

**Organization of MISO States**  
**Hot Topic Response**  
**Distributed Energy Resources**  
**September 2017**

**Introduction**

The growing amount of Distributed Energy Resources (DERs) driven by customer preferences and increasingly affordable technology make this a timely and important topic for MISO stakeholders to consider. DERs are exclusively connected to the utility distribution system and are, therefore, under the jurisdiction of retail regulators.<sup>1</sup> Yet, the expected increases in adoption of these resources will eventually result in impacts on the systems within MISO's purview. The Organization of MISO States (OMS) recognized these concerns when it established DER as a priority for 2017, and it has initiated discussions on how to address the nexus between retail and wholesale DER-related interactions.

At the June 2017 OMS Board of Directors meeting, the board approved a DER overview statement and Action Plan outlining OMS' next steps on DER.<sup>2</sup> Key statements from that document include:

*The potential for DERs to occupy a prominent space on the distribution systems of state-jurisdictional utilities inherently leads to state regulator involvement and has effects on state-jurisdictional resource adequacy planning. Simultaneously, increases in DERs can affect the transmission system and the wholesale markets, impacting key roles played by RTOs. This includes transmission planning, reliable system operation, and efficient market operation.*

*Proper information sharing between the distribution and transmission systems concerning DER location and operation is essential to ensure that DERs are efficiently and reliably integrated into both [distribution and transmission] systems.*

*It is important to engage in this issue now so that OMS and the MISO region can proactively establish the optimal approach to DER integration, from the distribution level to the transmission-level, to prevent any potential issues.*

The OMS proposed DER as a topic for this AC meeting to share the current perspectives of state regulators<sup>3</sup> and to hear the ideas and concerns of the broader stakeholder community. This discussion will help outline the next steps of the OMS-led DER initiative and provide a baseline for future discussions among stakeholders.

---

<sup>1</sup> The Illinois Commerce Commission does not agree with certain statements in this OMS paper regarding the extent of state jurisdiction over DER and does not agree that state regulators do, or should, have a blanket right to bar aggregation of distributed energy resources for purposes of offering into wholesale markets. States like Illinois, which have restructured generation ownership, encouraged retail markets, and set out on a NextGrid investigation with respect to future distribution system operations, rely to a great degree on the robustness of competition in wholesale power markets. This competition can be negatively impacted when barriers to wholesale market participation are raised.

<sup>2</sup> *OMS Approach on Distributed Energy Resources*, June 15, 2017, available at:

[http://misostates.org/images/PositionStatements/OMS\\_DER\\_Overview\\_and\\_Work\\_Plan\\_Document.pdf](http://misostates.org/images/PositionStatements/OMS_DER_Overview_and_Work_Plan_Document.pdf).

<sup>3</sup> For purposes of this response, "State Regulators" and "state(s)" shall include the Council of the City of New Orleans.

**1. Using the hypothetical composite definition in the introduction above as a reference, what resources (type and size) do you include and exclude as distributed energy resources, and why?**

The OMS supports a broad definition of DER to include all resources that are interconnected to the utility distribution system. The resources do not have to generate electricity and may include resources such as storage, energy efficiency, and demand response (DR).<sup>4</sup> A broad definition is needed to capture the wide variety of technical capabilities these resources possess. How these capabilities are utilized – on the distribution system, transmission system, or some combination thereof – is dependent on individual state and local policies, and a broad definition enables the needed flexibility. The definition of DER should neither limit participation nor require it, at any level, thus allowing for a variety of approaches.

A wide variety of resources exist within the broad definition of DER that can be differentiated by technology and size. There may be more meaningful ways to differentiate DERs, however, that could prove more useful to MISO when considering impacts to planning, operations, and markets. Specifically, ownership, controllability, and predictability are key differentiators. Within these sub-categories of DER, important distinctions can be made to determine the appropriate treatment. Once discussions of potential MISO tariff and Business Practice Manual modifications begin with stakeholders, further distinctions, definitions, and detail will be needed.

The OMS has identified several reasons why these sub-categories are important for consideration at the MISO-level:

**A. Ownership**

The ownership of a DER – by an individual customer, third party, or utility – can determine who has control over the resource and who gets paid for the services it provides. This can vary in a multitude of ways, with many arrangements possible throughout the MISO footprint. The ownership may also determine how communication with the resource is conducted. At a certain size, communication with every resource may be impractical and simpler solutions should be examined. Ultimately, control of the DER (for reliability) and, in most states, payment for the services it provides, are subject to state interconnection and operational rules and state tariffs.

**B. Controllability**

Some resources depend on measurement & verification, such as energy efficiency and DR, to determine their impact on the grid, while others can be directly metered like the output of distributed generators. The metering capability may have an impact on the ability to settle a DER at sufficient granularity. Furthermore, it is important to keep in mind that not all DERs will be actively controlled. In these cases, autonomous settings can be used to achieve preferred resource behavior.

**C. Predictability**

The dependability of a particular resource's performance will impact what services can be provided to both the distribution and transmission systems. Traditional generators use historical performance data to provide a statistical assessment of a resource's availability. A similar construct could be developed for DER. The need to manage the predictability of DER performance may vary throughout the MISO footprint as increases in load flexibility (e.g., from DR and storage) may be able to offset any uncertainty autonomously.

Finally, an RTO should remain technology-neutral. MISO should remain focused on the impact that a resource has in the three broad areas of planning, operations, and markets, and not box itself into

---

<sup>4</sup> The North Dakota Public Service Commission, South Dakota Public Utilities Commission, and Public Utility Commission of Texas do not support the inclusion of energy efficiency in the definition of DER.

potentially restrictive definitions. The ability of resources to participate at the wholesale-level may or may not be permitted, depending on state and local policy decisions.

## **2. As distributed energy resources grow in the MISO region, including the potential for increased aggregation, what implications do you see in the following areas:**

Accurate net-load forecasts at the Transmission-Distribution (T-D) interface are critical for the three areas discussed below. A holistic review of these processes could help inform MISO stakeholders how DERs are incorporated into load forecasts. This review could include best practices from other RTOs that have higher penetrations of DERs as well as intra-MISO methodology sharing.

In addition, state and local regulators have the authority to determine whether or not aggregation by third parties is allowed within their jurisdictions.<sup>5</sup> The OMS has recently made filings at FERC that further clarify the organization's position on this subject.<sup>6</sup> Aggregation can also occur by state-regulated utilities. Ultimately, the burden should be placed on market participants to ensure they are following all applicable state and local regulations. MISO can help facilitate this through coordination with OMS and/or individual state and local commissions in order to properly interpret related policies to ensure that unauthorized resources are not participating in wholesale markets.

### **A. Reliable Operations**

Reliability is a primary focus of OMS as DER penetration increases at various rates throughout the MISO footprint. Maintaining bulk electric system reliability in an equitable manner throughout the footprint will be the responsibility of MISO, state and local regulators, and distribution utilities. This outcome will be most easily achieved with all distribution utilities maintaining reliability on their own systems and effectively managing their interfaces with the transmission system. To support this bottom-up approach to reliability, distribution utilities continue to invest in improving the control and visibility throughout their systems. This includes smart grid software, advanced metering, and advanced system controls, among other things. Furthermore, additional reliability benefits will be realized through the adoption of the pending IEEE 1547 interconnection standards for DERs and national guidelines related to DER data that are currently under development by the NERC Essential Reliability Working Group.

At the transmission level, increasing amounts of DERs participating in the wholesale markets will necessitate rules similar to those utilized for existing resources to incent performance. In the near term, these rules may look similar to those currently utilized for demand-side resources. When offering through an aggregator, whether a vertically-integrated utility or a third party (where allowed), the burden should be on the offeree to ensure a resource is able to perform as offered into the MISO markets.

### **B. Efficient Markets**

Efficient markets require accurate supply and demand information. As DERs expand within MISO, the ability to maintain a reasonably accurate picture of supply and demand should be a priority. The interaction of wholesale and retail price signals must be accounted for in order to ensure market efficiency and equitable treatment of resources.

A DER should not receive a price signal (e.g., payment) from both its retail tariff and the MISO market for providing the same service. Specifically, if a DER is capable of providing services at the wholesale level that are not otherwise already compensated through a retail rate, a DER should be allowed to participate in the wholesale market, assuming state policy allows such participation.

In today's markets, information on supply is provided on multiple timescales. For longer-term considerations, (i.e., resource adequacy), market participants submit information through MISO's

---

<sup>5</sup> The Public Utility Commission of Texas does not support this statement.

<sup>6</sup> OMS filings available at: <http://misostates.org/index.php/filings/ferc-filings/179-2017-ferc-filings>.

Module-E Capacity Tracking (MECT) tool. This tool captures information on both conventional generators and demand-side resources. A resource's total capacity accreditation is determined through testing, historical performance data, or a combination thereof. Over shorter time periods, supply information is shared through offers into the energy and ancillary service markets. These existing tools may be sufficient to accommodate additional supply-side information related to DER in the near term.

On the demand side of the equation, distribution utilities are constantly submitting updated load forecasts to MISO which then get aggregated to clear the required amount of resources within the MISO markets. Although increasing DER penetration may complicate the task of load forecasting, increases in technology deployment on distribution systems are leading to greater levels of control and visibility which can soften these impacts and even lead to improvements.

### **C. Transmission Planning**

Potential implications of DER on the transmission planning process are numerous. The existing planning processes were established prior to the expectation that load growth would continue to decline and new generation would increasingly come from customers behind the meter instead of central station generators. Therefore, it will be important to review and revise MISO's approach to planning to ensure it will accommodate the evolving future. Although MISO facilitates planning for economic transmission projects, state resource decisions that include DER may impact the need for and location of future transmission.

Transmission assets are long-lived (50+ years) and can take 5-10 years to develop. Some DERs, on the other hand, can be planned and operational in a matter of months. The potential for DERs to impact the need for transmission projects, in the planning process and even after approval, needs to be analyzed and well understood, especially if DER deployment is occurring outside of a formal planning process (i.e., through economic-driven customer adoption). The timing of DER integration will be important to consider against the backdrop of the current transmission planning and development approaches.

At a minimum, MISO needs to have a process that provides sufficient information on identified transmission system needs to allow for adequate consideration of non-transmission alternatives (NTAs). The OMS is supportive of recent changes to Business Practice Manual 020, which establishes a framework for NTA consideration, but it remains to be seen how effective the process will be. There is also a role for states to play in how this process gets incorporated into their own resource planning decisions, including whether or not transmission is used to acquire capacity or generation.

This additional complexity introduced by DER to long-term planning of economic transmission needs to be an important consideration in the ongoing Regional Transmission Overlay Study (RTOS) and Market Efficiency Project (MEP) processes. The uncertainty surrounding the amount and location of DER penetration presents a significant challenge to the existing planning process and may warrant a holistic and fundamental overhaul of how MISO approaches planning.

- 3. In terms of both operations and planning, MISO currently has limited visibility into distributed energy resources that are interconnected at the retail level. As a result, MISO is limited in its ability to assess current and potential future impacts on the reliability of the regional Bulk Electric System. How should MISO and stakeholders work together to enhance communications between the retail/wholesale and distribution/transmission areas while also being mindful of jurisdictional boundaries?**

To date, the discussions surrounding increased communication and visibility at MISO have been high-level. The entire stakeholder community would benefit from a more detailed discussion regarding the specific information MISO would need, under what circumstances the information would be provided, and the potential consequences of the information exchange. This type of open discussion will be

facilitated as part of the OMS-led DER effort. It's difficult to determine how best to enhance communications until more detail is known on what information is necessary.

Limiting the interaction of MISO with DERs, at least initially, enables simplicity and reinforces reliability. Although enhanced coordination may be needed, it will likely not amount to enhanced control or extensive visibility into distribution systems. Rather, it will more likely lead to enhanced, accurate information on what is occurring at the T-D interface. Reliability of distribution systems must be maintained by distribution utilities, and reliability of the bulk electric system flows from that. MISO should only need a sufficient amount of visibility to ensure efficient commitment and dispatch of resources. If a lack of visibility is leading to over or under-commitment, all market participants are harmed.

At higher levels of DER penetration, it may become important for MISO to have greater visibility into expected net-load forecasts and the status of distribution systems that may impact DER availability. This may include the sharing of such information as distribution maintenance plans, solar forecasts, or abnormal circuit configurations. This communication may be more efficiently made directly to the market participants who offer DER into the wholesale market and who can then communicate with MISO through updated offers. Regardless of the process, all MISO stakeholders will need to be open to new lines of communication that help ensure the reliability of both the distribution and transmission systems. It is expected that as DER penetration increases on a particular distribution system, the visibility and tools available to that distribution utility will increase as well. It is important to have a robust discussion about the near-term expectations and to continue the conversations as the penetration and technology continue to evolve.

**4. What do you believe are the key drivers of growth of distributed energy resources? How could stakeholders and MISO work together to assess the pace and the means by which distributed energy resources are growing in the MISO region, and how different parts of the region may be affected?**

Economics, advances in technology, customer preferences, and state and local policy decisions are impacting the growth of DER within the MISO footprint. These drivers are non-uniform across the region and effects across the system will vary as a result. MISO should work with stakeholders to ensure that, regardless of the driver or amount of growth, all market participants maintain equitable access to the benefits of a reliable transmission system and efficient wholesale markets.

The OMS recognizes several opportunities for MISO to work with stakeholders to understand the potential scale of DER deployment. Currently, states are working with MISO on an effort to assess the pace of future DER growth through the Applied Energy Group's study on Energy Efficiency, Demand Response, and Distributed Generation. Further evolution of this study may be a valuable first step in assessing the pace and means of DER growth. Additional information on DER could also be incorporated in the OMS-MISO Resource Adequacy Survey to gain further benefits without significant effort.

As the OMS-led effort on DER continues, a better picture may eventually emerge of the best path forward in the MISO stakeholder process. At this time, however, it is too early to recommend a specific set of items to be incorporated into the stakeholder process. This uncertainty and the market, technology, and planning issues implicated contribute to DER's importance as a hot topic discussion. The OMS looks forward to hearing the various viewpoints of the MISO stakeholder community.