Regional Electric System Planning in the Midwest:
A Primer for Clean Energy Advocates

This Primer summarizes the key *planning results* and *ongoing processes* critical to decision-making on grid infrastructure expansion and how to pay for it (cost allocation) in the Midwest. The purpose of the Primer is to help equip Midwestern NGOs for effective participation in regional and interregional planning processes important to the attainment of a sustainable electric power future.

Prepared by:

Rishi Garg, Project Attorney
Project for Sustainable FERC Energy Policy
1200 New York Ave, N.W., Washington DC, 20005
P: 202-289-2433 C: 847-971-0020
E: rgarg1976@gmail.com

The Project for Sustainable FERC Energy Policy
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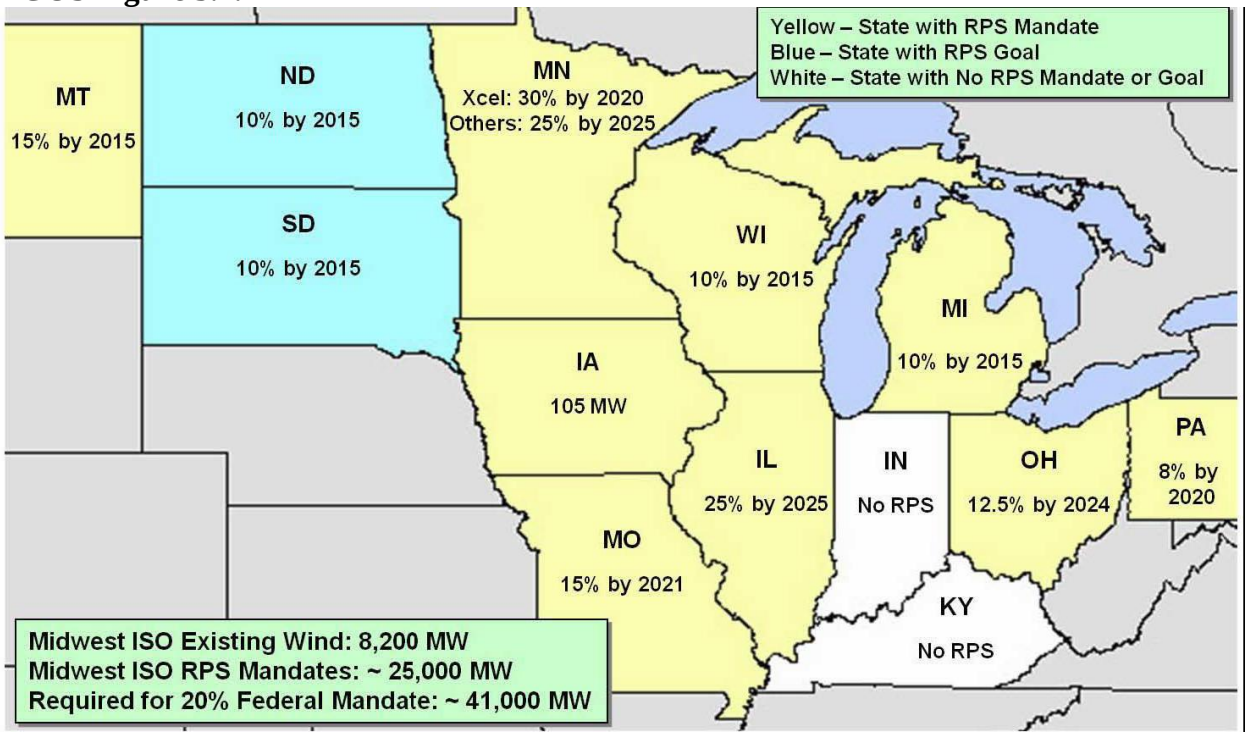
Table of Contents

I. NGO Participation in MISO Transmission System Planning & Cost Allocation Decisions

A convergence of factors, including the emergence of cost-competitive clean energy resources,[1] state policy mandates to integrate clean supply and demand-side resources (DSRs) into the grid, and pending federal regulatory actions,[2] has created new opportunities for environmental advocates to influence important electric system planning and cost allocation decisions. Recognizing these factors, the Midwest Independent System Operator (MISO) has begun to work with stakeholders to take actions that address them.[3] Such actions include:

- Development of the 2010 Regional Generation Outlet Study (RGOS), which recognized the renewable portfolio standard (RPS) mandates or goals of 11 Midwestern states and identified combinations of transmission infrastructure investments to accommodate them;[4]

RGOS Figure 3.1.1



[1] In 2006, prices paid for electricity generated at large wind farms averaged near 5 cents/kWh, (after the Production Tax Credit). See *20% Wind Energy by 2030*, a report by the US Department of Energy, July 2008, p. 27. Costs are expected to fall further due to expansions in manufacturing volume. See *id*., p. 28.

[2] The Federal Energy Regulatory Commission has proposed rules on the integration of Variable Energy Resources into the electric grid and reforms to regional system planning and cost allocation. Also, the EPA is expected to issue new rules on air and water emissions from power plants.

[3] This Primer focuses on opportunities for environmental NGO advocates to impact decision-making affecting the *wholesale* bulk power system, which includes facilities used to transmit electricity in interstate commerce and the sale of power for resale (wholesale sales). This Primer does not discuss *retail* distribution grid systems, which fall under state jurisdiction; nor does it discuss distribution-level environmental NGO advocacy opportunities.

[4] *Regional Generation Outlet Study*, a report by the Midwest ISO, November 19, 2010, p. 22

- An independent assessment by Global Energy Partners, LLC (GEP) of available energy efficiency (EE) and demand response (DR) resources located within MISO's footprint with projected increases through 2030;[5] and
- An analysis of the potential system impacts of federal Environmental Protection Agency (EPA) power sector emission regulations.[6]

These actions reflect MISO *efforts* to initiate planning reforms that may advance grid sustainability goals and provide *opportunities* for the NGO community to engage in and guide MISO and stakeholder planning decisions.

A) *Why should NGOs participate in regional transmission system planning and cost allocation decision-making processes?*

NGO participation in MISO system planning and cost allocation processes is critical because stakeholders in those processes *identify* system needs, *assess* proposed system solutions, and *determine* resource options that have important and long-term environmental, reliability and economic impacts on the region.

Environmental NGOs offer a unique combination of policy perspective, analytical skill and relevant information that is critical to, and often missing from, comprehensive transmission system planning. For example, a 2009 study by the American Council for an Energy Efficient Economy (ACEEE) and the Energy Center of Wisconsin (ECW) projected energy savings of 10% by 2020 in the Midwest due to EE installations.[7] The Union of Concerned Scientists (UCS) released the *Climate 2030* report, recommending a series of electricity policy changes to help achieve an 80% reduction in greenhouse gas emissions from 2005 levels by 2050.[8] Synapse Energy Economics submitted a review of GEP's EE and DR Assessment, which analyzed alternative future EE penetration rates through 2030, and recommended that MISO study at least four alternate futures in addition to the GEP Assessment.[9] Environmental NGOs can help ensure that studies such as these, which take seriously environmental concerns (and are traditionally absent from planning processes) are placed before MISO stakeholders and considered, on an equal footing with other studies, before planning decisions are made.

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[5] *Assessment of Demand Response and Energy Efficiency Potential for Midwest ISO*, a report by Global Energy Partners, LLC, November 2010.

[6] *Proposed EPA Regulation Impact Analysis*, a presentation by MISO to the Planning Advisory Committee, November 23, 2010.

[7] *A Review and Analysis of Existing Studies of the Energy Efficiency Resource Potential in the Midwest*, a whitepaper prepared by the Energy Center of Wisconsin and the American Council for an Energy Efficient Economy, August 2009. The report also concluded that the attainment of 2% annual retail energy sales from EE by 2015 was a realistic projection. See *id*., p. 15.

[8] *Climate 2030: A National Blueprint for a Clean Energy Economy*, a report by the Union of Concerned Scientists, May 2009. Recommended electric industry policies included a national Renewable Electricity Standard and increased R&D investments into renewable and carbon capture and storage technologies. See *id*., Executive Summary, p. 5.

[9] *Demand Side Resource Potential, A Review of Global Energy Partners' Report for Midwest ISO*, a report by Synapse Energy Economics, LLC, September 3, 2010. Synapse recommended that MISO study a "Modified GEP" (1%) scenario, a "State's Average" (1.4%) scenario, a "Best Practices" (2%) scenario and an impact analysis of each scenario on the peak load forecast through 2030. See *id*., pp. 11-12, Figures 4 and 5.

In addition, the Federal Energy Regulatory Commission (FERC or Commission) has proposed new rules for all planning authorities and transmission owners that require real opportunities for *all* stakeholders to participate meaningfully in transmission system planning processes.[10] A group of public interest organizations (PIOs) filed comments supporting the proposed rule and stating that effective NGO participation in planning processes is critical because regional plans must be *broadly supported* and be designed to achieve *long-term sustainability*.[11]

Our unique perspectives and analytical skills, in conjunction with expanded participation opportunities suggest that environmental NGOs should fully engage in regional transmission system planning processes and work to transform the existing grid infrastructure into a cleaner, smarter and more sustainable electric power system.

B) *What role does the MISO play in regional transmission system planning and cost allocation and why is its work critical to a sustainable grid?*

MISO is a "public utility" under the Federal Power Act (FPA). The FPA defines a public utility as any person who owns or operates facilities subject to the Commission's jurisdiction, and Commission jurisdiction extends to all *facilities that transmit electricity in interstate commerce and all electricity sold at wholesale in interstate commerce*.[12] The Commission oversees "reliability standards" and determines whether they are just, reasonable, not unduly discriminatory or preferential, and in the public interest, enforcing compliance with the standards by independent system operators such as MISO.[13] In order to help eliminate undue preference, the Commission issued Order 888, which requires FERC-jurisdictional public utilities to have open access transmission tariffs (OATTs) so that transmission owners cannot favor or grant transmission access to some resources while limiting transmission access to others.[14]

To further improve planning processes, the Commission issued Order 890 which requires that regional planning be conducted according to the following 9 planning principles:

(1) Coordination	the process for consulting with transmission customers and neighboring transmission providers;
(2) Openness	planning meetings must be open to all affected parties
(3) Transparency	access must be provided to the methodology, criteria, and processes used to develop transmission plans
(4) Information Exchange	the obligations of and methods for customers to submit data to transmission providers must be described;

[10] Notice of Proposed Rulemaking on Transmission Planning & Cost Allocation by Transmission Owning and Operating Public Utilities, Docket No. RM10-23-000, June 17, 2010, ¶52.
[11] Joint PIO Initial Comment, Docket No. RM10-23-000, September 29, 2010, ¶14.
[12] See 16 USC §824(a) – (e). For a helpful introduction to FERC jurisdiction, please see *An Overview of the Federal Energy Regulatory Commission and Federal Regulation of Public Utilities in the United States*, a presentation by Lawrence Greenfield, Associate FERC General Counsel, December 2010.
[13] See 16 USC §824o(a(6)) and (d(2,6)).
[14] See Order 888, 75 FERC 61,080, April 24, 1996 and 18 CFR 35.28(a) & (C).

(5) Comparability	transmission plans must meet the specific service requests of transmission customers and otherwise treat similarly- situated customers (e.g., network and retail native load) comparably in transmission system planning;
6) Dispute Resolution	An alternative dispute resolution process to address both procedural and substantive planning issues must be included;
(7) Regional Participation	There must be a process for coordinating with interconnected systems
(8) Economic Planning Studies	Study procedures must be provided for economic upgrades to address congestion or the integration of new resources, both locally and regionally
(9) Cost Allocation	A process must be included for allocating costs of new facilities that do not fit under existing rate structures, such as regional projects.[15]

Compliance with these planning principles requires system operators, including MISO, to review and integrate the transmission system plans of all utilities within their footprint. Recently, the Commission took more aggressive steps to improve planning processes by issuing a Notice of Proposed Rulemaking (NOPR) on Transmission Planning & Cost Allocation. In the proposed rule, the Commission stated that an open, transparent, inclusive and comprehensive regional transmission planning process may be necessary to ensure that rates, terms and conditions of transmission service are just and reasonable.[16] The Commission explicitly found that greater regional coordination in transmission planning would expand opportunities to identify and implement cost-effective regional solutions to local and regional needs *and* could better facilitate the integration of location-constrained renewable energy resources needed to fulfill public policy requirements (such as the RPS's adopted by many states).[17]

These developments suggest that the Commission is concerned about sustainable grid planning. As noted in Joint PIO Initial Comments, underlying the proposed reforms is the Commission's fundamental duty under the FPA to regulate the industry in a manner that ensures a *sustainable electric power future*.[18]

C) *What opportunities exist for strategic NGO advocacy in MISO stakeholder processes and within MISO governance structures?*

Environmental NGOs can participate in ongoing stakeholder deliberations and negotiations *and* make recommendations on important matters to be considered by MISO's Board of Directors. This subsection provides brief descriptions of several forums in which NGOs may want to expend time and resources.

Planning Advisory Committee (PAC): The PAC provides advice to MISO staff on policy matters related to the process, adequacy, integrity, and fairness of the Midwest Transmission

[15] See Order 890 issued February 16, 2007 and Order 890-A issued, December 28, 2007, ¶181.
[16] See Commission NOPR, fn. 10, *supra*, ¶49.
[17] See generally, *id.*
[18] See Initial PIO Comments, fn. 9, *supra*, ¶8. NGOs can help regional stakeholders and Commissioners define *sustainable electric power future*.

Expansion Plan (MTEP).[19] The PAC's duties include participation in interregional planning; development of planning objectives and guidance on key planning milestones; provision of sector viewpoints on system reliability and economic needs, potential solutions and cost-sharing principles; and provision of subject-matter expertise on policy issues related to transmission planning.[20] Currently, the PAC is reviewing a series of planning futures (discussed in more detail in Section II) to determine which futures should be included in MTEP 2011 analyses,[21] and evaluating results of the RGOS to determine which transmission lines, designed to meet state RPS mandates, should be included in MTEP 2011.

Supply Adequacy Working Group (SAWG): The SAWG develops recommendations on analytical tools and market mechanisms to ensure adequate capacity supply ("resource adequacy") and, thus, the reliability of the bulk power system within the MISO footprint.[22] The group will disband upon the successful implementation of a mechanism that ensures the acquisition of adequate planning resources for the region.[23] Currently, the SAWG is considering a MISO proposal to implement a process in which all load and resources would participate in annual auctions to procure adequate capacity resources.[24] Eastern RTOs have forward capacity markets to procure the capacity resources necessary to meet projected load requirements, and they have successfully integrated EE and DR into their capacity market constructs, paving the way for demand reductions (or "negawatts") to compete with traditional resources in the planning process to meet system capacity needs.

Demand Response Working Group (DRWG): The DRWG develops recommendations designed to allow DR and distributed generation (DG) to participate in the markets, and the group encourages the development of new DR resources.[25] Stakeholders have facilitated the integration of DR resources into MISO energy and ancillary services markets, and MISO is seeking FERC approval of a proposal that would enable private aggregators of retail customers (ARCs) to offer demand reductions into those markets.[26] Integrating demand side resources (DSRs) into electric markets reduces peak demand and market prices and can significantly lower peak load forecasts, reducing the need to construct additional generation and transmission infrastructure.

Informal Communications/FERC Advocacy: Environmental NGO representatives can arrange formal (letters or presentations) or informal (conference calls) communications with

[19] MISO PAC Charter, updated December 2010, p. 1.
[20] See *id*.
[21] The identified futures are: Business As Usual (BAU) with Mid-Low Demand and Energy Growth Rates; Business As Usual (BAU) with High Demand and Energy Growth Rates; 20% Federal Renewable Portfolio Standard (RPS); Carbon Cap with Nuclear; and Federal RPS + Carbon Cap + Smart Grid + Electric Vehicles ("Kitchen Sink"). See Midwest Transmission Expansion Plan 2010, p. 9.
[22] MISO SAWG Charter, updated December 2010, p. 1.
[23] See *id*.
[24] Supply Adequacy Working Group Capacity Construct FAQ, December 9, 2010.
[25] MISO DRWG Charter, updated December 2010, p. 1.
[26] See MISO ARC Filing, submitted to FERC October 2, 2009.

MISO staff and Board members on issues of importance. NGOs may also decide to file comments at FERC in response to MISO proposals seeking Commission approval.[27]

II. MISO's Current Approach to Identification of Grid Needs and System Solutions

Annual development of a comprehensive planning document, the MTEP, enables MISO and its stakeholders to assess the adequacy/reliability of the existing transmission system and forecast system needs based on assumptions about trends in load growth and availability of generation resources.[28] The purpose of the MTEP is to ensure that the transmission system:

1) Operates reliably;

2) Provides economic benefits such as increased market efficiency;

3) Facilitates public policy objectives such as integrating renewable energy; and

4) Addresses other issues or goals identified through the stakeholder process.[29]

Over the past few years, the MTEP has evolved from a rigid analysis of projects designed only to meet reliability and economic needs, to one that is beginning to evaluate all resource options and relevant public policies comprehensively. For example, MTEP 2008 contained only one reference to EE,[30] described limited circumstances under which DR could participate in markets,[31] and rejected outright the possibility of adopting a capacity market construct.[32]

In contrast, MTEP 2009 acknowledged, for the first time, that clean energy technologies, such as Smart Grid and EE, have impacts on generation and transmission planning.[33] It also recognized that current load-forecasting methodologies and assumptions were outmoded and likely incapable of accommodating public policy imperatives. It discussed efforts underway at all levels of government to reduce the environmental impacts of energy generation, including renewable resource development, carbon reduction goals, EE and Smart Grid, and it acknowledged that the development of federal policies requires changed assumptions about levels, and perhaps even the profile, of load which, in turn, could result in a different transmission plan than what might be considered under a traditional paradigm.[34] Finally, MTEP 2009 stated that future analyses should look further at alternative scenarios *that rely more heavily*

[27] Appendix B to this Primer provides instructions on how to obtain a FERC User Account and track FERC dockets. It also lists open FERC dockets that may be of interest to Midwest Environmental NGOs.
[28] MTEP 2010, Executive Summary, p. 11.
[29] See *id.*, p. 1.
[30] See MTEP 2008, p. 69.
[31] See *id*. ¶283.
[32] See *id*., ¶365 and ¶376.
[33] See MTEP 2009, p. 2.
[34] See *id*, p. 56

on EE and DR as resources that modify both supply and demand patterns and capabilities, as well as at alternative supply-side resource and technology mixes.[35]

MTEP 2010, discussed below, further recognizes the value that clean supply and DSRs can offer the bulk power system. Containing comprehensive analyses of wind integration studies and clean energy future scenarios, MTEP 2010 provides significant sets of data on clean resource integration that will help focus advocacy efforts in the development of MTEP 2011.

A) *How are system needs identified and system solutions selected?*

Through a series of reliability and economic analyses, MISO determines whether system resources are sufficient to meet future demand over a ten-year planning horizon, accounting for a variety of potential uncertainties. These uncertainties include lower than expected capacity expansion, increased unit retirements, inaccurate load forecasts, an aging generation infrastructure, and reduced external transmission and generation support.[36] MISO must estimate future demand growth and ensure that sufficient transmission, generation, and other system resources are in place to reliably and cost-effectively meet its projected demand. NGO participation can help ensure that all available resources, including EE and DR, are reasonably considered in the development of load forecasts *and* as resources able to meet projected demand.

Based on projections provided by MISO's load-serving entities (LSEs), forecasted peak demand in 2010 of 100,578 MWs is expected to grow over the ten-year period to 111,727 MWs in 2019.[37] An independent assessment by GEP estimated baseline peak demand in 2010 to be 98,963 MWs, and projected that peak demand would reach 116,165 MWs in 2030. While GEP's analysis was not completed in time for inclusion in MTEP 2010,[38] MISO staff has begun to examine how to integrate the GEP Assessment results and alternative forecasts into MTEP 2011.

After system requirements have been determined, stakeholders begin a process to identify and select system solutions. Projects are proposed and categorized into Appendices A, B and C depending upon their value and feasibility. When first submitted, projects are listed in Appendix C. They are moved to Appendix B after MISO has documented their need and effectiveness, and to Appendix A after gaining approval by MISO's Board of Directors.[39] More specifically,

Appendix A Projects are
• Recommended by MISO staff and approved by MISO's Board of Directors

[35] See *id*., p. 268.
[36] See MTEP 2010, p. 11
[37] See *id*.
[38] See GEP Assessment, fn. 4, *supra*, p. v. The Assessment found that increases in demand from 2010 to 2030 will be more than offset by over 20,000 MWs of savings from EE and DR.
[39] See MTEP, Section 2, p. 18. Put another way, projects in Appendix A reflect planned projects approved by the Board of Directors. Projects in Appendix B represent proposed projects for which a need has been identified, but are not timely or require additional analysis. Appendix C contains projects for which the need has not been verified. See *id*., Executive Summary, fn. 1.

Appendix B Projects are

- Still in the planning process or the review and recommendation process
- Analyzed to ensure that they address a transmission need
- Ineligible for regional cost sharing because review is not completed[41]

- Required to meet reliability, economic or public policy requirements
- Eligible for regional cost-sharing after review process completed by MISO staff and stakeholders[40]

Appendix C Projects are

- Long-term conceptual projects still in the early stages of the planning process
- Un-reviewed for need or effectiveness and ineligible for cost sharing
- Not included in power flow reliability analyses due to their uncertainty[42]

B) ***How were the future scenarios MISO is studying selected?***

To address uncertainties and potential grid impacts of public policies such as state RPSs, carbon caps or taxes, and other regulations, MISO examines multiple future scenarios through the MTEP process. This permits the grid operator to account comprehensively for a wide array of potential policy outcomes.[43]

In order to develop appropriate planning assumptions for each future, MISO has relied on the independent work of a number of collaborative entities, including the Midwest Governors' Association (MGA), the Upper Midwest Transmission Development Initiative (UMTDI), and the Organization of MISO States (OMS). OMS identified a range of planning futures and cost allocation methodologies for MISO consideration through its Cost Allocation Regional Planning (CARP) process.

The following five future scenarios were selected by MISO stakeholders for study in MTEP 2010:

[40] See *id*., p. 19.
[41] See *id*., p. 20.
[42] See *id*.
[43] See *id*, p. 3. For example, MISO recently completed the RGOS (discussed in detail in Section III), which identified a sub-set of transmission projects as renewable energy transmission solutions designed to meet state RPS mandates. Stakeholders will study the identified projects as part of the MTEP 2011 planning process.

Business as Usual with High Demand and Energy Growth Rate
Assumes a quick recovery from the economic downturn in demand and energy projections and models the power system as it exists today, using current reference values and trends and projecting demand and energy growth rates based on recent historical data. It assumes that existing standards for resource adequacy, renewable mandates, and environmental legislation will remain essentially unchanged.
Business as Usual with Mid-low Demand and Energy Growth Rate
Predicts a continuation of the economic downturn, with related impacts on growth in demand, energy consumption, and the inflation rate.
Carbon Cap and Trade with Nuclear
Models a declining cap on future CO_2 emissions. The carbon cap is modeled after the Waxman-Markey bill, which would have required an 83% reduction of CO_2 emissions from a 2005 baseline by the year 2050. For the purposes of this analysis, a 30% reduction from the 2005 baseline would be assumed for 2025.
Federal RPS
Requires that 20% of the energy consumed in the Eastern Interconnect come from wind resources by 2025. State mandates are the same as those modeled in the Business as Usual Future and any additional renewable energy required is met with wind.
Federal RPS, Carbon Cap and Trade, Smart Grid, and Electric Car - the "Kitchen Sink" Future Scenario
Combines the impact of multiple future policy scenarios into one future. It is assumed that the increased penetration of Smart Grid will lower overall demand growth. Electric vehicles are assumed to increase off-peak energy usage and the overall growth rates.[44]

C) *To what extent has MISO begun to consider clean energy policies and resources in system planning?*

MISO has begun a comprehensive analysis of clean energy policies and resources for inclusion into MTEP 2011. MISO plans to include EE and DR estimates developed by GEP into each of the five future scenarios selected for study in MTEP 2010.[45] This type of analysis will require the conversion of GEP's EE and DR data into inputs that are compatible with MISO's modeling software - the Electric Generation Expansion Analysis System, or EGEAS. The EGEAS model will allow MISO to compare the economic and system impacts of the EE/DR inputs on each future scenario, including estimated system costs (e.g., levelized costs, present

[44] MTEP 2011, p. 54.
[45] See *Global Energy Project – Midwest ISO Results*, a presentation to the MISO PAC, November 23, 2010. For purposes of categorization, each future scenario is designated with an "S:"
S1: CARP Business as Usual with High Demand and Energy Growth; S2: CARP Federal RPS;
S10: PAC Carbon Cap with Nuclear; S8: PAC Business as Usual with Mid-Low Demand and Energy Growth; and
S4: CARP Federal RPS + Carbon Cap + Smart Grid + Electric Cars.

value costs) and MW reductions.[46] After MISO completes analyses for each future, stakeholders will have an opportunity to identify system solutions for the MTEP 2011 planning period.[47]

MISO will also analyze the potential impacts of proposed EPA clean air and water rules on its bulk power system and include the results of that analysis in MTEP 2011.[48] According to a recent NERC analysis, the four proposed EPA rules could impact 46-76 GWs of existing capacity by 2018.[49] MISO plans to study the impacts of the proposed rules on resource adequacy, the energy and ancillary services markets, and capacity costs.[50] Specifically, MISO will develop and study six scenarios, one for each proposed rule, one scenario recognizing no EPA rules, and a final scenario that combines the four EPA rules.[51]

Many environmental NGOs believe that responsibly planning for the grid-related consequences of new public policies requires comprehensive regional planning processes that ensure identification of relevant public policies and their potential system requirements and impacts, as well as evaluation of the full array of solutions to address those policies and impacts in a timely and cost-effective manner.[52] The preparations MISO has initiated to analyze potential impacts of clean energy resource integration and public policies on its bulk power system are positive steps toward more comprehensive system planning. They also provide important opportunities for environmental NGO participation.

III. Clean Resource Integration into MISO Planning and Markets

By undertaking the RGOS and GEP Assessments, MISO has demonstrated a willingness to consider non-traditional supply and demand resources as system solutions. However, these studies will remain nothing more than academic exercises unless their *results* are *incorporated* into planning processes, and the resulting system plans are actually implemented. Environmental NGO advocacy is critical to demonstrating to MISO stakeholders that clean energy resources can be integrated into system planning in a reliable and cost-effective manner.

A) *How does MISO propose to integrate the abundant wind resources located within its footprint into its planning process?*

MISO initiated the RGOS in response to the growing demand for renewable sources of energy. As more states created RPS goals or mandates, it became important to identify renewable resource-rich areas and to develop plans for connecting resources from those areas to

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[46] See *id*., slides 4-8.
[47] See *id.*, slide 9. MISO has already begun to share results for Futures S1 and S2. See *id*., Appendix.
[48] See *Proposed EPA Regulation Impact Analysis*, a presentation to the MISO PAC, November 23, 2010.
[49] See *2010 Special Reliability Scenario Assessment: Resource Adequacy Impacts of Potential US Environmental Regulations*, a report by the NERC, October 2010, p. 13. The four proposed rules include 1) a Clean Water Act rule on cooling water intake structures; 2) a Clean Air Act emissions standard on electric power sources (referred to as Maximum Achievable Control Technology or MACT); 3) a Clean Air Transport Rule (CATR); and 4) a Coal Combustion Residual Disposal regulation (CCR). See *id*., p. 1.
[50] See EPA Impact Presentation, fn. 47, *supra*, slide 6.
[51] See *id*., slide 11. Each scenario will include carbon costs ranging from $0 to $100 per ton.
[52] See Joint Reply Comment of Public Interest Organizations, Docket RM10-23, ¶36, November 12, 2010.

load centers.[53] The RGOS work built upon analyses completed in earlier collaborative efforts. For example, the UMTDI process identified and approved a combination of local and regional wind zones used in the RGOS, and the MGA affirmed the method used in selecting those wind zones as the best approach to wind zone selection.[54] Initial RGOS analyses showed that locating wind zones in a distributed manner throughout the system, as opposed to locating the wind close to load or only where the best wind resources are located, resulted in a set of wind zones that could help reduce costs needed to meet the state RPS requirements – a least cost approach to meeting state goals.[55]

RGOS stakeholders developed three transmission expansion scenarios to integrate wind from designated wind zones, each meeting state RPS requirements within MISO's footprint:[56]

(1) **Native Voltage** overlay – infrastructure additions that do *not* introduce new voltage classes into areas where they do not currently exist, e.g., the addition of new facilities with comparable or lower voltage levels to existing grid facilities;[57]

(2) **765 kV** overlay – infrastructure additions that include/permit the introduction of 765 kV lines throughout the study footprint; and

(3) **Native Voltage with DC** transmission – infrastructure additions that include/permit the expansion of DC technology within the study footprint.[58]

The RGOS includes a comparative analysis of the three overlay alternatives' physical infrastructure requirements including number of new lines, lines miles, right-of-way acres, river crossings and new substations.[59] The chart below compares and contrasts additional features:

Comparisons of Transmission Overlay Alternatives[60]

	Potential Disadvantages	Potential Advantages
Native Voltage Overlay	1. Does not extend as far south as other two overlays 2. Likely need for additional investments and rights-of-way if RPS mandates expanded 3. Mandates uncertain leading to not-yet-studied future costs	1. Lowest construction costs of three overlays 2. Less dependence on neighboring regions' expansion plans 3. Readily integrates into existing MISO system -

[53] See MTEP 2010, p. 49. There are over 8,000 MW of wind resources installed in the MISO footprint as of July 2010, and the generation queue has over 60,000 MWs of wind resource requests. See *id*., p. 275.
[54] See *id*.
[55] See *id*., p. 250.
[56] See *id*.
[57] See RGOS Report, November 2010, p. 9.
[58] See *id*., p. 1. The three overlay plans represent potential investments of $16 to $22 billion dollars in transmission over the next 20 years and consist of 6,400-8,000 miles of new transmission.
[59] See *id*., Table 1.2-1, p. 4.
[60] For a comprehensive discussion of potential advantages and disadvantages, see *id*., pp. 9-11.

	and environmental impacts	allowing for quicker construction
765 kV Overlay	1. System development possibly dependent on investment decisions made in Western PJM 2. Development and management learning curves (with associated costs) due to introduction of 765-kV lines	1. Greater Adjusted Production Cost (APC) savings than Native Voltage Overlay 2. Less miles of transmission needed to deliver the same amount of renewable energy than Native Voltage Overlay
Native Voltage with DC Overlay	1. Conventional DC costs much higher than AC alternatives for shorter distance needs 2. Newer DC technologies – HVDC with Voltage Source Control (VSC) not yet evaluated	1. Reduced amount of needed AC transmission (less physical infrastructure and impacts) 2. Reduction of land-based transmission and access to areas of the footprint not possible with Native Overlay

An important outcome of the RGOS process has been the identification of a subset of transmission lines likely to qualify as Multi-Value Projects (MVPs) (discussed in detail in Section V).[61] MISO has characterized the MVPs as the next, most immediate transmission investment steps, meeting RPS mandates and regional reliability needs.[62] All eleven identified MVPs are compatible with each of the three transmission overlay options.[63]

[61] See *id.* The 11 candidate MVPs identified by the RGOS represent $5.8 billion in transmission investments, $4.4 billion in MISO and the remainder in PJM.
[62] See *id.*
[63] See *id.*

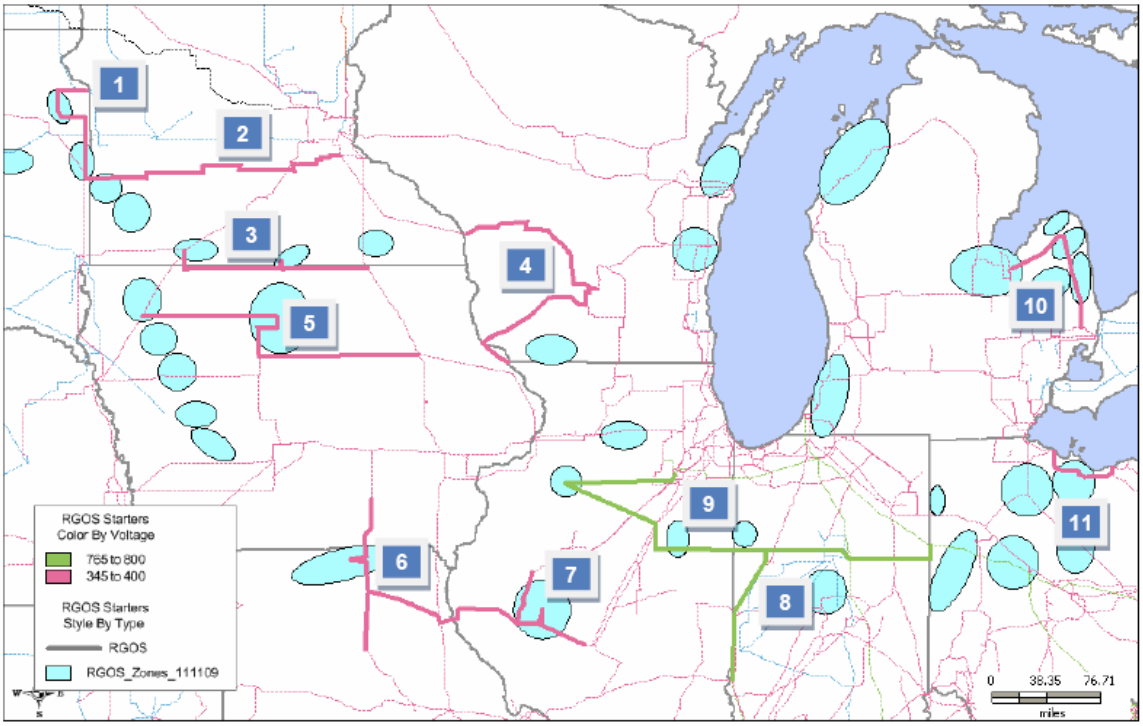

Figure 1.3-2: RGOS-identified Candidate Multi-Value Projects (Midwest ISO and PJM Lines Shown)

It is also important to note that stakeholders in the RGOS process did not reach consensus regarding the amount of renewable generation ultimately needed to comply with current and future RPS mandates. Some stakeholders asserted that a much higher level of wind generation will be required than what was included in the RGOS analyses, while others suggested a lower amount.[64] Moreover, stakeholders did not reach consensus on which of the three transmission overlays was the best solution; nor did they agree on whether each of the 11 proposed MVP lines should be included in MTEP 2011. By participating in the MTEP 2011 development process, environmental NGOs can help MISO stakeholders achieve consensus on a transmission build-out plan that carefully considers environmental concerns, including clean resource availability, public policy mandates, and sensitive land and wildlife habitat issues.

B) *How does MISO plan to integrate demand-side resources located within its footprint into its planning process?*

In 2009, MISO contracted with GEP to provide a *20-year load forecast* that accounts for currently-available and projected EE and DR resources to provide a basis for modeling future transmission capacity requirements.[65] MISO intends to study DSRs as resource options available to meet system needs; e.g., if a particular combination of demand-side management (DSM) programs is economically viable, then those programs will be included in the resource mix fed

[64] See *id.*, p. 97.
[65] See GEP Report, p. 1-1. MISO initiated the Assessment in order to develop better and "defensible" estimates of EE and DR for its load forecasts. See *id.*, Executive Summary, p. v.

into economic production cost models as future power supply units.[66] It is therefore critical that environmental advocates participate in MISO's evaluation of the GEP Assessment to ensure that accurate EE and DR forecasts are fed into the models.

A problem that demonstrates the need for NGO participation is GEP's accumulation of data *based solely on reporting from LSE's* within MISO's footprint about participation in utility-based EE and DR programs. Based on this limited data set, GEP estimated that MISO's baseline peak demand will increase from 98,963 MW in 2010 to 116,165 MW in 2030, an average growth rate of 0.8% per year.[67] GEP also estimated that peak demand savings from DSRs totaled 4,372 MW in 2010, representing 4.4% of the total peak load in the baseline forecast (3.9% from DR and 0.5% from EE). In addition, GEP estimated that cumulative effects from DSR programs will total over 20,000 MWs in 2030, representing over 17% of the peak demand forecast (7.6% from DR and 9.7% from EE).[68] The GEP Assessment indicated that projected load growth from 2010 through 2030 would be more than offset by increased customer participation in utility-based DSR programs.

Believing that DSR assessments based solely on utility reporting on utility programs underrepresented future EE and DR acquisition rates, Environmental NGO advocates contracted with Synapse Energy Economics to provide a response to the GEP Assessment that proposed consideration of *three alternative EE scenarios based upon more reasonable and aggressive assumptions about EE penetration rates.*[69] Synapse prepared technical analyses supporting the three alternative EE penetration scenarios, and NGOs submitted a response, based on the Synapse Report, to MISO staff.[70]

Challenging GEP's assumption that EE acquisition rates continually drop after the first five years of the planning period (from 1.0% in 2010 to 0.9% after 2015, 0.3 % after 2020, and 0.1% after 2025), Synapse countered that actual experience with EE programs demonstrates steady acquisition rates of 1% or above.[71] Based on a review of various EE potential studies in the Midwest and other regions, Synapse analyzed the following three alternative EE acquisition rates:

Alternative Energy Efficiency Acquisition Rate Scenarios

GEP Scenario with Fixed 1% Incremental Savings	Compared to GEP's scenario, total savings from EE in this scenario increases from 58,605 GWH to 97,338 GWH in 2030, and total energy consumption decreases from 509,322 GWH to 469,758 GWH in 2030.[72]

[66] See MTEP 2010, p. 286. Commenting on the value of accurate DSM estimations and representations, the MTEP states that DSM not only allows for deferred capacity savings but also influences transmission overlay proposals.
[67] See GEP Assessment, p. v.
[68] See *id*.
[69] See Synapse DSR Report, fn. 8, *supra*.
[70] See *Environmental Sector Response to Global Energy Partners' Assessment of Demand Response and Energy Efficiency in the Midwest ISO*, submitted by the Project for Sustainable FERC Energy Policy, Environmental Law & Policy Center and Wind on the Wires, August 27, 2010.
[71] See Synapse DSR Report, p. 3.
[72] See *id*., p. 4.

States' Average 1.4% EE Potential	Producing total cumulative savings from EE in 2030 of 118,740 GWH, the savings more than doubles the 58,605 GWH projected in the GEP Assessment and is significantly more (20% more) than the 97,338 GWH in the "GEP Scenario with Fixed 1% Incremental Savings Scenario."[73]
Best Practices 2% Average	This assumption produces total cumulative savings in 2030 of 150,347 GWH, or almost three times the cumulative savings as the GEP analysis. It also exceeds the 118,740 GWH in the "Sates' Average" scenario and the 97,338 GWH in the "GEP Scenario with Fixed Incremental Savings Scenario."[74]

Synapse also analyzed the impact of the alternate EE penetration scenarios on GEP's peak load forecast and determined that at a 1% annual penetration rate, cumulative savings from EE will rise to 19,373 MW from 11,233 MW (suggested in the GEP Assessment), dropping the net peak load forecast from 104,932 MW to 96,792 MW in 2030. In the "States' Average EE Potential Scenario" and "Best Practices Scenario" cumulative savings from EE increase to 23,392 MW and 29,618 MW respectively, and result in the net peak demands of 92,773 MW and 86,547 MW respectively in 2030.[75]

PAC stakeholders are currently studying ways to integrate GEP's EE and DR values into the five future scenarios selected for study in the MTEP 2011 planning process. MISO staff has stated a willingness to consider alternative estimates of DSRs as part of the MTEP 2011 process. Stating that periodic assessments of DSRs are important steps for grid expansion planning, MISO plans to complete a revised approach to surveying, estimating, and forecasting for MTEP 2011.[76] Environmental advocates can encourage stakeholders to consider more aggressive and reasonable EE acquisition rates so that future planning studies will more accurately represent all available resource options.[77]

C) *Is MISO considering additional reforms that could lead to further clean resource integration?*

In order to assure meaningful consideration of all resource options during a 10 or 20-year planning period, it is important to make reasonable assumptions about penetration levels of resources likely to serve greater portions of load in the future than they do today. For example, DG resources (such as photovoltaic technologies and combined heat and power (CHP)), storage technologies, Smart Meters, Plug-in Electric Vehicles and DR are likely to provide grid services

[73] See *id*., p. 8. Synapse arrived at the 1.4% EE acquisition rate by averaging state EE goals of 20 states including six Midwestern states.
[74] See *id*., p. 10. The 2% EE acquisition rate is indicative of the highest-rated and most successful state and utility EE programs.
[75] See *id*., p. 11.
[76] See MTEP 2010, p. 286.
[77] While calling attention to the GEP Assessment's shortcomings, environmental advocates acknowledged that the GEP Assessment represented the kind of analysis that is helpful to achieving better system plans, and commended MISO for taking an important first step.

at an increasing rate in the coming decades, and planning studies should make reasonable assumptions that reflect the likely participation levels of these resources.

Environmental NGO advocates should work with MISO staff to determine how best to integrate data and assumptions into MISO's EGEAS model so that planning studies do not under-represent important clean energy resource options. For example, GEP stated that it received no information from utilities on existing storage resources and, therefore, did not include storage in the Assessment as a resource for EGEAS modeling purposes.[78] However, a CHP study indicated that Indiana, Wisconsin, Illinois and Ohio have collectively installed approximately 5,800 MWs of CHP resources to date.[79] Environmental advocates should make sure that the most current data on clean energy resource penetration are placed before MISO stakeholders and integrated into system planning processes. Importantly, MISO plans to explore more fully the potential benefits of a variety of energy storage technologies in MTEP 2011. Stating that it plans to consider energy storage as a resource option in planning models and future-based scenarios, MISO suggests that it may develop and evaluate an entirely new storage-based scenario in MTEP 2011 *if enough interest is expressed.*[80]

IV. Preventing Environmental Harm in System Planning

A) *Are there opportunities to prevent resources that produce harmful emissions from interconnecting to transmission lines?*

Under current FERC policies, all public utility transmission providers are required to file tariffs at the Commission with provisions designed to assure open, non-discriminatory grid access and transmission service to all users.[81] Given the existing regulatory framework, environmental advocates' best opportunities to prevent dirty resources from interconnecting to the transmission system may be to reform current planning processes so that they are responsive to environmental goals.

Responsibly planning for the grid-related consequences of new public policies requires comprehensive regional planning efforts that ensure identification of relevant public policies and their potential system impacts, as well as evaluation of the full array of solutions available to address the needs arising from those policies in a timely and cost-effective manner. As documented in a recent report by Synapse Energy Economics, the failure to account for public policy requirements in planning processes is likely to yield excessive or misplaced investments in new transmission and generation infrastructure due to unrealistic projections of future transmission needs.[82]

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[78] See GEP Assessment, p. 2-5. Storage technologies can include thermal energy storage, CHP and cogeneration.
[79] See Synapse DSR Report, p. 18 (citing Energy and Environmental Analysis Inc./ICF, *Combined Heat and Power Installation Database*, available at http://www.eea-inc.com/chpdata/index.html.
[80] See MTEP 2010, p. 290.
[81] See FERC Order 888, fn. 13, *supra*.
[82] *Public Policy Impacts on Transmission Planning*, a report by Synapse Energy Economics prepared for EarthJustice, December 10, 2010, p. 1

Synapse suggests that planning processes could yield better investment decisions at reduced costs if they integrated the following considerations:

- At-risk and retiring generation;
- New types of generation resources;
- Load growth reductions related to increased use of EE resources; and
- Greater use of DR resources to meet demand and energy needs.[83]

Failure to address at-risk generation (generation that may retire due to age, expense, or inability to comply with new regulations) in a timely manner can lead to excessive reliability payments to old, dirty generators that stay online for reliability purposes while planning authorities spend years studying potential replacements.[84] Because options for replacing at-risk resources need to be identified early in planning processes, Synapse recommends that each planning authority adopt criteria to evaluate at-risk generation by reviewing state, regional and federal environmental policies designed to reduce carbon emissions.[85]

Synapse also recommends that planning regions file annual assessments of at-risk generation units with the Commission and adopt protocols for monitoring those units that identify the following milestones:

- Implementation dates of new regulations likely to affect at-risk units
- Transmission enhancements to enable retirements without reliability violations
- Timing of upgrades to existing facilities to allow continued operation

Planning authority adoption of the types of planning reforms outlined in the Synapse Report would enable old, dirty generators to retire and be replaced by clean resources in a manner that preserves reliability and avoids excessive out-of-market costs. Environmental NGO advocacy designed to help MISO adopt better planning practices could lead directly to emission reductions.

B) *Are there opportunities to minimize transmission infrastructure impacts on sensitive land and wildlife habitats?*

While environmental advocates have suggested to regional planning stakeholders that sensitive land and wildlife considerations should be factored into planning decisions, system operators have been unwilling or unable to develop mechanisms for evaluating land and wildlife issues or data inputs to help model the impacts of resource options on sensitive lands and wildlife areas.

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[83] See *id*., p. 35.
[84] See Supplemental Comments of EarthJustice, Docket No. RM10-23-000, December 10, 2010, p. 2. Synapse's analysis shows that the annual costs of keeping even small, marginal units operating for reliability reasons would exceed $50 million a year and may be as high as $100 million. If 60 GWs of at-risk generation is kept on line for reliability reasons in 2015-2016, the annual costs could reach billions of dollars. See Synapse Public Policy Report, fn. 81, *supra*, 9. 36.
[85] See *id*.

Environmental advocates have traditionally focused attention on state-level transmission line siting and permitting processes, ensuring that 1) Environmental Impact Statements (EISs) have considered all potential project impacts, 2) proposed facilities reflect the lowest-impact alternatives, and 3) unnecessary lines designed to enable the interconnection of dirty energy resources are prevented from being built.

As part of the Eastern Interconnect Planning Collaborative (EIPC) process (described in more detail in Appendix A), the NGO Caucus has contracted with consultants experienced in biological resource mapping and plans to submit data on sensitive lands and wildlife areas to EIPC stakeholders once it has been developed. Western Interconnection NGOs have been parties to the development of several of these kinds of tools and have been involved with planning processes that incorporated lands and wildlife concerns.[86]

V. Allocation of Costs for Transmission Infrastructure to Serve Renewable Resources

A) *What regional infrastructure proposal has been made by MISO and how did MISO propose to allocate its costs?*

Prior to proposing MVPs and a cost allocation approach to paying for them, MISO had only considered infrastructure requirements and cost allocation for reliability projects, economic projects and generator interconnection projects.[87] Recognizing the need for a cost allocation approach that would enable development of transmission infrastructure that would support public policy requirements, MISO stakeholders organized themselves into stakeholder groups to evaluate cost allocation alternatives. The OMS Cost Allocation and Regional Planning (CARP) group and the Regional Expansion Criteria & Benefits Task Force (RECB TF) worked in parallel over the course of 2009-2010 to develop cost allocation alternatives, and ultimately, after weighing the input of stakeholders, MISO adopted the MVP cost allocation methodology for facilities with broad system benefits.[88]

As discussed in Section III, the RGOS produced three different overly (or backbone) transmission plans that meet existing state RPS mandates. MISO estimated total costs of $16.3 billion for the *Native Voltage* overlay option, $20.2 billion for *765 kV* overlay option, and $21.9

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[86] California's Renewable Energy Transmission Initiative (RETI) identified competitive renewable energy zones (CREZ's) and transmission projects needed to accommodate the state's renewable energy goals in the most cost effective and environmentally-benign manner. RETI's Environmental Working Group helped identify restricted areas, such as national parks, and developed rating criteria to identify the potential environmental impacts of developing renewable projects in a CREZ. The criteria were based on environmental factors including 1) the amount of land needed for project development, 2) existing land disturbances, 3) proximity to protected areas, and 4) wildlife abundance and corridors. A formula was used to assign each rating criterion a numerical value indicating the relative environmental impact of each criterion in each CREZ. See *Environmental Working Group Interim Draft Phase 1B Report*, August 15, 2008, pp. 2-3 and http://www.energy.ca.gov/reti/index.html.

[87] See MTEP 2010, p. 53.

[88] See *id*. MTEP 2010 listed the system-wide benefits that the MVP methodology could offer, including:
1. Helping advance the integration of renewable resources to meet state public policy requirements;
2. Alleviating major areas of congestion by supporting investments that allow more efficient delivery of energy to load (thereby reducing the amount of wind energy that must be curtailed due to trapped generation); and
3. Easing the burden of interconnection costs for new generators in the queue. Importantly, not all stakeholders to the OMS CARP and RECB TF processes supported the MVP recommendation.

billion for the *Native Voltage with DC* overlay option.[89] With substantial stakeholder input, MISO also identified a set of eleven MVPs that would meet current state RPS mandates and regional reliability needs.[90] These MVPs were chosen using three steps:

Step 1: Identify useful transmission corridors common to multiple Midwest ISO studies.
Step 2: Identify RPS timing needs and synchronize with Generation Interconnection Queue (GIQ) locations.
Step 3: Evaluate the constructability of transmission infrastructure facilities.[91]

In July 2010, MISO filed tariff amendments at FERC proposing that MVPs become a new transmission planning and cost allocation category. The filing defined MVPs as projects that enable the reliable and economic delivery of energy in support of documented energy policy mandates and that address, through the development of a robust transmission system, multiple reliability and/or economic issues affecting multiple transmission zones.[92]

MISO proposed to spread 100% of network upgrade costs for MVPs to all load and exports, contending that MVPs and their associated transmission upgrades would provide region-wide benefits to the Midwest ISO footprint as a whole.[93] The proposal also sought to reduce cost burdens on new generators, Generator Interconnection Projects (GIPs), by requiring subsequent GIPs that benefit from the transmission upgrades funded by earlier GIPs to help pay the costs of the upgrades.[94]

B) ***What action has been taken by the FERC on MISO's proposal?***

The Commission accepted MISO's MVP cost allocation proposal and concluded:

- The MVP methodology will identify projects that provide regional benefits and allocate the costs of those projects accordingly;

- The MVP methodology is an important step in facilitating investment in new transmission facilities to integrate large amounts of location-constrained resources, including renewable generation resources, to further support documented energy policy mandates or laws, reduce congestion, and accommodate new or growing loads; and

- The existing cost reimbursement policy for network upgrades, along with the addition of the new Shared Network Upgrades classification, provides a better balance for allocating

[89] See RGOS Report, p. 5.
[90] See *id*, p. 97.
[91] See *id*., pp. 91-93.
[92] See MISO MVP Proposal, Docket No. ER10-1791, July 15, 2010, p. 2.
[93] See *id*., p. 18. According to MISO, given the integrated nature of its transmission system, the regional benefits that accrue from MVP network upgrades impact all users of the MISO transmission system in some way. See *id*.
[94] See *id*. The costs of Shared Network Upgrades (SNU's) would be shared with previous interconnection customers.

cost responsibilities for large network upgrades associated with interconnecting with the electric transmission grid.[95]

In proposing to spread the costs of MVP lines among all MISO loads and exports, MISO took another positive step towards integrating clean resources into the grid. Commission acceptance of the proposal has placed planning to meet important public policy goals on an equal footing with planning to meet reliability and economic efficiency goals. However, detailed analyses of the eleven proposed MVPs are required to determine whether they are truly the optimal solutions to accommodate public policy requirements. Stakeholders are carefully reviewing the identified lines in the PAC process, and environmental advocates should consider participating in the analysis to ensure that the projects included in MTEP 2011 benefit clean energy resource integration.

[95] MVP Order, ER10-1791, December 16, 2010.

Appendix A: *An Overview of the Eastern Interconnect Planning Collaborative Process*

In June 2009, the U.S. Department of Energy issued a Funding Opportunity Announcement (FOA) seeking proposals to conduct comprehensive, interconnection-level planning analyses for the Eastern, Western and Texas Interconnects.[96] The FOA's objective was to facilitate development of comprehensive analyses of transmission requirements under a broad range of alternative futures and preparation of indicative long-term interconnection-wide transmission expansion plans.[97] The funding opportunity covered two topics – *Interconnection-Level Analysis and Planning* (Topic A) and *State Cooperation on Electric Resource Planning and Priorities* (Topic B).[98]

A coalition of NERC Planning Authorities (PAs) representing nearly the entire Eastern Interconnect, which had previously initiated a joint planning process known as the Eastern Interconnection Planning Collaborative (EIPC), received funding to conduct the analyses and planning required under Topic A.[99] The EIPC proposal was designed to meet two main objectives:

1) Development of interconnection-wide transmission system models and analyses consistent with existing regional plans to ensure that projects already included in regional plans could continue to completion; and
2) Facilitation of transmission studies on an interconnection-wide basis to address long- term planning questions, such as those surrounding the integration of large amounts of renewable resources, in collaboration with industry stakeholders *via* an open and transparent planning process.[100]

The results of EIPC analyses will be available to inform policy makers, providing valuable inputs to Planning Authorities and stakeholders in the development of regional, inter-regional and multi-regional transmission infrastructure plans.[101]

Recognizing an important, first-of-its-kind opportunity to impact planning studies in the Eastern Interconnect,[102] NGO representatives organized into an interconnection-wide caucus of more than 30 organizations and elected representatives to serve on various EIPC committees and

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[96] See U.S. DOE FOA 000006, CFDA No. 81.122, *Electricity Deliverability and Energy Reliability Research, Development and Analysis*, June 15, 2009.
[97] See *id*., p. 5.
[98] See *id*., p. 6.
[99] Eastern Interconnection Transmission Analysis, Application for Financial Assistance, September 9, 2009. A coalition of NGOs submitted a proposal under Topic B called the Sustainable Transmission for Eastern Interconnection Planning Project (STEPP) proposal, but failed to obtain funding.
[100] See *Prepared Opening Remarks of David A. Whiteley*, FERC Technical Conference on Regional and Interregional Planning, Docket No. AD09-8, September 21, 2009, p. 2.
[101] See *id*.
[102] Notably, the FOA recognized the importance of clean resource integration in the EIPC process, requiring as two of its evaluation criteria: i) consideration of all available technologies for electricity generation, energy storage, transmission, end-use energy efficiency, demand management, and management of transmission- and distribution-level facilities; And satisfying all current state and federal requirements for renewable energy goals, energy efficiency goals, and goals for reducing greenhouse gas emissions. See DOE FOA, p. 24.

working groups. The Stakeholder Steering Committee (SSC) is the main stakeholder governance body of the EIPC process and the duties of its members include:

- Representing the viewpoints of the multiple organizations within their sectors
- Making efforts to arrive at consensus-driven decisions
- Conducting all meetings and activities with transparency
- Developing, through working group guidance, eight macroeconomic futures to analyze with 72 related sensitivities;
- Determining criteria for selecting the macroeconomic futures and three transmission build-out scenarios (for detailed transmission expansion and reliability analysis).[103]

The SSC is comprised of a total of 29 members representing the following electric industry sectors:

- Transmission Owners & Develops (3)
- Generation Owners & Developers (3)
- Other Suppliers (3)
- Transmission-Dependent Utilities, Public Power & Coops (3)
- End Users (3)
- Non-Government Organizations (3)
- State Representatives (10)
- Canadian Provincial Representative (1)[104]

The technical analyses needed to develop the macroeconomic futures and interconnection-wide plans are being performed in a number of topic-specific working groups. The NGO caucus has selected representatives to participate in each of these working groups:

- The **Roll-Up Working Group (RUWG)** to make recommendations on how to use the existing regional plans to develop a baseline for the modeling of proposed futures
- The **Scenario Planning Working Group (SPWG)** to recommend eight macroeconomic futures that cover a broad array of potential electric resource futures for analysis
- The **Modeling Working Group (MWG)** to develop data inputs and key assumptions to be used in the modeling analyses and sensitivity cases for the eight potential futures

NGOs have also selected a representative to participate in the SSC's Governance Task Force and have organized, within their own caucus, an Environmental Data Task Force to help develop data inputs for modeling the impacts of resource options on sensitive lands and wildlife areas. Finally, NGOs have played a key role in the development of the following eight potential resource futures: (1) Business as Usual, (2) Carbon Reduction – National Implementation, (3) Carbon Reduction – State/Regional Implementation, (4) Aggressive EE/DR/DG/Smart Grid, (5) Federal RPS – National Implementation, (6) Federal RPS – State/Regional Implementation, (7) Nuclear Resurgence, and (8) Combined Federal Climate and Energy Policy.

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[103] For a comprehensive list, see *SSC Charter*, available at http://www.eipconline.com/Resource_Library.html.
[104] See *id*.

Appendix B: *A List of FERC Dockets of Interest to the NGO Community and Tracking Instructions*

Open FERC dockets of potential interest include:

1. Docket No. RM10-11-000 - *Rulemaking on Integration of Variable Energy Resources*.
2. Docket No. RM10-23-000 - *Rulemaking on Reforms to Transmission Planning & Cost Allocation*
3. Docket No. RM10-17-000 - *Rulemaking on Compensation for Demand Response in Organized Wholesale Markets*.
4. Docket No. AD10-13-000 - *Request for Comments on Classification and Compensation of Electric Storage Technologies*.
5. Docket No. RM11-2-000 - *Adoption of Smart Grid Standards* and Docket No. PL09-4-000 - *Smart Grid Policy Statement*
6. Docket No. EL10-64 - *California PUC Feed-in Tariff Proposal*
7. Docket No. ER10-1791 - *MISO Multi-Value Project Cost Allocation Proposal*

FERC Online Registration Process and Docket Tracking Instructions:

1. Go to www.ferc.gov.
2. Under the "Documents & Filings" menu tab, click on "eRegister."
3. Click on the "eRegister" icon in the middle of the page and create a FERC online account (your user name should be your email address).
4. Once you have created a FERC online account, go back to "eRegister" and enter your log-in information.
5. Click on "eSubscription" located in the middle of the page or on the left-hand tool bar.
6. You will be asked to re-enter your user name and password. Do so and click "Log in."
7. Click on "Add New Subscription."
8. Enter a Docket Number and click on the Search tab.
9. Select the Docket Number that appears by clicking on the blue "X" and then click "subscribe."

Appendix C: *Principles of Cost Allocation*

Transmission infrastructure refers to the physical assets or equipment (lines, towers, transformers, etc.) that facilitate the movement of electricity from one location to another. The **transmission system** is a collection of physical assets that are interconnected and operated in a synchronized manner. These assets include:

- Network transmission facilities - typically higher voltage lines and related grid equipment;
- Local distribution facilities - lines/equipment that deliver electricity directly to end users, and
- Interconnection facilities – equipment that ties generation resources to the transmission system.

Decisions on allocating the costs of new or upgraded transmission facilities often begin with a discussion of whether the costs should be shared broadly by system users or borne solely by the parties who will benefit directly or measurably from the investment or whose new use of the system gives rise to ("causes") the need for additional infrastructure (e.g., a new generator or transmission customer). These alternatives are typically characterized as a "socialization" versus "beneficiary pays" or "cost causer" approach to cost allocation. Proponents of the broad cost allocation approach usually contend that some or most of the long-term benefits of a project (e.g., enhanced system reliability) cannot reasonably be assigned because all system users are benefited. Proponents of the alternative approach contend that cost causation or the benefits of the project at issue can properly be assigned. [105]

As the PJM report notes, there is no consensus on the best approach to cost allocation. In addition to noting the basic disagreements, the report helpfully summarizes the allocation issues to be resolved, the drivers of grid investments, and the critical role of transmission planning in sorting out grid expansion benefits and beneficiaries. Among the issues to be resolved are whether to allocate project costs i) to load or generation or both; ii) by amount of energy usage; iii) by the maximum (peak) amount of load or generation; iv) based on load flow impacts; and/or v) based on monetary impacts (e.g., reduced prices or costs).[106] In many cases, of course, decisions on cost allocation may be based on multiple considerations.

1. *Should costs be allocated solely to specific "beneficiaries" of transmission upgrades (beneficiary pays) or spread to all users connected to the transmission system?*

The definition of "beneficiary" often depends on the perspective from which the term is being defined. For example, identifying beneficiaries as those who impact electricity flows on various transmission lines (a power flow perspective) suggests that those *causing* facilities to become overloaded or *causing* reliability violations ("cost causers") would be the beneficiaries of an upgrade designed to eliminate the problem.[107] Beneficiaries might also be identified from a monetary perspective in which system costs and impacts (production costs, wholesale energy prices, changes in demand or generation, etc.) are compared before and after the proposed

[105] See *A Survey of Cost Allocation Issues, Methods and Practices*, a report by PJM Interconnection, March 2010, p. 5.
[106] See *id.*, p. *1*.
[107] See *id.*, p. 18.

project is brought into service, and parties gaining monetary benefits from the project would be identified as its beneficiaries.[108] On the other hand, beneficiaries may be identified to include the entire load because of the positive impacts of transmission projects in achieving public policy goals (such as the integration of clean resources which diversifies the fuel mix, enhances market competitiveness, and reduces prices.)[109]

The definition of "socialization" also depends on one's perspective. For example, one view is that broadly allocating costs across a wide array of users without distinguishing beneficiaries from non-beneficiaries creates "free-riders" or shifts costs to parties who derive little to no benefit from the upgrade.[110] Another view is that all transmission users benefit from upgrades due to positive externalities, reliability enhancements and price reductions (noted in the paragraph above). A third view is that it is too difficult (or impossible) to identify the beneficiaries because the transmission system is in constant flux and all transmission users will ultimately benefit from multiple project upgrades.[111]

2. ***Should transmission costs be allocated to load, generators or should a hybrid approach be used?***

As a general matter, regional transmission organizations (RTOs) allocate transmission costs to load.[112] In addition, generators interconnecting to the transmission system are generally responsible for the cost of direct interconnection facilities.[113] In several RTOs, generators requesting interconnection to the grid must pay for 100 % of network upgrades over and above the direct interconnection facilities in order to 1) alleviate potential reliability violations of their interconnection, 2) ensure deliverability as a capacity resource, or 3) meet other interconnection requirements.[114]

More recently, certain RTOs in the Eastern Interconnection have considered, and in some cases approved, transmission infrastructure cost allocation methodologies that would reduce cost burdens on generators in order to encourage the interconnection of abundant location-constrained resources, such as wind and solar, for delivery to load centers. The following table contains the status of three such efforts:

[108] See *id*., pp. 18-19.
[109] See *id*., p. 19.
[110] See *id*.
[111] See *id.*
[112] See *id*., p. 23. Though the manner in which costs are allocated to load and rate designs for cost recovery differ among RTOs.
[113] See *id*.
[114] See *id*., p. 24. According to this report, PJM, New York ISO and ISO New England retain this requirement.

Comparison of Cost Allocation Approaches in Three RTOs		
MISO	**SPP**	**PJM**
Multi-Value Projects (MVPs) costs are allocated 100% to all load and exports spread across the 13-state regional footprint. An MVP is a project which is needed to meet state policy goals—such as renewable standards—or a project that serves multiple reliability and market efficiency purposes in multiple pricing zones. (**Approved by FERC, December 16, 2010, MVP Order, ER10-1791**)	Costs of all transmission investments included in the regional expansion plan above 300kV are allocated 100% to load across the entire footprint. Projects between 100-300 kV are allocated 1/3 to the region and 2/3s to the zone and projects below 100 kV are allocated 100% to the zone. (**Approved by FERC, June 18, 2010; SPP Order, ER10-1069**)	Costs for all projects included in the regional expansion plan that operate at voltages of 500kV and above, are allocated 100% to load and spread across the entire PJM footprint. Projects below 500kV are allocated 100% to the zone in which the upgrade is required.[115] (**Approved by FERC but remanded by the 7th Circuit on evidentiary grounds; Docket No. ER10-549**)

Finally, in an effort to more closely align regional system planning with the allocation of system infrastructure costs, the Commission included in its proposed rule on Planning & Cost Allocation a requirement that RTOs include a method or set of methods for cost allocation in the regional operators' regional plans.[116] The NOPR stated that cost allocation methods may distinguish among facilities that are driven by reliability needs, congestion relief, *and the achievement of public policy requirements established by state or federal laws or regulations*.[117] If adopted as part of the Final Rule, this requirement could provide NGOs an opportunity to argue that the terms "benefits" and "beneficiaries" should be expanded to account for the achievement of environmental goals, such as greenhouse gas emission reductions and increased access to clean renewable resources.

[115] FERC approved PJM's approval to allocate costs of lines at 500kV and above on a "postage stamp" basis, under which all transmission service customers in a region pay a uniform rate per unit-of-service, based on the aggregated costs of all covered transmission facilities in the region. See *Order Establishing Paper Hearing Procedure*, Docket No. EL05-121-006, January 21, 2010, fn. 5. In contrast, costs of lines below 500kV were to be allocated on a "license plate" basis, under which a customer pays the embedded cost of transmission facilities that are located in the same zone as the customer. See *id*., fn. 3.

[116] See Commission NOPR on Planning & Cost Allocation, fn. 10, *supra*, p. 89.

[117] See *id*.

Appendix D: *List of Acronyms*

ACEEE – American Council for an Energy Efficient Economy
APC – Adjusted Production Cost
ARC – Aggregator of Retail Load
CHP – Combined Heat and Power
CREZ – Competitive Renewable Energy Zone
DG – Distributed Generation
DR – Demand Response
DRWG – Demand Response Working Group
DSM – Demand-Side Management
DSRs - Demand-Side Resources
ECW – Energy Center of Wisconsin
EE – Energy Efficiency
EGEAS - Electric Generation Expansion Analysis System
EIPC – Eastern Interconnect Planning Collaborative
EIS – Environmental Impact Statement
ERCOT – Electric Reliability Corporation of Texas
FERC – Federal Energy Regulatory Commission
FOA – Funding Opportunity Announcement
FPA – Federal Power Act
GEP – Global Energy Partners, LLC
GIP – Generation Interconnection Project
ISO – Independent System Operator
MISO – Midwest Independent System Operator
MTEP – Midwest Transmission Expansion Plan
MVP – Multi-Value Project
NERC – North American Electric Reliability Corporation
NOPR – Notice of Proposed Rulemaking
OATT – Open Access Transmission Tariff
PAC – Planning Advisory Committee
PIO – Public Interest Organization
RECB – Regional Expansion Criteria Benefits
RETI – Renewable Energy Transmission Initiative
RGOS – Regional Generation Outlet Study
RTO – Regional Transmission Organization
RPS – Renewable Portfolio Standard
SAWG – Supply Adequacy Working Group
SPP – Southwest Power Pool
UCS – Union of Concerned Scientists