



Ameren Illinois Company (AIC) Distribution Planning Perspectives Workshop

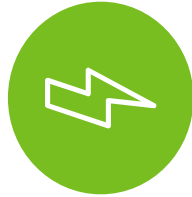
March 22, 2022





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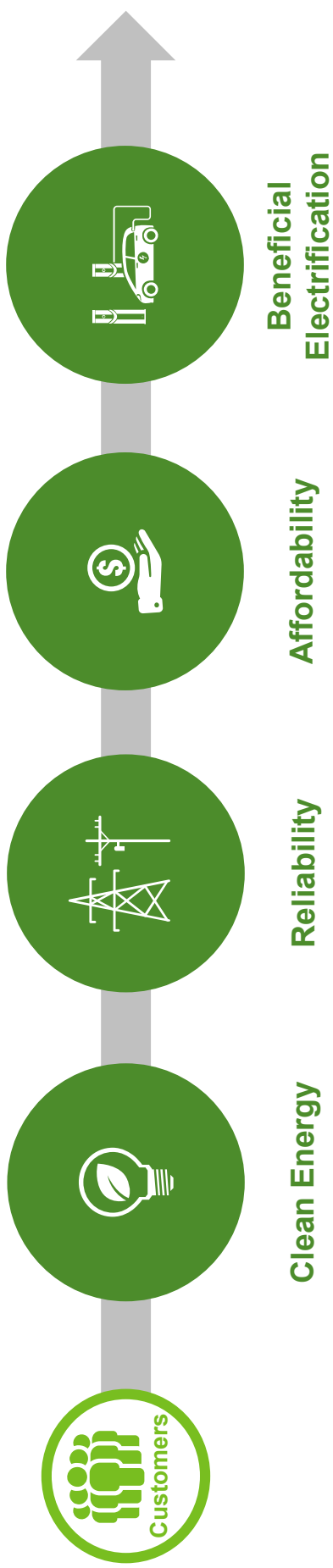
Energy Industry and Market Trends

Kristol Simms - Senior Director, Energy Efficiency &
Regulatory Policy Implementation

Energy Industry and Market Trends



The energy industry is experiencing a rapid rate of change in response to distributed energy resources, clean energy goals, and emerging technologies



As the grid modernizes, Ameren Illinois remains committed to its core principles of delivering safe, reliable, and affordable energy to its customers and communities

Clean Energy Transition

The electricity grid is becoming cleaner over time. Addressing emissions from the utility sector is critical to decarbonizing the economy and, ultimately, mitigating the impacts of climate change. Many states, including Illinois, have adopted Renewable Portfolio Standards to increase the amount of electricity generated by renewable sources.



Legislative Objectives



100% clean energy in Illinois by 2050



Expand funding for renewable energy



Add new categories of solar projects eligible for state funding

Ameren Illinois' Support for the Clean Energy Transition

- Ameren Illinois is an enabler of access to clean energy with a focus on cost-effective transmission and distribution; Ameren Illinois is a delivery-only company
- Ameren Illinois supports and facilitates customer adoption of distributed energy resources (DER) to help Illinois reach its clean energy goals
- Ameren Illinois piloting two utility-scale solar projects as part of the new energy legislation in equity investment eligible communities

Beneficial Electrification

Beneficial electrification refers to the process of replacing technologies that use fossil fuels (gasoline, coal, oil, and natural gas) with technologies that use electricity as a source of energy.



Legislative Objectives



One million electric vehicles adopted in Illinois by 2030



Incentives and programs to expand public EV charging stations throughout Illinois

Ameren Illinois' Support for Beneficial Electrification

- Established a Rider Electric Vehicle Charging Program (EVCP) with tariff provisions intended to encourage EV adoption
- Time-of-use use rate encourages off-peak charging and more efficient use of the system

Customer Benefits and Affordability



As Illinois moves forward and embraces the clean energy movement, it is important to ensure that the benefits of new clean energy options are available to communities across the state regardless of economic status. AIC is committed to ensuring that the benefits of the clean energy future are available to all of its customers.

Legislative Objectives



Bring the benefits of grid modernization and clean energy to all retail customers



Bring at least 40% of the benefits to Equity Investment Eligible Communities



Provide delivery services at rates that are affordable to all customers, including low-income customers

Ameren Illinois' Approach to Benefit Sharing

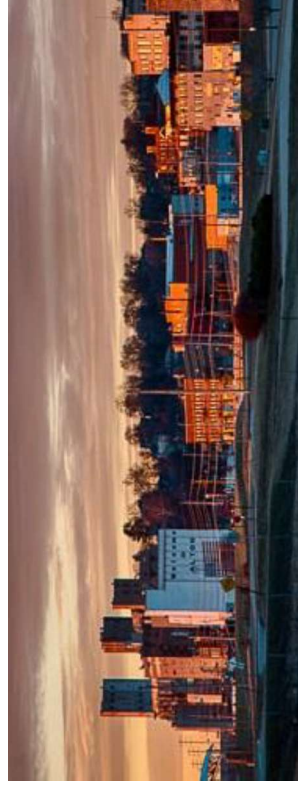
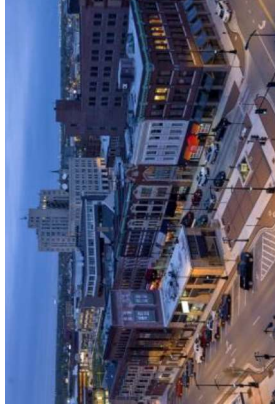
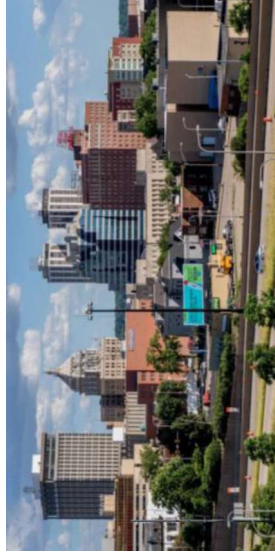
- Proactive identification and understanding of the benefits of grid modernization and clean energy and how those benefits flow to communities (e.g., access to community solar)
- Grid investments in equity investment eligible communities, coupled with energy efficiency (EE), low-and-moderate income (LMI), and economic development programs ensure program benefits accrue to customers across the service territory
- In addition to territory-wide programs and initiatives, AIC is focused on making targeted programs and initiatives accessible for equity investment eligible communities

Ameren Illinois Investment in EJ / R3 Communities



Ameren Illinois is committed to serving and investing in all communities, particularly equity investment eligible communities designated as EJ (Environmental Justice) and R3 (Restore. Reinvest. Renew.). Ameren Illinois has developed a list of the top five cities in the territory that include EJ and R3 areas and prioritizes investments accordingly.

- 1 Peoria
- 2 East Saint Louis
- 3 Decatur
- 4 Bloomington
- 5 Alton





Community Perspectives

Kristol Simms - Senior Director, Energy Efficiency &
Regulatory Policy Implementation

Ameren Illinois in Your Community



Every day, Ameren Illinois powers homes and businesses across Illinois. But we're dedicated to making our role in the community bigger than just power. We also work to empower our youth, neighbors, economy and community through programs, investments, volunteer efforts and more.



Empowering Our Youth

From educational school programs to offering energy-focused internships, we're helping the next generation shine bright



Empowering Our Neighbors

By offering energy assistance programs to those who need it and supporting initiatives to replace old streetlight bulbs with LEDs, we're working to take care of the neighborhoods we work and live in



Empowering Our Community

Giving back, community sponsorships, safety workshops and planning for a clean future are just a few ways we serve the communities we share



Empowering Our Economy

Strengthening our local economies pays off for everyone. We're proud to partner with local businesses and invest in infrastructure and development

Community and Clean Energy Benefits



AIC's commitment to working towards a clean energy future for all is already present in many facets of the organization. From investments, to planning, to community outreach, ensuring access to safe, reliable, affordable energy for all communities is prioritized. The energy efficiency and designated community statistics below represent the progress already being made towards ensuring a clean energy future for all of AIC's customers.

Communities Served



20% of AIC customers are served in R3 communities; 14% are served in Environmental Justice communities

- On average, Environmental Justice and R3 communities within the AIC service territory experience better reliability than non-designated communities
- AIC is committed to ensuring that the benefits of the clean energy future are available to all its customers

Clean Energy Investments



Planning and investment at AIC focuses on ensuring that the benefits of the clean energy future are available to all its customers

- AIC has facilitated more than \$50M in distributed generation rebates
- AIC's 2022-2025 plan (pending approval) commits an average of over \$27M/year towards income-qualified electric energy efficiency programs
- AIC has seen steady growth in DER over the last 3-4 years in both residential and commercial areas



Community Priorities

Ameren Illinois conducted three community forums in early March to inform customers and communities about the energy legislation and solicit feedback about their needs and priorities. Participants included municipal officials, economic developers, school board representatives, and community members, among others. The focus of these forums was to educate the community about the opportunity to speak at upcoming ICC workshops and to give community members a space to voice their thoughts, questions, and concerns directly to AIC staff.

During the community sessions, surveys were conducted by AIC to solicit feedback on the issues that matter most to them and on their current level of familiarity with the new Illinois energy legislation.



Affordability

Investment decisions must consider customer bill impact



Investment in Communities

Expanding and supporting community businesses and jobs

Top 3 Concerns

- Economic Development
- Budget/Finance
- Infrastructure/Technology

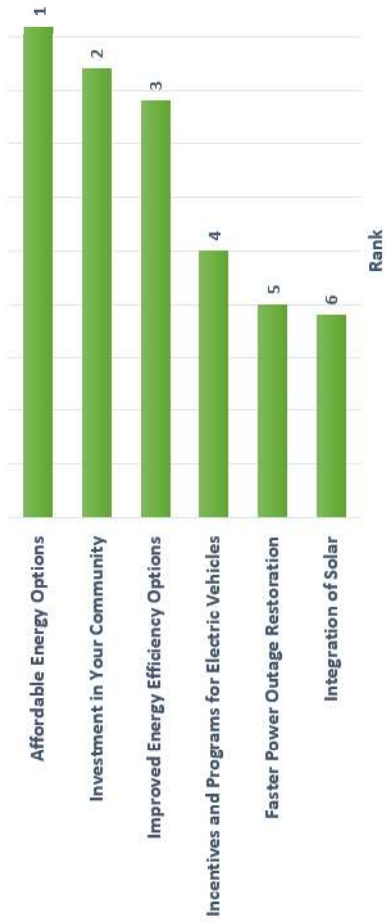
Top 3 Energy Priorities

- Affordable Energy Options
- Investment in Community
- Improved Energy Efficiency Options

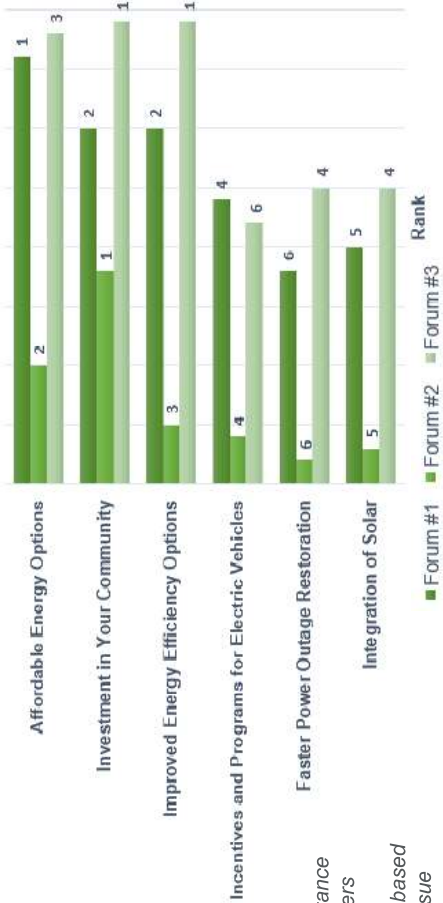


Community Priorities (Cont'd)

Overall Community Forum Rankings



Individual Community Forum Rankings



- Priorities ranked 1-6; 1 being highest importance
- Data gathered from a total of 35 distinct voters across 3 separate community forums
- Summary calculated as a weighted ranking based on the number of votes received for each issue



Customer Affordability



Ameren Illinois is committed to providing access to **safe, reliable, affordable** power to all customers in its territory. AIC offers a variety of programs and services to its customers to provide control over their payment options and to ensure that rates are kept affordable.



Budget Billing

A free option that helps level out seasonal changes in your energy bill by dividing the previous year's usage into predictable baseline monthly payments



Peak Time Rewards

This program gives eligible residential customers the opportunity to earn bill credits by reducing electricity usage during times of high electricity demand, typically summer afternoons



Voltage Optimization

Reducing the supply voltage to electrical equipment can reduce power consumption and customer energy usage



Investment in Communities

Advancing Economic Growth and Prosperity for Ameren Illinois and Ameren Illinois-Served Communities



Bringing the Benefits of the Clean Energy Future to All Ameren Illinois Customers



Low Income Budget and Savings (2022-2025 EE Plan)

Ameren Illinois is continuing to focus on helping low-income families save energy, reduce bills and improve quality of life.



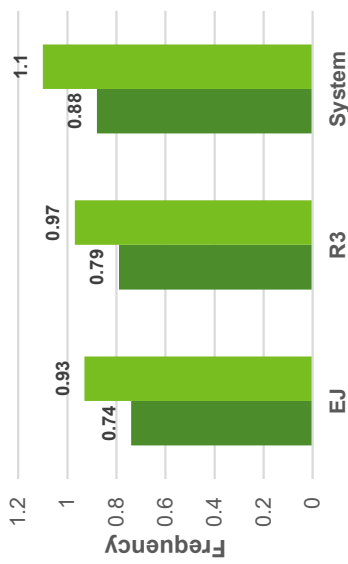
System Reliability Across Communities



The electric grid is planned for the benefit of all customers. Reliability and capacity upgrades are identified based on system studies that do not distinguish across neighborhoods or communities; investment dollars flow according to system needs.

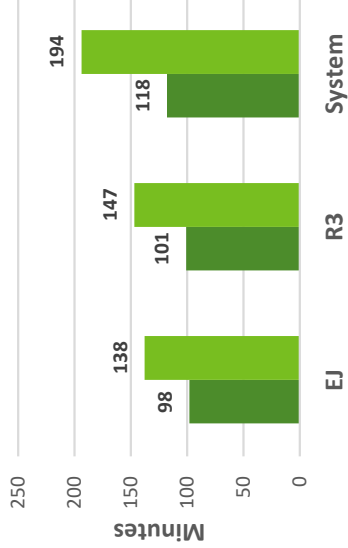
Approximately 174,000 customers are in EJ areas (14% of total customers) and 250,000 customers are in R3 areas (20% of total customers)*. 2021 system reliability performance for EJ and R3 customers performed favorably relative to the system average.

2021 SAIFI Comparison



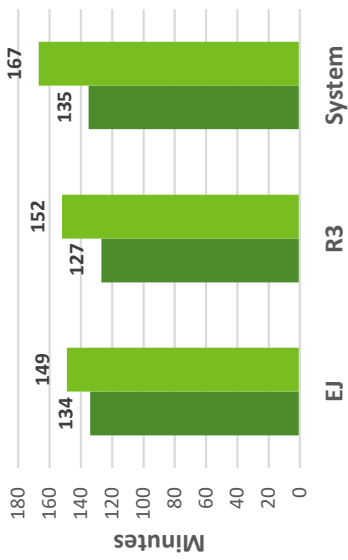
System Average Interruption Frequency Index
How often the average customer experiences an interruption

2021 SAIDI Comparison



System Average Interruption Duration Index
Total duration of the average customer interruption

2021 CAIDI Comparison



Customer Average Interruption Duration Index
Average time required to restore service

Lower Values are Better

* There is overlap of customers as some are in both EJ and R3 areas
MED = Major Event Day (■ Without MED ; ■ With MED)



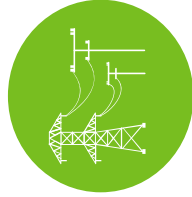
Stakeholder Discussion

We have heard from our customers that they prioritize affordability, community investments, and energy efficiency.

You've heard what we're doing in these areas – what would you like to see in the plan?



Break

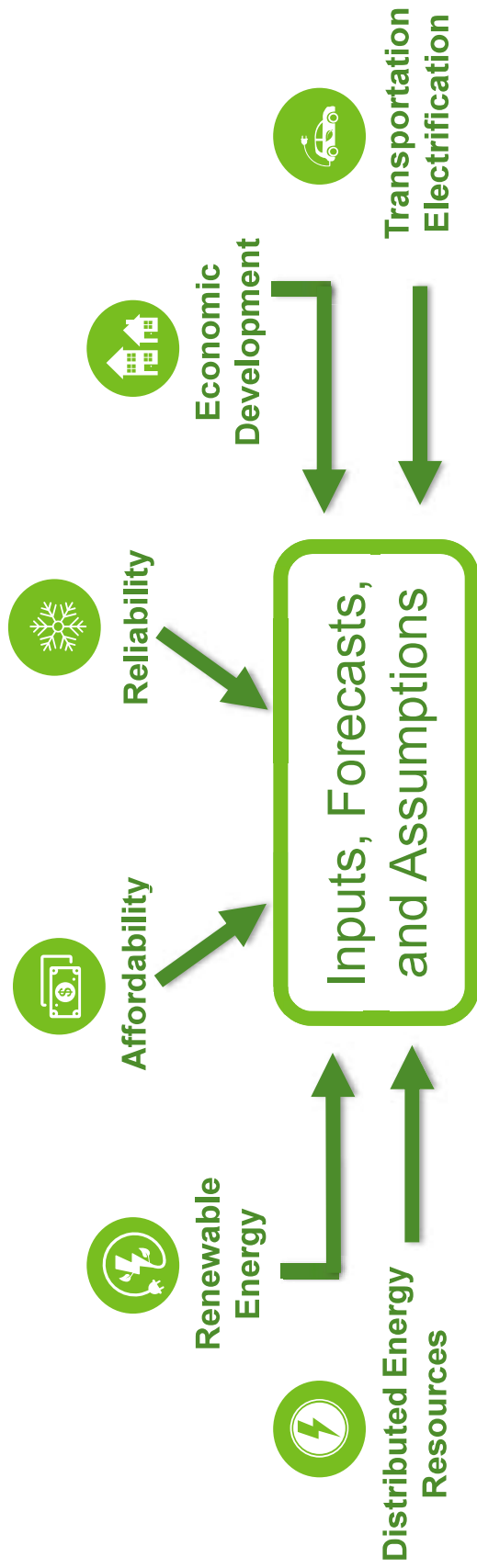


Ameren Illinois' Philosophy and Vision for Grid Planning

David Wakeman – Senior Vice President, Operations and Technical Services

For Informal Workshop Discussion Purposes Only

Bringing Reliable Power to Ameren Illinois Communities





Core Principals: Safety, Reliability, Resiliency, Affordability

Ameren Illinois is committed to providing all customers within its service territory access to **safe, reliable, resilient** power balanced with careful consideration of **customer affordability** and **environmental stewardship**.

To achieve this, Ameren Illinois adheres to a methodical, system-based distribution and capital investment planning process which takes into account customer needs, community benefits, and Illinois requirements.



Ensuring Power Reliability



Improving Service Resiliency



Maintaining Affordability

Ameren Illinois' Grid Modernization Journey



Future Energy Jobs Act (FEJA)

- Required defined energy efficiency savings each year
- Revised Illinois' renewable energy procurement
- Authorized \$30 million to develop and establish 3 clean energy-related job training programs
- Required utilities to identify cost-effective voltage optimization investment opportunities

2016

Energy Infrastructure Modernization Act (EIMA)

- Smart grid investments and initiatives, including:
- Distribution automation on 24% of circuits
- Substation equipment upgrades
- Sub-transmission line improvements
- Software and technology enhancements
- Smart meters (advanced metering infrastructure)

2012

New State Energy Law (SB 2408)

- Includes grid modernization investments and initiatives
- Establishes the Multi-Year Integrated Grid Plan and Multi-Year Rate Plan
- Increases funding for renewable energy and beneficial electrification
- Funds equity and just transition programs

2021



Distribution System Planning and Capital Allocation

George Justice – Vice President, Electric Operations and Technical Services
Robin Kies – Vice President, Financial Services and Performance Management

Distribution System Planning



Ameren Illinois utilizes a planning process designed to **meet the system needs and enhance reliability and resiliency for its customers.** The objective of the Distribution System Planning Department is to plan for adequate electrical capacity and system voltages to serve Ameren Illinois customer load with acceptable reliability, **at the lowest possible cost.**

In addition to an **annual planning process**, Ameren Illinois monitors the **performance of the physical assets** on the system through periodic inspections, maintenance programs, and operating practices. By using these inspection results, health monitoring, available data (SCADA, AMI), engineering knowledge and operational expertise, assets with higher risk of failure are identified and proactively replaced to ensure **maximum operating reliability for customers.**





Capacity Planning

AIC conducts an annual planning assessment of the distribution system to meet capacity needs while enhancing reliability and resiliency for its customers. The planning process begins with load analysis to develop load forecasts for the distribution substations which incorporate connected distributed energy resources (DER) in the load calculations. These forecasts are then combined with the loads associated with wholesale customers and large customers not served from the distribution substations to develop load forecasts at the transmission level. Annual system assessments are performed to identify system criteria violations (e.g., overloading, voltages outside of tolerances, etc.) and solutions identified. Capacity planning informs capital investments.

Key Capacity Planning Focus Areas



Operating a Safe, Flexible, and Reliable Electric Grid

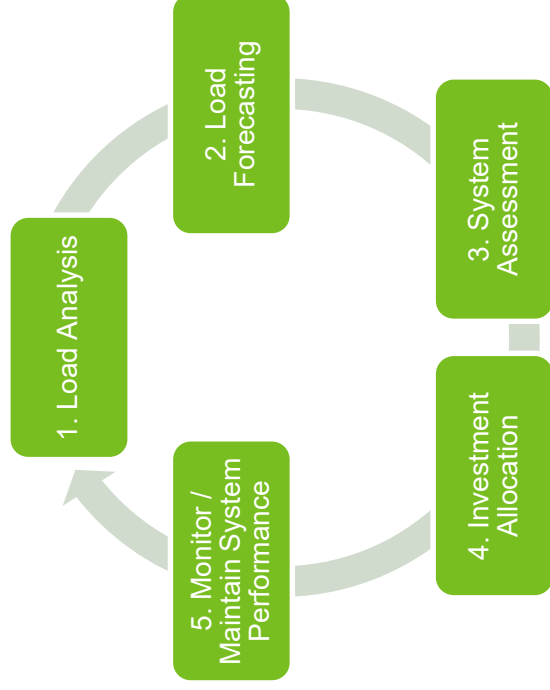


Making Reliability-Based Investments



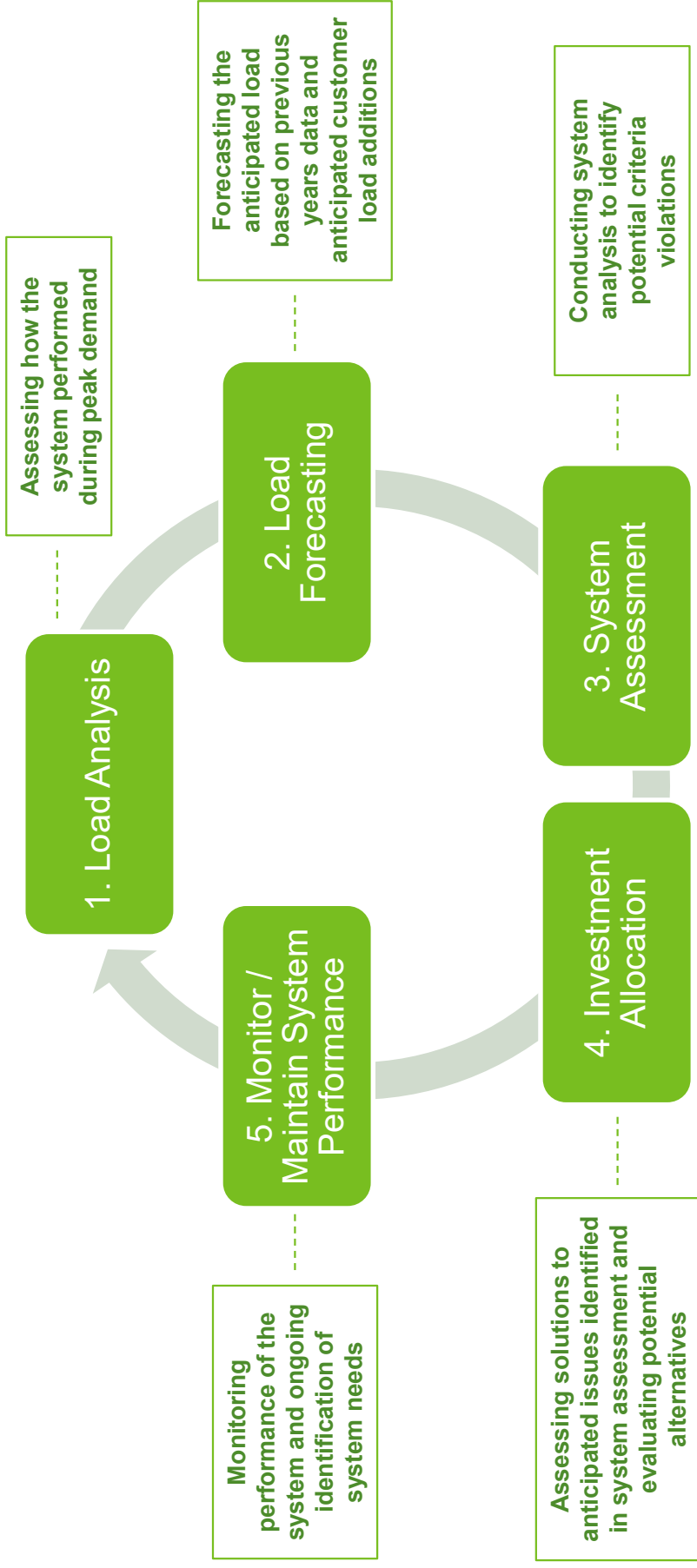
Facilitating DER Interconnections and Distribution System Maintenance

Capacity Planning





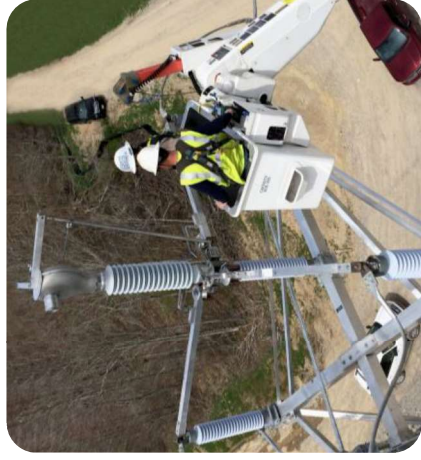
Capacity Planning: Current Process



Solution Evaluation



Planning grid needs requires consideration of a myriad of options that must ultimately best serve the needs of the customer. Urgency, effort, cost, longevity, and sustainability are considerations that must be balanced during the assessment.



Solutions may include:

- Phase balancing
- Line switching



Solutions may include:

- Line extensions
- New substations

Less Complex / Lower Cost

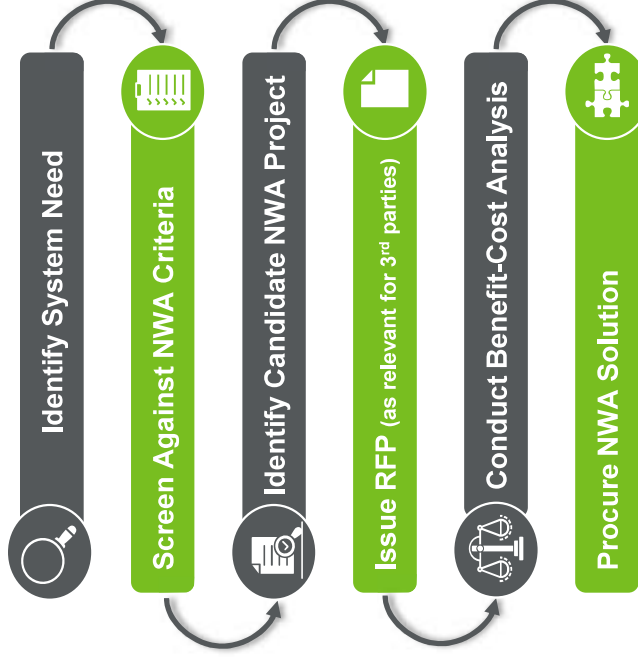
More Complex / Higher Cost

Non-Wires Alternatives



Non-wires alternatives (NWAs) have emerged as an alternative to traditional infrastructure investments in the electric transmission and distribution (T&D) system. NWAs leverage energy efficiency, demand response, distributed generation, and other DERs to address grid capacity needs, facility upgrades, or select contingencies. Ameren Illinois is evaluating key issues associated with ownership, maintenance, operation, technology, and management related to NWA solutions.

Simplified NWA Assessment Process



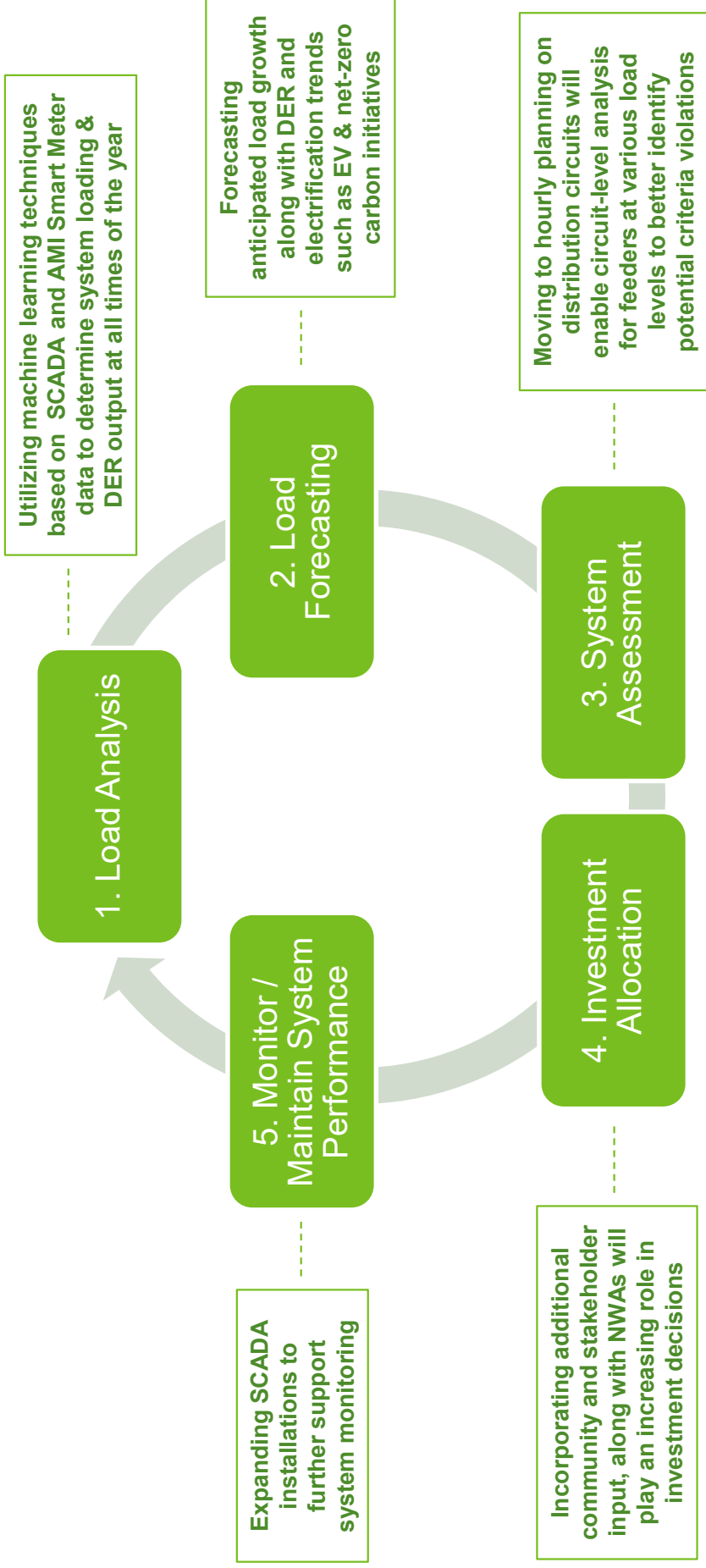
NWA Opportunities

- Allows infrastructure investments to be deferred to later times
- Provides more time to allow potential loads to materialize (in the case of capacity additions)
- May allow for reprioritization of capital to other needs
- Enables clean, non-carbon emitting grid resources
- Potential to enable 3rd party solutions to grid needs

Key Considerations

- Operating 3rd party-owned assets will require close coordination to ensure assets are dispatched to meet system needs
- Reliability and performance standards for NWA technologies must meet grid requirements
- Require careful cost-benefit analysis to ensure alternative solutions do not create costs for customers
- O&M expenses need to be included in ongoing project costs

Capacity Planning: Future Approach



Capital Investment Categories



System Capacity

Addition of new facilities, or upgrade of existing facilities not directly attributable to a single customer or a group of new customers



Operate the Business

Costs of supporting the operating activities



Storm/Failure/Spare

Reactive work caused by equipment failure, or other non-storm damage to equipment in which work area needs to be made safe or completed for public and coworker safety



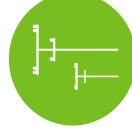
Regulatory Compliance

Work required by (or committed to) established regulatory programs



System Performance/Reliability

Work for which the primary goal is to prevent or reduce customer interruptions; frequency or duration



End of Life/Aging Infrastructure

Non-emergency repairs to failed or failing equipment and preventative equipment replacement and maintenance



Investment Allocation Strategy

System assessment and load analysis provide historical data that is augmented by forecasted data. Ameren Illinois considers a variety of additional inputs as seen below. The information from all these sources is compiled and used to make the best possible investment decision under a set of given circumstances.

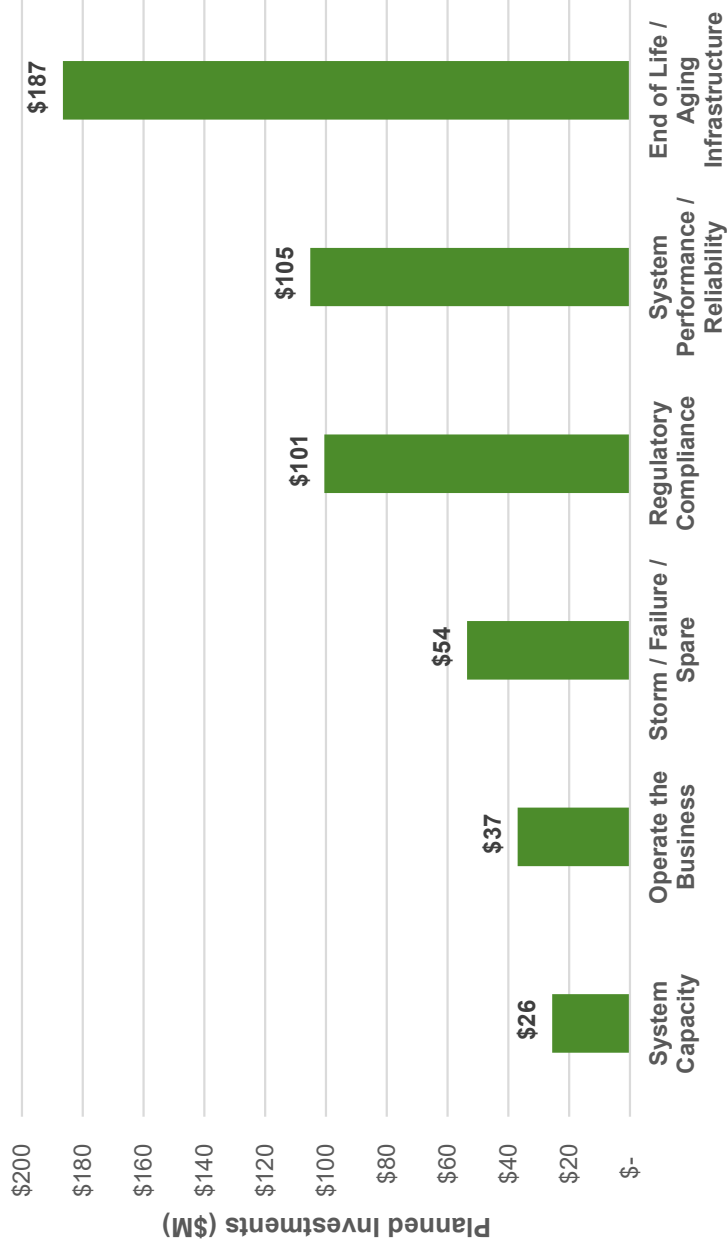
Projects that address the identified loading constraints or improve customer reliability through other means are prioritized based on the severity of the issue and the degree to which the project reduces the overall risk. The Company weighs reliability, risk and, cost to identify the most appropriate solution.





Electric System Planned Investments

Current (Pre-Workshop) Planned Capital Investments:
Yearly Average (2022-2026)





Stakeholder Discussion

What are your suggestions on how AIC can better inform its customers about the distribution planning process?



Break



How Distribution Planning is Changing

Cristin Lyons – Partner and Energy Practice Leader, ScottMadden Inc.



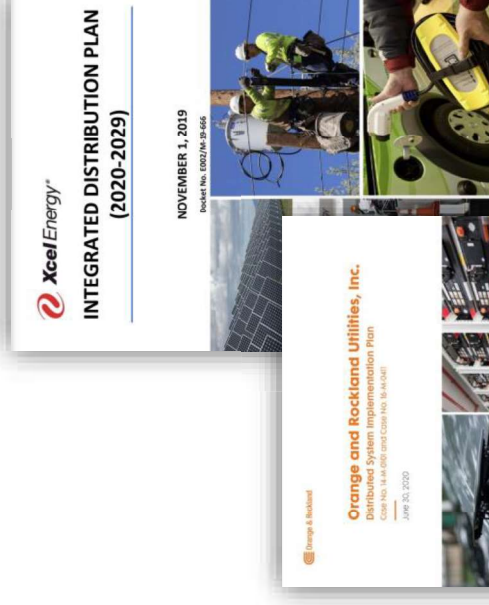
Changes to System Planning and Forecasting

The nature of system planning and forecasting is evolving for utilities. Customer interest in clean energy and state policy are driving significant focus on integration of zero-emission resources. Distribution planning is changing to accommodate Distributed Energy Resources (DERs):

- **Power flows from new sources**
 - The system will need to accommodate power flowing in two directions (to and from customers)
- **This creates complexity**
 - Increasing levels of DER can change the nature of how the distribution system operates, and in turn the needs for that system (infrastructure, smart grid devices, communications, etc.)
- **Utilities need to reliably interconnect new resources**
 - This will mean new processes and technologies in addition to enhanced interconnection rules
- **Many states are focused on multi-year grid plans to address these challenges**

The plans often include:

- System planning/forecasting
- T&D infrastructure
- Distribution operations
- Grid modernization
- Systems and technology
- DER/EV forecasting/integration/enablement
- System/hosting capacity data
- Cybersecurity
- DER interconnection
- NAWs



Revisiting Reliability and Resiliency



Reliability and resiliency have always been a central focus for utilities. However, with the introduction of DER, and the electrification of buildings and transportation, reliability and resiliency take on greater importance while also presenting new challenges for utilities.

- **Electricity is an essential component of modern society**, central to our quality of life and economic prosperity
- **Reliable delivery of electricity will become even more essential** as transportation, buildings, and industrial processes rely on it to a greater degree
- **Utilities have a mandate to maintain system reliability**, and must plan the system to ensure it is equipped to deliver electricity at the instant it is consumed
- **System planning has become more complex** because not only is demand increasing, but through electrification new and larger loads are connecting in new places and creating demand at new times
- **Aging infrastructure and hardening the system** against extreme weather further compound the planning challenge, especially as the forecasted impacts of climate change are considered



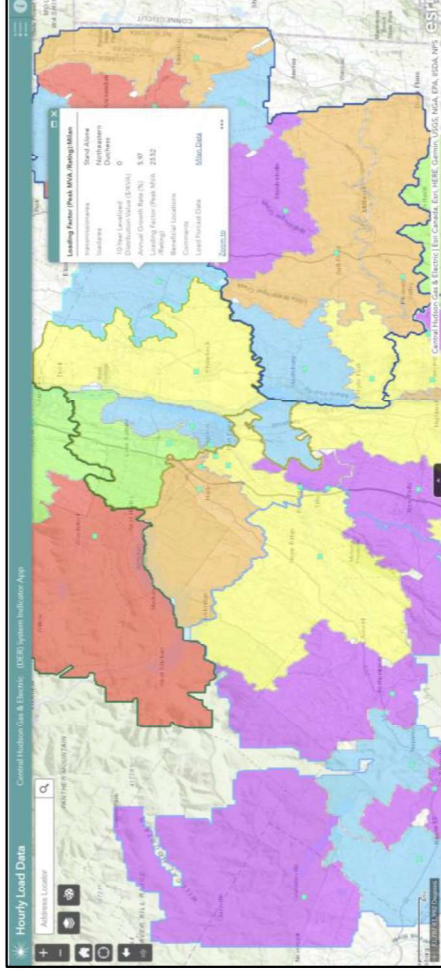


Data will Drive Future Planning Efforts

- **New devices and technology are creating more data for utilities to process and understand**
 - Future planning processes such as probabilistic planning will depend on data analytics capabilities
 - New capabilities and systems will be needed to support these advanced needs
- **Customers and other third parties are requesting transparency and access into select utility data as they look to add resources to the grid like solar or battery storage, or potentially offer these resources to meet grid needs.**

Such information includes:

 - Hosting capacity maps
 - Interconnection costs
 - System capacity data, by substation or circuit
- **Data sharing efforts have had mixed results**
 - In some cases, data shared has proven useful. Third parties and utilities may seek to offer new products to customers based on data collected about their behavior
 - In other cases, there has been little actual demand for it, or it has become cumbersome to keep refreshed
- **Cybersecurity and customer data privacy are paramount**, and any data sharing must balance the usefulness of shared data with these concerns



Growth of Distributed Energy Resources



System planning can enable the proliferation of DER, and regulators are increasingly requiring such programs be included in multi-year grid plans. At the same time, the increased adoption of DER will impact system planning and forecasting as well.

Key Considerations

- **DER Enablement Programs** and the way that they are designed can influence system planning in myriad ways
- **Data regarding DER adoption and performance on the system** becomes an increasingly important input in the planning process
- **Sharing hosting capacity data** can enable lower cost siting of DER. More advanced versions include data about DER already interconnected to the distribution system
- **DER forecasting** will become an important input as a modifier in the overall system forecast. However, developing a long-term DER forecast can prove difficult and may require some third-party input
- **Interconnection queues** can provide some insight into the immediate DER forecast, but may have minimal value for the long-term forecast

Example Enablement Programs

- Community Solar
- Utility-sited Energy Storage
- Virtual Power Plants
- Utility-owned Solar
- NAWAs



DER Interconnection



As new resources interconnect to the grid, their location and the way they operate on the system become increasingly important. As such, utilities are adapting processes to assess and interconnect these facilities.

- **Utilities across the country are streamlining the application and analysis process for new DER.** Depending on the size and location of the facility interconnecting, this can be an automated process or can require significant study
- **Regulatory changes can rapidly increase the volume and complexity of interconnection applications,** sometimes at a pace faster than the utility interconnection processes can evolve to address
- **Tools can help.** Automation of the analysis of small facilities and power flow modeling to address larger ones are helping move these processes forward
- **Application data can inform DER adoption scenarios in forecasting and planning.** The data tracked in interconnection systems can provide insight for more granular system planning and support scenario-based planning over time



Non-Wires Alternatives



NWAs are solutions to distribution system constraints that either defer or eliminate the need for traditional infrastructure. SB2408 defines NWAs “potential cost-effective solutions from non-traditional and third-party-owned investments that could meet anticipated grid needs”

Key Considerations

- **Suitability criteria** identify the types of grid needs that can be addressed with an NWA
- **Performance and Reliability** of NWA options must be equal to traditional solutions considered
- **A Cost Benefit Framework** enables the assessment of the solution against traditional utility investment
- **NWA Development Processes** are important for utilities to establish in order to develop/implement NWAs on an ongoing basis
- **Nationally NWAs** have mostly been identified in NY and CA.

NWAs have typically consisted of third-party owned resources, though not always. Hybrid approaches may include DER and traditional infrastructure.

Recent NWAs have featured large-scale storage connected to the distribution system, though EE and DR still play important roles.



Select Distribution Topics

Michael Abba – Director, Business Development
Andrew Parker – Manager, DER Integration Strategy

Beneficial Electrification



Ameren Illinois has been able to accommodate customer adoption and increased capacity requirements due to beneficial electrification as part of the current distribution planning process.

Ameren Illinois supports further adoption of beneficial electrification applications in a manner that:

- 1 Improves Grid Utilization
- 2 Supports Customer Affordability
- 3 Supports LMI, EJ, and R3 Areas and Programs
- 4 Educates Customers
- 5 Provides a foundation to learn from and build on in the future



Transportation Electrification



Ameren Illinois estimates there are only about 5,300 electric vehicles, and 60 publicly accessible charging stations in its 44,000 square mile territory. To further support charging station implementation and EV adoption, Ameren Illinois received approval for its Electric Vehicle Charging Program (EVCP) Tariff in July of 2021, which includes 6 programs and robust customer education and outreach.



Residential

A single premise designated for residential use



Multifamily Facility

One or more buildings used for Residential purposes with two or more Residential units located on the Premises



Education Facility

Provides electric transportation services to elementary school, secondary school, junior high school, high school, junior college, college, or university for the benefit of the students



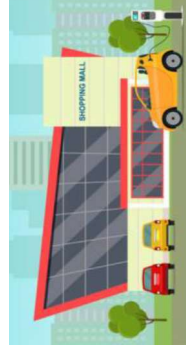
Transit Facility

Used predominantly for electric vehicle charging that provides electric transportation services to the general public



Corridor Charging Facility

Used solely to provide publicly accessible electric vehicle DC Fast charging along major travel routes as determined by the Company



Non-Corridor Charging Facility

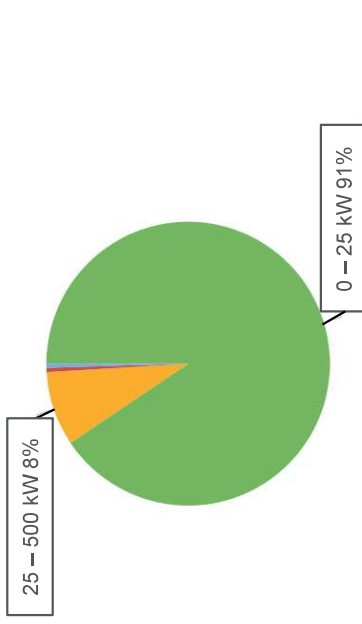
Used solely to provide publicly accessible electric vehicle DC Fast charging

DER Enablement

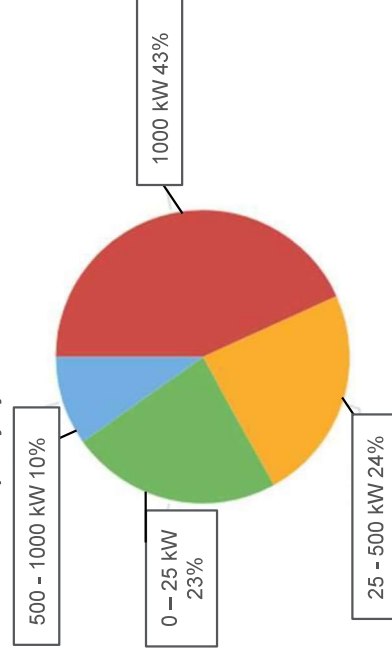
Over the last few years, AIC has experienced significant growth in DER and expects this trend to continue. Most interconnections are Level 1 sized between 0 kW to 25 kW.



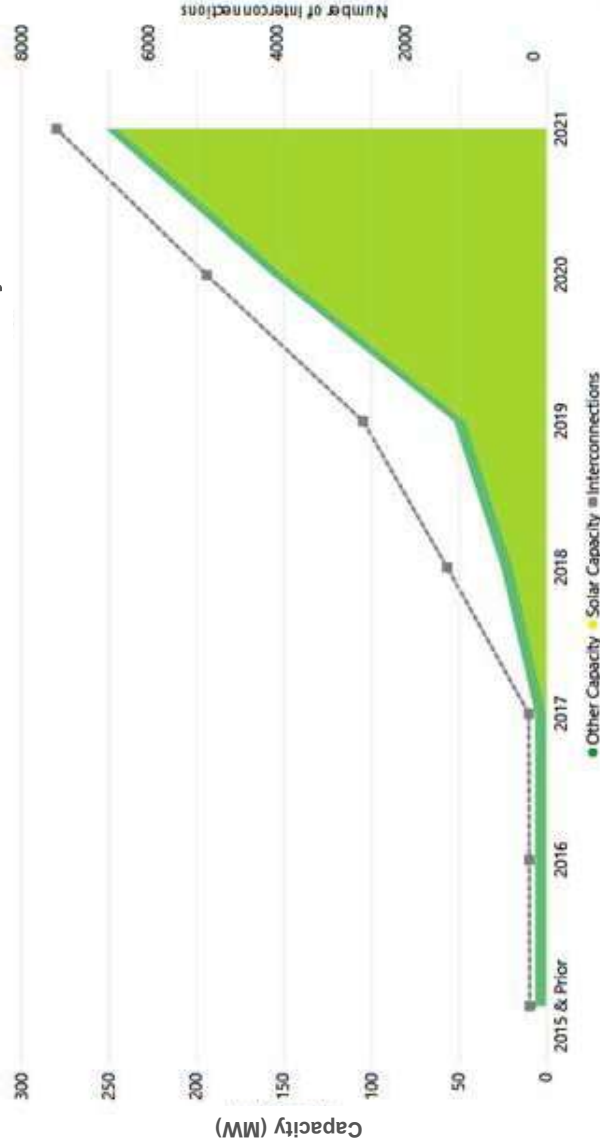
Number of Interconnections by Interconnection Size



Capacity by Interconnection Size



DER Installations in Ameren Illinois Territory



Hosting Capacity



Ameren Illinois is committed to the growth of DER on its system. The Company is enhancing processes and public facing information to help developers focus on areas where they may be able to install larger DG without incurring significant interconnection costs. AIC currently plans to post public-facing hosting capacity maps by summer 2022.

Hosting Capacity Maturity

- AIC will continue its strong support for the growth of DER on its system
 - Above all, timely and responsive communication
 - Automate processes where appropriate
 - Evolve as customers adopt new technologies
- AIC plans to post separate hosting capacity maps based on DER size
 - 20 kV and below
 - 34 kV and 69 kV
- Hosting capacity maps will be updated as needed to reflect system changes at an interval that provides value to customers
 - Customer dedicated substations are excluded from the analysis

Opportunities to Increase Hosting Capacity

- Improving overall hosting capacity accuracy by correcting GIS anomalies
- 4 kV to 12kV conversions where prudent (4 kV represents 9.5% of current distribution system line miles)
- Futureproof standards where appropriate
- Leverage site-specific smart inverter settings where appropriate and feasible
- Energy storage
- Control/coordination through centralized system (DERMs)
- Voltage optimization (formal plan already in place)
- Enhancing SCADA metering to provide better historic and current data
- Equipment upgrades

Community Solar

Community Solar is a solar facility shared by multiple subscribers/customers who receive credit on their electricity bills for their share of the power produced.



Community Benefits

- Opportunity to reduce cost of electric supply on a customer's monthly bill
- No need to install a solar array on one's own property
- Wider solar accessibility for customers from differing geographic or economic backgrounds
- Potential grid benefits based on location of solar installation

Future Impacts

- Presents opportunities to further communicate with communities and municipalities
- Illinois Power Agency (IPA)'s Long-Term Renewable Resource Procurement Plan will establish new renewable MW goals and likely drive new growth
 - 2021 law establishes a target by renewable type (wind, solar) along with size/categories (community, large BTM, small BTM)

AIC's Role

- Help connect the community solar facility to the Ameren Illinois electric grid
- Work with solar developers to ensure that the appropriate portion of renewable energy is deducted from customer monthly bills
- Enable customer subscriptions to renewable resources
- Provide smart inverter rebates to developers to defray the costs of construction





Thebes Energy Storage System

Delivering the reliable service AIC customers count on is more challenging in remote, rural locations or on rugged terrain, where it can take crews longer to assess and repair storm-related damage or complete routine maintenance. Ameren Illinois installed a cutting-edge battery system to provide backup power for Thebes; a small village located in a remote area near the Mississippi River.

The 1MW Energy Storage System (ESS) was installed as part of a pilot project intended to gain experience utilizing an ESS as a reliability device. The ESS was installed on the Gale circuit S34-528 previously identified as a worst performing circuit (WPC). The ESS is used as an automatic transfer voltage source for the community when an outage occurs. In late 2019, adjustments were completed that allow this energy storage system to work with other sophisticated controls to automatically restore service almost as soon as an outage occurs.

Community Impact

- Fewer outages
- Shorter outages
- Positive customer and community feedback

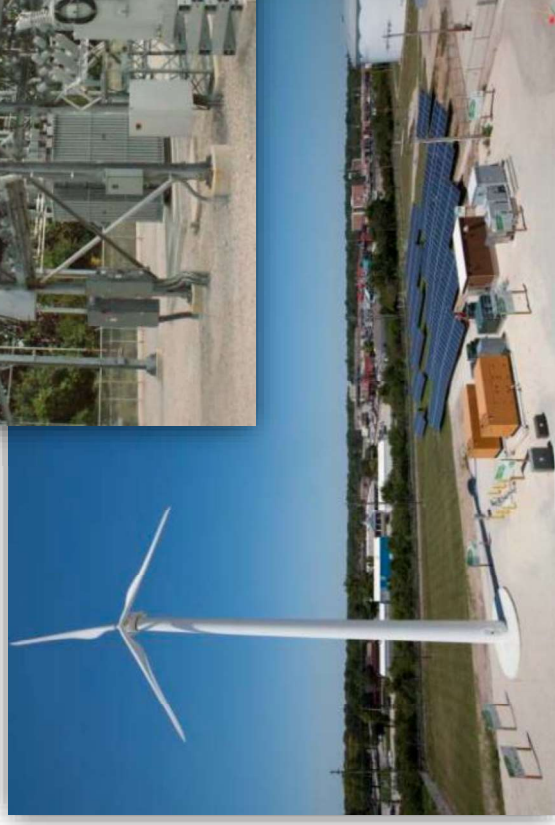


AIC Technology Application Center (TAC) Microgrid Overview



Ameren Illinois' Technology Applications Center (TAC) is a unique resource that allows the testing of programs, technologies, business models, and other Smart Grid-related activities while connected to the grid.

- The microgrid works towards greater reliability and resiliency for Ameren Illinois' customers
- TAC microgrid can produce up to 1475kW
 - 100kW from the wind turbine
 - 125kW from the solar array
 - 1000kW from the natural gas generator
 - 250kW stored in batteries
- Includes a substation control building to service the substation as well as a Home Area Network kitchen to test end use consumer devices
- Provides a testing platform to allow for Cyber-Security testing, DNP3, ModBus, and SCADA communications architectures commonly used by utilities



Technology



AIC recognizes that today's customers have high expectations for the energy that powers their quality of life. That's why Ameren Illinois is focused on building the **next generation energy delivery system** for central and southern Illinois. AIC has embarked on a plan to improve the efficiency and reliability of the natural gas and electric energy delivery system throughout its 43,700 square-mile territory. Over time, these upgrades will give customers information they can use to take control of their energy usage and reduce costs.

Sample of Investments to Date

- Installed **interrupters** (automated switching devices) throughout AIC's territory that reduce the number of customers affected by an outage and the length of outages
- Added several new **substation reclosers (Vipers)** that enhance SCADA visibility, enable system control / metering, improve event reporting / maintenance, and add reliability via single phase tripping capabilities and potential for tie into DA schemes
- Added **advanced communication technology** that provides real-time views into the operations of substations
- Installed 400 **TripSavers** that improve responses to faults and reduce momentary outages, with plans to install 1,400 additional this year

Technology Opportunities

- AIC Intelligrid Program
 - A robust, highly reliable, ubiquitous communications network that provides proactive management of network resources while maintaining situational awareness of all assets supporting the enterprise and operational technology (OT) networks
- Distributed Energy Resource Management System (DERMS)
 - Software platform to help manage distributed energy resource (DER) assets and integrate them into the grid
- Voltage Optimization
 - Regulation of voltage with the goal of reducing energy use while balancing power demand
 - Goal of ~420 GWh cumulative savings by the end of the program
- IED Management Suite (IMS) to remotely manage Intelligent electronic devices (IEDs)
- Expansion of SCADA monitoring



Stakeholder Discussion

Are there any voices that AIC has missed in this conversation?

Do you have suggestions as to how AIC can work proactively with developers of clean energy to maximize the benefit to its customers?

Distribution is Changing and so is Ameren Illinois



**Modernization and
Moving Towards Clean
Energy**



**Strategic Investments
in Technology and
Infrastructure**



**Prioritizing Customer
and Community Needs
– Now and in the Future**