

A CLEAN ENERGY FUTURE TAKES MORE THAN JUST ADDING RENEWABLES

A clean energy transition requires more than developing renewable energy projects. It involves public policy, permitting reform, and building a grid that allows renewables to supply their multiple benefits. In truth, a few small, but incredibly important road repairs can take the quest for a clean energy future from a long and winding road, full of hills and valleys, potholes, and detours to an ordinary road trip. And, in this case, boring is good!

As we strive to deliver on our clean energy quest, more than anything else, we must ensure that our electric grid is reliable. Our world is more connected, and electrified, than ever before; and the health and safety of millions of people depend on the grid's ability to deliver affordable, reliable, clean energy 24-7-365. Allowing renewable energy to provide capacity and other ancillary services will help the grid deliver the reliability we all demand and keep costs down for consumers.

So, what are ancillary services?

To remain stable, the grid must maintain a balance between supply and demand. That's easier said than done, however. Ancillary services are capabilities that a resource can provide beyond producing energy to help keep the grid balanced. They help grid operators maintain a reliable electric system, balance supply and demand, and help the system recover if a generator suddenly trips offline.

The Midcontinent Independent System Operator (MISO), like all grid operators, is required to operate an Ancillary Services Market where generation resources can offer other services such as regulation and frequency response, or reserves. Wind and solar can provide ancillary services such as reactive supply and voltage control, and regulation and frequency response. But MISO is excluding renewables from taking part in these market products. Therein lies the problem.

Let's dig into some of the ancillary services and what they mean. Remember, maintaining a balance between supply and demand is needed to keep our grid operating. As demand for electricity changes minute to minute, we need generators that can respond quickly to those changes by increasing or decreasing their output. Some generators, including wind and solar, are willing to offer regulation service, which means they will adjust their output to help maintain the balance. Other generators, such as nuclear and coal, are less flexible and operate more efficiently if their output is not adjusted minute by minute. Generators offering regulation and "frequency response" can adjust their output automatically "in response" to the frequency on the grid. This is especially important when a generator unexpectedly stops producing power due to unanticipated circumstances such as a machine failure, or extreme weather. Such a large loss could be catastrophic to the grid if other generators were not ready to respond by adjusting their output quickly and automatically. We also need generators that are willing to offer less energy than they are capable of, so that if more energy is needed later, they are ready to increase their output. This service of holding back output is called reserves.

Many Regional Transmission Operators (RTOs) around the country have been allowing wind and solar to supply ancillary services such as fast and accurate regulation, up and down ramping services, among others. Xcel Energy has been supplying ancillary services from wind power for over a decade, and two studies in the California Independent System Operator (CAISO) demonstrate that renewable resources can provide operating characteristics, like frequency response, that are similar to or better than, conventional resources. Yes, renewables and storage are some of the most flexible resources and can respond faster than other generating resources on the grid. Yet, MISO has explicitly prohibited wind and solar from supplying such services. And in fact, MISO is the only grid operator under Federal Energy Regulatory Commission (FERC) authority to establish this rule even though renewables have proven they can fill the need.

Fighting an uphill battle

According to MISO's recent Regional Resource Assessment Report, wind and solar are projected to serve 60 percent of the annual load in MISO by 2041. While this sounds like welcome news, there's a pothole we need to avoid. In a system that has high levels of renewables, we must allow the renewables to supply ancillary services otherwise, there won't be enough providers, and we will have to build new fossil fuel (thermal) plants (or keep existing ones online) even if they do not run often. Building new thermal plants is not generally cost-effective and it is counter to carbon reduction goals that many states have. Because MISO prohibits renewables from providing ancillary services, renewables are stuck, and consumers will be, too. That's why we must get MISO to change its rules.

In our MISO work, Clean Grid Alliance (CGA) strives to ensure there are fair rules for new generation connecting to the electric grid. "For many years, we have urged MISO not to treat wind and solar as energy-only resources, but to allow them to provide the ancillary services they are capable of providing," said CGA Technical/Policy Consultant Natalie McIntire.

"It's been an uphill battle trying to change MISO's market products and ancillary services so that they are technology neutral. It is critical that we prevail in this fight now because as the region transitions to greater penetration of renewables, we will need them to provide ancillary services as well as energy. Wind and solar have the capability to help maintain grid reliability, but only if the rules allow them to do so."

Natalie McIntire

Today there are 22 states that have 100 percent clean energy goals. Minnesota was the most recent state to join their ranks when its 100% Clean Energy bill was signed into law on February 7. "It will take time for MISO to update its rules and computer models to prepare for the clean energy future we are working toward. That's why we must start paving that road now," added McIntire.

MISO's "Regional Resource Assessment Report" also shows that as the solar generation fleet grows, the need for up-ramp capability will increase threefold by 2031, and fourfold by 2041. Up-ramping is an adjustment made by generators in response to a signal from MISO to produce more energy. MISO's ramp product is not an official ancillary service required under FERC Order 888, but it is an important market product, different from energy and capacity that both wind and solar can provide. Yet, at the precise moment when MISO's own studies point to a need for more up-ramping capability, they are simultaneously planning to prohibit wind and solar resources from providing this service. While CGA agrees that changes are needed to MISO's ramp product, removing the ability for renewables to take part is a step in the wrong direction. MISO must adjust its ramp product to efficiently allow all resources to provide this service.

Detours ahead

Recently, Solar Energy Industries Association (SEIA) and Earthjustice filed a complaint with FERC challenging MISO's rules that restrict renewable energy from providing ancillary services. MISO's existing market rules were designed around power plants that are large-scale, centralized generation facilities such as coal, gas, or nuclear plants. These outdated policies exclude wind, solar and battery hybrid resources from being eligible to supply vital functions to ensure grid reliability at a low cost. Renewables are zero fuel cost resources, which makes them more cost-effective than building new thermal plants. The market should be allowed to determine the most cost-effective resources to meet our ancillary service needs.

CGA supports this complaint which, if FERC agrees, would require MISO to change its ancillary service products to ensure that wind and solar supply all the services they can be capable of. MISO should capitalize on the influx of renewables to help provide these necessary services. "MISO is often a leader in the industry, but on this issue, it's time for them to catch up to their peers," said McIntire.

The road less traveled leads to big rewards

CGA's technical work leads us down the road less traveled, but one that has a great reward once we get there. That's why we engage enthusiastically in details like this that are imperative to achieve the long-term benefits of having a reliable clean energy grid. Not all good things come easy, but they are worth fighting for. With the right changes at MISO there is a light at the end of the tunnel.