



Inflation Reduction Act (IRA) & Infrastructure Investment and Jobs Act (IIJA)

AW-2023-0156 Workshop | April 21, 2023

Inflation Reduction Act Opportunities

Inflation Reduction Act Opportunities

IRA Investment Opportunities Assessment Process

0 IRA relevance

IRA screening

Examine the IRA bill to identify relevant energy related programs including

- Tax incentives
- Loans
- Grants

Activity

- To identify IRA programs relevant to Ameren and Ameren customers

1 Create long-list

Ideation & concept generation



Activity

- To categorize initial concepts into technology groups for qualitative assessment

2 Qualitative assessment

2.1 IRA and Ameren relevance

Initial filtering

Activity

- To remove technologies not included in IRA

2.2 Attractiveness & Feasibility

Opportunity prioritization

Activity

- To prioritization opportunities that are both attractive and feasible for Ameren to implement

3 Short-list for quantitative assessment

- 🚀 Develop detailed **rate-base and revenue requirement models**
- 🚀 Assess key immediate **strategic implications** for IRP and other Ameren operations
- 🟢 Develop detailed **rate-base and revenue impact models for IRP**
- 💡 **Transfer incentives & insights** to Ameren teams for internal assessment

- 🚀 Fast-tracked opportunity
- 🟢 Short-listed opportunity
- 💡 Other opportunities for Ameren internal assessment

Inflation Reduction Act Opportunities

Ameren Relevance



Energy systems

- **45/45Y:** Clean Electricity Production Tax Credit
- **48/48E:** Clean Electricity Investment Tax Credit
- **48(e)/48E(h):** Credit for Renewables in Low-income Areas
- **45U:** Zero-Emission Nuclear Power Production Tax Credit
- **45V:** Clean Hydrogen Production Tax Credit
- **22001:** Electric Loans for Renewable Energy
- **50141:** Funding for Department of Energy Loan Programs Office
- **50144:** Energy Infrastructure Reinvestment
- **50151:** Transmission Facility Financing
- **13302:** Residential Clean Energy Credit
- **50232:** Canal Improvement Projects

Advanced manufacturing

- **48C:** Advanced Energy Project Credit
- **45X:** Advanced Manufacturing Production Credit

CCUS

- **45Q:** Credit for Carbon Oxide Sequestration

xEV & fuels

- **13404:** Alternative Fuel Vehicle Refueling Property Credit
- **50142:** Advanced Technology Vehicle Manufacturing Loan Program
- **50143:** Domestic Manufacturing Conversion Grants
- **13401:** Clean Vehicle Credit
- **13402:** Credit for Previously-Owned Clean Vehicles
- **13403:** Credit for Qualified Commercial Clean Vehicles
- **60101:** Clean Heavy-Duty Vehicles
- **13201:** Extension Credit for Biodiesel/renewable diesel
- **13704:** Clean Fuel Production Credit
- **22003:** Biofuel Infrastructure Program
- **40007:** FAST program
- **60108:** Clean Air Act

EE & smart load

- **13301:** Energy Efficient Home Improvement
- **13304:** New Energy Efficient Homes Credit
- **50121:** Home Energy Performance-based Rebates
- **50122:** High-efficiency Electric Home Rebate
- **13303:** Energy Efficient Commercial Buildings Deduction
- **30002:** Green and Resilient Retrofit Program
- **50123:** State Home Efficiency Contractor Training
- **50131:** Latest and Zero Building Code Adoption

Other related programs

- **50145:** Tribal Energy Loan Guarantee Program
- **60113:** Methane Reduction Program

Key:

Applicable for Ameren

Applicable for Ameren customers

Not applicable for Ameren

Inflation Reduction Act Opportunities

Eligible Technologies



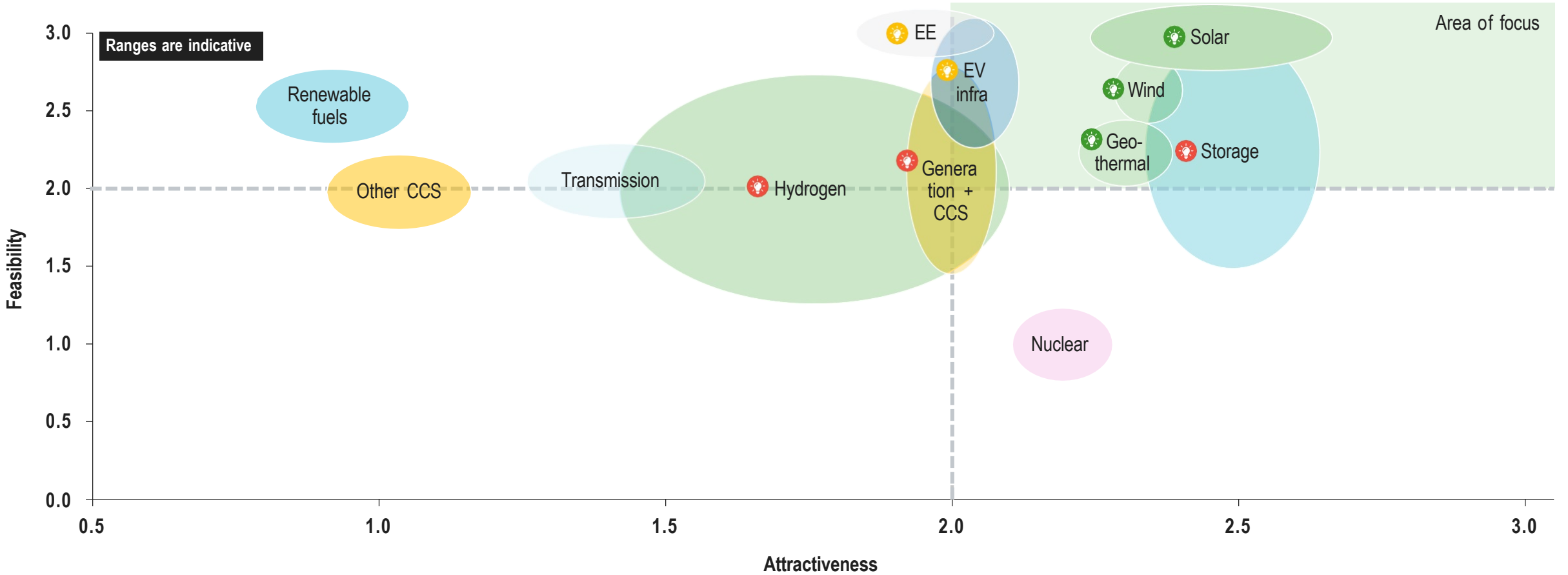
Generation	Hydrogen	Storage	CCUS	xEV & fuels	EE & smart load	T & D
<ul style="list-style-type: none"> • Solar <ul style="list-style-type: none"> – PV – Distributed PV – CSP • Wind <ul style="list-style-type: none"> – Onshore – Offshore • Nuclear <ul style="list-style-type: none"> – Current fleet – Advanced reactors • Other clean generation <ul style="list-style-type: none"> – Geothermal – Fuel cell – Hydropower • Natural gas <ul style="list-style-type: none"> – CCGT 	<ul style="list-style-type: none"> • Hydrogen <ul style="list-style-type: none"> – CCGT – H2 blend – CCGT – H2 – SCGT – H2 – H2 - Green – H2 - Blue – H2 - Turquoise – H2 - Pink – H2 T&D – H2 storage 	<ul style="list-style-type: none"> • Storage <ul style="list-style-type: none"> – Stacked blocks – Liquid air – Above ground CAES – Underground CAES – Li-ion battery – Fly wheel – Pumped hydro – LDES 	<ul style="list-style-type: none"> • CCUS <ul style="list-style-type: none"> – NGCC + CCS – Coal + CCS – CCS – DAC – CO2 storage 	<ul style="list-style-type: none"> • Clean Fuels <ul style="list-style-type: none"> – Biofuels – RNG – Other alternative fuels • Fuel infrastructure <ul style="list-style-type: none"> – L2 smart charger – DCFC infra - LD – DCFC infra - MD & HD • xEV programs <ul style="list-style-type: none"> – xEV - LD – xEV - LD commercial – xEV - MD & HD 	<ul style="list-style-type: none"> • EE & Smart load <ul style="list-style-type: none"> – EE homes – EE buildings – Ind. electrification – Heat pump 	<ul style="list-style-type: none"> • Distribution <ul style="list-style-type: none"> – Electric – Natural gas – CO2 • Transmission <ul style="list-style-type: none"> – Electric – Natural gas – CO2

Technologies covered under the IRA
 Technologies not covered under the IRA or relevant for Ameren to deploy

LD – light duty, MD – medium duty, HD – heavy duty, CCGT – combined cycle gas turbine, SCGT – single cycle gas turbine, PV – photovoltaic, LDES – long duration energy storage, CSP – concentrated solar power, CAES – compressed air energy storage, RNG – renewable natural gas

Inflation Reduction Act Opportunities

Qualitative Assessment Rankings









● Fast-tracked opportunity
 ● Short-listed opportunity
 ● Other opportunities for Ameren internal assessment

Inflation Reduction Act Opportunities

Short-Listed Technologies



		Primary IRA incentive ¹⁾	Secondary IRA incentives	Max capturable from primary IRA incentive	Use case	Attractiveness	Feasibility
Hydrogen		Hydrogen PTC - 13204 (45V)	ITC - 13702 (48E) Various loan programs	\$3.00 per kg	Hydrogen blending for CCGT and/or LDC	<ul style="list-style-type: none"> IRA incentive is highly attractive for low carbon H₂ Supports efforts to decarbonize gas LDC 	<ul style="list-style-type: none"> Blue H₂ technology is mature and green H₂ technology is maturing There may be regulatory uncertainties in the near term
CCS		Credit for Carbon Oxide Sequestration 13104 (45Q)	Various loan programs	\$85 per metric ton	Carbon capture and storage on CCGT	<ul style="list-style-type: none"> 45Q is extremely attractive for carbon storage Significant contribution to emission reduction on a NG CCGT 	<ul style="list-style-type: none"> Carbon capture technology is relatively mature CO₂ storage siting and permitting may be complex
Storage		ITC - 13702 (48E)	Various loan programs	50% of investment	Short and long duration storage for grid deployment	<ul style="list-style-type: none"> Incentives for stand alone storage is highly attractive to accelerate deployment Will contribute to capacity, grid flexibility and resiliency 	<ul style="list-style-type: none"> Technology maturity varies and some can be deployed quickly (i.e., Li-ion) Interconnection queue and regulatory framework in MISO may create challenges
Geothermal		ITC - 13702 (48E)	Various loan programs	50% of investment	District heating	<ul style="list-style-type: none"> Strong incentives and even more attractive with potential bonuses 	<ul style="list-style-type: none"> Technology is mature with new technology being developed to tap into new resources There may be regulatory uncertainties in the near term
Solar		ITC - 13702 (48E)	PTC - 13701 (45Y) Various loan programs	50% of investment	Clean electricity generation	<ul style="list-style-type: none"> Strong incentives and even more attractive with potential bonuses 	<ul style="list-style-type: none"> Mature technology with existing regulatory framework for deployment
Wind (onshore)		PTC - 13701 (45Y)	ITC - 13702 (48E) Various loan programs	\$3.1/kWh	Clean electricity generation	<ul style="list-style-type: none"> Strong incentives and even more attractive with potential bonuses 	<ul style="list-style-type: none"> Mature technology Siting and permitting process can be complex and costly

1) Generally preferred program to maximize economic benefits

Inflation Reduction Act Opportunities

Next Steps



- Continue assessment of highest-ranking IRA technologies and opportunities
 - Qualitative
 - Quantitative
- Incorporate results into Ameren Missouri's triennial IRP filing (October 2023) and additional upcoming regulatory filings

Infrastructure Investment and Jobs Act (IIJA) & Grant Process Update

Priority IIJA Programs for AMO/Capital Governance

Capital Governance is actively pursuing ~\$260M of IIJA awards for \$500+M worth of infrastructure projects across five programs, with GRIP Resilience & Smart Grid Grants being top priority

	Primary Applicant	IIJA Program	Program Overview AMO Proposal For Applications	Program Category	FOA 1 st Round / Due Date Timeline	Total Federal Funding / Cost-Share	Max AMO Award / Cost-Share
In-Scope	AMO	<u>GRIP Topic Area 1: Grid Resilience Grants¹</u>	<u>Grants for grid resiliency efforts</u> <i>Undergrounding of distribution lines in STL</i>	T&D	Paper Due: December 16th App Due: April 6 th	\$2.5B / 50%	\$100M / 50%
	AMO	<u>GRIP Topic Area 2: Smart Grid Grants¹</u>	<u>Expanding smart grid investments & functions</u> <i>Rural substation upgrades and line conversions</i>	T&D	Paper Due: December 16th App Due: March 17 th	\$3B / 50%	\$50M / 50%
	AMO	<u>Energy Improvements in Rural or Remote Areas (ERA) Topic 2²</u>	Funds for large projects that improve or develop energy systems in rural/ remote communities <i>Rural substation upgrades</i>	T&D	Paper Due: April 14 th App Due: June 28 th	\$1B / 50%	\$100M ⁵ / 50%
Potentially Pursuing	AMO	<u>Hydroelectric Efficiency Improvement Incentives³</u>	Incentive program to finance improvements the <u>efficiency of hydro assets</u> <i>TBD</i>	Hydro	App Opened: March 22 nd App Due: June 20 th	\$75M / 30%	\$5M / 70%
	AMO	<u>Maintaining & Enhancing Hydroelectric Incentives</u>	Incentive program to upgrade existing <u>hydroelectric generation assets</u> <i>TBD</i>	Hydro	App Opens ⁴ : May 26 th App Due ⁴ : July 18 th	~\$553M / 30%	\$5M / 70%
Total Funding Available:						~\$7.13B	~\$260M

¹Request for Information (“RFI”) and Draft Funding Opportunity Announcement (“FOA”) were released on 8/31/2022, First Official FOA opened 11/15/2022; Funding to be allocated via multiple, annual solicitations

²Request for Information (“RFI”) was released on 10/11/2022; First Official FOA opened 03/01/2023; Funding to be allocated via multiple, annual solicitations

³Application Guidance was released on 03/22/2023, Funding likely to be expended in this singular solicitation

⁴Based on estimates from publicly available materials (as of 04/17/2022)

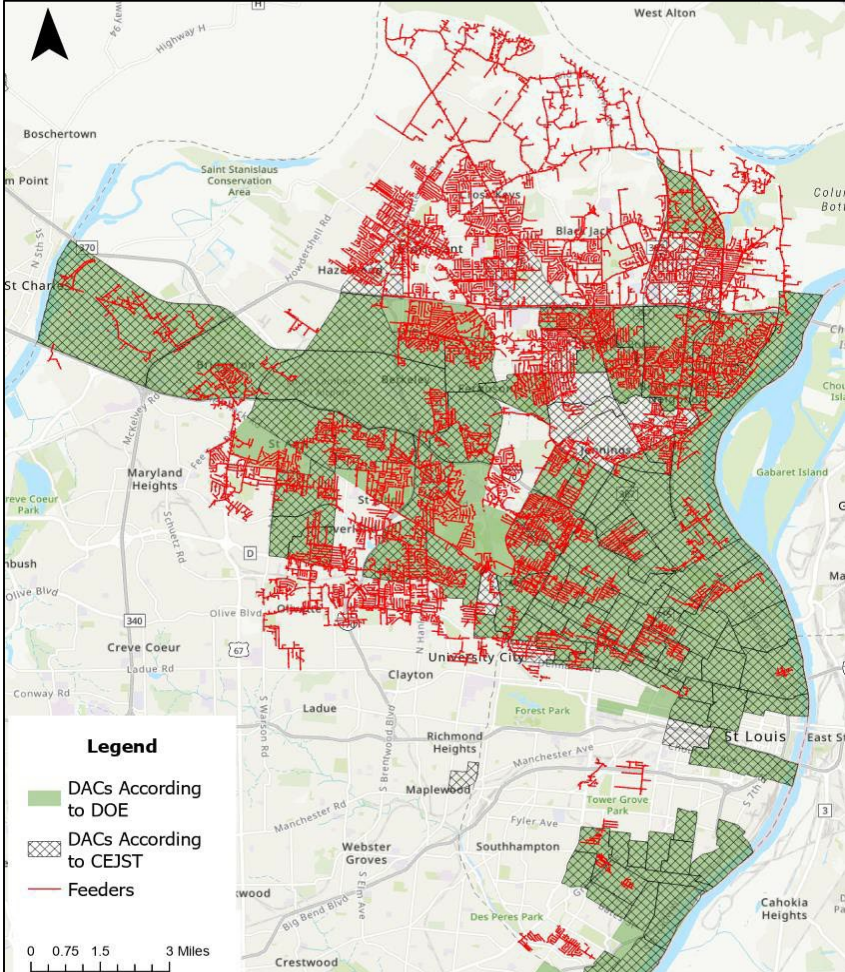
⁵Cap Size for a singular grant is dependent on topic area selected within the ERA program; Topic 1: Community-Scale Demonstration: Max Cap is \$10M; Topic 2: Large-Scale Demonstration: Max Cap is \$100M

Ameren Missouri's GRIP Topic 1 Proposal: Smart Undergrounding

The Smart Undergrounding Program will improve reliability and resiliency for over 255,000 historically underserved and disadvantaged St. Louis City and County residents

Program Goals Benefit the Entire St. Louis Community

Prime Recipient
Ameren Missouri
Total Miles Targeted for Undergrounding
~270 Miles of Backlot Circuit
Total Estimated Costs
~\$200M
Cost Share (DOE / Ameren Missouri)
~\$100M / ~\$100M
Key Personnel
<u>Role: Project Lead</u> Kevin Harper, PMP <i>Superintendent, Contractor Services</i>
<u>Role: Technical & Business Point of Contact</u> Joseph Wondolowski <i>Manager, Capital Planning</i>



The Customer: Systematically address portions of worst performing, near end-of-life circuits by strategically undergrounding hard-to-maintain and difficult-to-access urban backlots in disadvantaged communities (DACs)*

The Grid: Improve reliability and resiliency by an average of 50% and provide higher capacity to support future shifts in generation and load

The Community: Promote economic opportunities for certified underrepresented businesses (MBEs) in Missouri and local unionized labor

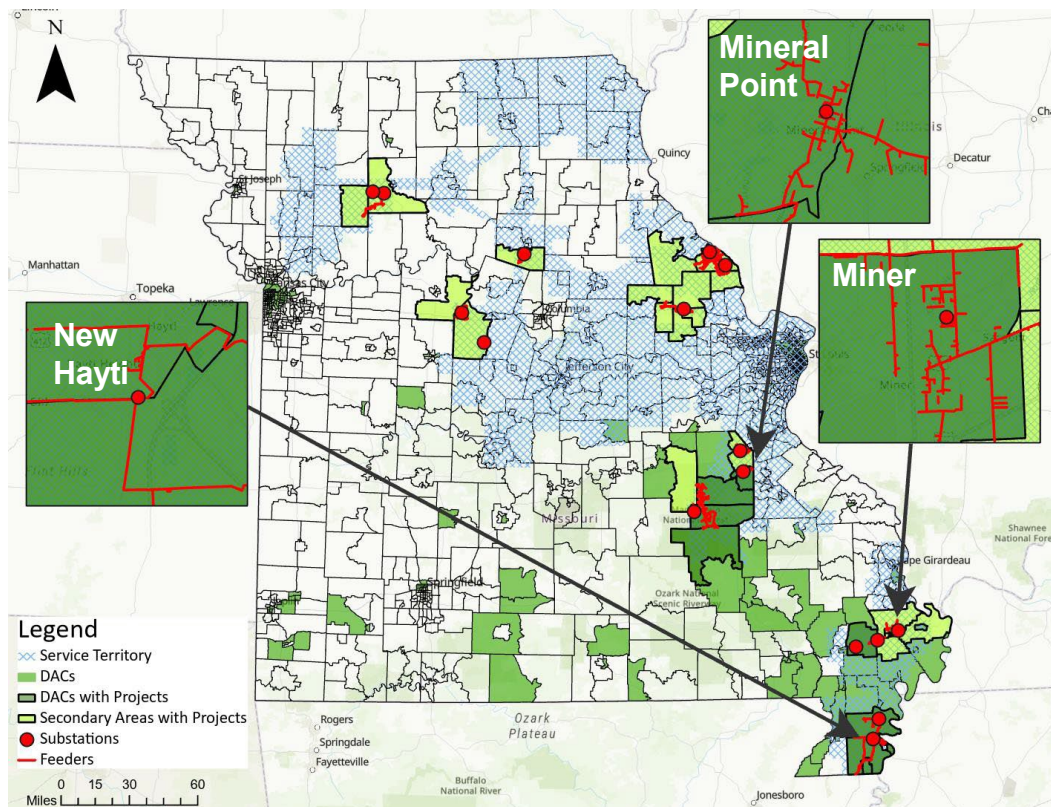
*Disadvantaged Communities are those as defined by the Department of Energy (DOE) and Climate Equity Justice Screening Tool (CEJST) on maps located at <https://energyjustice.egs.anl.gov> and <https://screeningtool.geoplatform.gov/en/#3/33.471-97.5> respectively

Ameren Missouri's GRIP Topic 2 Proposal: Rural Modernization

An innovative, impactful solution that improves reliability and resiliency, simplifies operations, and brings smart technology to better serve rural DACs

Rural Modernization Program
<p>Prime Recipient</p> <p>Ameren Missouri</p>
<p>Targeted Substation Upgrades</p> <p>16 Total Substations (13 Pad-Mounts and Three 22 MVA Substations)</p>
<p>Total Estimated Costs</p> <p>~\$100M</p>
<p>Cost Share (DOE / Ameren Missouri)</p> <p>~\$50M / ~\$50M</p>
<p>Key Personnel</p> <p><u>Role: Project Manager</u> Jim Huss, Senior Director, Operations Excellence</p> <p><u>Role: Technical & Business Point of Contact</u> Joseph Wondolowski, Manager, Capital Planning and Analysis</p>

Targeted Substations*



* New Hayti, Miner, and Mineral Point Substations are considered large substations and will be replaced with modern 22 MVA substations due to a current/anticipated load growth of >5 MVA which is not suitable for pad-mount upgrades. These 22 MVA substations will utilize enclosed substation switchgear design with Intellirrupters.

ERA: Potential Projects For Consideration

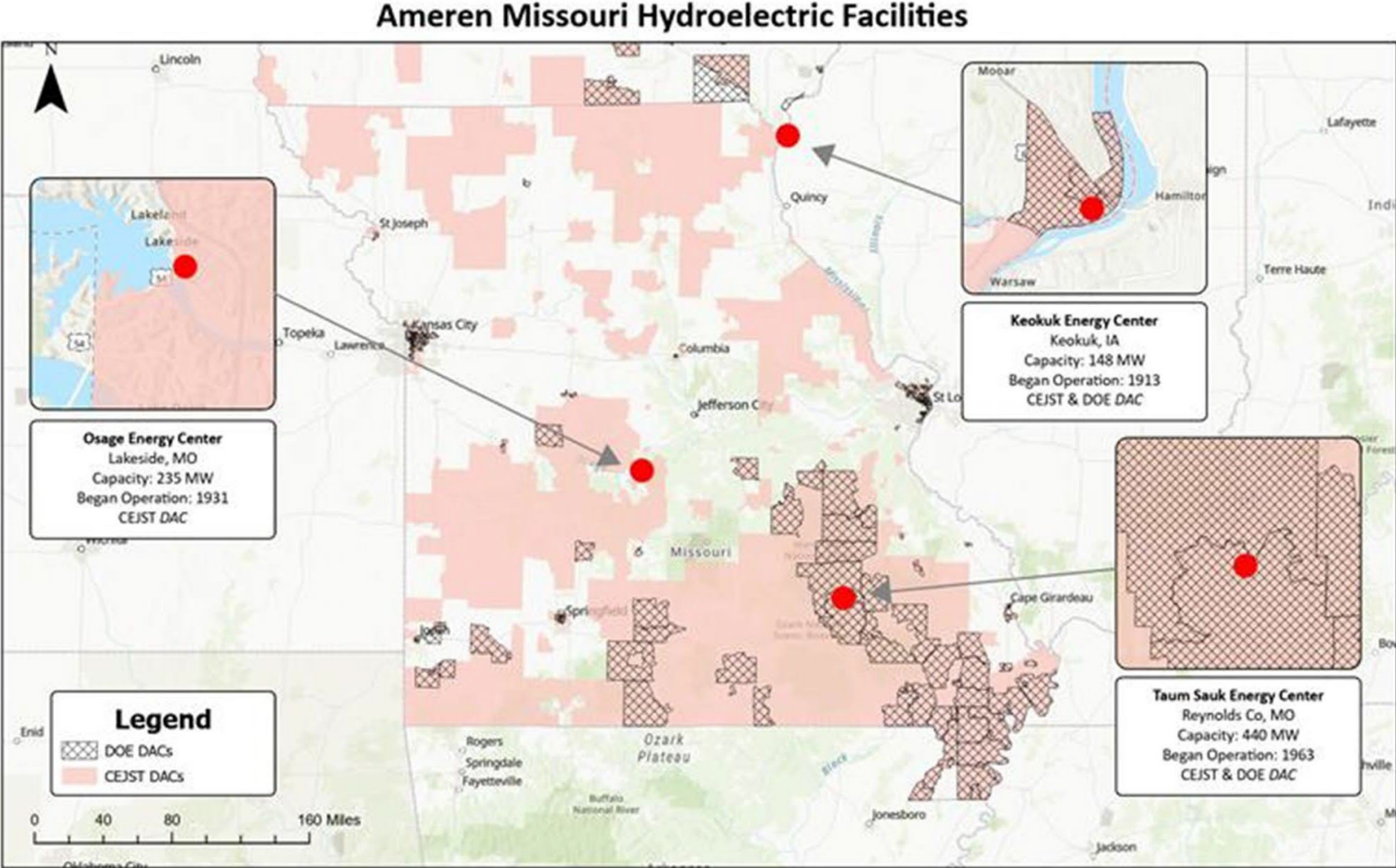
AMO could utilize ERA dollars to expand on their Rural Modernization proposal efforts



Proposals in Consideration	Targeted Locations
<p style="text-align: center;">Pad-mounted Transformer Installations</p> <p>Replace aging rural substations with pad-mounted transformers and supporting smart reclosing devices:</p> <ul style="list-style-type: none"> • Initial portfolio of 22-30 sites recommended as strong candidates • Priority given to sites that do not require 4kV to 12kV conversion to reduce costs and scope • Application will use and expand upon many of the same themes as the Rural Modernization proposal • Aligns with “Improving overall cost-effectiveness of energy generation, transmission, or distribution systems” eligible project category • Would include the instillation of “smart” device aligned with demonstration and innovation aspect of the program 	<p>ERA definition of rural: Incorporated city/town/village of $\leq 10,000$ residents in 2020 census AMO definition of rural: Sub serves $\leq 1,000$ customers and peak load of ≤ 5 MVA</p>
<p style="text-align: center;">Benefits</p> <ul style="list-style-type: none"> • Up to 40% Reliability Improvement through DA installations in impacted communities • Improved outage and loading data • Reduced outage times • ~50% situated in DACS • Majority Union Labor for Overhead Work 	

Map of Ameren Missouri Hydro Facilities¹

Based on recent clarifications, all three AMO Hydroelectric facilities are located within disadvantaged communities, meaning projects at any facility helps advance the DOE's Justice40 objective



¹Maps of program defined Disadvantaged Communities: <https://energyjustice.egs.anl.gov> & <https://screeningtool.geoplatform.gov/en/#/3/33.471-97.5>

Community Benefits Plan (CBP) Overview

Cross-functional AMO team is supporting key CBP requirements and tasks

Owner	CBP Key Support
Community Outreach & Regional Account Executives	Schedule and host community engagement events to discuss GRIP proposals and community impacts
	Develop SMART goals related to community engagement
	Procure letters from community partners of interest
	Negotiate and finalize a Community Benefits Agreement with partner(s)
Government Affairs	Procure letters of support from government and legislative officials
Workforce Development	Identify and procure letters from workforce development partners aligned to areas and demographics of interest
	Coordinate with Community Benefits Agreement subcommittee to discuss potential workforce development benefits and commitments to be included on potential Community Benefits Agreements with partners and stakeholders
HR	Develop SMART Goals related to DEIA initiatives for full-time employees
Labor Relations	Procure letters of commitment from unions
Supplier Diversity	Develop SMART Goals related to supplier diversity
	Identify minority-owned supplier, vendors, and contractors for program
Contractor Services & Procurement	Identify suppliers, vendors, and contractors that exhibit DEIA practices
Environmental Solutions	Complete and communicate environmental questionnaire findings
Communications	Identify mediums to share updates related to funding for public release
	Review and approve materials subject to public release

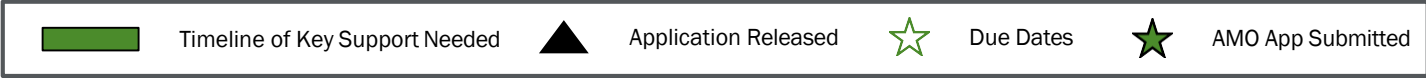
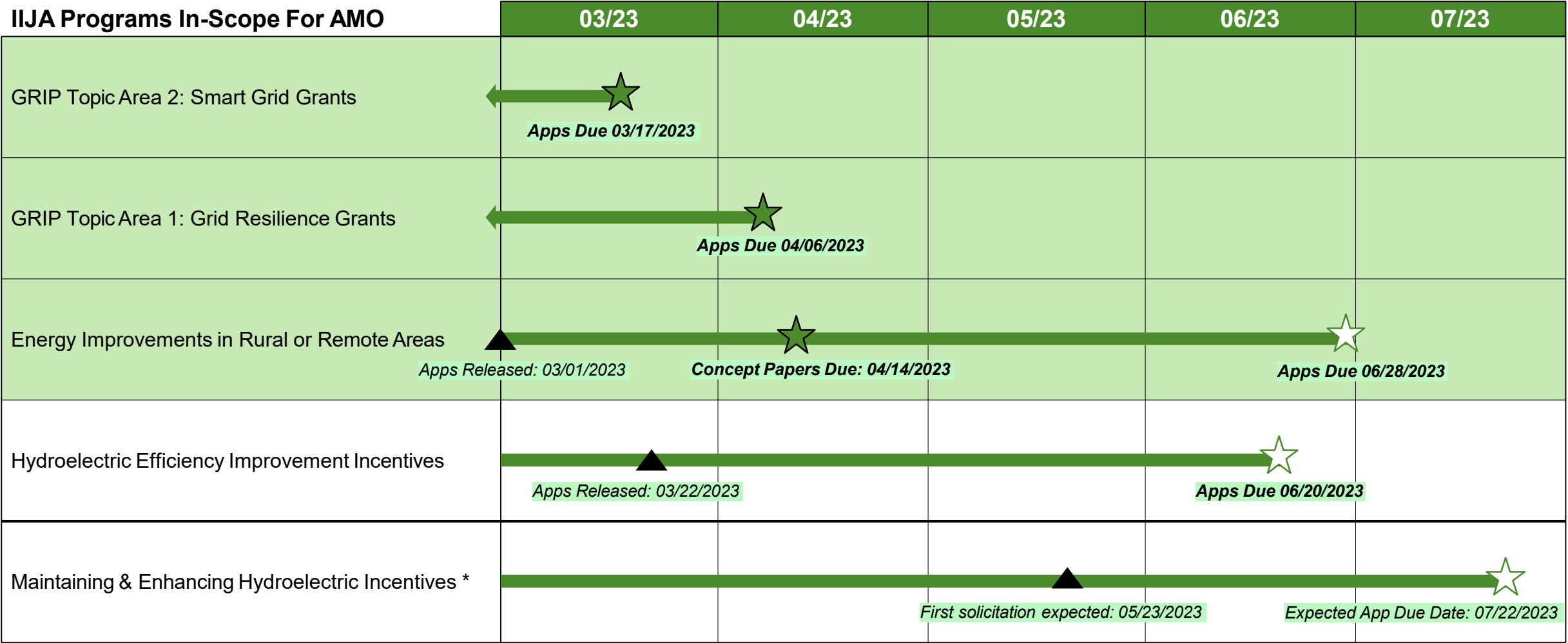
Key Beyond Housing 24:1 Community Leadership with Ameren Missouri Team Members



[Left to Right] Front Row: Tommie Bugett, Candice Brown, Reyna Spencer, **Mayor Jackson (Beverly Hills)**, Samantha Williams, **Councilwoman Rita Days (St. Louis County Council)**, Connie Taylor; *Back Row:* Mike Allen, Joe Wondolowski, **Mayor McGee (Vinita Park)**, **Chris Krehmeyer (CEO, Beyond Housing)**, Marco Tipton, **Mayor Griffin (Wellston)**

IIJA Key Program Timelines

Based on in-scope IIJA programs application work will likely continue until mid to late-July



*Based on outcomes of DOE informational webinar 02/16/2023