

A wide-angle photograph of a solar farm at sunset. The solar panels are arranged in long, parallel rows that stretch towards the horizon. The sky is filled with soft, golden light from the setting sun, and the background shows a line of trees and some utility poles. A person wearing a white hard hat and a dark shirt is walking on a gravel path between the rows of solar panels in the foreground.

**Overview of Ameren Missouri's Smart Energy Plan
Presented by Rick Eastman
February 26, 2019**

Smart Energy Plan - A Forward-Looking, 5-Year Plan Designed to Modernize the Electric Grid, Drive Customer Benefits and Ensure Stable and Predictable Rates



Senate Bill 564 made possible Ameren Missouri's Smart Energy Plan (SEP). SEP is transforming the grid to ensure customers have affordable, reliable and cleaner energy that meets their growing needs and expectations

Key Elements of the Smart Energy Plan

- \$5.3B in electric investments over the next 5 years
 - Requires a minimum of 25% annual investment in Grid Modernization
 - Allows up to 6% of capital for smart meter program
 - Encourages renewable energy by providing up to \$28M in solar rebates to customers, and requiring a minimum \$14M investment in Ameren owned solar
- \$1B wind asset acquisition to transition to a cleaner energy future for customers
- Catalyzes economic development and provides job creation
- Delivered a 6% rate cut in August 2018, and freezes rates until April 2020
- Establishes first-ever rate caps of 2.85% to control future increases over the life of the plan



Public Stakeholder Meeting: March 4th

- Millbottom Event Center in Jefferson City
- Doors open at 5:30 PM
- Mark Birk to give overview at 6:00 PM

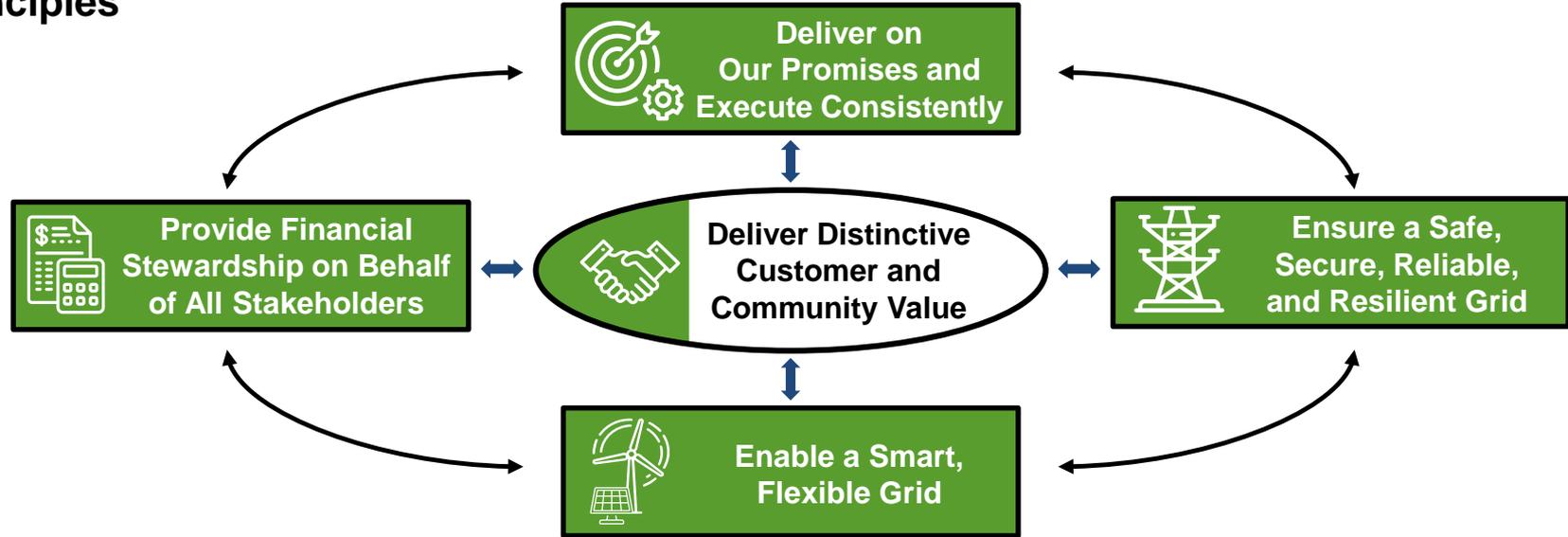
Ameren Missouri's Smart Energy Plan Vision is Driven by Customers...



Vision

Ameren Missouri's grid is secure, modern, affordable, resilient and reliable, which enables transformational choices and benefits for our Customers, Communities, and Co-workers.

Principles



... and will transform Today's Grid into the Grid of the Future

Customers are counting on a grid that will be smarter, self-healing, more robust, resilient, and secure



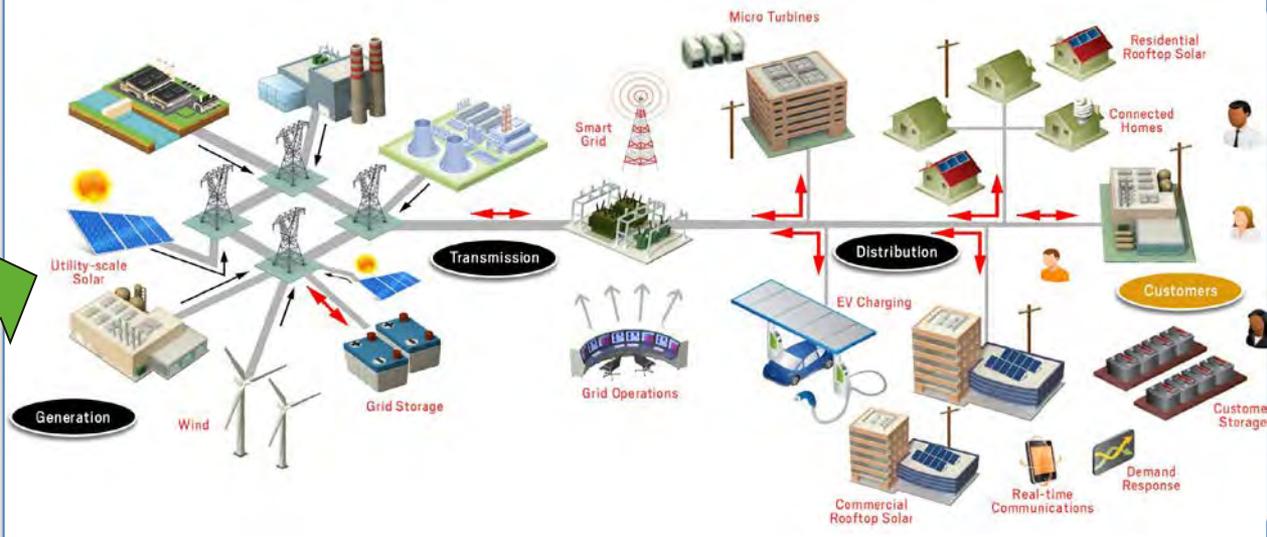
Today

- Grid – Reliable, efficient, meets peak demand, aging infrastructure, one directional energy flow
- Generation Portfolio – Heavy coal-based, limited renewables, distributed energy resources
- Customer – Homogenous service, few special offerings



Tomorrow

- Grid – Upgraded infrastructure, smart meters, smart technology, sensors and data analytics to drive reliability, efficiencies, and resiliency
- Generation Portfolio – Cleaner, more diverse, expansion of renewable and distributed energy resources
- Customer – Customer centric services and product offerings delivering affordable electricity to consumers where they want it, when they want it, and how they want it



Smart Energy Plan 5YR Total Capital Overview

A 5-year average of 37% of capital investments will go toward grid modernization



	2019	2020	2021	2022	2023	Total *
Smart, Reliable Grid Operations	\$335	\$451	\$406	\$391	\$361	\$1,944
Smart Meter Program	\$30	\$55	\$52	\$56	\$52	\$245
Non-Nuclear Generation & Environmental	\$186	\$177	\$182	\$197	\$227	\$969
Nuclear Generation	\$75	\$66	\$61	\$76	\$74	\$352
Hydro Generation	\$35	\$34	\$43	\$33	\$15	\$160
Renewable & Gas Turbine Generation	\$12	\$22	\$20	\$26	\$19	\$99
Secure & Reliable Transmission	\$141	\$136	\$154	\$148	\$154	\$733
Cyber & Technology Upgrades	\$89	\$90	\$90	\$90	\$90	\$448
Operational & Customer Support Facilities	\$54	\$97	\$59	\$51	\$54	\$314
Innovative Opportunities	\$14	\$9	\$6	\$5	\$4	\$38
Grand Total - Capital	\$971	\$1,135	\$1,073	\$1,074	\$1,049	\$5,302
Wind Asset Acquisition (two sites)		\$1,000				\$1,000
Grand Total, Including Wind	\$971	\$2,135	\$1,073	\$1,074	\$1,049	\$6,302

* Millions \$

Top Smart, Reliable Grid Operations Investment Categories

Our investment strategy establishes a modern grid to address the needs of our communities and businesses



2019	2019 - 2023		Plan	Customer Value
\$69	\$267	Substations	70+ new or upgraded substations; Optimize system by reducing the overall number of substations by 5-10% in the long-term	State-of-the-art design features that enable optimal long term performance and customer affordability benefits
\$30	\$245	Smart Meter Program	Deploy more than 800K meters of Ameren MO's 1.2M electric meter population in the next 5 years	Faster connect/reconnect, decreased overall meter reading cost, and improved outage communications
\$24	\$142	Smart Grid	By 2023, deploy ~600 switching devices and accompanying communications technologies to limit the impact of an outage	Deploying self-healing equipment to rapidly detect and isolate storm-related and other circuit interruptions, speeding power restoration for customers
\$16	\$121	System Hardening	Target Worst Performing Sub-Transmission Circuits	Boost reliability to communities, critical facilities (e.g., hospitals, water/treatment facilities), major employers, and manufacturers
\$12	\$95	Solar	Includes five solar+battery storage sites connected to 34.5kV distribution voltage, plus Community Solar & Solar Partnership projects	Improves 34.5kV winter peak reliability. Defers distribution costs. Meets growing renewable & sustainability interests

* Millions \$

Grid Operations Key Investments – Planned Execution Examples



Substation Modernization Pershall (North St. Louis County)

- Consolidate four end-of-life substations to one modern, smart substation
 - Outage performance for this class of modern substations is 88% better than the 4 current substations
 - Significant reliability improvements for 12,000+ customers with a history of frequent outages
- In addition to the substation upgrade, significant circuit improvements are planned which include building in redundancies and self-healing technologies, and partial undergrounding
- Construction targeted to begin Q1 2020

Downtown Jefferson City Smart Grid Project

- Construct a self-healing grid by upgrading 8 manual switchpads to automated switchpads
 - In the last 5 years, 8 unplanned extended outages resulted in 784 customer interruptions; most less than one hour
 - New equipment locates the outage and isolates the fault, allowing power restoration to customers on the working cable sections
 - The self-healing grid creates significant customer benefits, with outage time for some customers reduced from hours to seconds
- Construction targeted to begin Q1 2019

System Hardening Conway 81

- Upgrade 10.5 miles of subtransmission lines with more resilient assets to better serve area hospitals and 400+ residential customers
- Install 20 new composite poles (stronger material, storm hardening) and 115 new wooden poles, install fiber conductors for communications, upgrade to more effective lightning protection equipment, and install self-healing DA devices
 - Reduce momentaries that can impact direct and indirect customers (e.g., hospital patients)
- Construction targeted to begin Q1 2019

Customer Benefits

-  Reduced Frequency & Duration of Outages
-  Reduction of Momentary Outages
-  Fewer Truck Rolls
-  Faster Restoration Time

-  Improved Resiliency

JEFFERSON CITY OPERATING CENTER

Downtown Jefferson City Smart Grid Project –
\$1.2 million project costs – Start Date: 2019

Construct a self-healing grid by upgrading 8 manual switch pads to automated switch pads

- The self-healing grid creates significant customer benefits, with outage time for some customers reduced from hours to seconds

Jefferson City – Fairgrounds Substation Project - \$250,000 –
Start Date: 2019

Cables will be upgraded and installed in conduit, which is a protective casing. Hardens the system and provides improved reliability for customers for decades.



CENTRAL MISSOURI OPERATING CENTERS

Callaway/Montgomery Counties

Vandalia – Upgrade substation – \$2.2 million project costs –
Start Date: 2021

Holts Summit – Upgrade substation – \$320,000 – Start Date: 2023

New Bloomfield – Upgrade substation – \$315,000 – Start Date: 2020

Upgrading aging substations with modern, smart grid equipment that will reduce or eliminate outages, while minimizing repairs to maintain.

New digital communication network upgrades will allow for quicker detection of outages and the ability to re-route power and restore service quicker for customers.



AUDRAIN & COOPER COUNTY – MEXICO AND BOONVILLE OPERATING CENTERS

Substation Upgrades & Cable Upgrades

Mexico – Vandalia substation upgrade – \$2.2 million project costs –
Start Date: 2021

Boonville – Overton substation upgrade – \$3.3 million project costs –
Start Date: 2019

Boonville – Tisdale Cable upgrades – \$243,000 project costs –
Start Date: 2019

Upgrading aging substations with modern, smart grid equipment that will reduce or eliminate outages, while minimizing repairs to maintain.

Replace aging conductors with miles of new stronger overhead lines that will be more resilient to severe weather and improve customer reliability.



LAKE OF THE OZARKS OPERATING CENTER

Substation Upgrades & New Digital Communication Network

Versailles – \$147,000 project costs – Start Date: 2021

Mt. Carmel – \$297,000 project costs – Start Date: 2021

Upgrading aging substations with modern, smart grid equipment that will reduce or eliminate outages, while minimizing operational repairs to maintain.

New digital communication network upgrades will allow for quicker detection of outages and the ability to re-route power and restore service faster for customers.



NORTHEAST MISSOURI - KIRKSVILLE OPERATING CENTER

Brookfield Substation – \$8.7 million project – Start Date: 2020

Build a new substation with smart grid technology that will replace three aging substations.

This single substation will serve the area with improved reliability and future capacity at lower operating cost, which will help keep customers' rates affordable.



EXCELSIOR SPRINGS OPERATING CENTER

Conductor and Cable Upgrades – Lawson, MO –
\$727,000 project costs – Start Date: 2019

Replace aging cable and conductors with miles of new stronger overhead lines that will be more resilient to severe weather and improve customer reliability.



SOUTHEAST MISSOURI – CAPE GIRARDEAU OPERATING CENTER

Cape Rock Substation & New Overhead Lines –
\$10.9 million project costs - Start Date: 2020

Build a new substation with smart grid technology that will serve the area with improved reliability and future capacity at lower operating cost, which will help keep customers' rates affordable.

Solar & Battery Storage – \$19 million

This is one of a series of innovative solar and battery storage projects located throughout the state to improve reliability for customers. This project is estimated to generate 10MW solar + 2.5MW battery storage.



Innovative Solar Solutions

Year	2019	2020	2021	2022	2023	Total
Investment	\$12M	\$83M	--	--	--	\$95M



Objectives:

- **Reliability** – Alleviate seasonal peak demand issues
- **Customer Affordability** – Defer traditional distribution investments through solar-plus-storage alternatives. Provide opportunities for customers to participate in and contribute to community solar programs and Ameren Missouri-owned solar projects
- **Renewable Penetration** – Increase solar energy production to give our customers clean energy options

Solar-plus-Storage

Invest in solar-plus-storage projects as non-wires alternatives

- Install solar-plus-storage in 2020 to bring 50+ MWs of clean energy to outstate residential customers
- Sites strategically selected to bolster reliability and peak-time availability



Community Solar

Monitor progress and interest in Community Solar Pilot Program

- Install a 1-MW solar facility at Lambert Airport and offer solar energy to smallest rate classes
- Fully subscribed in <8 weeks, with waitlist increasing daily



Distributed Solar Partnership

Develop relationships with customers for solar partnerships

- Develop 1.8 MW solar car port canopy at BJC HealthCare
- Pursuing other similarly sized solar opportunities with customers



Smart Meter Program

Year	2019	2020	2021	2022	2023	Total
Investment	\$30M	\$55M	\$52M	\$56M	\$52M	\$245M



Objectives:

- **Technology Upgrade** – Current meter system is approaching end-of-life and will not be supported by vendor after 2025
- **Customer Affordability** – Keep customer rates affordable through significantly reduced meter infrastructure operating costs (e.g., eliminating the existing AMR system cuts meter reading costs per customer by ~40%) once fully implemented
- **Customer Experience** – Provide customers more options and control through enhanced product and service offerings, e.g., improved outage communications, rate options, and superior online energy usage visibility
- **Operational Performance** – Eliminate truck rolls associated with move in/move out and other remote connect/reconnect processes to significantly decrease customers' wait time for service connection changes (e.g., reconnecting service after moving into a home)

Deployment Goals

- Install the first smart meter in July 2020
- Complete AMI Deployment of ~67% of Ameren MO's electric meters population by EOY 2023
- Install an average of 210,000 electric meters annually between 2020 and 2023
- Full deployment completed in 2025



* All estimates based on pending contracts

The Smart Energy Plan will transform the energy grid of today, powering the quality of life for our customers, communities, and co-workers for generations to come



Customers



- Stable and predictable rates
- More options and controls as a result of enhanced product and service offerings

Communities



- Greater reliability and resiliency
- Job creation (direct & indirect)
- Access to cleaner energy sources

Co-workers



- Enhanced safety & security
- Help our Co-workers deliver on our customer-first commitments with new tools and technologies

Keeping You Informed at:
[AmerenMissouri.com/SmartEnergyPlan](https://www.AmerenMissouri.com/SmartEnergyPlan)

Supplier/Contractor Pre-Qualification Website

Ameren Missouri Smart Energy Plan

Submit the form to pre-qualify for bidding on work packages in the following areas:

Directional Boring Services

Hydro Excavation Services

Underground Cabling Installation Services

Underground Duct Bank Installation Services

Overhead Line Electrical Installation Services

Start the Form >



SMART ENERGY PLAN - CONTRACTOR REQUEST FOR INFORMATION

Instructions

This is a Request for Information for Contractors interested in working on Ameren Missouri's new Smart Energy Plan. Ameren Missouri will review this information to pre-qualify Contractors for bidding on work packages in the following areas:

- Directional Boring Services
- Hydro Excavation Services
- Underground Cabling Installation Services
- Underground Duct Bank Installation Services
- Overhead Line Electrical Installation Services

Next

[ameren.com/company/business-partners/suppliers](https://www.ameren.com/company/business-partners/suppliers)

Retail Electric Suppliers

Resources and Information for Retail Electric Suppliers





FOCUSED ENERGY. *For life.*