price. This greatly overstates the potential savings from LRTP Tranche 1 under this metric.

Specifically, the long run marginal cost for capacity both within the local zone and elsewhere in MISO is roughly the same – CONE. The long run marginal cost savings, if any, that occurs between locating capacity in the local zone versus importing it from elsewhere in MISO is the difference between the CONE prices for the two locations less any difference in the offsetting energy and operating reserve margins that can be earned (from the new capacity resource) between the two locations. The long run marginal cost savings is not the CONE price itself. Furthermore, even if there are some years where there is surplus capacity elsewhere in MISO, it would not necessarily occur in each and every year following the completion of construction of the



LRTP Tranche 1 transmission projects. There could be some years where the market price for capacity elsewhere in MISO is at the CONE price. In addition, the market price for capacity elsewhere in MISO during those times when surpluses occur would not necessarily be zero as historical experience in MISO shows. Finally, it is not a given that the market price for capacity in the local zone will always be at the CONE price during every year following the completion of the LRTP Tranche 1 transmission projects.

Given the foregoing, the magnitude of MISO's forecasted savings from this benefit needs to be moderated. To that end, as a minimum, we recommend that two adjustments be made. First, we recommend the unconstrained capacity market price for the MISO North/Central Subregion be assumed to be \$15 per MW-day (close to the seven year average of the price from 2015/2016 through 2021/2022) rather than \$0 per MW-day. Second, we recommend that Zone 7 (Lower Michigan), the only zone forecasted by MISO receive a benefit under this metric, only be assumed to clear at the MISO CONE price for 25% of the years following the date all of the LRTP Tranche 1 transmission projects enter service. During those years where there is assumed price separation between Zone 7 and the rest of the MISO North/Central Subregion, the savings would be based on the cost difference between the MISO CONE price for Zone 7 and \$15 per MW-day. In the other years, the cost difference (and, thus, the savings) would be zero (0) since there would be no cost separation between Zone 7 and the rest of the MISO North/Central Subregion. We still believe this will overstate the cost savings under this metric since the long run marginal cost difference between local capacity and capacity located elsewhere is, as we have noted, the locational difference in CONE price offset by the locational difference in the energy and operating reserve margins that can be earned. However, our two recommended adjustments would make a significant correction in the right direction.

MISO Response:

The Reduced Resource Adequacy Requirements benefit metric represents the savings from deferred resource investment that would be required to meet local clearing requirements under a Future 1 expansion scenario due to lack of import capability and does not attempt to forecast the future capacity market prices. The value of Cost of New Entry (CONE) is used as a proxy for the capital cost savings realized by increased import capability to enable access to resources elsewhere. Even with sufficient capacity there will be a price for capacity within the zone as well as outside the zone, but the clearing price of future capacity markets is beyond the scope of this calculation.

MISO's Calculation of the Forecasted Avoided Risk of Load Shedding is Greatly Overstated by Assuming the MISO North/Central Subregion will Experience a Firm Loss of Load Event every Three Years and that the LRTP Tranche 1 Transmission Projects will allow a Complete Avoidance of such Events

We understand MISO's proposed Avoided Risk of Load Shedding metric to be an attempt at quantifying the resiliency benefit provided by the LRTP Tranche 1 transmission projects with respect to severe weather events such as Winter Storm Uri in 2021. We support MISO's efforts toward developing such a metric. However, MISO's specifically proposed metric at this time greatly overstates the magnitude of the benefit that would be provided by LRTP Tranche 1 with respect to resiliency. It does so because it assumes that there is an expectation of one loss of load event in the MISO North/Central Subregion related to severe winter weather every three years and that the LRTP Tranche 1 project would completely avoid those events.

MISO's resource adequacy provisions are specifically designed to produce a loss of load expectation of no more than one firm load curtailment within ten years anywhere within the MISO footprint. Furthermore, as of the date of the submission these substantive comments, MISO has pending before FERC in Docket No. ER22-495-000 a proposal to move to a seasonal resource adequacy construct and availability-based capacity accreditation for resources. MISO also has further plans to improve its modeling, capacity accreditation and market rules as part of the Resource Availability and Need portion of its Reliability Imperative. We fully expect the increased frequency of severe weather events will be addressed by MISO in the aforementioned reforms to maintain a loss of load expectation of no more than one firm load curtailment in ten years particularly given the little tolerance that will exist from stakeholders and policymakers with respect to any significant slippage from that historic resource adequacy target. Given this, it is unreasonable to assume that



the MISO North/Central Subregion will experience a loss of load event every three years without the construction of the LRTP Tranche 1 projects.

It is also important to note that a loss of load expectation of no more than one firm load curtailment in ten years does not mean the loss of load expectation during the winter period is one day in ten years. At best case, given the current historic summer peaking nature of the MISO system, no more than half of the loss of load events would be expected to occur during winter months. As a result, it is not reasonable to assume there would be a loss of load event in winter months at a frequency greater than one day in 20 years. Even then, MISO has not shown that LRTP Tranche 1 transmission projects would alone be sufficient to avoid that one winter loss of load event in 20 years.

In response to the above concerns, MISO has suggested that the proposed Avoided Risk of Load Shedding benefit metric is trying to capture a cost risk. In addition, MISO has indicated that its \$3,500 per MWh Value of Lost Load (“VOLL”) estimate used in its calculation of savings under this proposed metric may be greatly understated. However, neither these responses justify the overstatement that is currently within MISO’s current calculation for this benefit.

First, the benefit to cost analysis for LRTP Tranche 1 is required to be performed on an expected value basis, not a cost risk basis. To the extent there are cost risks incorporated into the analysis, they need to be reflected on a probabilistic basis such that the analysis reflects expected values. Probabilistically, for the reasons discussed above, it is not reasonable to assume that more than one winter loss of load event in 20 years can be avoided by the LRTP Tranche 1 projects.

With respect to the VOLL price, there is not consensus at this time to support a higher VOLL price than \$3,500 per MWh. As such, it should not necessarily be assumed that the \$3,500 per MWh price is greatly understated. Furthermore, even if there was overwhelming evidence indicating it was overstated, it would not justify overstating the expected frequency of the winter loss of load events that could be avoided with the addition of the LRTP Tranche 1 transmission projects.

To address the above concerns with respect to MISO’s Avoided Risk of Load Shedding calculation for LRTP Tranche 1, as a minimum, MISO’s calculation should be adjusted to change the frequency of the winter loss of load events that are assumed to be avoided by LRTP Tranche 1 transmission projects from one in three years to one in 20 years.

Thank you for the opportunity to provide this feedback. We look forward to continuing to work with MISO and other stakeholders with respect to the above issues.

Our silence with respect to other aspects of Draft Addendum should not be interpreted as a tacit endorsement of any position being taken, or recommendation being made, by MISO in the Draft Addendum.

MISO response:

Avoided Risk of Load Shedding represents a reliability/resiliency benefit of mitigating risks of load shedding resulting from large scale generation outages caused by severe winter weather events. This is similar to the approach used to capture other reliability benefits such as the mitigation of thermal or voltage violations resulting from the contingencies prescribed by the planning standards. It is not necessary to assess probability of these contingencies occurring to justify the need for a transmission upgrade. Instead, the industry standard requires mitigation of risks by addressing all the post-contingent violations that are identified in the reliability analysis. There is still value in eliminating the risk of the violation even if the contingency does not occur, and similarly with LRTP, there is value in reducing the risk of load loss by improving the transfer capability.

The approach used to monetize the value of this metric is based on the current \$3500/MWh Value of Lost Load (VOLL) used in market pricing to represent value of avoiding risk of load shedding. While VOLL is based on direct costs of an outage to a customer, it does not fully capture all the indirect costs that occur downstream of the customer class



and as a market pricing mechanism which reflects a willingness to pay to avoid load shed and is more representative of the value of risk rather than expected load loss. Furthermore, the value of VOLL is often derived from customer survey information and subject to a wide range of opinions. While MISO uses a \$3500/MWh value in the current market pricing structure, the IMM has suggested the value is actually much higher at \$23,000/MWh. For the purposes of the LRTP benefits analysis, MISO has applied the lower end value as a reasonable measure of the value of avoided risk of load loss because it has already been established as a representative value of load loss in market processes.

The benefits analysis looks at a subset of generation outage events that can result from severe winter weather events that can impact small areas or zones as well as the larger footprint. Each zone can be affected by a smaller scale winter storm that affects the local generation which represents a separate event that should be mitigated. The analysis examines each of the Local Resource Zones separately because the transmission limitations may limit imports to cover generation deficiencies within each zone. Larger scale winter storm events can cause generation outages across multiple zones that result in load loss where transmission limitations prevent wider area power transfers. These scenarios are analyzed separately because the risks of load loss are related to different generation outages and different transmission constraints. The overall value reflects total reduction in risk of load loss provided by LRTP for all the event scenarios.

The frequency of risk used in the benefits analysis is derived from the historical occurrences of large-scale winter storms (Billion-dollar events), but this does not suggest that actual load loss will occur with every storm event. As discussed earlier, the benefits analysis captures the avoided risk rather than avoided actual load loss because this represents a reliability/resiliency benefit realized by addressing the risk of the occurrence of an event. It is not prudent to rely on history as an indicator for futures resource availability risks. The composition of the future resource fleet is significantly different from that of the past with greater variability and uncertainty that results in an increased risk of operational issues.

Feedback Subject (Invenergy LLC): Comments on the Draft MTEP21 LRTP Tranche 1 Addendum – Grain Belt Express

Verbatim stakeholder comments:

Invenergy LLC (“Invenergy”) appreciates the opportunity to submit these comments on behalf of Grain Belt Express LLC (“Grain Belt Express” or “GBX”), to address MISO’s proposal to add the Tranche 1 transmission projects identified via its Long Range Transmission Planning (“LRTP”) initiative as an addendum to its MISO Transmission Expansion Plan (“MTEP”) 21.^[1]

Grain Belt Express supports the mission MISO has outlined for its LRTP effort, to take “a long-term view of bulk electric system development to ensure the values of a reliable and efficient grid are achieved...”^[2] However, MISO’s failure in the LRTP Tranche 1 Addendum to consider how advanced stage merchant transmission projects interconnecting to MISO and its neighboring systems will be impacted by, and in turn ultimately impact, MISO’s design of the LRTP projects and the resulting cost-benefit analysis was a misstep in delivering on this mission, inconsistent with recent guidance from the Federal Energy Regulatory Commission (“FERC”) that suggests RTOs should focus on the most efficient and cost-effective transmission solutions and at cross-purposes with guidance from the Department of Energy (“DOE”) encouraging the development and construction of high-voltage lines connecting areas with significant renewable energy resources to demand centers and linking together independently operated grid regions. Last month FERC issued its Notice of Proposed Rulemaking (“NOPR”) to reform the Commission’s electric regional transmission planning requirements:

“we propose reforms to require public utility transmission providers to conduct long-term regional transmission planning on a sufficiently long-term, forward-looking basis to identify and plan for transmission needs driven by changes in the resource mix and demand...Specifically, without these reforms, we believe that



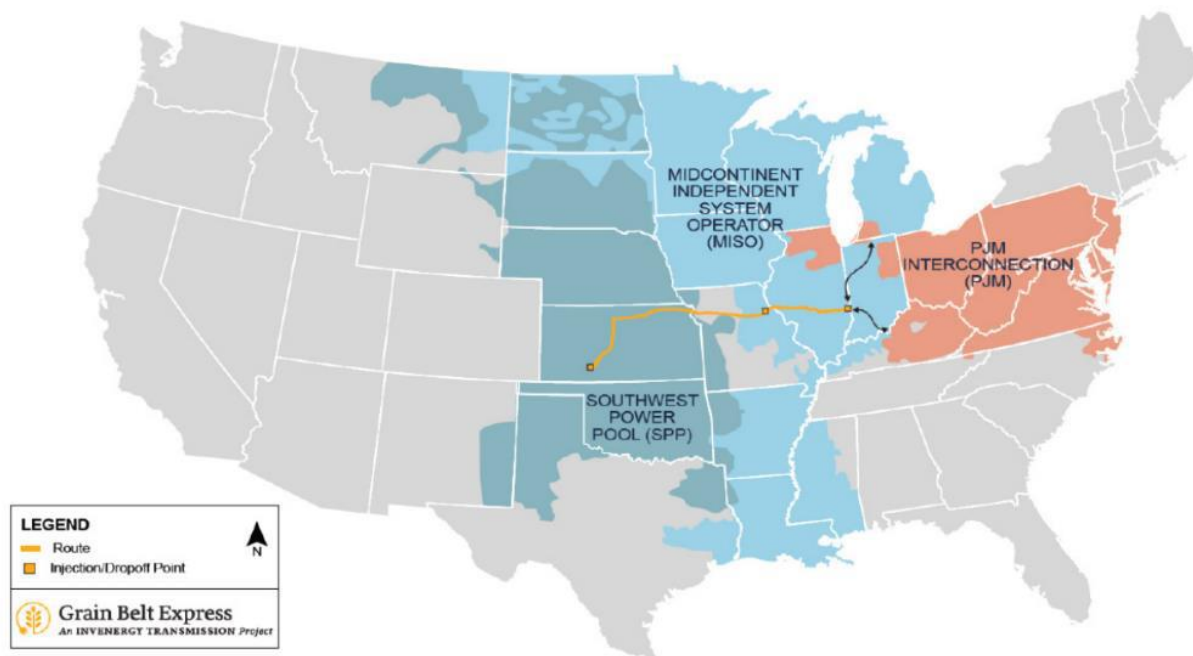
regional transmission planning processes are unlikely to identify the more efficient or cost-effective solutions to transmission needs driven by changes in the resource mix and demand.”[\[3\]](#)

Depending on their design and proposed use, regional and interregional merchant transmission projects can provide significant reliability benefits to MISO’s system and can potentially help MISO load avoid paying for duplicative LRTP upgrades that serve the same or similar functions. Just as MISO works to coordinate its system planning with neighboring RTOs SPP and PJM, so too should MISO coordinate with merchant transmission developers to advance the most optimal system design at the lowest cost to energy consumers. Transmission planning cannot occur in a vacuum.

Grain Belt Express is an advanced stage merchant transmission project with construction permits in 3 of 4 states, long-executed interconnection agreements with neighboring systems, over 70% of the ROW in KS and MO acquired and a COD prior to the projects proposed in this LRTP Tranche 1 MTEP 21 Addendum. Given the ostensible advanced stage of Grain Belt Express, this merchant project should have been considered in the LRTP Tranche 1 base case or, at the very least, as a sensitivity in the Tranche 1 analysis from the start. It is our preference that MISO correct this error by updating its analysis prior to any formal board vote on the portfolio. However, understanding the disruption this may cause to moving this important set of transmission projects forward, Grain Belt Express strongly urges MISO to commit to incorporating GBX into its base case assumptions or conducting a sensitivity including GBX for Tranche 2 to ensure additional LRTP projects are selected based on a more comprehensive and realistic picture of the MISO system in the future, and to present this to the Board for its approval or notification.

I. Grain Belt Express HVDC Line Will Facilitate Clean Energy Goals and Provide Reliability Benefits During System Emergency Conditions

Grain Belt Express is developing an approximately 800-mile high voltage direct current (“HVDC”) interregional merchant transmission line that will run from an HVDC converter station in Ford County, Kansas to an HVDC converter station in eastern Missouri, and will continue to an HVDC converter station in Clark County, Illinois, continuing approximately 1.6 miles to Indiana where it will interconnect with the AEP 345 kV transmission system (the “GBX Line”). The GBX Line is designed to carry approximately 4,000 MW of electric power. Grain Belt Express will tap into one of the country’s strongest renewable energy resource areas and deliver power to load centers in the Midwest and in Eastern power markets.



By directly linking three of the largest U.S. power markets (SPP—MISO—PJM), GBX will increase electric system reliability for each region through:

- Emergency two-way power flow between regions;
- Black start capability (ability to “jump start” outage-affected regions using power from another region);
- Greater geographic diversity of renewables; and
- Stronger ties to adjacent regions.

However, the benefits of these ties to neighboring regions, how they might impact the need for regional projects in the MISO footprint, and how they might impact the design of MISO’s transmission portfolio to improve reliability in its footprint cannot be assessed unless and until GBX is incorporated into the MISO transmission planning process.

II. Grain Belt Express Concerns with MISO LRTP Tranche 1 Addendum

A. *Inequitable and unreasonable treatment of merchant transmission*

Grain Belt Express appreciates MISO’s position that, in the context of generators, it cannot consider projects that have not yet executed interconnection agreements in the transmission planning base case. MISO has relied on this position to argue that Grain Belt Express was appropriately excluded from the planning assumptions for Tranche 1 of LRTP. Respectfully, Grain Belt Express is an advanced-stage interregional transmission line interconnecting to MISO’s system and should not be treated as just another generator in the queue. While GIA execution may be an appropriate indication of whether a generation project is “real” and will reach COD, the timeline and cost for large scale, linear transmission infrastructure is very different and many of the project milestones that Grain Belt Express has reached are a much stronger indication of “realness” than if a generator executes its GIA and puts 20% of network upgrades at risk. It is not equitable or reasonable to apply these assumptions to advanced stage merchant transmission projects, particularly a project such as the Grain Belt Express that has obtained siting permits in 3 of 4 states, executed long-term interconnection agreements with neighboring systems, and acquired over 70% of the necessary right-of-way



in Kansas and Missouri. These are indicia of a viable merchant transmission project that should be considered by MISO in its long-term transmission planning.

Furthermore, Attachment FF does not specify that an executed interconnection agreement is *required* for a project to be incorporated in the MTEP analysis and planning process. Nor does Attachment FF prohibit consideration of known merchant transmission projects such as the GBX Line in MISO's reliability and economic cost/benefit analyses of multi-value project ("MVP") projects. Even if an interconnection agreement were a requirement for inclusion in the LRTP analyses, the GBX Line has had an executed interconnection agreement with SPP (a market adjacent to MISO) since October 17, 2016, which, presumably, MISO was aware of and GBX expects to execute its interconnection agreement with MISO as soon as this year.

B. MISO's Tranche 1 cost-benefit analysis may be flawed

LRTP portfolio design should be comprehensive and complementary to merchant transmission projects in the MISO region so that consumers in MISO end up paying only for the most cost-effective and efficient system upgrades that result in the benefits sought. The LRTP analysis should account for the fact that GBX Line will be available for use during emergency events and allow MISO access to generation from adjacent markets to which GBX will be interconnected. At a minimum, the LRTP analysis should examine how flows on the MISO system will change as large injections and withdrawals from the GBX line at its POI occur to make sure that transmission planning in and around the project location is optimized.

As noted above, Grain Belt Express is expected to be in service well before any of the Tranche 1 projects will be operational. Attachment FF Section I.C of MISO's Tariff requires MISO to "develop the MTEP for expected use patterns and analyze the performance of the Transmission System in meeting both reliability needs and the needs of the competitive bulk power market, under a wide variety of contingency conditions." Consistent with Attachment FF, MISO's LRTP process should account for merchant transmission projects that will be in operation before the Tranche I projects are completed. Without taking into account the potential impacts of GBX, it is possible that the LRTP portfolio will not result in the same benefit to MISO's system that the current models show related to congestion and fuel savings and avoided future transmission investment.

To qualify as an MVP under Attachment FF of the MISO Tariff, and particularly under Criterion 3 in Section II.C.2.c, the LRTP project must address at least one Transmission Issue associated with a projected violation of a reliability standard and at least one economic-based Transmission Issue that provides economic value across pricing zones, with total financially quantifiable benefits exceeding total project costs.^[4] The economic and reliability analysis of the proposed LRTP projects will be incomplete without an eyes-wide-open assessment that includes of all existing and planned transmission on the MISO system, whether that transmission has been planned via the MISO process or by a merchant developer. The failure to consider planned merchant transmission in MISO's LRTP analyses is exactly the type of issue that FERC is addressing in its recent ANOPR, which asked "whether the existing regional transmission planning and cost allocation processes...relies on less comprehensive information" and "whether and how to better coordinate between regional and local transmission planning processes to identify more efficient or cost-effective solutions".^[5] Subsequently FERC issued its NOPR to remedy concerns "that the absence of sufficiently long-term, comprehensive transmission planning processes appears to be resulting in piecemeal transmission expansion to address relatively near-term transmission needs."^[6] FERC further stated:

"We are concerned that continuing with the status quo approach may cause public utility transmission providers to undertake relatively inefficient investments in transmission infrastructure, the costs of which are ultimately recovered through Commission-jurisdictional rates. That dynamic may result in transmission customers paying more than necessary to meet their transmission needs, customers foregoing benefits that outweigh their costs, or some combination thereof—either or both of which could potentially render Commission-jurisdictional rates unjust and unreasonable or unduly discriminatory or preferential."^[7]

In particular, LRTP Tranche 1 includes projects intended to relieve loading on transmission elements, increase transfer levels and improve voltage profiles, and address potential voltage instability on the MISO



system.^[8] Because Grain Belt Express will be in operation by the time the Tranche 1 projects are brought online but has not been included in the LRTP base case, it is unclear if the expected reliability benefits will be borne out as expected.

In addition, Section II.C.5 of Attachment FF to the MISO Tariff lists five specific types of economic value that an MVP may provide, including production cost savings, which can be realized through reductions in both transmission congestion and transmission energy losses, and capacity savings due to reductions in the overall Planning Reserve Margins resulting from transmission expansion. Any production cost savings dependent on decreases to transmission congestion should be re-examined accounting for the injection and withdrawal of GBX in the same region. The LRTP Tranche 1 Portfolio Detailed Business Case quantifies the reliability and economic benefits of the Tranche 1 projects, including \$13-19.7 billion for congestion reduction and fuel savings of and \$1.4-\$2.08 billion for avoided transmission investment, but those economic benefits may be in question because the existence of the GBX Line is not accounted for in the LRTP analysis.^[9]

C. Failure to account for the GBX Line may cause economic harm to GBX

Failure to account for the GBX Line in the current design of LRTP Tranche 1 may result in the inefficient construction of local upgrades and/or new congestion created by LRTP projects at Grain Belt's planned MISO points of interconnection. Grain Belt Express has been assigned responsibility for millions of dollars in upgrade costs for its transmission to transmission interconnection which may have appropriately been addressed by LRTP Tranche 1, or in future LRTP Tranches, if the project were included in MISO's base case. Moving forward with a suboptimal project design that ignores advanced stage merchant transmission development on MISO's system, only to fix the issues created by the flawed analysis later, is not a model of efficiency or cost-effectiveness.

III. Recent FERC and DOE policy proceedings support better recognition of MHVDC into RTO transmission and markets policy to enable the cost-effective integration of clean energy

Increasing coordination and transparency in MISO's LRTP process by engaging in a more collaborative planning process with merchant HVDC transmission projects like GBX is critical, will result in the build out of more economically efficient and cost-effective transmission facilities and is consistent with recently issued FERC and Department of Energy ("DOE") policies.

The DOE recently released its Building a Better Grid Initiative to Upgrade and Expand the Nation's Electric Transmission Grid to Support Resilience, Reliability and Decarbonization to implement the Infrastructure Investment and Jobs Act ("IIJA").^[10] With this initiative, DOE will identify critical national transmission needs and support the buildout of long-distance, high voltage transmission facilities that meet those needs through collaborative transmission planning, innovative financing mechanisms, coordinated permitting, and continued transmission related research and development. DOE stated that meeting clean energy goals requires "deploying interstate high-voltage lines connecting areas with significant renewable energy resources to demand centers and linking together independently operated grid regions." To facilitate its coordinated transmission deployment program, DOE notes that "[e]arly and collaborative engagement is an essential element of building a reliable, resilient, and efficient electric grid." DOE emphasized that new approaches to transmission planning are necessary to provide "greater certainty to drive investment to the highest-need transmission projects and enable development of the projects with the largest long-term benefit for consumers." Grain Belt Express is exactly the kind of project DOE has identified as being critical to meeting clean energy goals in the U.S. and given that MISO and its neighbors do not have the authority today to plan a transmission project that crosses three RTOs, MISO should be doing what it can to facilitate its development rather than working at cross purposes with GBX.

FERC's NOPR proposed reforms for Long-Term Regional Transmission Planning emphasize the need for better consideration of and coordination with merchant transmission in regional planning. For example, FERC proposes to require that public utility transmission providers include in their OATTs as part of their regional transmission planning process a method to assess generation developers' commercial interest in developing



generation that considers “any merchant or other entity commitments to build (including deposits or payments to secure or fund) transmission facilities that would serve generation.”^[11] Including advanced stage merchant transmission projects like Grain Belt Express in MISO’s LRTP process is consistent with FERC’s proposed reforms aimed at building more regional transmission projects to facilitate clean energy goals.

IV. Conclusion

Grain Belt Express’ preference is for MISO to perform a sensitivity to determine the true costs and benefits of Tranche 1 under a holistic analysis that considers GBX. The LRTP initiative is a forward-thinking transmission planning process with laudable goals, and the process to select transmission projects should be done in tandem with planned merchant transmission projects to obtain greater efficiencies and reliability while minimizing costs borne by ratepayers. Thus, we strongly urge MISO to commit to incorporating GBX into its base case analysis or conducting a sensitivity including GBX for Tranche 2 to ensure additional transmission projects are selected based on comprehensive reliability and economic analyses, and either present that information to the Board for approval or apprise the Board that MISO will be incorporating GBX into its Tranche 2 analyses to ensure additional LRTP projects are selected based on a more comprehensive and realistic picture of the MISO system in the future.

MISO response:

MISO staff appreciates Invenergy LLC’s comments for the MTEP21 Addendum and LRTP process for Tranche 1. As Invenergy LLC stated, MISO does have concern with including projects in our futures that do not have signed interconnection agreements, or representation in a state or utility IRP. MISO maintains that concern and notes that all interconnection requests, generation and merchant HVDC in the queue are treated similarly, where projects without agreements at the end of September 2020 were excluded from the Futures and LRTP models. As Invenergy notes, their generator interconnection agreement was not signed until the fall of 2021 after the futures were already completed and LRTP analysis had started. MISO takes issue with the assertion that the study was inequitable and that benefits are flawed as there is no substantiated reason or accompanying analysis that demonstrates that to be true. Additionally, Invenergy did not bring their concern regarding inclusion in Tranche 1 analysis until March of 2022. With that said, MISO has committed to working with Invenergy on these concerns and developing an avenue for considering the Grain Belt Express project in a sensitivity study in the LRTP Tranche 2 process.

Feedback Subject (Environmental Sector): Comments on the Draft MTEP21 Addendum

Verbatim stakeholder comments:

Draft LRTP Tranche 1 Portfolio Report

The Environmental Sector appreciates the opportunity to comment on the Draft LRTP Tranche 1 Portfolio Report (Draft Report). Our Sector has engaged in MISO transmission planning efforts for more than a decade because it is central to a core priority among Sector members: the equitable, affordable and reliable transition to zero emission energy resources. We offer strong support for MISO’s Long-Range Transmission Planning (LRTP) process and the approval of transmission investments to enable the evolution of MISO’s resource fleet. These projects and this effort are long-overdue. The failure of previous efforts like the Regional Transmission Overlay Study (RTOS) that collapsed due to stakeholder concerns has put MISO significantly behind in making sure system needs are addressed as both supply and demand evolve.

Having experienced the past failures of meaningful, forward-looking transmission planning, we are heartened to see this initial portfolio of projects going before the Board of Directors for approval. And while the LRTP Tranche 1 Portfolio represents an historic investment in the MISO system, we must continue to view it in the context of the system-wide transition that we are in the midst of. Tranche 1 represents only the initial, most



critical projects necessary to maintain system stability as the next increment of new resources is developed. Multiple iterations of LRTP and additional tranches of transmission system investments will be necessary to enable the ongoing evolution of the resource portfolio being driven by MISO states, member utilities, and consumers.

Even as we stress the urgency with which MISO must move forward with ongoing transmission planning efforts, we want to recognize the remarkable job MISO staff have done to build a strong reliability and business case for Tranche 1 while navigating the diversity of stakeholder positions. From the creation of the LRTP Futures, the identification and articulation of issues, the consideration of solution alternatives, and the exploration of benefit metrics upon which the business case rests, MISO staff have been diligent in their methodology, patient in their approach, and thoughtful in their consideration of stakeholder input. MISO's due diligence to prioritize issues, identify preferred solutions, and hold them up to robust scrutiny to ensure they provide value to MISO consumers is reflected in the Draft Report. The Draft Report represents a nation-leading transmission planning effort and sets a solid foundation that justifies Board approval and on which future transmission planning efforts can build.

Specific to the Draft LRTP Tranche 1 Portfolio Report, we offer the following comments:

1) More emphasis should be placed on the need for ongoing LRTP efforts beyond Tranche 1. With its basis in Future 1 of MISO's 3 planning scenarios (Futures), Tranche 1 projects are based on the most conservative projections of the pace and scale of the generation fleet evolution - projections that are quickly proving overly conservative.^[1] MISO's 2022 Draft Regional Resource Assessment, presented to the Resource Adequacy Subcommittee on April 20, 2022, demonstrates how the scale and pace of fleet transition continues to accelerate.^[2] While the environmental sector applauds the Tranche 1 portfolio, we urge that the process required to plan for the entirety of Future 1, (including the MISO South territory), along with consideration of the grid expansion needed to support Futures 2 and 3 move forward expeditiously. Member states will need the full complement of LRTP projects to address the challenges that the recent 2022 PRA and Regional Resource Assessment draft results have shown us a glimpse of. To that end, we recommend the LRTP Draft Report:

- a) More specifically present Tranche 1 results in the context of the larger, more comprehensive LRTP process that MISO envisions over the coming years, and
- b) Provide a specific timeframe on the planned additional tranches in this iteration of LRTP and on how frequently MISO will do LRTP planning going forward in recognition of the ongoing transition of the MISO system.

MISO response:

MISO staff appreciates the comments from the Environmental Sector to the MTEP21 Addendum and LRTP process for Tranche 1. The MISO Long Range Transmission Planning initiative represents a multi-year effort that will deliver regional transmission solutions needed to meet future needs based on the range of scenarios established in the Futures development. MISO has previously shared a comprehensive LRTP roadmap of ideas for transmission development to meet the growing future challenges. Recognizing the need to act promptly, MISO focused the initial LRTP studies on Future 1 scenarios to propose a set of no-regrets Tranche 1 projects that serve as the foundation for continuing development. MISO continues to engage stakeholders in ongoing LRTP efforts and will share further details as work progresses to explore additional solutions in subsequent Tranches.

2) More emphasis should be placed on the reliability-based benefits of Tranche 1 projects. The Environmental Sector appreciates the expansion of benefits considered for LRTP projects, but MISO should continue to emphasize the reliability contributions of the Tranche 1 projects. First and foremost, LRTP Tranche 1 projects are reliability-based projects intended to maintain system stability under anticipated future conditions. More emphasis should be given to this critical context and to the reliability benefits of the LRTP lines that are not fully captured in the business case analysis.



We appreciate the time taken to provide details on each project proposed and the issues they are intended to address. This will be critically important as projects move to the state and local level for siting and permitting. The project-by-project descriptions get at the heart of the LRTP - to ensure reliability as the resource fleet evolves. However, the Draft Report fails to aggregate and elevate these reliability benefits in a way that fully characterizes the urgency of these investments. We would encourage MISO to place more emphasis on the reliability benefits of LRTP Tranche 1 projects, the urgency of addressing identified reliability issues, the benefits of improved regional reliability throughout the MISO system, and how reliability benefits relate to the overall justification for Tranche 1.

MISO response:

The reliability benefits are summarized in the business case report to demonstrate the specific needs that have been addressed with the inclusion of the LRTP projects. The issues include steady state thermal/voltage violations, transfer limits, and voltage stability limits identified in the studies and are limited to the scope of analysis that was developed for assessment of Tranche 1 projects. As LRTP work shifts towards analysis of future Tranches, MISO has been exploring ways to enhance the reliability analysis and to incorporate details to more extensively quantify the reliability benefits.

3) More emphasis should be given to climate change impacts as a driver of MISO system needs. The Environmental Sector is well-aware that MISO is not an advocate for solutions to the climate crisis, but it should not shy away from the impacts that both mitigation (e.g., the shift to zero-carbon resources) and adaptation (e.g., the need to prepare for extreme weather) are having on its planning and operations. The Draft Report, in combination with the Futures White Paper and other Reliability Imperative publications, does a good job of articulating the scale and pace of resource fleet transition that necessitates MISO's LRTP process. However, MISO has not done a good job articulating the threats posed by extreme weather and other impacts of climate change and how the system must build resilience to those threats.

To that end, we strongly support MISO's effort to include resilience metrics in its LRTP business case development, currently articulated as the "avoided risk of load shedding" benefit metric. But this metric and the Draft Report's discussion do not accurately articulate the urgency of building resilience into the MISO system, the myriad of climate risks that the system faces, or how a more robust, better connected, and regionally diverse grid will play a critical role in withstanding the extreme weather events that the scientific community continues to forecast.^[3]

Anecdotal evidence compiled through the National Oceanic and Atmospheric Administration points to a trendline showing an increasing frequency of high impact weather events that reach the billion dollar threshold in damages.^[4] While there is nuance to impacts on the bulk power system related to different events, there should be an accounting for the value of a more resilient system in avoiding load shed events in alignment with this increased frequency. Similarly, the Intergovernmental Panel on Climate Change has linked the increase in extreme weather events to human-induced climate change, showing both a historical record linking increased warming to an increased number of extreme events, and a projected increase in extreme events under a number of warming scenarios.

MISO should continue to inform stakeholders of its efforts to understand the best available science on climate change and how it will impact the MISO system going forward. This understanding - that MISO's efforts around resilience are not uninformed reactions to past events, but rather informed preparation for forecasted future events - will be critical to stakeholder support for further resilience-base investments, and we encourage MISO to better articulate its efforts in this regard.

MISO response:

The LRTP business case represents a balanced set of metrics that are sufficient to show value of the transmission investment. The benefit components reflect a reasonably broad range of interests, but it is not intended to be an exhaustive examination. The adoption of reliability/resiliency benefits such as avoided risk of load shedding was



intentionally limited in scope due to the challenges not only in analyzing the future weather impacts, but also in monetizing the value to the customer. While it is generally useful to analyze and understand the impacts of extreme weather on grid operations in general, the business case analysis should assign the appropriate value to the benefits that are specifically attributed to the recommended projects. The limited treatment of avoided risk of load shedding offers a reasonable way to capture resiliency as a part of the overall value of the portfolio without overestimating the benefit.

4) The Draft Report should better articulate MISO’s conservative approach to quantifying identified benefit metrics. The Environmental Sector appreciates and fully supports MISO’s efforts to identify and quantify several benefit metrics associated with the proposed Tranche 1 portfolio of projects. Benefits of transmission system investments such as improved resilience, reduced carbon emissions, and reductions in the overall costs of meeting system needs have long been recognized amongst stakeholders but rarely, if ever, quantified. MISO is truly carving out a leadership role amongst RTOs in its efforts to quantify a range of benefit metrics to inform the business case for Tranche 1.

Throughout the business case development MISO has been clear to stakeholders its approach to quantifying benefit metrics is a conservative one. This is understandable given the need for confidence that Tranche 1 investments will provide net benefits to MISO consumers. While a conservative approach may be warranted, it is also worth articulating so that stakeholders have perspective on the full range and scope of benefits that transmission system investments, in particular LRTP-based investments, can provide. For example:

Avoided Loss of Load: MISO’s methodology for estimating this benefit is limited to extreme winter weather events, both winter storms and extreme cold temperatures. This narrow perspective is a highly-conservative measure of the total LRTP benefits of avoided loss of load. Extreme heat, hurricanes, drought, and flooding are all projected to impact the MISO territory as climate change impacts worsen. Each of these has the potential to impact resource and/or transmission availability - risks that are mitigated with a more robust regional transmission system. Future efforts to quantify the avoided loss of load benefit should consider these additional impacts. At a minimum, the Draft Report should make note of the conservative assumptions currently used to quantify this benefit metric.

Environmental Benefits: MISO has provided a range of savings related to decarbonization using multiple inputs from state, regional and Federal proposals. However, it should be noted that the Biden administration, and many states have proposed a social cost of carbon as high as \$125/metric ton.^[5] It must also be noted that MISO makes no effort to quantify the benefits of reducing emissions of criteria air pollutants such as NOx and particulate matter despite decades of scientific research into the health impact and subsequent economic costs of these emissions.^[6] The Environmental Sector appreciates MISO’s inclusion of a decarbonization metric that accounts for the social burden of greenhouse gas emissions, but MISO’s current approach significantly undervalues the environmental benefits stemming from Tranche 1 projects and the increased reliance on zero-emissions resources that it enables.

Avoided Capital Cost of Local Resources: As numerous studies have shown, a regional and interregional transmission buildout results in a much lower need for local generation and significantly decreases generation expansion needs overall.^[7] Due to the higher cost of a local resource strategy compared to a regional resource strategy enabled by transmission expansion connecting to a greater diversity of resources, the \$17B calculated by MISO is likely lower than the economic benefit to load and savings associated with construction costs. This is especially true for areas that are currently constrained in MISO such as “load pockets” that would be forced to site generation locally in lieu of a transmission solution.

Limiting benefit valuations to a 20-year outlook: We applaud MISO’s presentation in the Draft Report of the estimated benefits at both 20 and 40 years out under different discount rate assumptions. This approach provides valuable insights to stakeholders seeking to better understand the value of the proposed Tranche 1 investments. Even though MISO and stakeholders widely recognize a 40-year asset life for transmission system investments, the business case is centered around a 20-year outlook of assumed benefits that is based on depreciation schedules rather than actual expected asset life. While we appreciate the various



justifications for this approach, they do not obviate the fact that these investments are expected to (and almost certainly will) provide additional benefits beyond the 20-year timeframe in which benefits are quantified.

These examples, combined with MISO's explicit recognition of qualitative and indirect benefits and the reduced exposure to natural gas price volatility, provide a compelling case that MISO's benefit/cost estimates for Tranche 1 projects are conservative. The Draft Report should do a better job of articulating this conservative approach to benefits quantification and emphasizing the confidence stakeholders should have that benefits will likely surpass those estimated in the business case and significantly outweigh the costs of Tranche 1.

The Environmental Sector offers these comments in the spirit of making the final LRTP Tranche 1 Report as accessible and informative to stakeholders as possible. Broad stakeholder support for MISO's LRTP efforts will be critical to moving projects forward and the success of ongoing LRTP efforts. The Environmental Sector strongly supports MISO's LRTP efforts to date, supports approval of Tranche 1 by MISO's Board of Directors, and looks forward to working with MISO on future LRTP efforts. As mentioned above, the LRTP efforts represent a nation-leading effort to be responsive to the changing landscape of how we produce, distribute, and consume energy. The Environmental Sector applauds MISO for its leadership and supports the analysis and conclusions put forth in the Draft Report.

MISO response:

The methodologies used to assess the value of LRTP transmission are based on existing analytical methods using a reasonable set of assumptions that provide a somewhat conservative assessment of value. While other approaches and assumptions could be applied to arrive at different levels of benefits, the rationale used in the analysis supports the validity of the results while recognizing that the value can be somewhat subjective. The business case attempts to address this fact by demonstrating that the different components have a range of values.

- *Using a narrowly defined set of winter events to calculate the avoided load shedding avoids some of the uncertainty of storm related damage from events like hurricanes and flooding. The business case will be revised to note this conservative treatment.*
- *The value of environmental benefits is subject to a wide range of opinion as to the value of carbon as well as other types of emissions. The business case specifically addresses the decarbonization benefit since carbon reduction goals are a key element of the future resource plans of many MISO members.*
- *Resource planning strategy varies considerably by member and avoided capital cost is dependent on the assumptions used. The Avoided Capital Cost of Local Resources benefit captures the cost differential between a purely local build out where no to very little transmission is needed versus the Future 1 scenario where LRTP transmission is included.*
- *While the 20-year outlook is used to evaluate the value relative to meeting the MVP Tariff criteria for regional cost sharing, the business case includes the calculation of the 40-year present value of the benefits to show that benefits continue to accrue over the expected useful life of the transmission assets.*

Feedback Subject (Otter Tail Power Company): Comments in support of the Draft MTEP21 LRTP Tranche 1 Portfolio Report

Verbatim stakeholder comments:

Otter Tail Power Company appreciates the opportunity to comment on MISO's April 12, 2022, MTEP Report Addendum: Long Range Transmission Planning Tranche 1 Portfolio Report. We have also submitted comments as one of the Certain MISO TOs but wanted to provide some additional commentary from our company's perspective.



We strongly support MISO's Long Range Transmission Planning effort and the portfolio of projects identified in Tranche 1. These projects are urgently needed to maintain a reliable system during the ongoing resource transformation. Furthermore, these transmission projects will also enhance the reliability of the grid to be better able to withstand more frequent extreme weather events in the future.

Long-term planning necessarily involves uncertainty. However, we view that the Tranche 1 portfolio represents a set of no-regrets transmission projects that have been developed through MISO's proven long range transmission planning process that successfully produced the MTEP11 MVP portfolio. This process is held up by the industry as the premier model for long-range transmission planning.

MISO has completed a robust analysis of the Tranche 1 projects confirming that the benefits will far exceed the costs of the projects. Our customers, and customers throughout the MISO Midwest region, will benefit from the Tranche 1 projects providing a continued reliable system, enabling increased regional delivery of lower cost energy, and mitigating the risks of increasing severe weather events. Based on our knowledge of the system and past studies that have been performed in our region, we feel confident the Tranche 1 projects will alleviate the short-term congestion that OTP has observed on our system and represent a portfolio of long-term, no regrets projects. In conclusion, we support MISO's business case and recommendations for the LRTP Tranche 1 Portfolio.

MISO response:

MISO staff appreciates Otter Tail Power Company's comments and support of the MTEP21 Addendum and LRTP process for Tranche 1.

Feedback Subject (DTE Energy): Comments on the Draft MTEP21 LRTP Tranche 1 Portfolio

Verbatim stakeholder comments:

DTE appreciates the opportunity to provide feedback to MISO on the Long Range Transmission Plan (LRTP) Tranche 1 Report. DTE acknowledges that generation fleets, severe weather patterns, federal and state decarbonization goals, and electrification will bring a new set of challenges to the transmission system that will require more involved coordination and collaboration between MISO and its Stakeholders to explore transmission solutions that protect customer vulnerabilities to reliability and cost concerns.

While DTE supports the LRTP purpose, we have serious concerns. DTE's concerns are as follows:

1. The proposed postage stamp cost allocation should be re-evaluated in its application to the Tranche 1 projects as the current distribution of costs are inconsistent with the cost allocation principles outlined in FERC Order 1000.
2. The assumptions that are included in the MISO Futures are outdated and should be reassessed regularly to determine if the scope included in the LRTP projects still align with utility build plans and load forecasts.
3. The transparency in the LRTP modeling has failed and must be restored to provide stakeholder faith in project selection as information sharing throughout this process has lacked what's needed for Stakeholder to thoroughly vet LRTP projects to ensure that the transmission build is cost efficient.

I. The proposed postage stamp cost allocation should be re-evaluated in its application to the Tranche 1 projects as the current distribution of costs are inconsistent with the cost allocation principles outlined in FERC Order 1000.

As part of the transmission planning process, the cost associated with the LRTP projects should be allocated in a manner that is roughly commensurate with the estimated benefits as required in FERC Order



1000. Application of a postage stamp cost allocation assumes that energy usage is highly correlated to project beneficiaries which may or may not be the case depending on the key drivers behind transmission expansion.

In the case of the current portfolio of LRTP projects, the key drivers are changes within the generation fleet, severe weather patterns, federal and state decarbonization goals, and electrification. Because these drivers are not inherently correlated to energy usage the **postage stamp cost allocation is vulnerable to misalignment of cost and beneficiaries.**

An example of this can be seen when comparing the economic benefits that MISO has estimated for Zone 7 to the costs that have been allocated to Zone 7 and then comparing these results to other Zones within MISO. **Zone 7 has a benefit to cost ratio of 2.1 which is the lowest of all seven zones within the MISO Midwest Subregion** and is one of two Zones that have a benefit to cost ratio below the total average (Zone 2 also has a B/C ratio below the average). This suggests that Zone 7 has been allocated a proportionately greater share of the costs relative to the benefits when compared to other Zones.

Under MISO's current proposal, Michigan customers will get assigned \$2.8B of LRTP costs. This is an **additional \$0.5B cost burden on Michigan customers** compared to a beneficiary-based cost allocation using a pro-rata share of MISO calculated benefits to Local Resource Zones.

This example illustrates the disconnect between energy usage and beneficiaries. Adoption of a “beneficiary pay” based methodology using a common set of benefits would align more with FERC’s cost allocation principles and minimize the risk of free ridership. With the timeline of Tranche 2 approval tentatively scheduled for early 2023, **MISO must aggressively work with Stakeholders to develop a “beneficiary pay” based cost allocation** using a subset of common benefits that can be easily quantified.

MISO response:

MISO's benefit/cost analysis for the Tranche 1 Portfolio shows at least a 2.1 B/C ratio for each Cost Allocation Zone in the MISO Midwest Subregion using the more conservative 20-year horizon and 6.9% discount rate, and it doesn't put a dollar value on the significant number of reliability issues that are also being addressed. This represents a significant benefit to all MISO customers in the Midwest Subregion resulting in a cost allocation roughly commensurate with all economic and reliability benefits, including those customers in Cost Allocation Zone 7.

II. The assumptions that are included in the MISO Futures are outdated and should be reassessed regularly to determine if the scope included in the LRTP projects still align with utility build plans and load forecasts.

MISO must establish a process in which it re-evaluates the assumptions that go into the MISO Futures. The current set of assumptions within the MISO Future 1 scenario are driving the scope of the LRTP Tranche 1 projects. The **MISO Futures were finalized back in December of 2020** which suggests that any IRP related information would be predicated on IRP's submitted prior to December of 2020. Since that time there have been revisions to utility build plans, some of which could have material impacts to the assumptions built into the MISO Futures. This increases the risk of an over or under built transmission system which **creates sub-optimal results for customers.**

MISO should **develop a cadence in which the assumptions that underlay the Futures are updated** frequent enough to capture the most recent utility plans. The annual **Regional Resource Assessment that MISO publishes could be used as a reference** to address changes to utility IRPs.

MISO response:

MISO agrees that over time (e.g., 2 to 3 years) certain elements of the Futures, such as members' plans and state/federal policies can evolve and should be evaluated to determine if there is benefit to updating certain input information. Based on when the current set of Futures were finalized, MISO agrees it is timely to start that review with



stakeholders soon. This topic is currently on the Planning Advisory Committee (PAC) management plan for the 4th quarter of this year; however, work may begin earlier.

III. The transparency in the LRTP modeling has failed and must be restored to provide stakeholder faith in project selection as information sharing throughout this process has lacked what's needed for Stakeholder to thoroughly vet LRTP projects to ensure that the transmission build is cost efficient.

As we appreciate the opportunity in shaping the electrical system of the future, we strive to ensure that our input is heard and incorporated into the studies and eventual outcome of the proposed plans. During this LRTP process, MISO shared the information when requested, however, **data provided was fragmented** and it has given the Stakeholders a **puzzle to solve** in order to create a customized process to insert the data into the PROMOD database model.

With respect to the starting point given to us, **more time is needed** to re-use the pieces of data provided to **re-create the reference case vs change case** comparison and **step through all of the benefit metrics** to gain understanding and provide valuable feedback, **including potential alternatives**.

The observed timeline below never met the ability for DTE to effectively validate models and propose alternatives.

- Aug-Nov/2021 - MISO's deadline for providing alternatives by the Stakeholders on the LRTP projects
- August 2021 – February 2022 – DTE and many stakeholders repeatedly asked MISO for LRTP transmission models and associated criteria
- 2/11/2022 - Michigan LRTP Discussion between MISO and CMS/DTE/ITC
- 3/4/2022 – LRTP Tranche 1 transfer analysis results released
- 3/9/2022 - Tech meeting held at DTE request to discuss PROMOD database structure and any other inputs necessary to perform the run of the reference case and the change case
- 3/14/2022 - MISO provided some partial information on the database build process for the transmission elements and committed to update the reference case databases and the RRFs csv
- 3/16/2022 - LRTP Reference database provided/updated for the y2030, y2035 and y2040
- 3/23/2022 - DTE asked for some more clarification and received additional pointers from MISO on how to establish a process for the transmission element import into the PROMOD change case runs
- 3/23/2022 – LRTP Tranche 1 voltage stability results released
- 4/5/2022 - Additional PROMOD inputs provided including the new event file for the y2030 and the csv file containing RRFs $\geq 5\%$ dfax
- 4/13/2022 – 5/12/2022 - Substantive Feedback window
- 4/24/2022 – MISO LRTP Tranche 1 powerflow final models released

Throughout the LRTP planning process **MISO has provided its modeling data to Stakeholders late and in a format that is very fragmented and difficult to analyze**. Working around these issues has been very time consuming and has **impacted Stakeholder's ability to conduct a thorough analysis of alternatives**. MISO's reluctance to provide data to Stakeholders in a useable format limits the collaborative support that Stakeholders can provide throughout the process to ensure the most optimized transmission solutions are selected. To improve this process, MISO should work more transparently and collaboratively with Stakeholders throughout the modeling process. Specifically, **MISO should conduct a series of technical meetings** with Stakeholders with the intent of taking an in depth look into the LRTP modeling so that the **inputs and methodologies of reliability and economic analysis are clear and easily replicable**.

MISO must ensure that the scope of the alternative selection analysis is provided clearly to the Stakeholders. MISO must provide change case data inside the PROMOD specific database as a case and detailed direction for reusing the associated simulation files and results so that stakeholders can replicate them and provide effective feedback. Another recommendation is to have MISO provide all the inputs that go into benefit metric "X" and all the outputs that MISO generated; generating these metrics should also be easily repeatable by the Stakeholder.



Going forward for future tranches, **there must be an overall process change** so that the necessary materials are provided to the Stakeholders and a **90-day window given to provide alternatives feedback after MISO provides all models**. MISO should consider adding another iteration in the timeline for the analysis/feedback of the alternatives as they are implemented from the various Stakeholders in the base case vs change case data.

MISO response:

MISO appreciates the suggestions provided by stakeholders in written comments and will consider how to improve the LRTP process going forward so that information is timelier and more beneficial for all stakeholders. Regarding Tranche 1, MISO used two types of models to perform the LRTP study analysis: reliability-based power flow models and economic based production cost models.

MISO posted a reliability modeling document in December of 2020 outlining the proposed assumptions and other factors such as generation dispatch and load pattern to develop the power flow models. Stakeholder comments were requested on the models, which minimal feedback was received. MISO then began work on the reliability models in the spring of 2022 once the Futures data was ready for use in those models. MISO posted models to its Sharefile site and gave regular updates concerning those models at monthly LRTP workshops and discussed the modeling assumptions/process in detail at the June 2021 LRTP workshop.

Additional information pertinent to the study work such as contingency files and transmission line parameter details (e.g., idev files) to model alternative solutions were also made available through the Sharefile as those files were ready for posting. MISO endeavored to provide stakeholders the necessary information to perform their own study analysis, which MISO recognizes didn't always meet the needs of all stakeholders. One area for discussion with stakeholders in future LRTP Tranches is to determine the right balance between providing processed analysis versus raw data for stakeholder review. Processing the output for readability and use by stakeholders is a time and resource intensive process for MISO staff, while raw output can be posted quickly but may be more time consuming to decipher by the end user. MISO is committed to make this part of the process better going forward.

MISO provided all economic production cost models (reference and change cases) for review and feedback in a timely manner. Consistent with past economic planning practices, MISO did not post any economic models with the full set of LRTP Tranche 1 projects. Adding new transmission to production cost models is a very resource intensive process so MISO has developed its own internal post-processing tools to add and analyze transmission alternatives to production cost models. This improves the efficiency of the analysis but does not result in a new economic model with added transmission that could be used by stakeholders. The results of MISO's post-processing techniques are the same as if a transmission project was added to the base model topology and all information required for stakeholders to do their own analysis was provided via Sharefile.

IV. Conclusion

In summary, there are several steps that MISO must take to allow the process to support the purpose behind long range transmission planning.

First MISO must remove the postage stamp cost allocation from LRTP projects and immediately begin working with Stakeholders on developing a “beneficiary pay” based cost allocation predicated on a common set of benefits. Easy to quantify benefits that are widespread across the MISO footprint should be targeted as the basis for cost allocation. MISO and Stakeholders could then work to expand the list of benefits if needed and revise the cost allocation.

Second, MISO must establish an annual cadence in which the MISO Futures are updated to reflect the most recent information. The scope of LRTP projects that have not started construction should be revised to reflect the latest assumptions.



And last, MISO must work more openly and collaboratively with Stakeholders throughout the modeling process. As mentioned, MISO should host a series of technical meetings with Stakeholders to review the LRTP modeling methodology along with the detail that supports the transmission expansion plan.

MISO Response:

MISO's approach in Tranche 1 was to take feedback in parallel to the study work. This feedback was allowed at any time during the process; such feedback was not limited to specific windows. MISO highly values constant and iterative feedback, desiring to discuss issues, comments, etc. as they arise and will continue to operate in that fashion. As such, the suggestion of a 90-day window for stakeholder review and feedback has the potential to create significant schedule delays. While MISO worked to provide information for any stakeholder with appropriate access to perform their own study work, we will consider how to improve this going forward in order to facilitate additional feedback and if there is value in designating potential feedback windows as suggested here.

Feedback Subject (Missouri River Energy Services): Comments on the Draft MTEP21 LRTP Tranche 1 Portfolio Report

Verbatim stakeholder comments:

1. Is 2030 a realistic in-service dates for all projects? Projects will be competing against each other for materials, labor availability, and regulatory attention. Projects may need to be prioritized on importance.
2. MISO should take a public stance on if lines should be built double circuit capable. States will likely highly scrutinize this decision either way and the transmission owners and MISO need a unified stance. We base these comments on what we understand occurred for the CapX projects as well as one project we were not involved in some years back.
3. There is no mention of reactive support equipment or synchronous condensers previously referred to as under build. Does MISO still intend to have under build as part of Tranche 1?
4. Please add to the footnote in Table 1-1 that cost are subject to change based on feedback from the transmission owners. MRES would also like to remind MISO that we identified that some facilities did not fit in the assumed age/condition benefits section as the facilities were newly built.
5. Section 5: It is noted that thermal screening is done against 80% of rating. We feel the reason for doing so and any significance of 80% vs. 100% should be explained in the same section as it may otherwise be an easy target question to be raised as this report is leveraged when projects are before state commissions for permitting.
6. Page 56, "Reduced Resource Adequacy Needs" section. 2nd paragraph starts with "the local serving entities". Is the intended term is "load serving entities"?

MISO response:

MISO staff appreciates Missouri River Energy Company's comments to the MTEP21 Addendum and LRTP process for Tranche 1.

1. *A 2030 tranche 1 portfolio in-service date is reasonable based on the information known at this time. Specific project in-service dates are an in-progress effort that MISO is working to refine prior to the MISO Board of Directors approval.*
2. *MISO has considered and collected stakeholder feedback on where double circuit capability may be advantageous as individual projects are scoped. MTEP Appendix A will identify those facilities that should be capable of a second circuit in-line with the desire to maximize use of rights-of-way.*
3. *Under build is part of and included in the Tranche 1 projects as discussed during LRTP workshops and will be included in MTEP Appendix A. However, no reactive support devices were identified as part of Tranche 1. It*



is anticipated that reactive support will be further studied as part of Tranche 2.

4. Comments #4, #5, and #6 - Thank you for the suggestions. MISO staff is considering this in the report.

Feedback Subject (Iowa Office of Consumer Advocate): Comments on the Draft MTEP21 LRTP Tranche 1 Portfolio Report

Verbatim stakeholder comments:

The Iowa Office of Consumer Advocate (Iowa OCA), a division of the Iowa Department of Justice, represents Iowa consumers and the public generally in all proceedings before state and federal authorities concerning matters that may impact the rates and services of Iowa public utilities. Iowa Code §§ 475A.2(2), (5) (2021). The Iowa OCA is a member of the Public Consumer Sector.

FERC Order 890 and, subsequently, FERC Order 1000, set forth various transmission planning principles that contemplated a coordinated, open, cost-effective, transparent, and non-discriminatory regional transmission planning process. With these principles in mind, OCA continues to note that the current long-rang transmission planning process is not particularly open and transparent for stakeholders like OCA. OCA has struggled to gain access to the transmission planning documentation necessary for comprehending the business case for the proposed Tranche 1 projects, both from MISO and from local transmission owners. And, while MISO staff has extensively explained the various elements of LRTP Tranche 1 at a high-level, OCA lacks the financial resources, technical capabilities, and time to evaluate the data and inputs used by MISO to justify its business case for Tranche 1. For example, OCA lacks the software necessary to review MISO's power flow models. OCA notes that access to models and data used in transmission planning processes is necessary for stakeholders to understand whether plans are well-founded and propose reasonable solutions to transmission needs. If these models and data are only accessible through expensive software, technology and extensive modeling experience, it is unclear if this transmission planning process is truly open and transparent. With this context, OCA offers the following feedback concerning the benefit cost ratios used in the LRTP Tranche 1 business case and the apparent lack of consideration given for transmission alternatives.

MISO response:

MISO staff appreciates the comments from the Iowa Office of Consumer Advocate to the MTEP21 Addendum and LRTP process for Tranche 1. MISO understands the concerns on some entities' inability to access certain data, however, we are limited in our ability to provide some data due to Critical Energy Infrastructure Information (CEII) requirements to safeguard information that could be used to plan an attack on critical information, while other information is restricted to ensure that market sensitive data on company operations is not disclosed. MISO initiated additional modeling access abilities in its Tariff last year to provide access to some data to additional entities and the OCA may qualify under those new terms.

MISO also understands the engineering analysis that took place in LRTP (and will continue in later tranches) is very technical and some stakeholders do not have the engineering resources to perform their own analysis. MISO staff tried its best to provide information at workshops that would help inform all stakeholders and provide context around this very technical analysis. MISO is always open to discussing study information in a 1-1 meeting to help facilitate better understanding in future LRTP studies.

The benefit cost ratios as currently calculated by MISO for the LRTP Tranche 1 projects are overstated. MISO's LRTP planning analysis claims economic benefits that should not be included given that the values are based on hypothetical avoided capital costs that have not been shown to be realistic or logical, representing a large share of LRZ 3 benefit metric. Specifically, in the detailed workbook provided by MISO to support the LRTP business case, the calculation of benefits associated with avoided capital costs of local resource investments is actually based on LRTP enabled capacity, not avoided projects. Moreover, MISO's calculation of the LRZ 3 levelized avoided capital cost of local resources assumes an unreasonable amount of resource



deployment (approximately three gigawatts of Solar and/or Solar + Storage) that is not supported or corroborated by the near or midterm goals of LRZ 3 electric utilities. The PV installed capacity cost is not commensurate with known installed cost and MISO gives very little weight to known projects that are being studied in MISO interconnection queue. Further, MISO should not justify the need for additional capital investment by counting economic benefits derived from accomplishing goals and avoiding risks that MISO is not required to nor burdened with achieving, such as decarbonization.

MISO response:

The avoided capital cost of local resource investment represents the largest component of overall value for the LRTP portfolio and is distributed based on load ratio share of energy withdrawals of the Cost Allocation Zones which is in direct proportion to the allocation of costs of the transmission.

MISO's approach to the business case for the LRTP Tranche 1 Portfolio was to quantify the multiple types of benefits the transmission provides to address the reliability issues and resource expansion needs identified in MISO's Future 1. In developing the methodology for each of the six benefit metrics, MISO was mindful to avoid overstating the amount of benefits attributed to each metric, and most stakeholders broadly have agreed transmission provides the values being calculated by the various benefit metrics. Within that broad agreement, though, there has been continuing discussion on the details of the calculations used to derive the benefits.

In particular there has been a lot of stakeholder discussion on the cases used to calculate the Congestion and Fuel Savings, Decarbonization, and Avoided Capital Cost of Local Resource Investment benefit metrics. A more detailed explanation of how those benefit metrics are complementary and don't result in overstating of benefits is provided below.

The Congestion and Fuel Savings metric, Carbon Reduction, and the Avoided Capital Cost of Local Resource Investment assume that the Future 1 member plans and goals must be met, and that regional resource expansion requires the LRTP portfolio to be achieved. However, they show different benefits in how the portfolio enables these goals to be achieved.

- *For the Avoided Capital Cost benefit metric, the reference case establishes the fact that without the LRTP Tranche 1 Portfolio, a local resource buildout is required to meet the Future 1 requirements. The benefits focus on costs of the physical construction of resources, without regard to their ability to be delivered to load, and it captures the differences in capital costs in that local versus the Future 1 scenario buildout.*
- *In the Congestion and Fuel Savings benefit analysis, the reference case focuses on a local buildout considering deliverability constraints. To model the potential deliverability limitations, a distribution factor (DFAX) method was used to identify the resources that could be materially attributed to the LRTP Tranche 1 Portfolio, and the modeling assumed those 20 GW of renewable resources would not be available without the LRTP Tranche 1 Portfolio. The deliverable generation was then used to calculate production and carbon reduction benefits.*

The solar capital cost was sourced from the 2020 National Renewable Energy Laboratory (NREL) Annual Technology Baseline (ATB)¹ and adjusted to consider the investment tax credit². This dataset was the most current release publicly available on NREL's website at the time the MISO Futures were developed. Although MISO only added resources into its base model that had successfully completed the generation interconnection queue with a Generator Interconnection Agreement (GIA), MISO's siting process utilized an 80% weighting preference towards the interconnection queue when determining where to site the new generation capacity identified in the MISO resource expansion analysis.³

The LRTP business case seeks to capture value in a broad set of benefits that represent the diverse interests of our stakeholders. While members may differ on their specific goals and on the value placed on specific benefits such as Decarbonization, the analysis demonstrates that the LRTP Tranche 1 Portfolio provides multiple types of benefits in

¹ NREL 2020 ATB: <https://atb.nrel.gov/electricity/2020/data.php>

² Described on pages 86 – 88 of the MISO Futures Report: <https://cdn.misoenergy.org/MISO%20Futures%20Report538224.pdf>

³ Described on page 42 of the MISO Futures Report: <https://cdn.misoenergy.org/MISO%20Futures%20Report538224.pdf>



excess of costs to customers across the Midwest Subregion.

Based on OCA's review of LRTP Tranche 1, and the data available to OCA, there appears to be little consideration given to transmission alternatives that could have been used as the first option to forego the construction of additional transmission infrastructure and make more efficient use of existing transmission infrastructure. OCA understands that MISO has made comments in the past against the use of tools like ambient adjusted line ratings and dynamic line ratings for long-range transmission planning. See Comments of Midcontinent Independent System Operator, Inc., Implementation of Dynamic Line Rating, FERC Docket No. AD22-5-000 (Apr. 25, 2022). However, a comparison of transmission solutions to non-transmission alternatives is necessary to ensure that all LRTP projects are the most cost-effective and is required by Order 1000. This comparison is important to OCA for two reasons. First, without a comparison to alternatives, it is unclear if the projects in Tranche 1 are cost-effective solutions. This is of particular importance to OCA since its constituents, as transmission customers, will ultimately pay for the projects proposed in Tranche 1. Second, any new transmission will be an additional burden on rural landowners. OCA receives constant feedback from rural landowners during the transmission franchising process and most landowners favor minimizing the construction of additional transmission. Non-transmission alternatives decrease the need for additional construction and the burden on landowners.

MISO response:

As for the suggestions around inclusion of non-transmission alternatives (NTA), MISO agrees there may be places appropriate for their uses but given the longer-term large regional nature of the issues being addressed in the LRTP study, which were also identified in MISO's RIIA study, NTA's are not at the scale to be able to reliably and cost-effectively address the system needs being in evaluated in the LRTP study.

Feedback Subject (MISO South TOs): Comments on the Draft MTEP21 Report

Verbatim stakeholder comments:

The MISO South Transmission Owners (MISO South TOs)¹ appreciate the opportunity to comment and offer the following feedback on the Long Range Transmission Planning (LRTP) Business Case proposal. Assuming FERC approval of the pending LRTP cost allocation filing for, MISO South customers will not be allocated any costs associated with LRTP Tranche 1; however, the MISO South TOs nonetheless offer these comments, in an abundance of caution, to ensure that MISO has a reasonable opportunity to consider our feedback on the LRTP benefits metrics. Based on the expectation that MISO's approach to these benefits metrics may be applied to future LRTP projects, the cost of which may be allocated to MISO South customers. If MISO were proposing to use these benefit metrics, as presently designed, to support approval of LRTP projects whose costs would be allocated to MISO South customers, the flaws in MISO's benefits metrics and methodologies that are discussed below are significant enough that the MISO South TOs likely would not be in a position to support such projects or concur with MISO that such projects have reasonable business cases. The MISO South TOs therefore strongly urge MISO to take reasonable steps to address these significant concerns – preferably, now, but at a minimum before approving any future LRTP projects that would be allocated to MISO South customers.

Summary

The MISO South TOs have significant concerns regarding the reasonableness of MISO's proposed business case metrics due to the unlikelihood of realizing the benefits as quantified in several of those business case metrics. Simply put, the business case as presented substantially overstates the value of some of the benefits and double-counts certain other benefits. Ultimately, the quantification of expected LRTP benefits must reflect the benefits that are reasonably achievable in real-time operation should the proposed projects be developed. And while the MISO South TOs believe that MISO has selected reasonable *categories* of benefits, several metrics appear to significantly overstate the *quantity* of projected LRTP benefits. Even if the concerns discussed below are addressed, it appears the benefits of the Tranche 1 projects are likely sufficient to exceed the costs of those projects, but the overstatement of



benefits has the potential to undermine support for Tranche 1 and future tranches of LRTP projects that use these metrics. If the concerns discussed herein are not reasonably addressed, that could undermine the prospects for getting such projects approved by applicable regulators and, ultimately, constructed.

¹ The Entergy Operating Companies are Entergy Arkansas, LLC, Entergy Louisiana, LLC, Entergy Mississippi, LLC, Entergy New Orleans, LLC, and Entergy Texas, Inc. The other MISO South Transmission Owners are Arkansas Electric Cooperative Corporation, Cleco Power, LLC, and Cooperative Energy.

1. Inappropriate Use of Overlapping Benefits Metrics

A. Congestion and Fuel Savings (CFS) and Avoided Capital Costs of Local Resource Investment

The MISO South TOs believe that the **Congestion and Fuel Savings (CFS)** and **Avoided Capital Costs of Local Resource Investment (LRI)** benefits significantly overlap with one another – to the extent that both are not achievable together. **As currently constructed, one of these benefits should be removed from the business case.** These two benefit metrics compare a regional portfolio achieved with the benefit of the LRTP projects to different alternate scenarios. MISO’s business case thus hinges on the assumption that if the LRTP projects are not constructed, then two different alternate transmission and generation futures, and all of the costs associated with each, would simultaneously result. Such an assumption is obviously unreasonable, and the resulting benefits, therefore, are incorrectly calculated and overstated, as further described below.

It should be beyond any reasonable dispute that summing up the “benefits” from avoiding the costs of two separate and conflicting base cases is not a reasonable way to calculate the anticipated benefits of transmission projects.

Reference Case #1

The MISO South TOs are concerned that MISO’s first reference case generally assumes that without the LRTP projects, numerous local renewable generation resources must be constructed to achieve utility sustainability goals. The resulting capital costs of all the local renewable generation resources needed in this future are huge, and one set of “benefits” of the LRTP projects is the avoidance of these significant capital costs.

Although such a future state would certainly be inefficient compared to the LRTP- enabled future that represents MISO’s change case, this reference case scenario would be reliable and would meet utility sustainability goals. It would also entail very low fuel costs, for obvious reasons.

Reference Case #2

Contrary to reason, MISO simultaneously compares the LRTP-enabled future to a separate base case with a different, smaller resource build-out and assumes that the LRTP projects provide “benefits” from avoiding significant production costs that would arise in this future.

Fundamentally, regardless of the merit of either of MISO’s two alternate base cases, *they cannot both come to pass in the absence of the LRTP projects.* Yet, despite all reason, MISO’s approach assumes they do – and sums up all the avoided costs in each to arrive at a set of LRTP “benefits.”

MISO must abandon this unsound approach. The benefits, approximately \$13 billion for CFS and \$17 billion for LRI, are dependent on the contrast of a reference scenario and the LRTP enabled scenario. Since the reference cases in the CFS and LRI studies contradict each other, one having a larger generation portfolio than the LRTP case and the other smaller, these two benefits are not simultaneously achievable, so the benefits cannot be additive.

Additionally, not only are the non-LRTP reference cases used in the CFS and LRI analyses fundamentally different in terms of resource portfolios, they are also different in terms of their decarbonization outcomes. MISO establishes a reference case in the LRI analysis that achieves member decarbonization goals, but with the CFS analysis reference case, member decarbonization goals are not achieved. This inconsistency in reference case decarbonization outcomes highlights a



critical flaw. MISO has conditioned the LRTP study process on the notion that resource change is occurring to meet utility goals and it is incumbent on MISO to ensure these goals are met in the most efficient and reliable manner possible. Measuring benefits based on a reference case that does not meet member decarbonization goals violates the central driver behind MISO's LRTP process and does not reflect a plausible future that MISO LSEs would ever pursue. Thus, decarbonization itself should not vary between business cases, it is a constraint that should be held constant across all business case categories.

MISO response:

MISO staff appreciates the comments from the MISO South TOs to the MTEP21 Addendum and LRTP process for Tranche 1. MISO's approach to the business case for the LRTP Tranche 1 Portfolio was to quantify the multiple types of benefits the transmission provides to address the reliability issues and resource expansion needs identified in MISO's Future 1. In developing the methodology for each of the six benefit metrics, MISO was mindful to avoid overstating the amount of benefits attributed to each metric, and most stakeholders broadly have agreed transmission provides the values being calculated by the various benefit metrics. Within that broad agreement, though, there has been continuing discussion on the details of the calculations used to derive the benefits.

In particular there has been a lot of stakeholder discussion on the cases used to calculate the Congestion and Fuel Savings, Decarbonization, and Avoided Capital Cost of Local Resource Investment benefit metrics. A more detailed explanation of how those benefit metrics are complementary and don't result in overstating of benefits is provided below.

The Congestion and Fuel Savings metric, Carbon Reduction, and the Avoided Capital Cost of Local Resource Investment assume that the Future 1 member plans and goals must be met, and that regional resource expansion requires the LRTP portfolio to be achieved. However, they show different benefits in how the portfolio enables these goals to be achieved.

- *For the Avoided Capital Cost benefit metric, the reference case establishes the fact that without the LRTP Tranche 1 Portfolio, a local resource buildout is required to meet the Future 1 requirements. The benefits focus on costs of the physical construction of resources, without regard to their ability to be delivered to load, and it captures the differences in capital costs in that local versus the Future 1 scenario buildout.*
- *In the Congestion and Fuel Savings benefit analysis, the reference case focuses on a local buildout considering deliverability constraints. To model the potential deliverability limitations, a distribution factor (DFAX) method was used to identify the resources that could be materially attributed to the LRTP Tranche 1 Portfolio, and the modeling assumed those 20 GW of renewable resources would not be available without the LRTP Tranche 1 Portfolio. The deliverable generation was then used to calculate production and carbon reduction benefits.*

B. Reduced Resource Adequacy Requirements

For the Reduced Resource Adequacy Requirements category, MISO uses a non-LRTP future assumption that is not in alignment with the LRI benefit category.² As described above, the LRI benefit category assumes that the non-LRTP future requires a local expansion of resources. If this same assumption is used for the "Reduced Resource Adequacy Requirements" benefit category, then in the non-LRTP future there will be a large excess of local capacity in all MISO LRZs which will easily meet zonal Local Clearing Requirements. As a result, a reduction in zonal LCRs attributed to LRTP projects will not produce any incremental new benefits beyond what is expected in the non-LRTP future; it is therefore incorrect for MISO to claim any realized "Reduced Resource Adequacy Requirement" benefits associated with LRTP projects. Simply put, while a non-LRTP future in which local renewable resources are deployed to meet sustainability goals and regulations may be inefficient, it would have sufficient resource adequacy in each zone. Consequently, MISO may not reasonably attribute resource adequacy benefits to the LRTP projects if they are justified on the basis of a comparison against this base case.



MISO response:

The Reduced Resource Adequacy Requirements benefit metric represents the benefits from deferred resource investment that would be required to meet local clearing requirements under a Future 1 expansion scenario and does not assume the future is based on a local expansion scenario. The Resource Adequacy benefit thus measures only the incremental benefit associated with the increase in transmission import capability and does not consider any benefits associated with the enablement of additional resources to meet future needs. Since the Reduced Resource Adequacy Requirements is a benefit that is complementary to other benefits such as Avoided Capital Cost Of Local Resource, we have already captured the benefits from the Future 1 capacity expansion needed to meet future energy needs as a prerequisite. This approach recognizes the additive nature of the benefits and avoids the potential for overlapping benefits associated with the capacity expansion.

2. Avoided Risk of Load Shedding

The MISO South TOs continue to have significant concerns with MISO's approach to calculating the Avoided Risk of Load Shed benefit. The current calculation methodology includes monetization of risk elimination at the full cost of actual occurrence of load shed and substantially overestimates the likelihood of occurrence based on historical data. The result is a drastically overstated set of "benefits" attributable to avoided load shed and/or risk of load shed.

- The proposed methodology is valuing the risk of load shed at the full price of the Value of Lost Load (VOLL). While MISO states that it has calculated this benefit "at the low end" of VOLL, the value it used (\$3,500/MWh) is currently the only value for lost load included in the MISO tariff. This is not the "low end" of VOLL but rather represents VOLL, full stop. Putting aside whether it is reasonable to ascribe value to an LRTP project because it helps avoid the *mere risk of load shed* – as opposed to load shed itself – there can be no reasonable dispute that whatever the value of avoiding the risk or

² As described above in the Congestion and Fuel Savings section, in order to create a coherent and accurate LRTP business case, MISO must identify a single set of non-LRTP future assumptions and use those non-LRTP future assumptions across all business case categories.

possibility of load shed, it is substantially less than the value of avoiding actual load shed. To assign value to the avoided *risk* of load shed that is equivalent to the value of lost load itself is, on its face, wholly unreasonable. This overstatement of benefits must be addressed for MISO's analysis in this area to have any credibility.

- MISO has assigned a 100% probability of occurrence every three years to a *potential* event, and has valued a benefit that is akin to purchasing an insurance policy against a peril (load loss) at VOLL – the full value of the item being insured. If insurers charged the full value of a home as the premium for a homeowners insurance policy, they would not sell many policies – because such a policy would be worthless. Instead of this approach, MISO could take one of two approaches: (1) assign a probability to load shed that is less than 100% (given that severe weather events have historically occurred every three years and only one ever – Winter Storm Uri – has resulted in load shed); or (2) reduce the value of lost load to reflect the fact that the benefit is intended to reflect only an insurance policy against the risk of load shed, and thus the likelihood of needing to "cash in" on the policy (due to actual load shed occurring) is something less than 100%. There is simply no reasonable argument to defend MISO's current approach on this point.
- The MISO South TOs also believe that the regional/local approach is double counting the risk for certain zones:
 - The methodology assigns monetary benefit to overlapping zones and regions as if the local **and** regional event (loss of more than 50% of generation capacity) will happen every three years.
 - The regional **and** local event (loss of more than 50% of generation capacity) must occur every three years for this benefit to be realized.
 - The data presented thus far does not support the value MISO has assigned to the reduction of



risk. While winter weather events have occurred on an average frequency of every 3 years, only one of those events has ever resulted in load shed in the entire history of MISO. MISO's proposed methodology values this benefit as though every winter event has resulted in load shed and every event going forward will do the same. Plainly, that is not reasonable.

MISO response:

Avoided Risk of Load Shedding represents a reliability/resiliency benefit of mitigating risks of load shedding resulting from large scale generation outages caused by severe winter weather events. This is similar to the approach used to capture other reliability benefits such as the mitigation of thermal or voltage violations resulting from the contingencies prescribed by the planning standards. It is not necessary to assess probability of these contingencies occurring to justify the need for a transmission upgrade. Instead, the industry standard requires mitigation of risks by addressing all the post-contingent violations that are identified in the reliability analysis. There is still value in eliminating the risk of the violation even if the contingency does not occur, and similarly with LRTP, there is value in reducing the risk of load loss by improving the transfer capability.

The approach used to monetize the value of this metric is based on the current \$3500/MWh Value of Lost Load (VOLL) used in market pricing to represent value of avoiding risk of load shedding. While VOLL is based on direct costs of an outage to a customer, it does not fully capture all the indirect costs that occur downstream of the customer class and as a market pricing mechanism which reflects a willingness to pay to avoid load shed and is more representative of the value of risk rather than expected load loss. Furthermore, the value of VOLL is often derived from customer survey information and subject to a wide range of opinions. While MISO uses a \$3500/MWh value in the current market pricing structure, the IMM has suggested the value is actually much higher at \$23,000/MWh. For the purposes of the LRTP benefits analysis, MISO has applied the lower end value as a reasonable measure of the value of avoided risk of load loss because it has already been established as a representative value of load loss in MISO's market processes.

The benefits analysis looks at a subset of generation outage events that can result from severe winter weather events that can impact small areas or zones as well as the larger footprint. Each zone can be affected by a smaller scale winter storm that affects the local generation which represents a separate event that should be mitigated. The analysis examines each of the Local Resource Zones separately because the transmission limitations may limit imports to cover generation deficiencies within each zone. Larger scale winter storm events can cause generation outages across multiple zones that result in load loss where transmission limitations prevent wider area power transfers. These scenarios are analyzed separately because the risks of load loss are related to different generation outages and different transmission constraints. The overall value reflects total reduction in risk of load loss provided by LRTP for all the event scenarios.

The frequency of risk used in the benefits analysis is derived from the historical occurrences of large scale winter storms, but this does not suggest that actual load loss will occur with every storm event. As discussed earlier, the benefits analysis captures the avoided risk rather than avoided actual load loss because this represents a reliability/resiliency benefit realized by addressing the risk of the occurrence of an event. It is not prudent to rely on past history as an indicator for future resource availability risks. The composition of the future resource fleet is significantly different from that of the past with greater variability and uncertainty that results in an increased risk of operational issues.

3. Decarbonization

As described above, with regard to the CFS benefit metric, MISO should assume that member decarbonization goals will be met to the same extent in both the reference case and LRTP future case. Following this framework, decarbonization itself should not be a benefit category in the business case because it is a constraint that should be held constant across all business case categories.



MISO response:

Decarbonization benefits are associated with the reduced carbon emissions that result from increased availability of renewable resources and greater dispatch efficiency determined in the production cost analysis. The LRTP transmission enables the energy delivery from the Future 1 renewable resources which avoids less efficient dispatch of local thermal resources that are needed to address the transmission constraints.

4. Transparency of Assumptions and Inputs to Ensure Replicability and Validation of Analyses

In addition to the concerns described above, MISO must provide stakeholders with the necessary information to perform calculations in parallel to the MISO analysis, or as close as reasonably possible. As of the April LRTP Workshops, MISO has not provided stakeholders with necessary underlying data, which impedes stakeholders' ability to replicate or validate MISO's methodology and conclusions.

- MISO has not provided stakeholders with the EGEAS LBA model inputs, such as the LBA-specific wind and solar profile inputs. Without this information, stakeholders cannot fully assess the validity or reasonableness of MISO's proposed LRI methodology.
- The local expansion step of the LRI methodology is run at the Local Balancing Authority (LBA) level as opposed to the LRZ level. This overly constrains the EGEAS LBA model and likely results in an overly large buildout of local resources in order to meet the desired emissions targets.³ Given that most LSEs in MISO approach resource planning on an LRZ basis and many LSEs' service territories span across multiple LBAs, the MISO South TOs believe that the local expansion model should be performed on an LRZ basis. Furthermore, performing the LRI on an LRZ basis would align the LRI methodology with MISO's 2022 Regional Resource Assessment which uses local expansion criteria at the LRZ level, not the LBA level.

MISO response:

The EGEAS LBA expansion was developed utilizing the same general assumptions as Future 1 and therefore the underlying data and assumptions have been publicly known since the Futures were developed in 2020. Additionally, much of that data and assumptions are included in the economic PROMOD models which has been available to those that have the proper NDAs. With respect to the request for the EGEAS wind and solar profiles, this is something that MISO hasn't published in the past, but it is something that we'll look at how that information can be shared as part of the Futures process going forward.

The EGEAS LBA expansion was used as a method to build a resource expansion scenario that requires little to no transmission and serves to derive the equivalent cost of resources that are locally sited. Since this analysis only considers resource investment costs, the LBA approach avoids the need to account for additional transmission investment that would be required if resources were sited more broadly.

³ MISO's LRI analysis shows that the regional capacity buildout is 43,431 MW and the LBA capacity buildout is 90,969 MW, over two times higher than the regional case. The magnitude of difference between these two cases causes the MISO South TOs to question the LRI methodology and/or the inputs used in the LBA expansion case.



Feedback Subject (ITC Companies): Comments on Draft MTEP21 LRTP Tranche 1 Portfolio

Verbatim stakeholder comments:

ITC's three regulated operating subsidiaries in the MISO footprint (International Transmission Company d/b/a ITC Transmission, Michigan Electric Transmission Company, LLC, and ITC Midwest LLC (collectively referred to herein as "ITC") appreciate the opportunity to comment in support of MISO's April 12, 2022 MTEP Report Addendum: Long Range Transmission Planning Tranche 1 Portfolio Report ("Addendum"). ITC joined with the Certain MISO TOs in submitting contemporaneous joint stakeholder feedback supporting the Addendum. ITC submits this supplemental stakeholder feedback to amplify its support for the Addendum, and to provide more details specific to ITC.

The ITC Companies support MISO in its effort to pursue needed transmission infrastructure required to bridge the gap between MISO's legacy grid and the future grid. MISO's future grid is expected to be used, valued, tested, and relied upon in ways its legacy grid has not. Renewable resources have operating characteristics that differ vastly from traditional thermal resources. MISO has demonstrated in the Addendum that the demands placed on the MISO transmission system are rapidly evolving, power flows are more dynamic, and the valued benefits of MISO's transmission system are being relied upon more and more. MISO has taken positive steps in the Addendum to capture these evolving benefits through better modeling and valuation of generation capacity deliverability. These steps are necessary to ensure resource adequacy by realizing regional power transfers are becoming more critical for baseline system reliability, *i.e.*, ensuring that power remains flowing when it is needed most.

Regional transmission expansion, such as the LRTP Tranche 1 Portfolio, should increase deliverability from regions possessing the greatest potential to regions that serve the greatest needs, and do so in a manner that is cost effective while maintaining high levels of reliability and resiliency. MISO's LRTP Tranche 1 Portfolio supports this task. In particular, MISO's LRTP Tranche 1 Portfolio will increase deliverability and transfer capability, strengthening MISO's ties from West to East, by stitching together new, cohesive 345kV backbone transmission infrastructure from Iowa to Michigan.

As one immediate result, ITC's Michigan system is projected to realize meaningful benefits with the potential for an immediate increase in LRZ 7 Capacity Import Limit ("CIL") estimated to be 38%. In addition to the step change in the import capability to LRZ 7, the new greenfield double circuit 345kV from Duck Lake to Hiple (Project 17) strengthens the reliability of Michigan's grid by providing a new EHV conduit. This project will enhance and diversify Michigan's tie lines to the MISO market – a meaningful step in hardening Michigan's grid and further integration into MISO's market.

ITC's Midwest system is valued for its proximity to regions with rich renewable resource potential that can be unlocked through transmission to support Iowa's ability to achieve utility energy objectives. MISO's Tranche 1 LRTP projects will open additional system capacity to allow needed generation to connect to the state's transmission system. These projects will provide for the deliverability of generation resulting in a more reliable and resilient grid, locally and regionally.

MISO's LRTP Tranche 1 projects are a positive step towards our future grid. This grid is a more integrated grid with power flows that vary by hour in magnitude and direction, efficiently bridging neighboring systems with the shared goal of reliability by delivering the available generation across the region to customers.

MISO response:

MISO staff appreciates ITC Company's comments and support of the MTEP21 Addendum and LRTP process for Tranche 1.
