



Long Range Transmission Planning *Technical Road Map*

PAC Meeting, October 2020

Executive Summary



- Long Range Transmission Planning (LRTP) seeks to ensure a reliable and efficient regional and interregional system that enables the changing portfolio across the near and long term
- LRTP will encompass more than one MTEP cycle
- LRTP will be multi-faceted with various aspects of reliability and economics
- Will be a regional approach accounting for subregional differences and needs under MISO's value based planning process

There are conditions precedent for longer-term transmission plans to be approved and successfully developed



Policy Consensus

Consensus that transmission is required to address the subregional and collective needs of the footprint



Robust Business Case

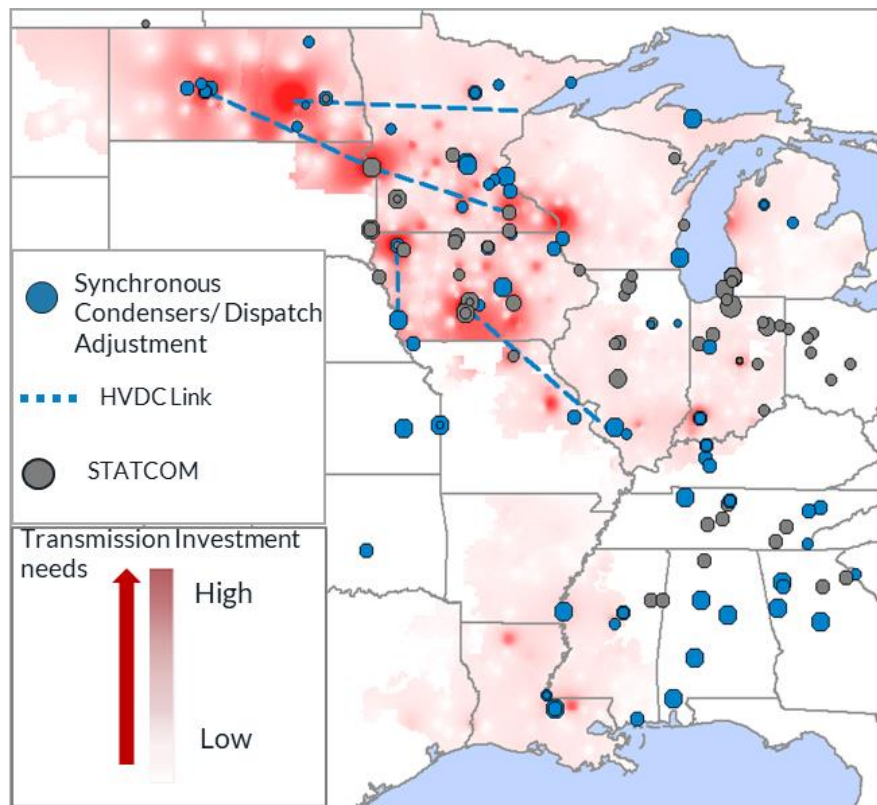
Analysis of subregional issues and solutions compatible with regional reliability and market operations needs



Cost Allocation & Recovery

Costs assigned roughly commensurate with benefits to each area

Work to-date indicates expected portfolio changes will cause significant grid and stability issues requiring increased transmission investment



Information provided from RIIA

- Issues are driven by reduction in conventional generation and the increase in inverter based (i.e. wind/solar/battery) generation
- Regional energy transfer increases in magnitude and becomes more variable leading to a need for increased extra high-voltage line thermal capabilities
- Increase in renewable penetration causes different dispatch patterns of conventional generators, leading to several dynamic issues
- Power delivery from weaker areas may need transmission technologies equipped with dynamic-support capabilities

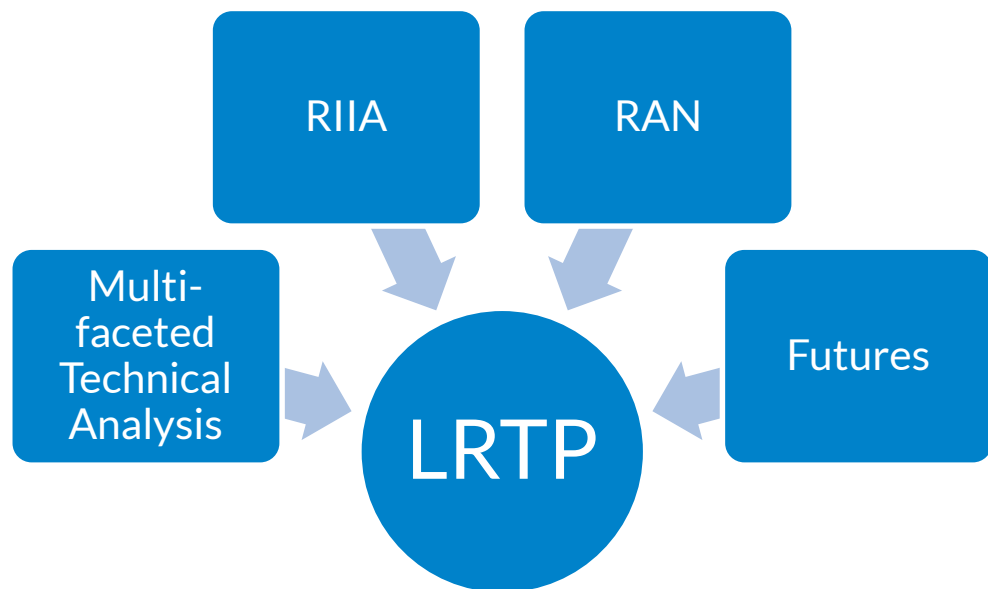


Long Range Transmission Planning

The Goal

L RTP will be a comprehensive approach under MISO's Reliability Imperative to provide a transmission road map of grid evolution that will be the foundation to drive future investment decisions

L RTP will focus on several aspects of the grid – reliability, stability, robustness, resiliency, system diversity, economics, and challenges associated with operating the system with the changing fleet (as identified in RIIA and RAN)

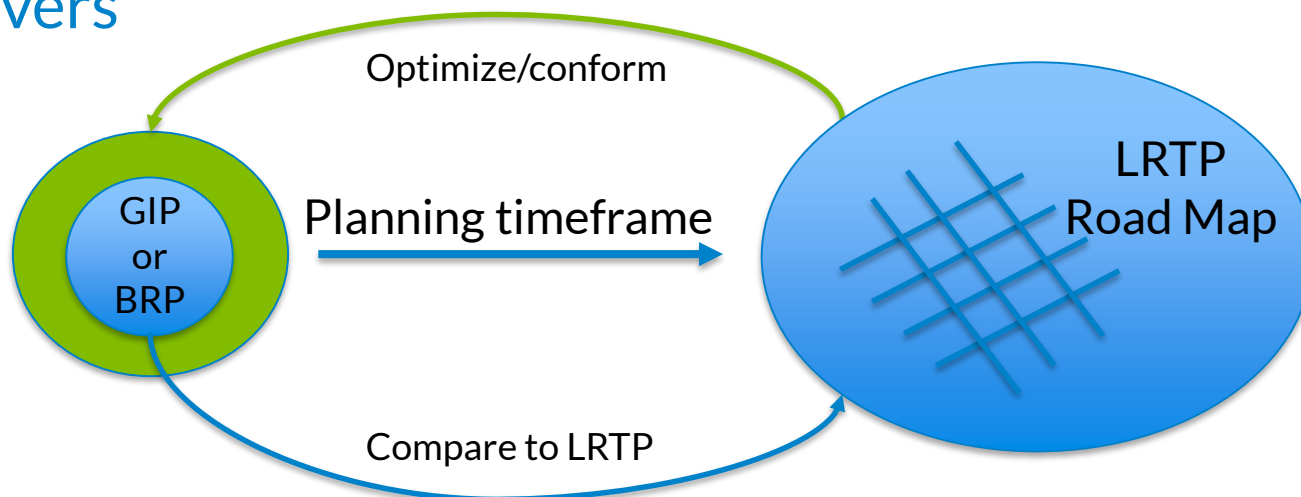


What is a Transmission Road Map?
MISO envisions this to be a foundational set of regional, subregional and interregional transmission projects that provide insight and direction for future investment

As the name implies, LRTP is a long-term grid plan but will also be a long-term effort spanning multiple MTEP cycles

- Near-term needs as well as a longer 20-40 year horizon are to be considered
- A regional approach for the overall footprint addressing both subregional and regional drivers
- Interregional coordination will provide additional opportunities for system optimization
- LRTP is not bound to an existing process (e.g. MCPS, GI) but rather will look across our transmission planning processes

A transmission road map will be adaptive to future changes in policy, generation build-out, and market shifts and will guide the optimization of near-term needs for compatibility with long-term drivers

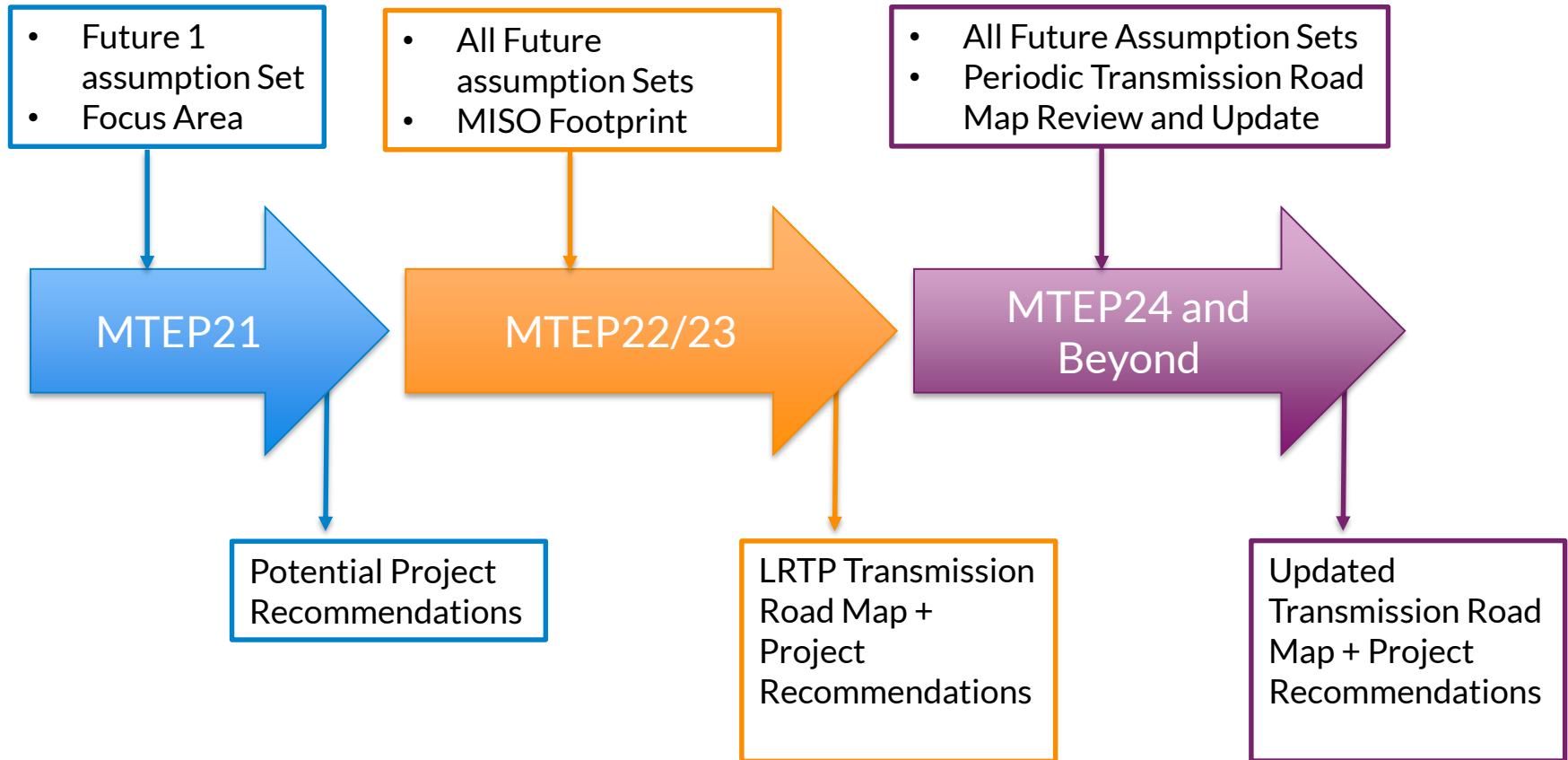


- The transmission road map will serve as a guide to inform future investment as transmission needs mature
- Periodic re-evaluation of the transmission road map will support alignment with fleet transition and policy changes
- As transmission needs may change over time, so to will the transmission road map

L RTP efforts in the MTEP21 cycle will set the foundation for continued study in future MTEP cycles

- L RTP in MTEP21 will focus primarily on the Future 1 assumption set
 - Provides a reasonable scope of work that can be accomplished in 2021
 - Capture potential near-term set of recommended transmission projects
 - Additional Futures will be used as necessary for robustness
- Potential MTEP21 transmission project recommendations
 - Necessary near-term transmission projects anticipated to be based on subregional needs that will provide for future regional expansion and align with the long-range transmission road map
 - Will be pursued for Appendix A if a business case is robust to support
 - Utilize existing Attachment FF planning criteria, benefits, and cost allocation where possible to support the business case

This is a journey we are on and the MTEP21 LRTP efforts is just the first leg



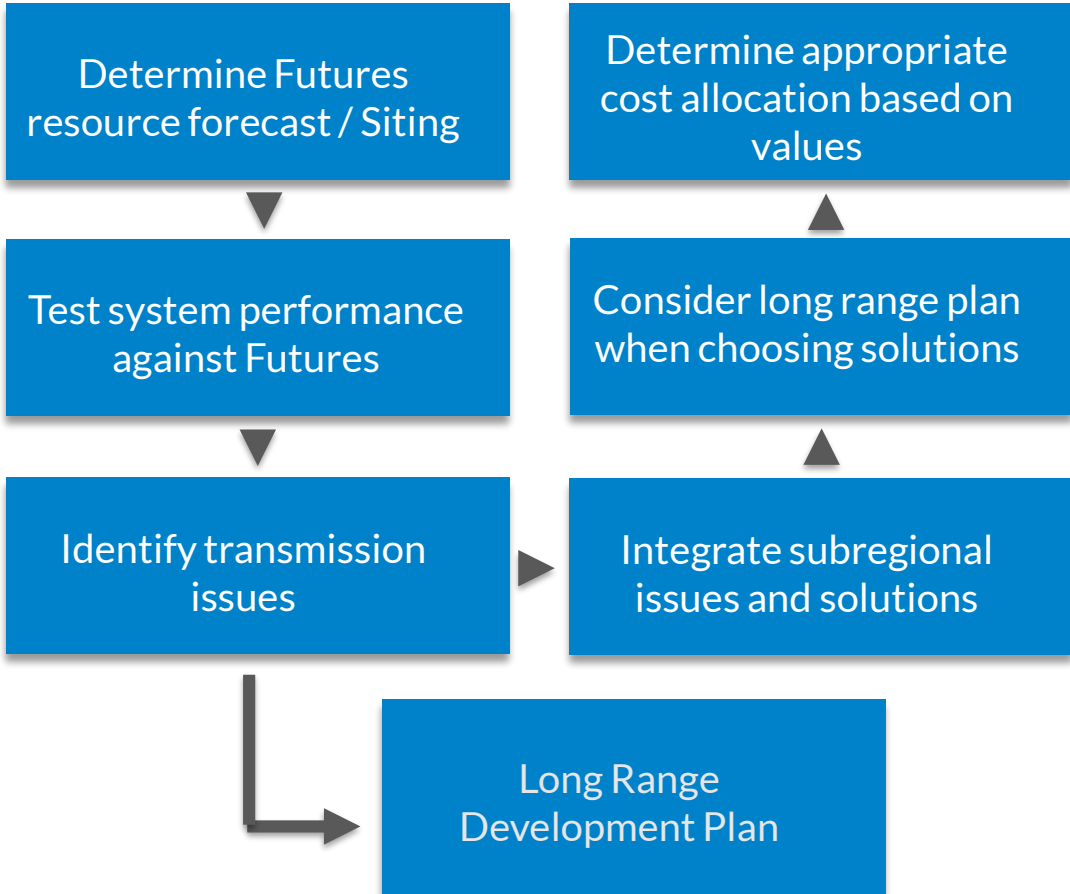


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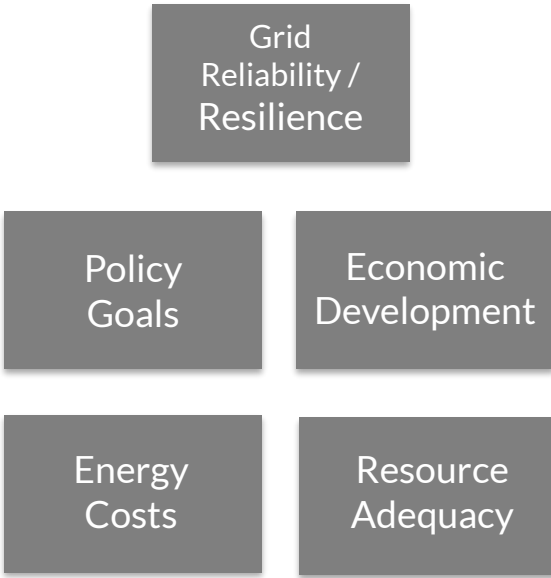
The Approach

L RTP will utilize MISO’s planning process which identifies grid needs based upon Futures, is multi-step, and considers subregional needs and solutions

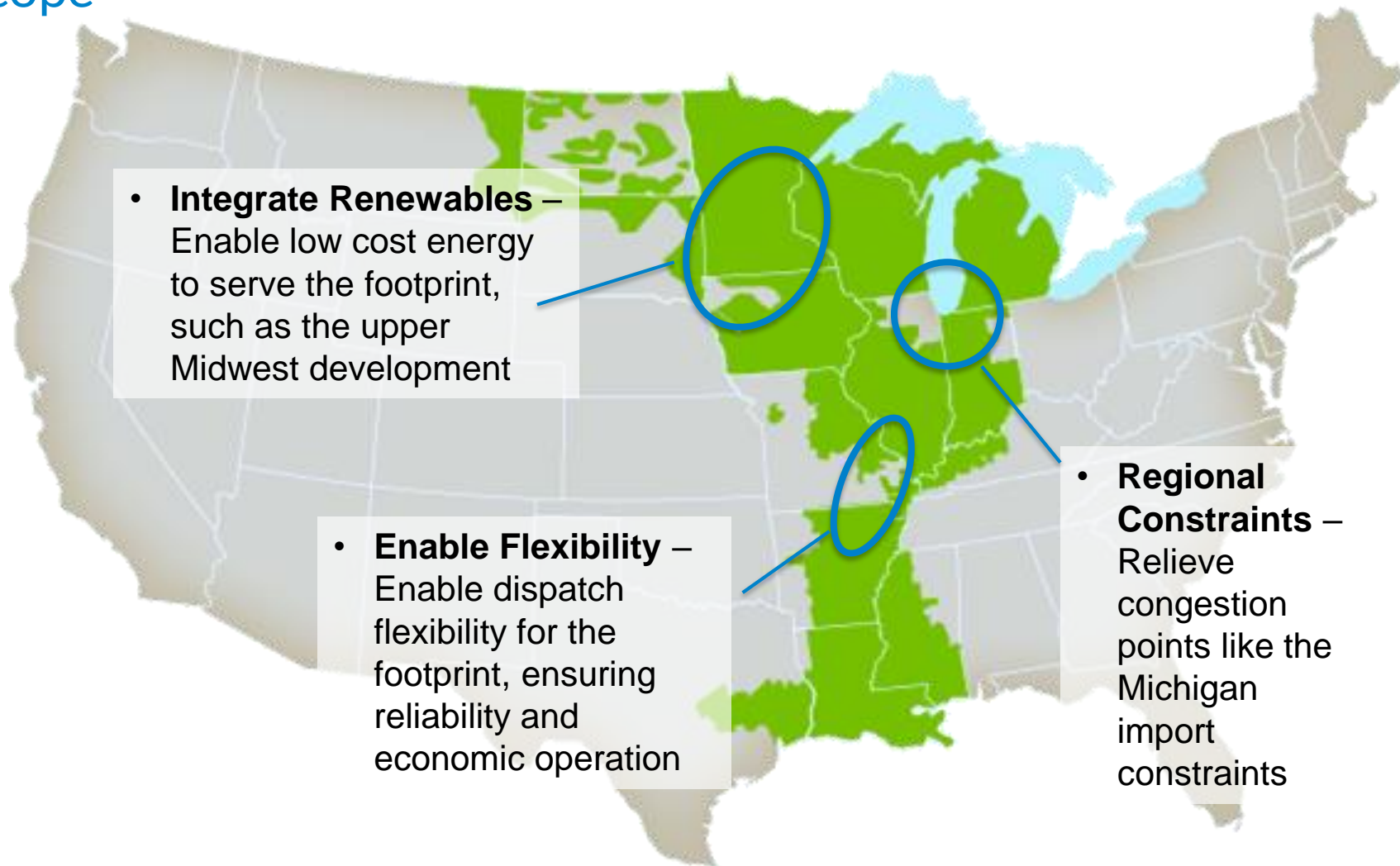
PROCESS



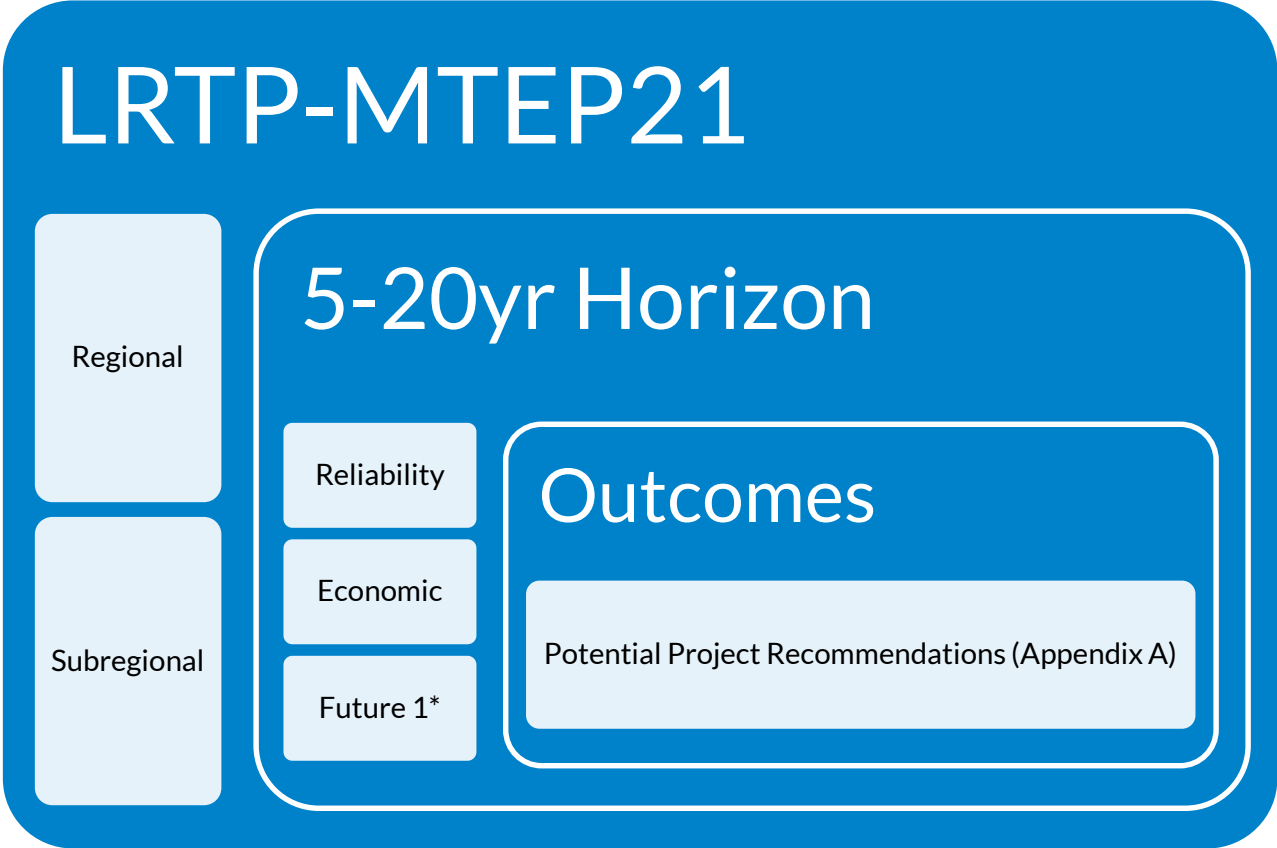
GOALS



L RTP in MTEP21 will be a coordinated single effort focusing on bringing together our recent focused work under a broader scope

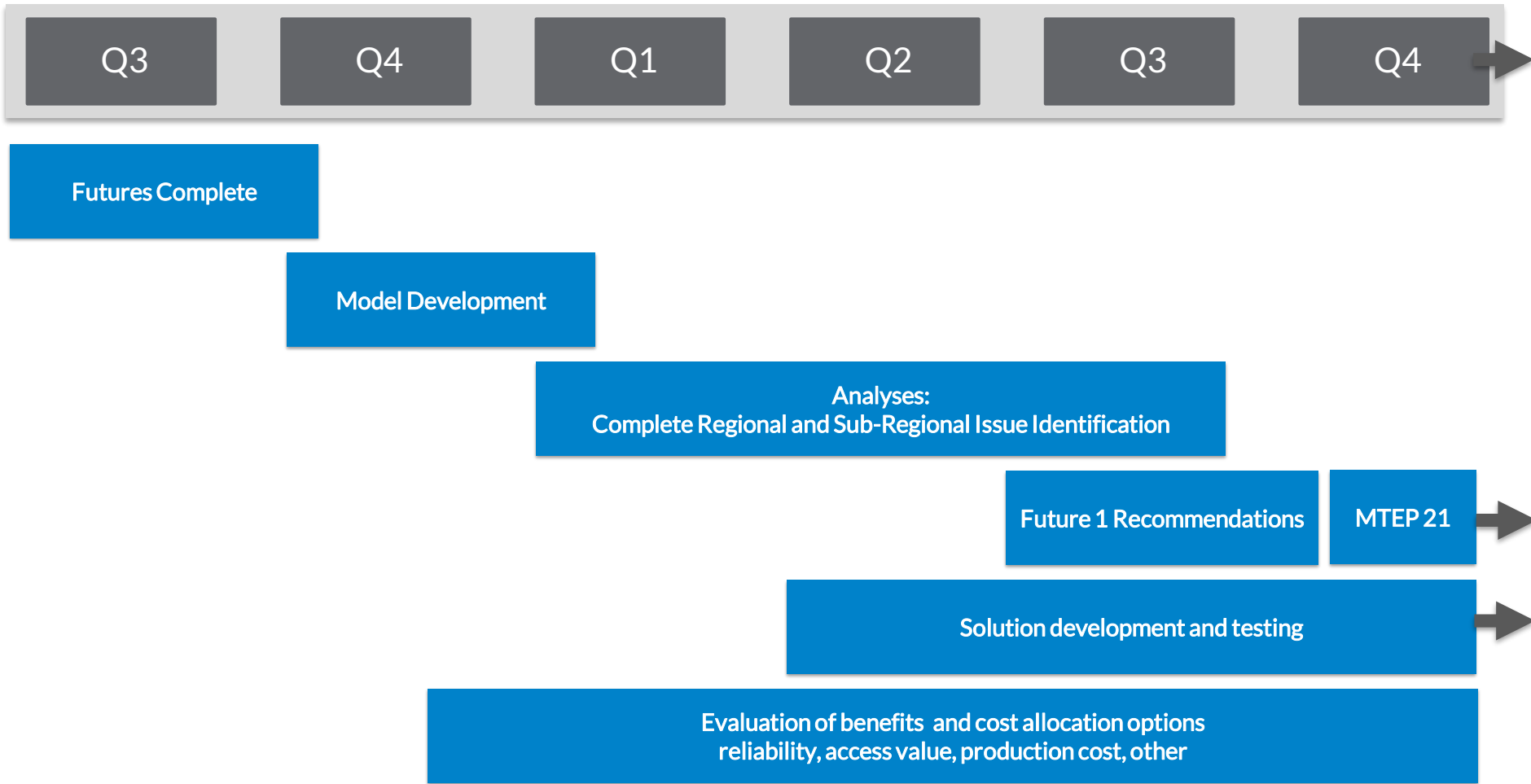


Efforts under MTEP21 will utilize Future 1 assumptions to identify near-term drivers and solutions



* Additional Futures will be used as necessary for robustness

Long Range Transmission Planning High-level 2020-2021 Timeline



MTEP22 and beyond will focus on further build-out and comprehensive analysis of the transmission road map

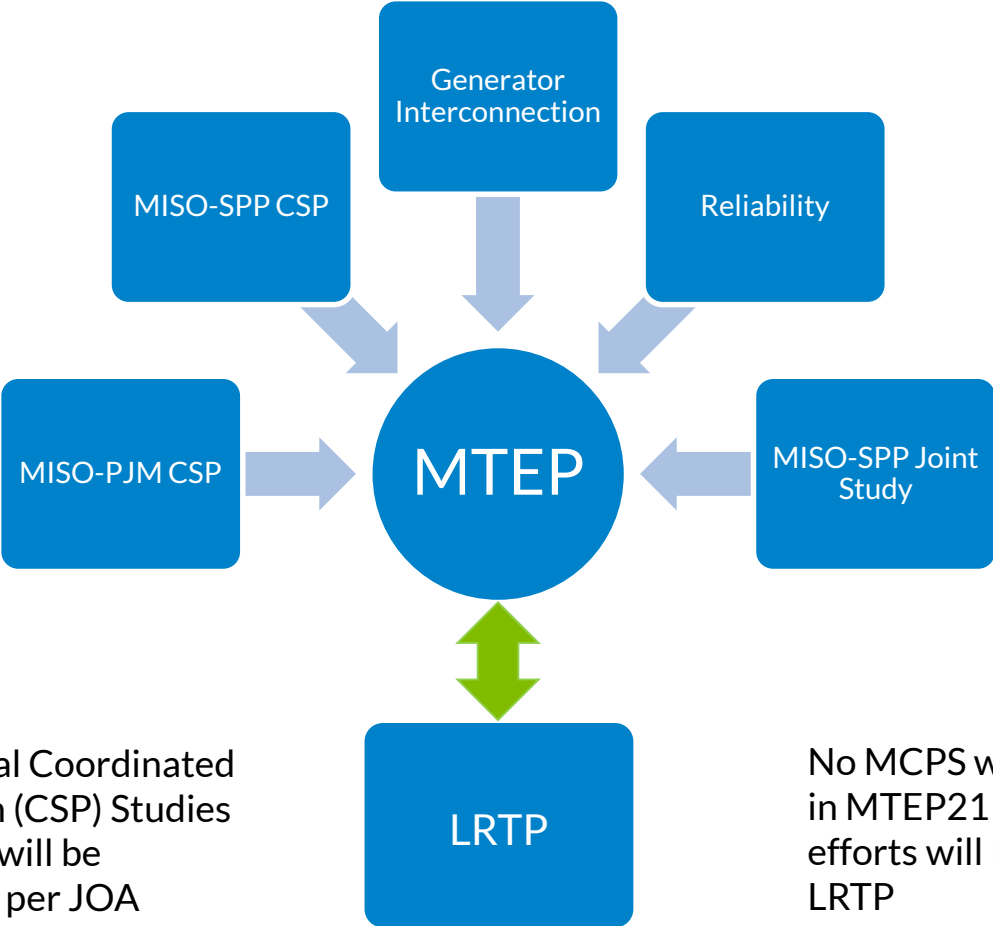
- Continued analysis of LRTP efforts in MTEP21 to support the transmission road map development
- Incorporate all Future assumption sets
- Encompass the entirety of the MISO footprint
- Maintain the regional approach with focus on the subregional drivers and needs
- Further Appendix A transmission projects will be delivered as business cases are mature
- Details on post-MTEP21 work will evolve in 2021



Long Range Transmission Planning

Other Considerations

It's imperative to maintain coordination with other MISO Transmission Planning efforts



Interregional Coordinated System Plan (CSP) Studies in MTEP21 will be determined per JOA processes

No MCPS will be conducted in MTEP21 as economic efforts will be focused on L RTP

Stakeholder Engagement

- MISO anticipates utilizing workshops and/or PAC and PSC when relevant information is ready to be shared and/or study discussions are warranted
- The RECBWG anticipates cost allocation discussions before the end of the year

Stakeholder Feedback Request

- The modeling strategy and model building are underway
- MISO will be posting a document on our modeling approach and will request feedback via email once posted
 - The feedback request will be managed through the Feedback Tool on the MISO website and will include an Issue Tracking ID# (<https://www.misoenergy.org/stakeholder-engagement/stakeholder-feedback/>)
- We will review comments and implement ideas as appropriate
- Review of the comments will be at the January PAC

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