

37. How are renewable energy sources and distributed generation impacting grid operation and reliability?

Over the course of the last couple of years, MISO has been integrating renewable energy into their system. Wind and solar have been the main study drivers for MISO's planning efforts when it comes to designing a more robust transmission system in the Midwest. With the increase in renewable energy sources coming online, trying to meet state renewable energy standards, the current transmission system has not been robust enough to handle this influx. One important aspect of renewable energy that has impacted reliability, at least within the MISO footprint, has been the fact that the renewable energy sources are located in areas with little transmission capability. Therefore, maintaining reliability at the points of interconnection for a lot of renewable energy has been a major obstacle to plan for. Also, from an energy market perspective this increase in intermittent resources, especially wind, has created additional ramping needs that requires committing more resources, and eventually a new ramp capability market product, which MISO is currently working on. The additional resources committed are to balance resources and load when both are changing in opposite directions, which means that sometimes the number of resources committed by MISO are determined by the total ability to increase or decrease output by so many MW per minute to keep supply and demand in balance. The need for MISO to commit additional resources increase the energy costs slightly due to start up and no load costs of the additional units committed and dispatched. The energy costs are the same.

Distributed generation can both be an asset, as well as impedance to grid reliability. On the one hand, distributed generation can provide additional support (i.e., voltage support) as it could provide an additional influx of power to a grid that could utilize that to maintain reliability. On the other hand, if the grid to which the distributed generation would connect is already near capacity, then the extra power flowing over an already overloaded line could reduce reliability.