Overview of Ameren Missouri's

Smart Energy Plan

Presented by Ryan Arnold

February 27, 2023

Smart Energy Plan

Designed to drive customer benefits, modernize the electric grid and ensure stable and predictable rates

Senate Bill 745, passed in 2022, is an expansion and extension of the successful Senate Bill 564 to continue helping customers. This plan continues the construction of smart energy infrastructure that will drive job creation and economic development across Missouri through at least 2028.

Key Elements of the Smart Energy Plan

- $9.9B in electric investments from 2023 to 2027
  - Requires 25% of annual investment be 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 Missouri owned solar
- Supports economic development and provides job creation

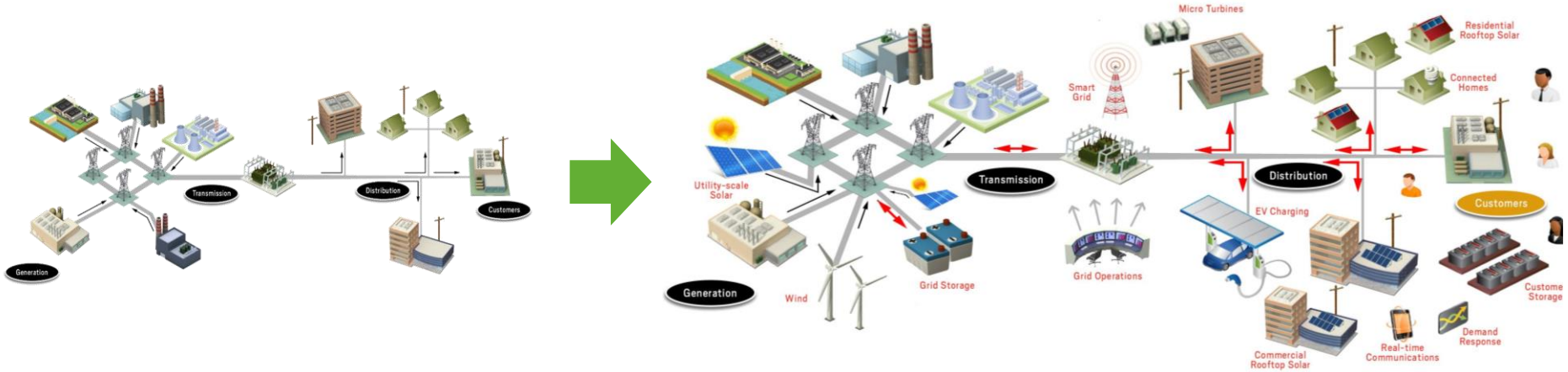
2022 SEP Progress

- Accomplishments
  - 45% of investment in Grid Modernization
  - More than 6.5M minutes of customer outages avoided
  - 800+ projects completed
- Economic impact
  - Economic Development Incentive program supported companies in creating nearly 1,000 new Missouri jobs*
  - 51% of suppliers were Missouri-based
  - $94M spent with Missouri-based diverse suppliers

*Job figures are estimates

It will Transform Today's Grid into the Grid of the Future

Customers are counting on a more reliable 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
- Customer – Homogenous service, few special offerings

Tomorrow

- Grid – Upgraded infrastructure, resiliency, smart technology, sensors and data analytics to drive reliability and efficiencies
- Customer – Expectations include highly reliable service with few momentaries and quick storm response times

2022 Results

Ameren MISSOURI

2022 Results

Supporting a reliable energy future for the communities we serve

Investment Category	2022 Progress	Expected Benefit	Status* (vs long-term goals)	2022 Capital Spend ($M)
Substations	Constructed 34 new or upgraded substations, a foundational asset in supplying energy to customers, targeting aged, capacity limited or those that were operationally challenged.	Continue to provide reliable service through reductions in the frequency and duration of outages and improved operating flexibility.	43% 175 substations	$92
System Hardening	Upgraded 56 miles of the sub-transmission system, a core asset in reliably delivering energy across the grid, including strengthened wood or composite poles, upgraded fiberglass cross-arms and insulators, and reconductoring.	Hardening to better withstand the impact of severe weather events; reductions in the frequency and duration of outages.	34% 500 miles	$48
UG Cable Upgrades	Upgraded 85 miles of aging cables with modern cables encased by protective conduit to safely connect our customers to the key “last mile” segment of the grid.	Reductions in the frequency and duration of outages.	40% 800 miles	$45
Distribution Automation	Placed 401 smart, automated switching devices to reroute power until a line is fixed, improving reliability.	DA switches and control systems drive reliability improvement up to 40% for the circuits on which they are installed.	50% 2,350 switches	$23

*Long-term goals are estimates and contingent on funding levels.

2022 Results

Supporting a reliable energy future for the communities we serve

St. Louis Historic Rainfall [Grid Resiliency]
On July 26, St. Louis received over 9 inches of rain, which is 25% of normal yearly amount in just 12 hours. Due to grid resiliency work accomplished in the Smart Energy Plan, the initial 26,000 customer power outages were quickly restored. In addition, over 9,500 customers avoided extended outages due to smart switch operations.

Jefferson City [Substation CBM]
This 50-year-old Idlewood substation was upgraded with automated sensors and smart technology equipment, which more rapidly detects and isolates outages and speeds power restoration. This project supports reliability for over 2,400 customers in the area.

St. Louis City [UG Revitalization]
In December 2022, the St. Louis downtown grid upgrade hit a milestone by finishing 120 miles of new PVC conduit under the streets to protect electric wires. This system is also one of the first in the nation to have smart technology in downtown environment to help reduce outages for customers. The subsequent cable installation process takes up less space and time, resulting in fewer traffic diversion.

2022 Results

Supporting a reliable energy future for the communities we serve


Ameren
MISSOURI
The Next 5 Years

Smart Energy Plan Capital Overview (Thousands $)

~40% of capital investments will go toward grid modernization over the next 5 years

	Actual	5-Yr Plan					
Smart Energy Plan Categories	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**5-Yr Total**
Smart, Reliable Grid Operations	$732,514	$712,548	$623,309	$604,032	$717,456	$675,642	$3,332,987
Smart Meter Program	$76,015	$61,410	$35,514	$7,074	-	-	$103,998
Non-Nuclear Generation & Environmental	$128,614	$112,474	$128,330	$109,528	$99,733	$214,665	$664,730
Nuclear Generation	$104,596	$104,621	$99,616	$99,205	$95,381	$100,220	$499,043
Hydro Generation	$23,204	$47,808	$36,416	$22,697	$43,809	$16,002	$166,732
Renewable & Gas Turbine Generation*	$38,525	$67,345	$773,129	$618,639	$616,090	$553,027	$2,628,230
*New Renewable Generation **	*$11,939*	$38,487	$749,754	$600,061	$590,014	$540,165	$2,518,481
Secure & Reliable Transmission	$243,613	$284,385	$295,044	$297,323	$297,767	$300,099	$1,474,618
Cyber & Technology Upgrades	$138,884	$158,392	$147,558	$151,736	$151,522	$151,040	$760,248
Operational & Customer Support Facilities	$79,384	$51,851	$72,052	$38,054	$40,025	$40,029	$242,011
Innovative Opportunities	$6,068	$4,865	$1,751	$1,424	$1,579	$1,589	$11,208
Subtotal	**$1,571,417**	**$1,605,699**	**$2,212,719**	**$1,949,712**	**$2,063,362**	**$2,052,313**	**$9,883,805**
Renewables Acquisitions	$17,871						
Grand Total	**$1,589,288**	**$1,605,699**	**$2,212,719**	**$1,949,712**	**$2,063,362**	**$2,052,313**	**$9,883,805**
Grid Modernization	***45%***						***40%***

*Renewable & Gas Turbine Generation is inclusive of New Renewable Generation

**New Renewable Generation Plan for 2023-2027 may include both self-built projects and acquired renewable assets, pending future regulatory proceedings

Top Smart, Reliable Grid Operations Investment Categories

Our investment strategy establishes a reliable and modern grid for our customers & communities

Category	2023 ($M)	2023-2027 ($M)	Plan	Customer Value
Substations	$95	$416	175+ new or upgraded substations; a foundational asset in supplying energy to customers, targeting operationally challenged, capacity limited or those that are aged. Distribution substations with critical components beyond their expected life serve over 700k of our ~1.2M customers.	Continue to provide reliable service through reductions in the frequency and duration of outages and improved operating flexibility.
UG Cable Upgrades	$51	$297	Upgrade 800 miles of existing aging underground cables with modern cables encased by protective conduit to safely connect our customers to the key “last mile” segment of the grid. Over 2,900 miles of our underground system already exceed their expected life.	Reduction in the frequency and duration of outages.
System Hardening	$45	$253	Upgrade 500 miles of the sub-transmission system, including strengthened wood or composite poles, upgraded fiberglass cross-arms, and new conductor. Around 36% of our sub-transmission circuits have a majority of assets beyond their expected life.	Hardening to better withstand the impact of severe weather events; reductions in the frequency and duration of outages.
Distribution Automation	$16	$87	Deploy over 2,350 smart and automated switching devices to reroute power until a line is fixed, improving reliability.	DA switches and control systems drive reliability improvement up to 40% for the circuits on which they are installed.

Grid Operations Key Investments

Planned Project Examples

Substation Capacity

Four Seasons Sub [Lake of the Ozarks]

- Building a new substation to relieve overload concerns at Horseshoe Bend and Lake Ozark.
- The addition of this substation will improve operating flexibility especially during growing winter peak months.

- Customers helped: 9,000+
- Construction start: 2023

Customer Benefits

- Lower frequency & duration of outages
- Faster response method that drives operational efficiencies
- Increased capacity to serve localized growing loads

Grid Resiliency

Boyle Switches [St. Louis City]

- Sectionalize feeder out of Boyle substation to reduce manual switching points while constructing new conduit and cable systems.
- This will allow for a safer and more efficient operation of the feeder while supporting customer reliability.

- Customers helped: 3,100+
- Construction start: 2023

Customer Benefits

- Lower frequency & duration of outages
- Faster response method that drives operational efficiencies

System Hardening

Babler Line Upgrades [Ellisville]

- Begin work to storm harden over two miles of sub-transmission line to support customer reliability.
- This circuit has experienced 18 interruptions over the past 5 years and over a quarter of the poles are over their expected life.

- Customers helped: 5,500+
- Construction start: 2023

Customer Benefits

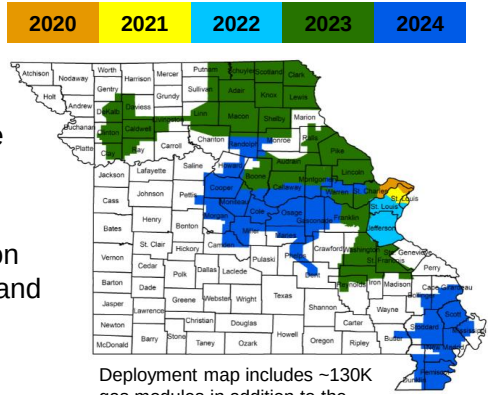
- Lower frequency & duration of outages
- Momentary Outages

Other Key Investments

Planned Program Examples

Smart Meter Program

- Upgrade approximately 1.2M electric meters by 2024
- Offer a suite of expanded rate options that give customers the power to choose a rate that fits their lifestyle
- Provide two-way communication that can more quickly pinpoint and restore outages
- Explore rate options at AmerenMissouri.com/RateOptions



Deployment map includes ~130K gas modules in addition to the 1.2M electric meters covered by the Smart Energy Plan.

Neighborhood Solar

- The Neighborhood Solar program was open from 2019 to 2021 to all non-residential Ameren Missouri electric customers who have space for solar panels, including parking lots, open land or rooftops
- Ideal partners in the program are institutions, schools, non-profit organizations and other non-residential locations that act as a hub in the community
- All Ameren Missouri-designated funding has been fully allocated to the sites currently under construction

Cape Girardeau Renewable Energy Center

This 1.2 MW facility is located on the campus of Southeast Missouri State University includes 3,500 solar modules

Customer Benefits

- More precise energy usage data
- Choice/Control with rate options
- Quicker restoration after outages
- Faster connection for new or moved service

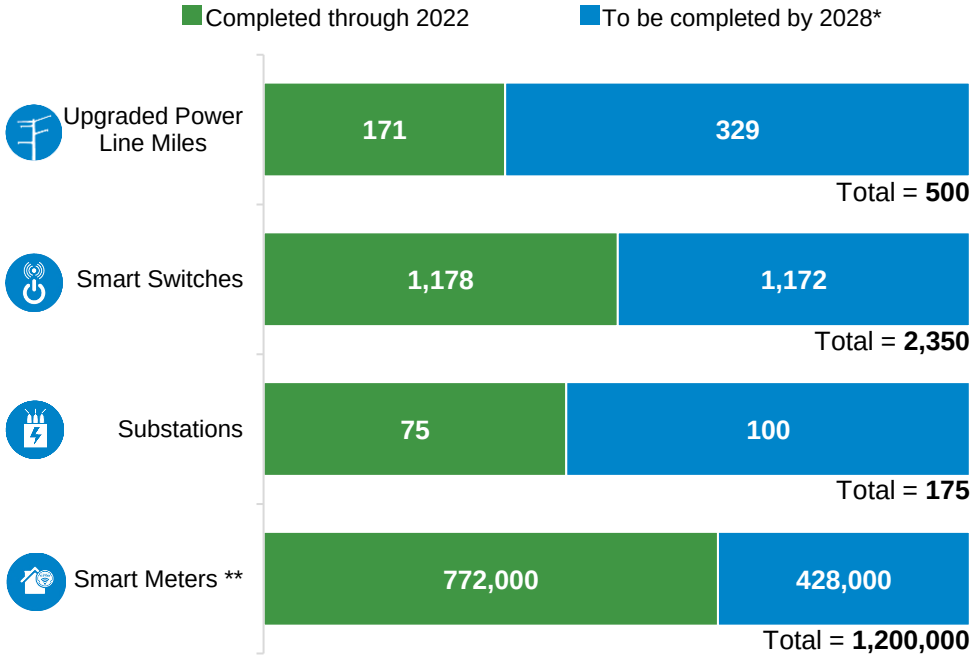
Current and Future Locations

- Habitat for Humanity St. Louis Headquarters
- Southeast Missouri State University
- Delmar DivINe
- Maryland Heights Community Center

Strategic Investment Plan

With the extension of the Smart Energy Plan, Ameren Missouri is ready to continue this work for the benefit of our customers, upholding our mission to power the quality of life

We are working diligently to create a **more resilient, more reliable** and **more sustainable energy system** while empowering you and your community every step of the way.



*Long-term targets are estimates and contingent on funding levels.
** Does not include gas modules. All installations by 2024.

Questions & Feedback

We want to hear from you.

Please provide comments, questions, and feedback via the following methods.

In this Meeting

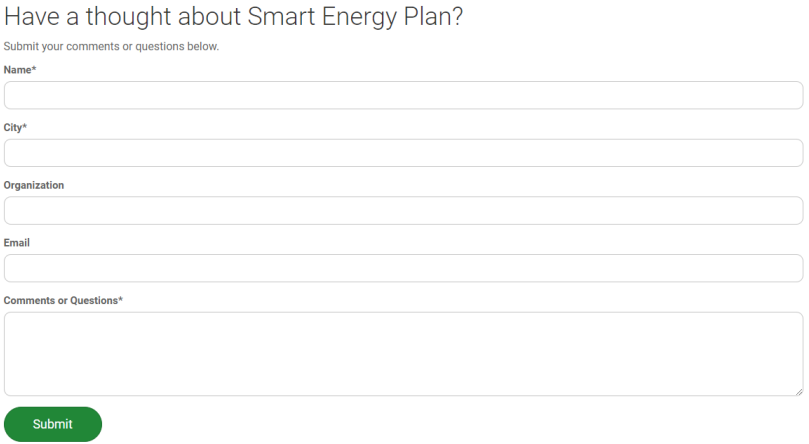
Online Participants
Raise Hand

Dial-in participants
Enter *5 to raise hand
Enter *6 to unmute

Billing Questions
SEPStakeholder@ameren.com

Online Form

- Amerenmissouri.com/stakeholder
- Open for one week




Ameren
MISSOURI