



**Utility Wind and Solar –  
Interconnection Issues**  
Presented at ILREC by Eddie Creighton on  
10-2-2024

# Ameren Illinois (AIC) Overview



- 1.2 million electric and over 800,000 natural gas customers
- Deliver energy to more than 1,200 communities
- 4,500 miles of electric transmission lines
- 46,000 miles of distribution lines
- 18,200 miles of natural gas transmission and distribution mains
- Ameren Illinois service territory spans 43,700 square miles

## AMEREN ILLINOIS SERVICE TERRITORY







Ameren Illinois DER  
Interconnection Process and  
Queue Overview

# Ameren Illinois' DER Interconnection Queue

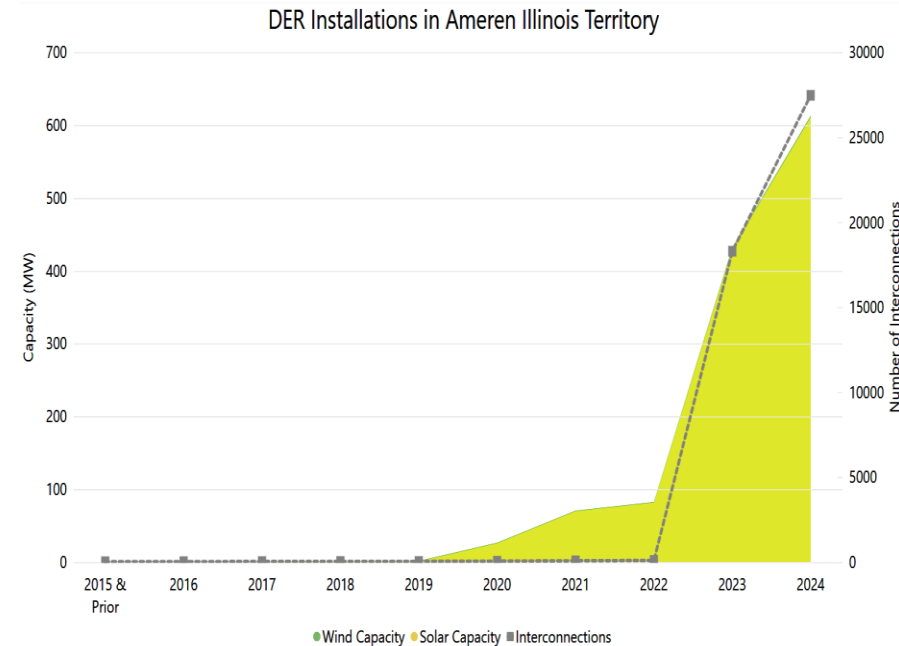


- The queue is a list of DER projects (usually solar, energy storage, or a combination of both) and the order in which AIC sequentially studies them.
- The queue allows AIC to determine which project is responsible for paying for system upgrades, as required by IL Admin Code.
- In late 2017, AIC began receiving its first large influx of megawatt (MW) scale generation. This trend has continued as state legislation and state/federal incentives drive more clean energy projects.
- Increased interconnection applications combined with increasing DER penetration resulted in reverse power flow violations further “upstream” of distribution substations
  - In some cases, projects being studied simultaneously were triggering the same system violations
  - AIC started queuing projects at the substation transformer level and quickly realized that would not capture subtransmission system impacts
  - Since 2022, queues have been based on subtransmission system impacts of projects connecting to distribution substations

# Today's Queue at a Glance

- Queue data as of 9/24/24
- Part 466 queue does not include Level 1 (25kW and below) projects that have fixed interconnection costs and a fast-tracked interconnection process

Project Type	Number of applications	Total MW of applications
Part 466 Projects Pending Study	1,153	4,593
Part 466 Projects in Study/Cost Estimate Status	294	781
Part 466 Projects in Construction/Witness Testing	742	1,222
Total Part 466 (projects 10 MW and below) Queue	2,189	6,596
Total Part 467 (>10 MW) Queue	84	2,706
<b>Total Queue</b>	<b>2,273</b>	<b>9,302</b>





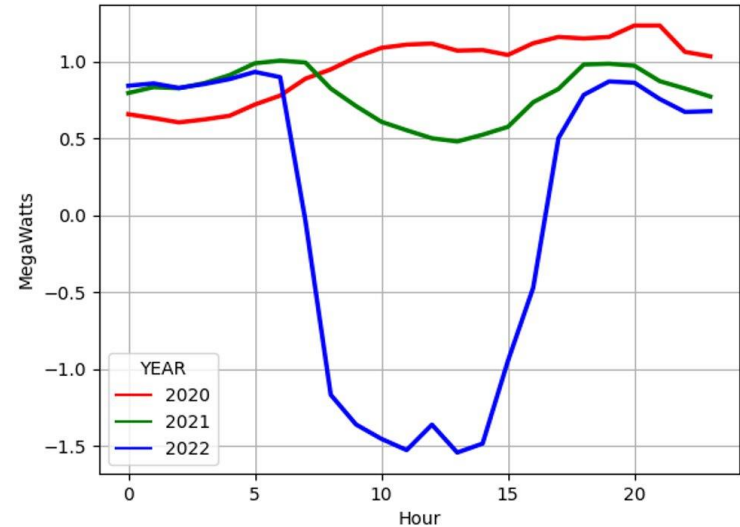


Interconnection Queue  
Challenges

# Relative Scale of “Small” Community Solar on Distribution Feeders



- Distribution assets designed and sized based on the anticipated load to be served
  - Typically, rural circuits are lightly loaded and serve sparse customers
  - Rural circuits are popular targets for interconnection applications due to available land
- Engineering studies and cost estimates for system modifications are typically required to allow megawatt-scale interconnections to proceed
  - Studies must be holistic and consider a multitude of system impacts
  - Accurate cost estimates are paramount to solar developers and take substantial time and effort to create



24 hour loading data for a rural distribution circuit with a community solar project connected in 2022 depicts substantial reverse power flow during daylight hours, exceeding the peak loading on that day from the prior two years

# MISO Affected Systems Study (AFS)

- Distribution connected generation systems can trigger the MISO AFS process when reverse power flow onto the transmission system is identified in an interconnection study
  - Projects first go through an initial MISO screening process to determine if a full study needs to take place before the generation can interconnect
  - MISO requires a \$60,000 fee per affected substation when full studies are required
- MISO AFS timelines do not align with Illinois Admin. Code timelines and can create uncertainty for projects with signed Interconnection Agreements (IA)
  - Studies take months to complete and create uncertainty for projects that would otherwise be able to proceed to construction
  - Transmission system upgrades may be identified adding substantial interconnection costs beyond what is captured in the IA
- High DER penetration levels are creating more opportunities for impacting the transmission system





Potential Solutions

# Potential Near Term Queue Speed Enhancements

- Better communication of results during study process
  - Keep projects moving forward without delays
  - Ensure restudies reach desired outcome
- Improving public facing data sources
  - Have added data to hosting capacity map and queue report based on DER developer feedback
  - Looking at more ways to improve data access while considering customer data privacy and grid security
  - Intention to drive projects to areas with no/low queue and high capacity and away from areas with limitations and long queues

## Longer Term Queue Considerations

- Investigate and leverage best practices from other states' interconnection rules and other utilities' interconnection processes
- New technology like DERMS and time-series system modeling to enable flexible interconnections, reducing the system modifications required to interconnect
- Investigate means to proactively add hosting capacity to the system and drive interconnections towards areas with added capacity
- Continue to solicit feedback from the DER stakeholder community



