Applying a Framework for Addressing Cost-Effectiveness and Distributional Equity in Distributed Energy Resource Investment Decisions

Illinois Work Group
Fifth Meeting

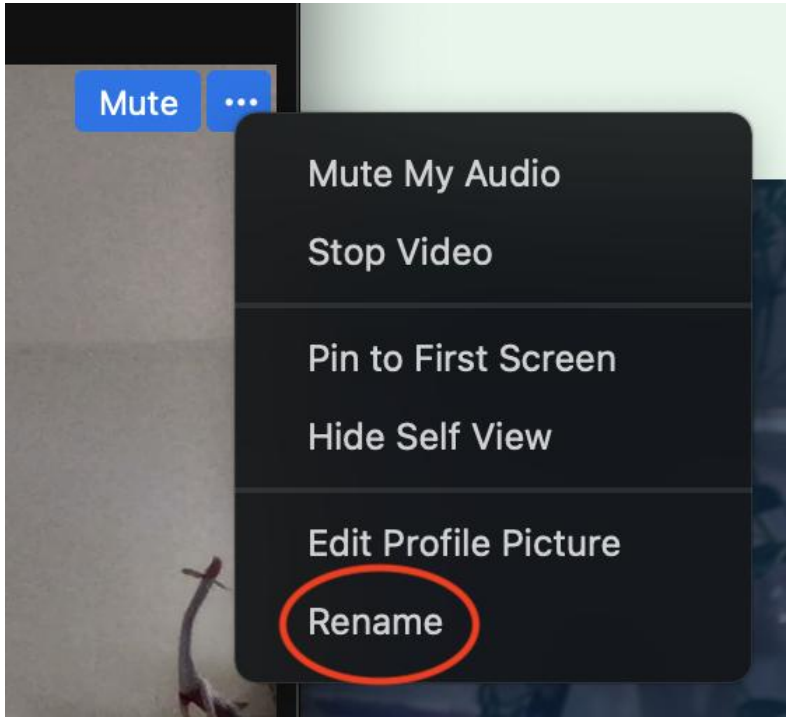
December 13, 2024

Julie Michals, E4TheFuture
Alice Napoleon, Tim Woolf, and Ida Weiss, Synapse Energy Economics
Greg Ehrendreich and Natalie Newman, Midwest Energy Efficiency Alliance

Housekeeping

- Please add your affiliations and pronouns to your Zoom name.
- Please mute yourself when you are not speaking.
- If you have a comment or question, please raise your hand or use the chat.
- We will be recording the session to share with DEA Work Group members that could not attend this call.

Questions?



Agenda

1. Introductions
2. Recap: project goals, the role of the DEA Work Group, and DEA
3. Stage 5 of DEA: Apply DEA metrics to priority populations (focus on Ameren)
   - Background on Ameren's BE plan
   - Initial metrics findings and results – Utility investment, Participation, and Emissions
   - Findings added since meeting #4 – Workforce impacts
   - Initial conclusions and recommendations
4. Project schedule and next steps

Case Study Objectives

1. Show ICC and stakeholders **how to conduct a DEA** using existing definitions for priority populations and metrics based on statute and utility plans.
2. **Identify gaps and limitations** and options to address gaps going forward.
3. Develop stakeholder understanding on **how to use map-based resources and spatial tools** to visualize DEA metrics for priority populations.
4. Using analysis results, **demonstrate the use of DEA, alongside BCA, to guide decision-making** on DER resource investments that accounts for impacts on priority populations.

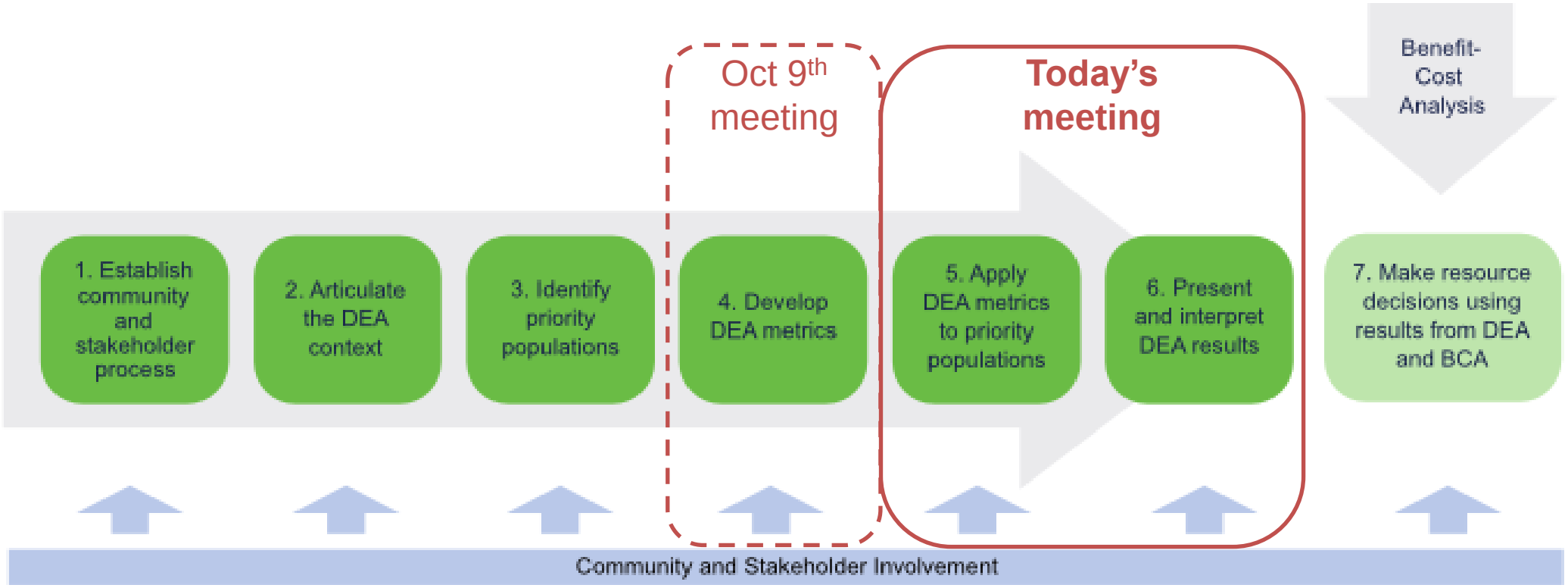
Reminder: Work Group Role and Meeting Guidelines

- Work Group Role
  - Participate in Work Group meetings – input is critical to project and is encouraged (via chat box, verbal input, follow-up emails, and/or subgroup phone calls)
  - Provide comments on DEA key methodologies, inputs, and assumptions
  - Review and comment on DEA and BCA results and draft/final case studies report
- Agendas and meeting materials will be sent in advance of meetings
- Meeting notes will be shared with Work Group
- Chatham House rule will apply
  - i.e., input shared in our meetings will not be assigned to or associated with any Work Group member or representative outside of the Work Group meetings

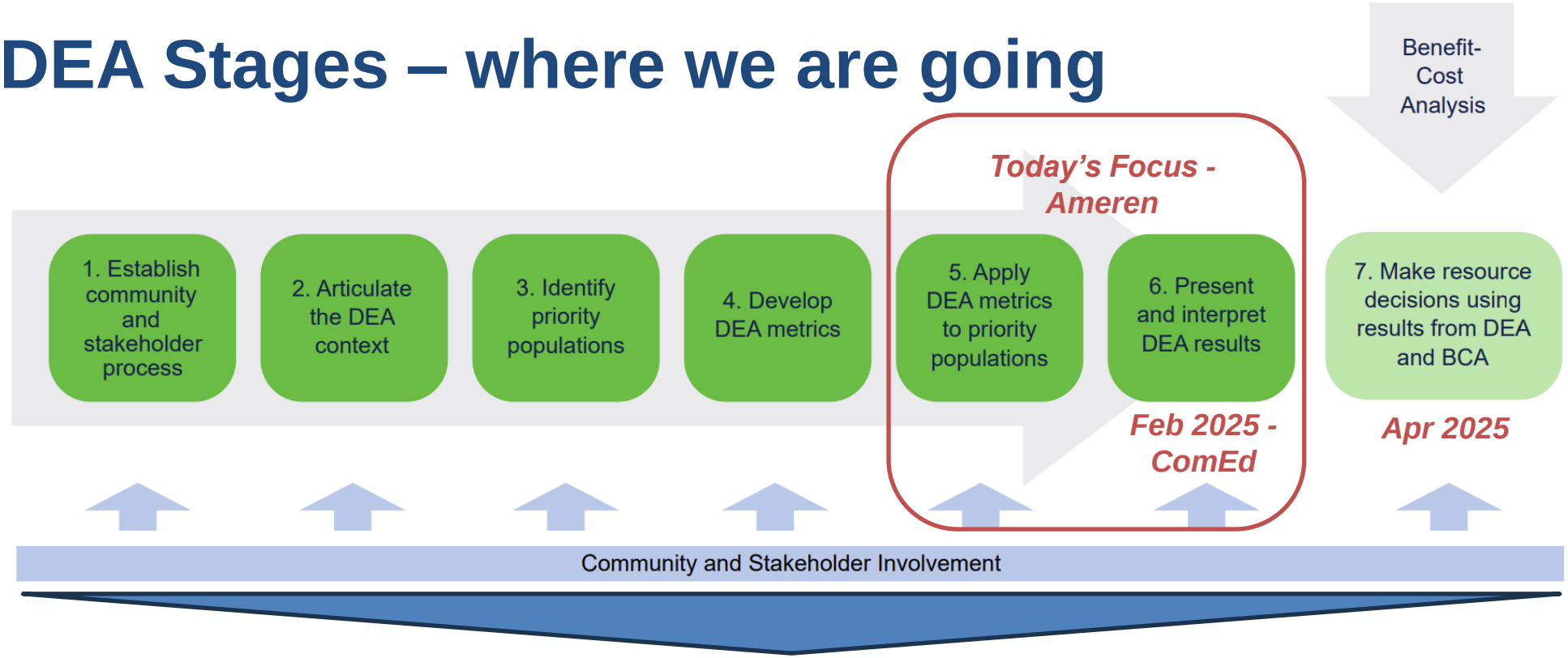
All Materials Posted to DEA Case Study Project Website:

DEACaseStudy.org

DEA Stages – where we are in the process



DEA Stages – where we are going



End product: Final report (June 2025)

- Describe Ameren BE and ComEd EE case studies
- Present priority populations, metrics, analysis for DEA
- Present results of DEA in relation to BCA results
- Provide recommendations for data collection to inform future DEA case studies

Ameren BE case study: recap from previous Work Group meetings

In previous meetings we determined the DEA context and priority population for each case study. During this meeting, we are focusing on Ameren:

Proposal	Utility	DER	*Programs*	Priority Population	Perspective
Case Study #2	Ameren	BE Plan,	ChargeSmart & ChargeReady	EIEC/LI	Prospective

At the last meeting (#4), we proposed metrics for the Ameren case study:

DEA Metrics	Ameren
1. Participation	Optional
2. Utility Investment	Yes
3. Rate and bill impacts	Yes
4. Energy savings	
5. Shutoffs	No

Background on
Ameren's Beneficial Electrification Plan

Acronyms

Acronym	Meaning
BE	Beneficial electrification
DC	Direct current (as in DC fast charger)
EV	Electric vehicle
EIEC/LI	Equity investment eligible community/low-income
PHEV	Plug-in electric hybrid
TRC	Total resource cost (test)
RIM	Ratepayer impact measure
CO_2	Carbon dioxide
NO_x	Nitrogen oxides
$PM_{2.5}$	Particulate matter <2.5 microns

Ameren BE Plan Overview

BE plans are required by the Electric Vehicle Act (20 ILCS 627)

Program type	Program	Standard Offering	EIEC/LI Offering
Bill and delivery credits	ChargeSmart	Special energy rates for charging during peak/off-peak	Same as Standard
	Residential Managed Charging	Bill credits to test managed EV charging	Same as Standard
Charging infrastructure	ChargeReady	Charger infrastructure incentives	Coverage of charger costs and more support for charging infrastructure
	Driver Education	EV & charger incentives for schools	EV & charger incentives for high schools in EIEC/LI communities
Technical assistance & education	Community Engagement & Consultation	Highly specific assistance to individual communities	Special financial assistance
	Trade Ally & Customer Service	Connects customers to EV experts	Same as Standard
	Fleet Assessment	Technical assistance for commercial customers	Same as Standard
	EV-as-a-service pilot	Education program reducing barriers to owning an EV	Same as Standard
Other	Home Ready	Home energy assessments	Fully covered assessments for income qualified customers
	EV School Bus Virtual Power Plant pilot	Electrifying school buses & virtual power plant demo	Same as Standard

Ameren BE Plan – Key Programs

ChargeReady (1)

Purpose: to increase access to charging infrastructure.

Residential offering: Complete coverage of costs to install and purchase level 2 residential chargers

Residential program available for: only EIEC/LI customers (Standard customers not allowed)

ChargeSmart (1)

Purpose: to provide time-of-use rate discounts and charges to encourage customers to charge EVs during low-cost hours.

Residential offering: Participants receive electric bill credits for charging their EVs during a preferred charging period and electric bill charges for charging their vehicle during non-preferred hours(1)

Residential program available for: all customers and no special incentives for EIEC/LI customers

(1) *Ameren Illinois Company Beneficial Electrification Plan 2.*

Stage 5 - Apply DEA metrics to priority populations

Initial findings for Ameren Beneficial Electrification Plan

Suggested Ameren BE DEA Metrics from WG Meeting #4

Potential Metric	October 9th Meeting			This meeting (December 13th)
	Recommend?	*Suitability*	*Key Rationale*	*Key Rationale*
1. Participation	Optional	Challenging to present	Participation is harder to aggregate for some BE programs and may be better captured by utility investment metric.	Included
2. Utility Investment	Yes	Strong	Good indication of neighborhoods that benefit most	Included
3a. Rate Impacts	Yes	Strong	Good indication of impacts on non-participants	Not included (impact on participants are the same)
3b. Bill Impacts	Yes	Strong	Good indication of impacts on participants	Calculated but under review with Ameren & will not be shared at this meeting.
4. Energy Savings	Yes	Strong	Good indication of impacts to participants	Not included (energy savings are an input into bill savings)
5. Shutoffs	No	Low	Relationship between transportation electrification programs and shutoffs is not well studied	Not included

Work group members asked about adding additional metrics: access to EV chargers and workforce development impacts.

Overview of metrics and data sources

Metric	Data Sources
Utility program investment ($, rebates & incentives)	Metrics calculated using utility data from the benefit-cost analysis
Participation	
Emissions	
Workforce impacts EV charger access	Metrics calculated using external public data or other reported utility data
Bill impacts	For future work group meeting Metrics calculated using utility data from the benefit-cost analysis

Metrics Results

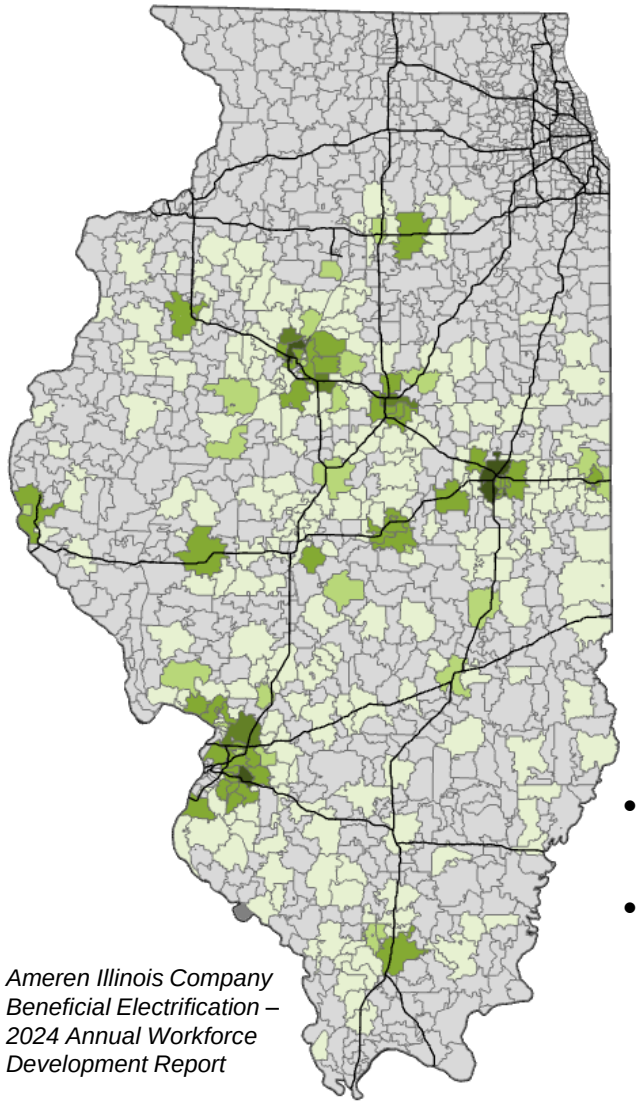
Metric: Participation

- How can participation in Ameren's BE programs be measured?
  - ChargeSmart – Number of vehicles participating in special EV time-of-use rate programs
  - ChargeReady – (1) number of chargers installed, (2) number of vehicles supported by the program
- Ameren assumes **25% EIEC/LI participation** in ChargeSmart and ChargeReady for Residential customers.
- Ameren's current customer base is **32% EIEC/LI**.(1)

(1) "Ameren Illinois' Refiled Multi-Year Integrated Grid Plan." Ameren Illinois Corporation (Mar 2024). Available at https://icc.illinois.gov/docket/P2023-0082/documents/348085/files/607904.pdf

Participation - ChargeSmart

Historical ChargeSmart Participation - 2023



Legend

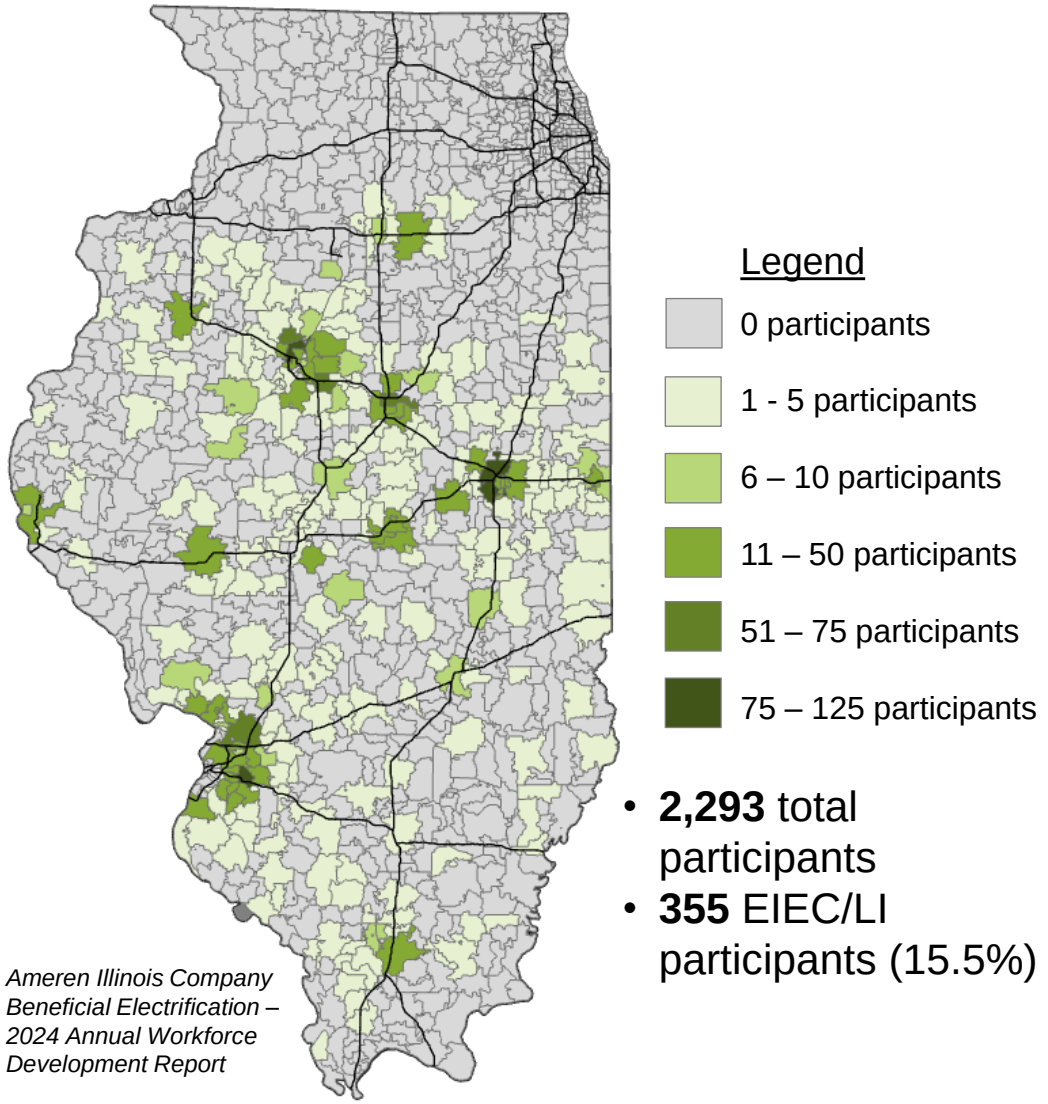
- 0 participants
- 1 - 5 participants
- 6 – 10 participants
- 11 – 50 participants
- 51 – 75 participants
- 75 – 125 participants

- **2,293** total participants
- **355** EIEC/LI participants (15.5%)

Ameren Illinois Company Beneficial Electrification – 2024 Annual Workforce Development Report

Participation - ChargeSmart

Historical ChargeSmart Participation - 2023



- **2,293** total participants
- **355** EIEC/LI participants (15.5%)

Ameren Illinois Company Beneficial Electrification – 2024 Annual Workforce Development Report

Forecasted Participation - 2026-2028

- Ameren predicts a total of **17,954 vehicle** participants in ChargeSmart
- **4,602 (26%)** of these vehicles assumed to be for customers in EIEC/LI communities

ChargeSmart	Number of vehicles participating (2026-2028, 3-yr total)			
	Standard	EIEC/LI	Grand Total	*% EIEC/LI*
Residential and Multi-Family	13,250	4,416	17,666	25%
Education, Fleet, and Transit Facility	102	186	288	65%
Grand Total	**13,352**	**4,602**	**17,954**	**26%**
% Participation (based on Eligible Customers in 2023)	1.6%	1.2%	1.5%	-

Participation - ChargeSmart

Projected Participation (2026-2028 BE Plan)

ChargeSmart	Standard	EIEC/LI
Total vehicles participating	74.4%	25.6%

Projected Participation Rates (by end of 2028)

ChargeSmart	Program Participation Rates* *(vehicles or chargers ÷ 2023 customers)*	
	Standard	EIEC/LI
% of total customers that participate in ChargeSmart	1.6%	1.2%

**Calculated as the number of chargers or vehicles divided by 2023 customer counts for EIEC/LI and all other customers, available from "Ameren Illinois' Refiled Multi-Year Integrated Grid Plan" (2024)*

Key takeaway

A quarter of all ChargeSmart participants are predicted to be EIEC/LI.

Overall, the EIEC/LI participation rate is slightly less than other customers.

Questions?

Participation – ChargeReady – New Chargers

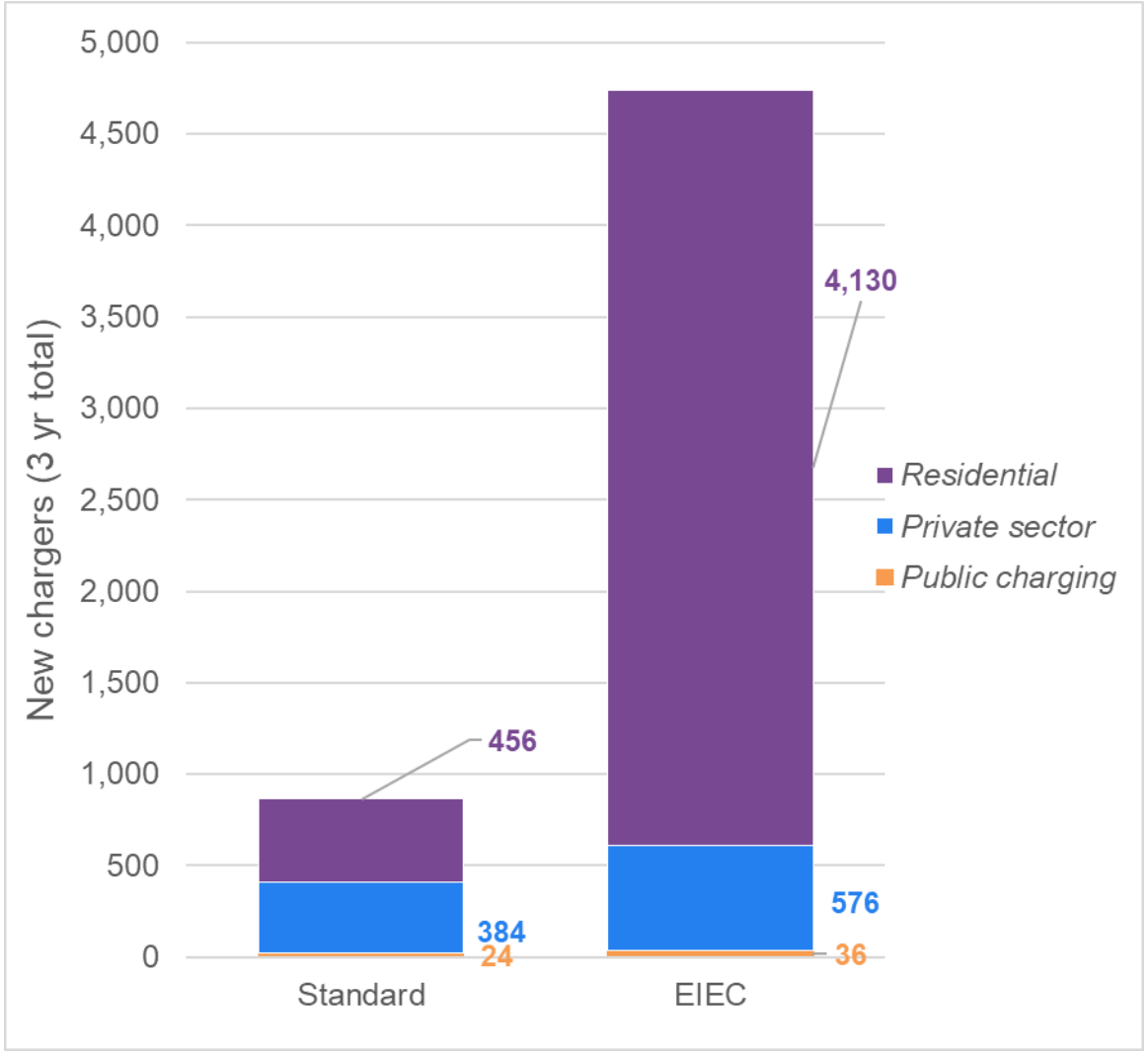
ChargeReady supports the installation of 5,606 **new** chargers in total.

85% of **all new** chargers are planned for customers in EIEC/LI communities.

90% of new **residential** chargers are planned for EIEC/LI customers.

60% of new **public and private sector** chargers are planned for customers in EIEC/LI communities.

Questions?



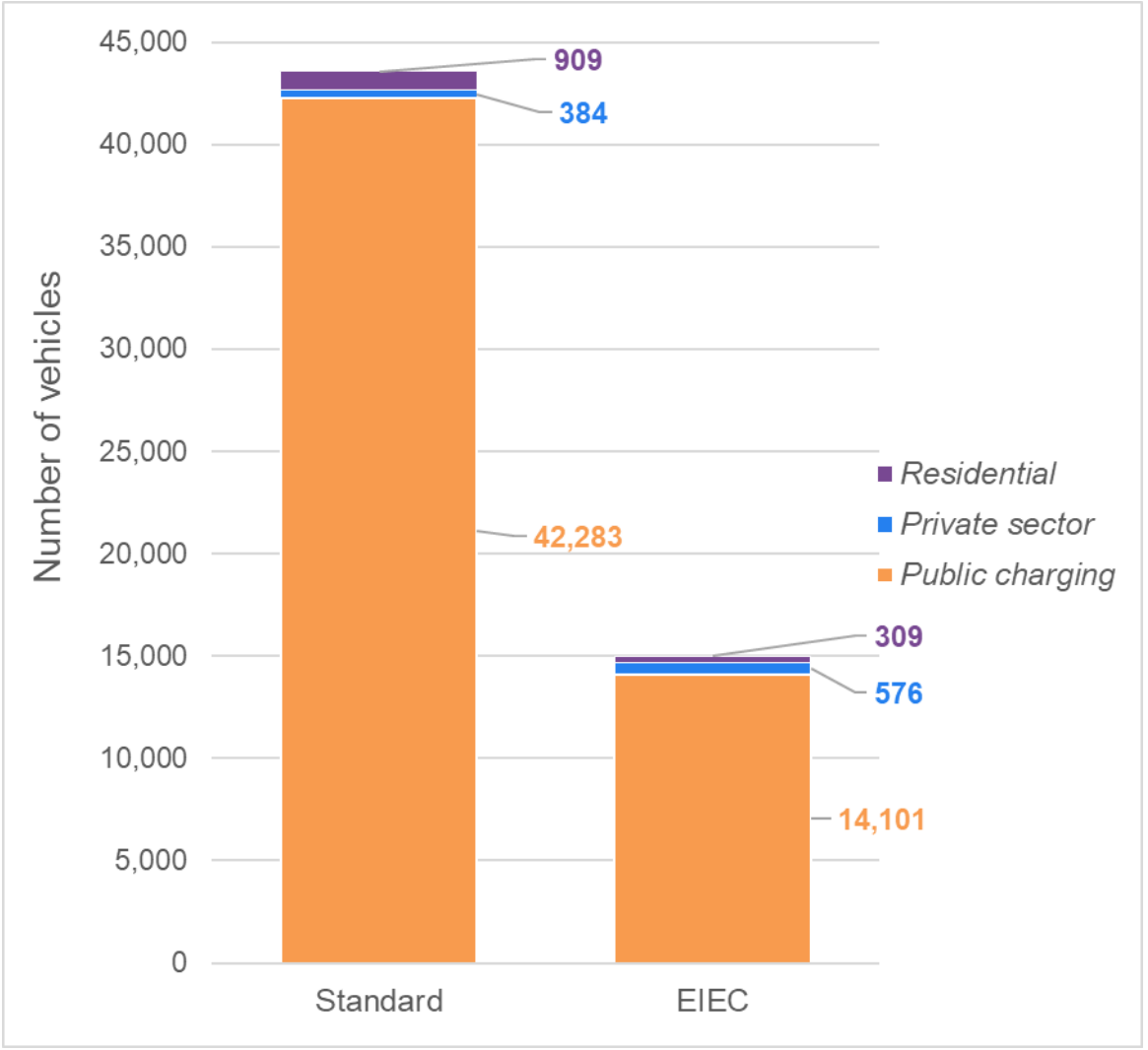
Participation – ChargeReady – Vehicles Supported

Ameren estimates **58,562** total vehicles will be charging at these newly installed chargers.

26% of **all** vehicles supported are planned for customers in EIEC/LI communities.

25% of all **residential** and **public charging** vehicles supported are planned for EIEC/LI customers.

60% of all **private sector** vehicles supported are planned for for EIEC/LI customers.



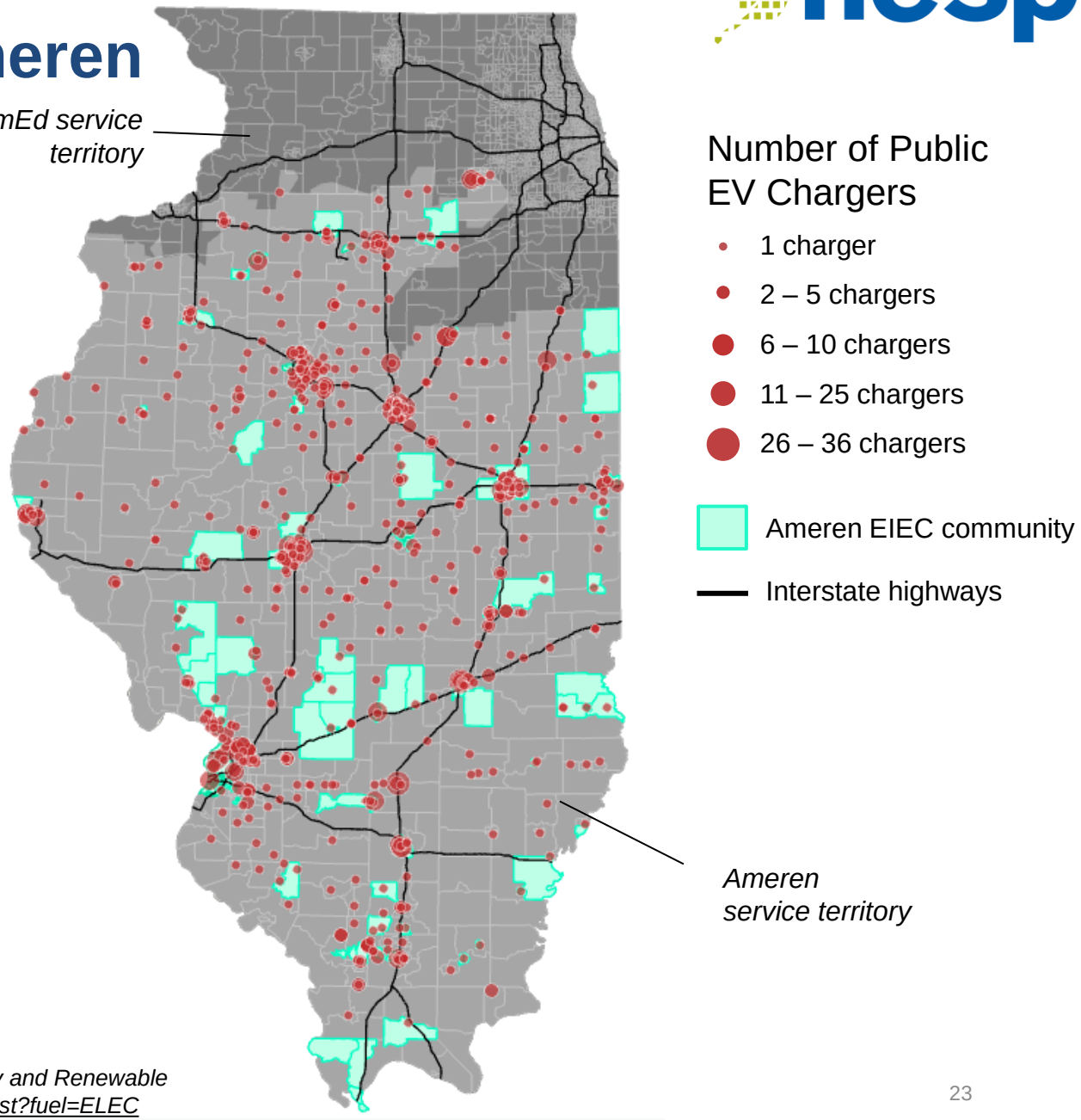
**Residential customers enrolled in ChargeReady are also required to enroll in ChargeSmart.*

Access to EV Chargers in Ameren

Number of Public EV Chargers

We mapped current locations of **publicly accessible EV chargers** in Ameren and compare the number of chargers in EIEC vs. other non-EIEC communities.(1)

Publicly accessible EV chargers			
Utility	**EIEC**	**Non-EIEC**	**Total**
Ameren	497	340	837



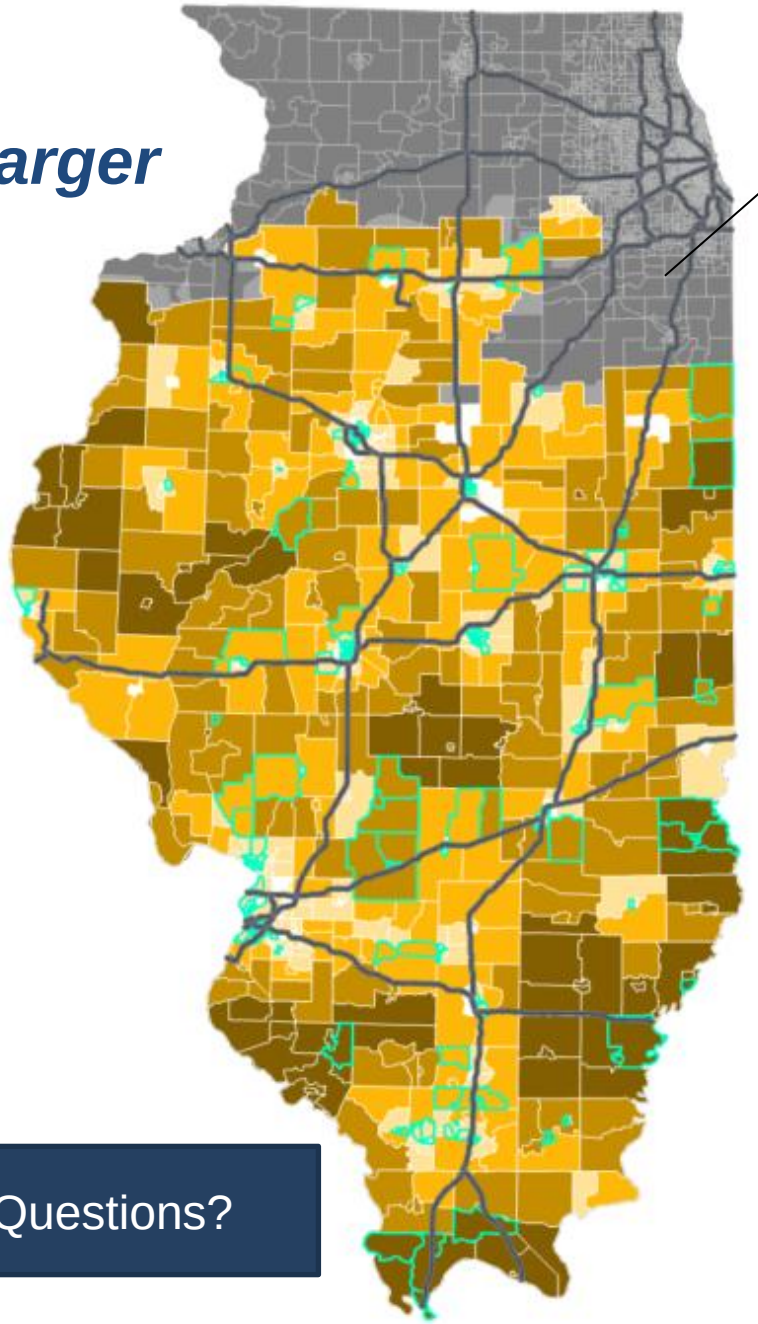
(1) "Electric Vehicle Charging Locations." U.S. Department of Energy – Energy Efficiency and Renewable Energy. (2024). Available at https://afdc.energy.gov/fuels/electricity-locations#/find/nearest?fuel=ELEC

Access to EV Chargers
Distance to nearest public charger

People living in EIEC communities are **4.8 miles** from the nearest charger.

People living in Non-EIEC communities are **8.4 miles** from the nearest charger.

Distance to nearest charger (miles)			
Utility	**EIEC**	**Non-EIEC**	**All Ameren**
Rural	13.9	12.2	12.4
Urban	2.6	3.5	3.1
Average	4.8	8.4	7.4



Questions?

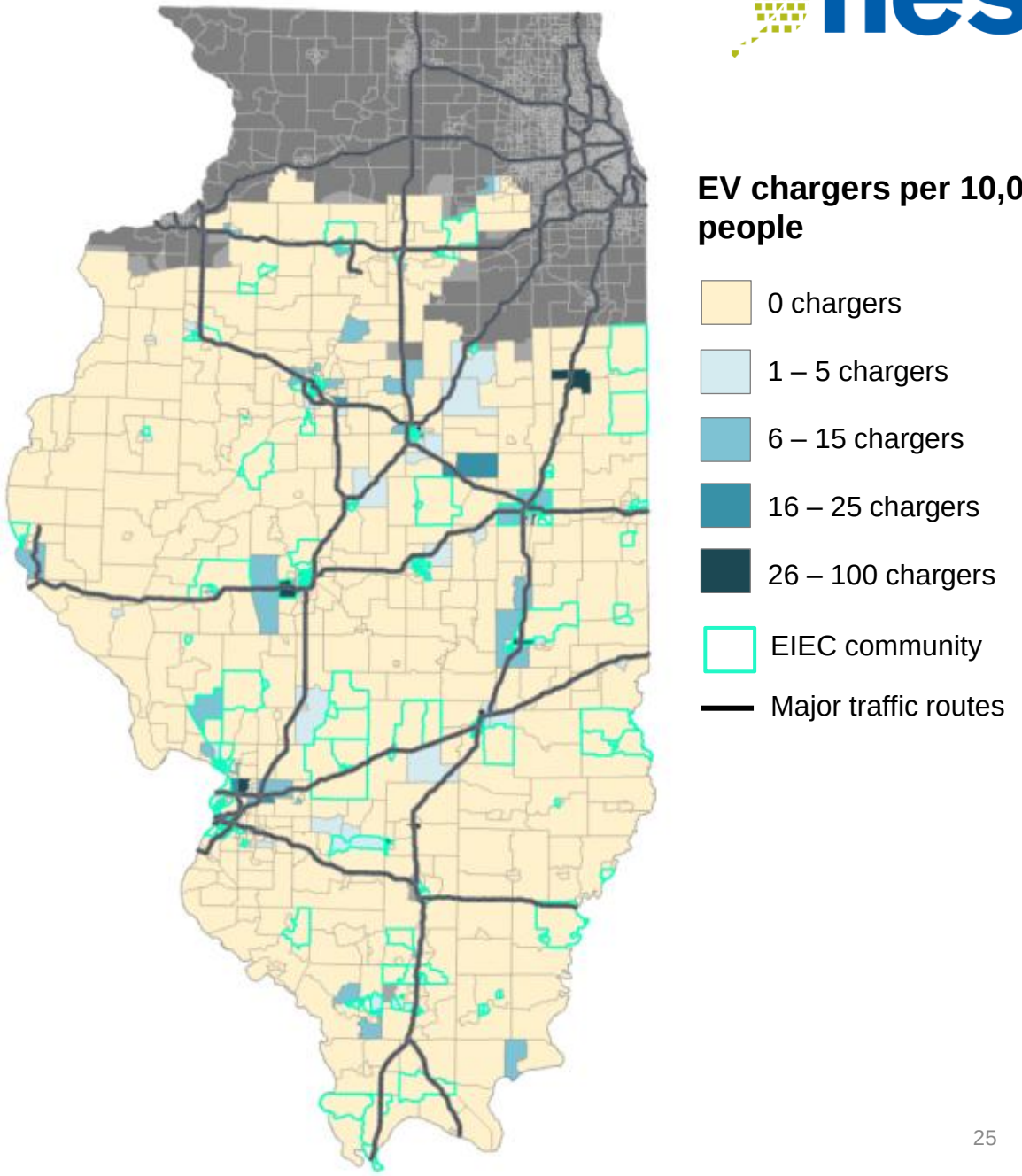
Access to EV Chargers

Public Chargers per 10,000 people

There are **3.5 chargers per 10,000 people** in EIEC communities in Ameren's service territory.

There are **2.2 chargers per 10,000 people** in non-EIEC communities in Ameren's service territory.

Chargers per 10,000 people			
Utility	**EIEC**	**Non-EIEC**	**All Ameren**
Rural	0.5	0.7	0.7
Urban	4.2	4.1	4.1
Average	3.5	2.2	2.5



EV Chargers – access vs. benefits

- Results from the EV charger mapping analysis suggest that EIECs populations have roughly equal or slightly higher access to EV chargers. However, it says nothing about **if these populations own EVs**.

- Locating an EV charger in an EIEC/LI community does not mean those populations own EVs and will see benefits from using those chargers.

- EV chargers **located along highways and major transit routes** likely serve long-distance travelers rather than the local host population.
  - Higher loads from charging EVs may require new electrical infrastructure (substations and distribution lines).
  - However, EIEC/LI communities that host these chargers may not necessarily be *using these chargers.*
  - Upgrading and siting of new electrical infrastructure to handle higher loads should critically consider if there are benefits to host EIEC/LI communities.

- **Reducing barriers to EV adoption for EIEC/LI customers** is as-important as siting new EV chargers.

- Ameren's **Community Engagement & Consultation** program provides direct financial support for communities looking to develop EV adoption strategies.

Participation - ChargeReady

Key Takeaway

- Ameren is proposed to install a total of **60 new publicly** available EV chargers by 2029.
- **40%** of publicly available chargers will be dedicated towards EIEC communities
- However, EIEC communities will only see benefits if they drive EVs.

Count of publicly accessible EV chargers in Ameren Territory				
Timeframe	**Non-EIEC**	**EIEC**	**Total**	***% Chargers in EIECs***
Current chargers (2024)	340	497	837	59%
Ameren proposed public chargers (BE Plan #2)	**36**	**24**	**60**	**40%**
Total Chargers (1/1/2029)	376	521	897	58%

Questions?

Metric: Utility investment

Ameren's 3-yr BE plan's electric incentive budget* is $79 million

ChargeReady and **ChargeSmart programs** make up 98% ($77 million) of the electric incentive budget.

Program	Standard	EIEC/LI	% EIEC/LI	Total	% of Portfolio
ChargeReady Program	$ 6.5 M	$ 35.1 M	**84%**	$ 41.6 M	53%
ChargeSmart Program	$ 26.3 M	$ 9.3 M	**26%**	$ 35.6 M	45%
Other programs	$ 0.1 M	$ 1.8 M	**95%**	$ 1.9 M	2%
Total Portfolio	**$ 32.8 M**	**$ 46.2 M**	**58%**	**$ 79.1 M**	**100%**

*includes all incentive spending (including bill & delivery credits) and excludes any non-incentive spending (administrative, IT, and overhead costs).

Key Takeaway

EIEC/LI customer segment receive **more** utility investment than standard customers.

- **ChargeSmart** incentives are more aimed towards standard customers rather than EIEC/LI participants.
- **ChargeReady** incentives are more aimed towards EIEC/LI customers.

Emissions

Ameren's BE plan leads to **emissions savings*** from replacing gasoline and diesel vehicles with battery and plug-in hybrid vehicles.

- 87% of NOx and 50% of CO_2 emissions reductions are due to vehicles driven by EIEC/LI customers who participate in ChargeSmart and ChargeReady.

Emissions reductions from switching to EVs, lack a **spatial** component.

- We know *which* customer type is participating (EIEC/LI or other) but not *where* the emissions reductions are occurring.
- For example, an EIEC/LI participant may live in one community but do all driving in another area. Emissions reductions would materialize in the community *where the driving is occurring* (this type of data is not available)

Ameren is conducting a neighborhood level emissions assessment in 2025.

* Includes avoided emissions from replacing combustion vehicles, increased emissions from more energy generation, and avoided emissions from load shifting during peak periods.

Figure 1. Net NOx emissions changes (2026-2028)

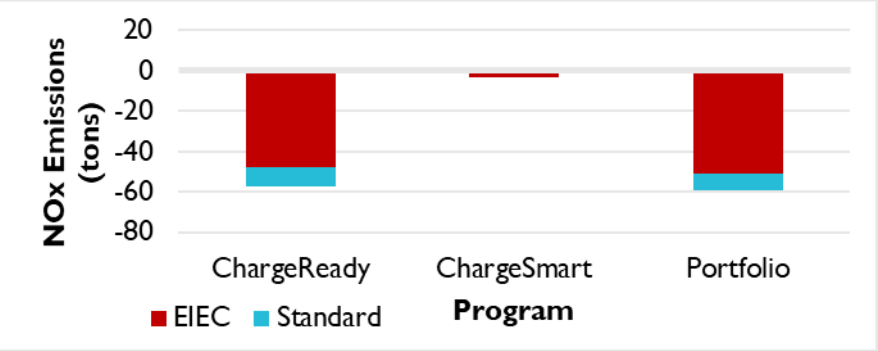


Figure 2. Net $PM_{2.5}$ emissions changes (2026-2028)

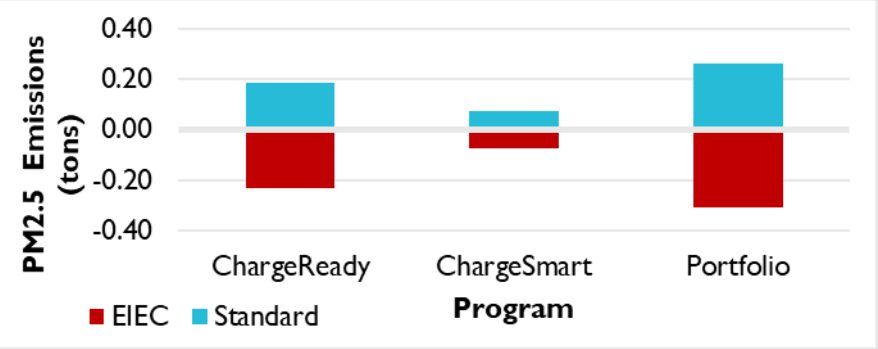
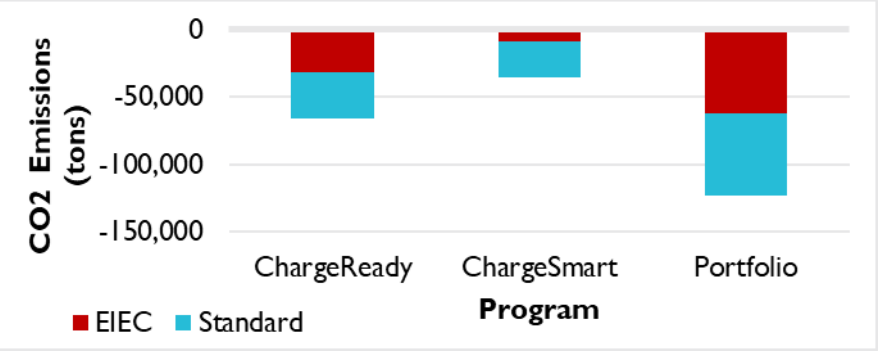


Figure 3. Net CO_2 emissions changes (2026-2028)



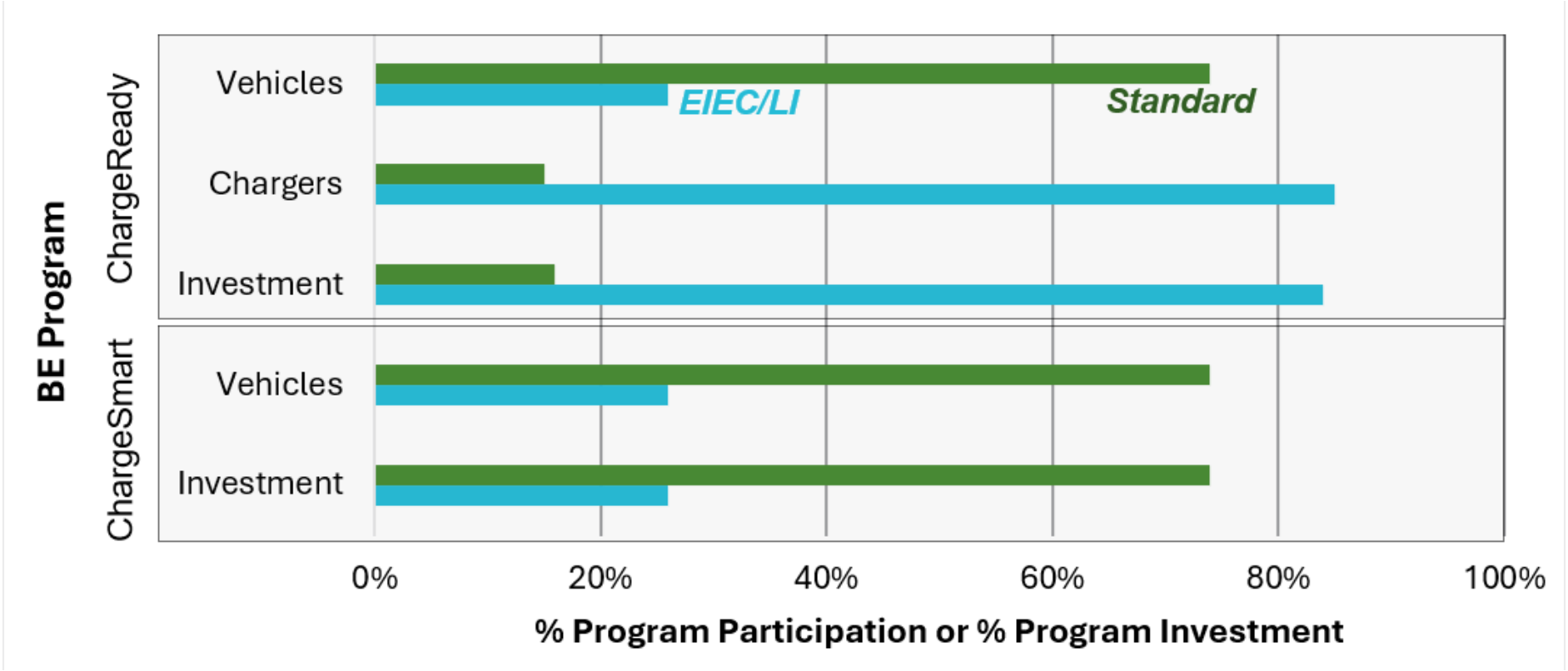
Emissions

Key Takeaway

- While over half of emissions reductions (CO_2, NOx, and $PM_{2.5}$) are due to EIEC/LI participation, we cannot say conclusively *where* these emissions reductions will be occurring.
- Therefore, we cannot conclude these reductions leads to health benefits for EIEC/LI customers.

Summary

Participation and Investment



Questions?

Other data: Workforce development

Workforce Impacts

Ameren released a workforce development plan in July 2024 with a goal to dedicate 31% of labor budgets to diverse businesses. Ameren's Illinois diverse business spending in 2023 was >$617 million.(1)

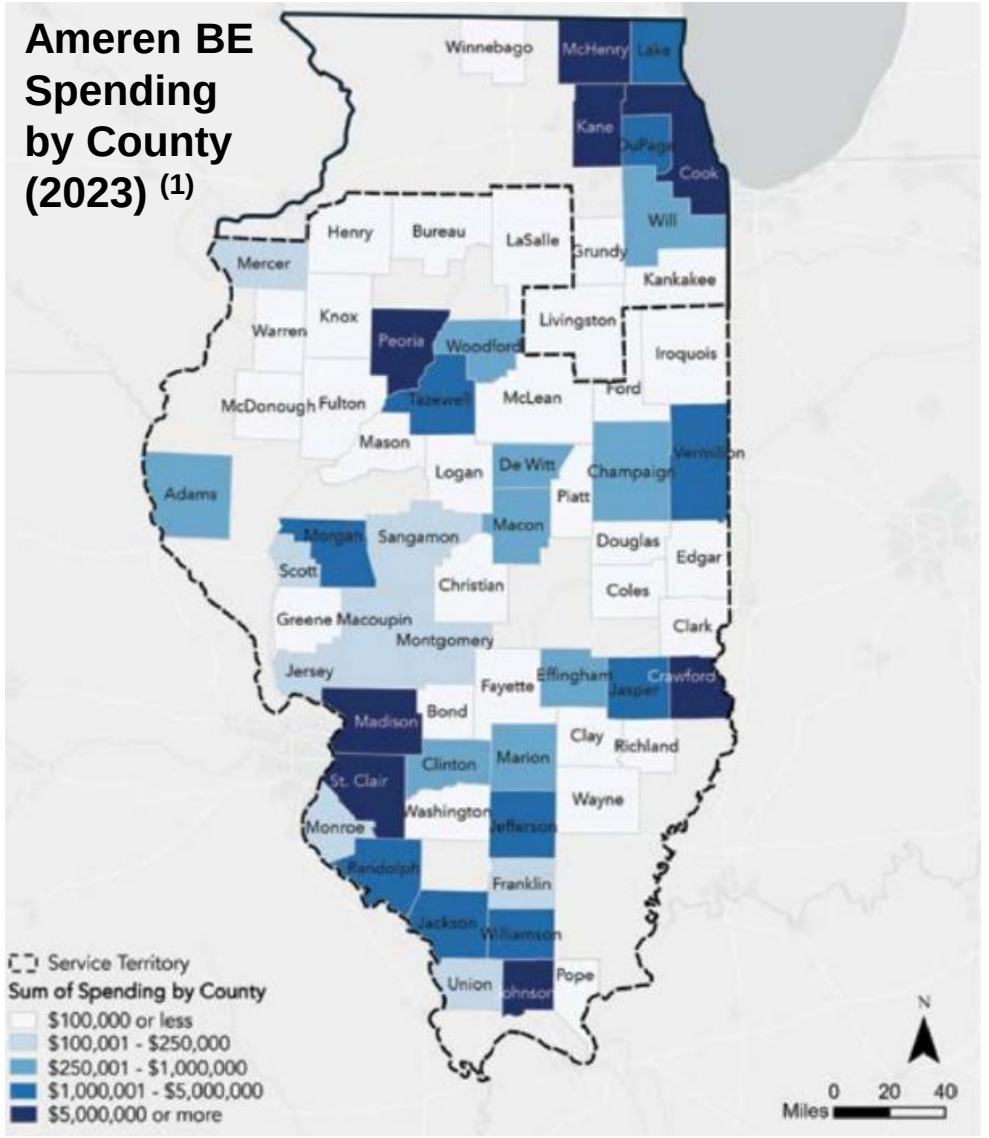
- Supported 5,770 jobs and >$382 million in wages earned in Illinois.

Ameren has contracted with 9 subcontractors to implement its BE program.(1)

- **44%** have local staff
- **33%** are certified as minority-owned, minority-nonprofit, or women-owned
- **44%** have submitted a Market Development Action Plan outlining how they will further DEI goals.

Key Takeaway

Additional tracking/data is needed for workforce development to be used as a DEA metric.



(1) *"Ameren Illinois Company Beneficial Electrification – 2024 Annual Workforce Development Report." Ameren Illinois Company (Jul 2024). Accessed online.*

Project Schedule and Next Steps

Estimated Project Schedule and Work Group Meetings

Work Group Meeting	Approximate Date
#1 - Introduction to process, relevant policies	March 6, 2024
#2 – Proposed Case Studies & DEA Context	May 10, 2024
#3 – Priority Populations and DEA Metrics	July 24, 2024
#4 – DEA Metrics	Oct 9, 2024
#5 –Ameren BE DEA - Initial Results	Dec 13, 2024
#6 – Ameren BE DEA – Results II & ComEd EE DEA – Initial Results	Feb 2025
#7 – Decision-making & Draft Report	Mar 2025
#8 – Final Report Debrief	Apr 2025

Next Steps

- Our team will finalize Ameren metric results and analyze forthcoming ComEd data for priority populations to present at the next meeting
- Our team will work with Ameren staff on bill impacts with the goal to share results at the next meeting.
- Please reach out to team with any questions/comments following this meeting (see next slide)
  - Project Coordination: Julie Michals at jmichals@e4thefuture.org
  - Lead Work Group contact: Greg Ehrendreich at gehrendreich@mwalliance.org

Thank you!
Contact Information

Julie Michals
jmichals@e4thefuture.org

Alice Napoleon
anapoleon@synapse-energy.com

Tim Woolf
twoolf@synapse-energy.com

Greg Ehrendreich
gehrendreich@mwalliance.org

Natalie Newman
nnewman@mwalliance.org

Check out NESP Events for NSPM and BCA webinars

Stay informed with NESP News

Project Team

Midwest Energy Efficiency Alliance

Liaison and facilitation

Gregory Ehrendreich
Manager

Natalie Newman
Sr. Policy Associate

E4TheFuture

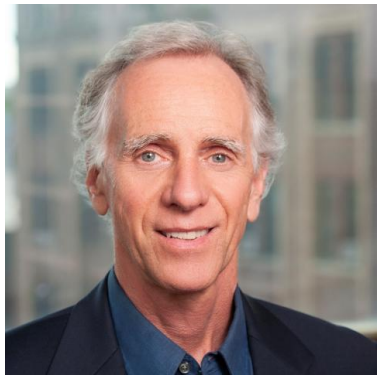
Project management

Julie Michals
Director

Synapse Energy Economics

Research and analysis

Alice Napoleon
Principal Associate



Tim Woolf
Senior VP

DEA Work Group – Going Into Meeting 4

First	Last	Organization
Kevin	Dick	389nm
Bev	Bowlby	Ameren Illinois
Peter	Millburg	Ameren Illinois
Agnes	Mrozowski	Ameren Illinois
Brice	Sheriff	Ameren Illinois
Celia	Johnson	Celia Johnson Consulting
Andrew	Weuve	Champaign County Regional Planning Commission
Mary Ellen	Guest	Chicago Historic Bungalow Association
Sarah	Moskowitz	Citizens Utility Board
Kyle	Danko	ComEd
Jim	Fay	ComEd
Molly	Lunn	ComEd
Cassidy	Kraimer	Community Investment Corp (CIC) Chicago
Kenyatta	Parker	Community Investment Corp (CIC) Chicago
MeLena	Hessel	Elevate
Pastor Booker	Vance	Elevate

First	Last	Organization
Quinn	Parker	Encolor Consulting
Chris	Neme	Energy Futures Group (for NRDC)
Fahad	Rashid	EPE Consulting
Cheryl	Watson	Equitable Resilience Sustainability
Selena	Worster Walde	Erthe Energy Solutions
Neil	Curtis	Guidehouse
Mark	Mandolini	Honeywell
Roger	Pavey	Illinois Association of Community Action Agencies
Elizabeth	Horne	Illinois Commerce Commission
Ronaldo	Jenkins	Illinois Commerce Commission
Latifat	Moradeyo	Illinois Commerce Commission
Jennifer	Morris	Illinois Commerce Commission
Jim	Zolnierek	Illinois Commerce Commission
Caty	Lamadrid	Inova Energy Group
Grey	Staples	Mendota Group
Karen	Lusson	National Consumer Law Center

First	Last	Organization
Kari	Ross	Natural Resources Defense Council
Scott	Metzger	Office of the Illinois Attorney General
Susan	Satter	Office of the Illinois Attorney General
Shelby	Smith	Office of the Illinois Attorney General
Hannah	Howard	Opinion Dynamics
Julia	Friedman	Oracle
Christina	Frank	Peoples Gas and North Shore Gas
Kristen	Kalaman	Resource Innovations
Deborah	Dynako	Slipstream
Nikia	Perry	Solutions for Energy Efficient Logistics (SEEL)
Keely	Hughes	The JPI Group
Stephen	Taylor	The Will Group
Boratha	Tan	Vote Solar
Erika	Dominick	Walker-Miller Energy Services
Carla	Walker-Miller	Walker-Miller Energy Services

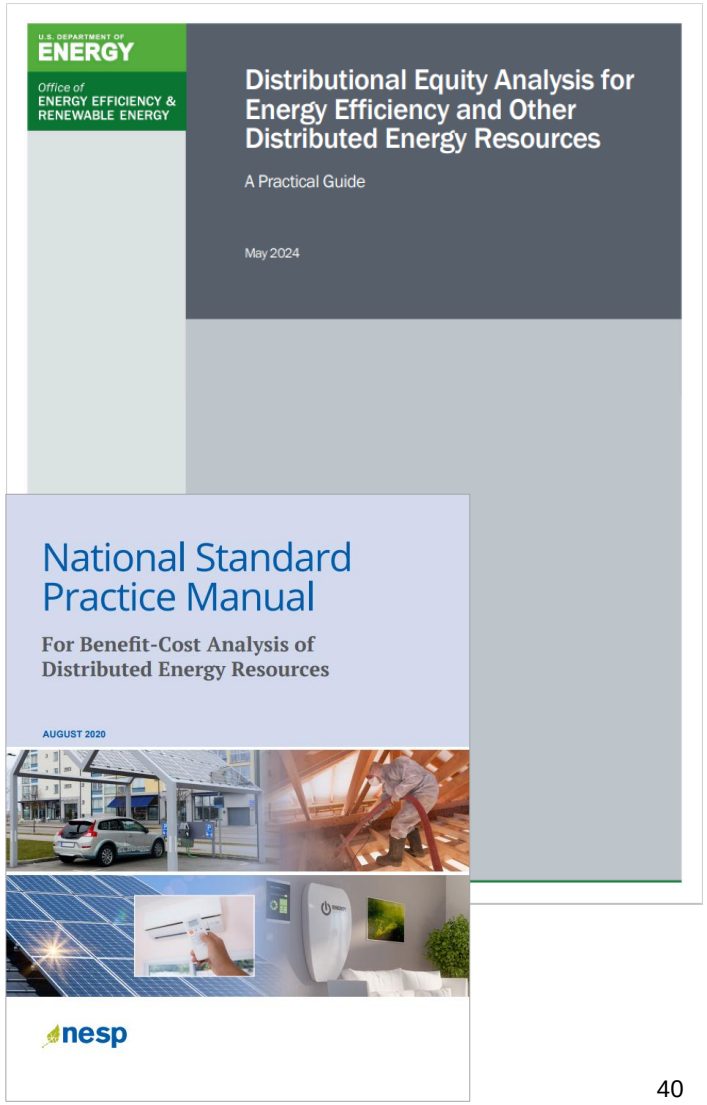
Guiding Resources for the DEA Case Studies

Distributional Equity Analysis for Energy Efficiency and Other Distributed Energy Resources *(May 2024)*

- Funded by US DOE, through Lawrence Berkeley National Lab (LBNL) and E4TheFuture
- Overseen by an Advisory Committee made up of experts in energy equity and in energy planning.
- Additional information and report available here.

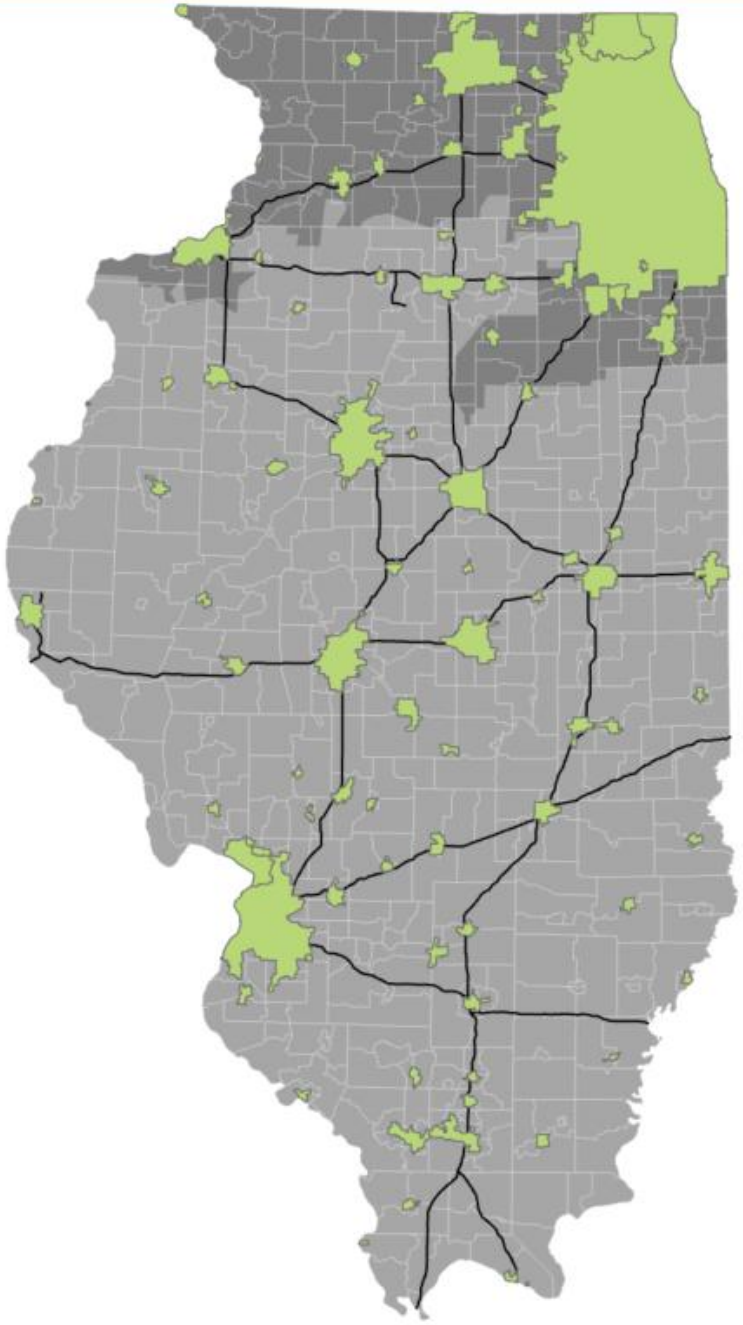
National Standard Practice Manual (NSPM) for DERs

- Benefit Cost Analysis (BCA) guidance being used by states across the country
- With state focus on equity, key questions raised about how BCA addresses equity (or not…)

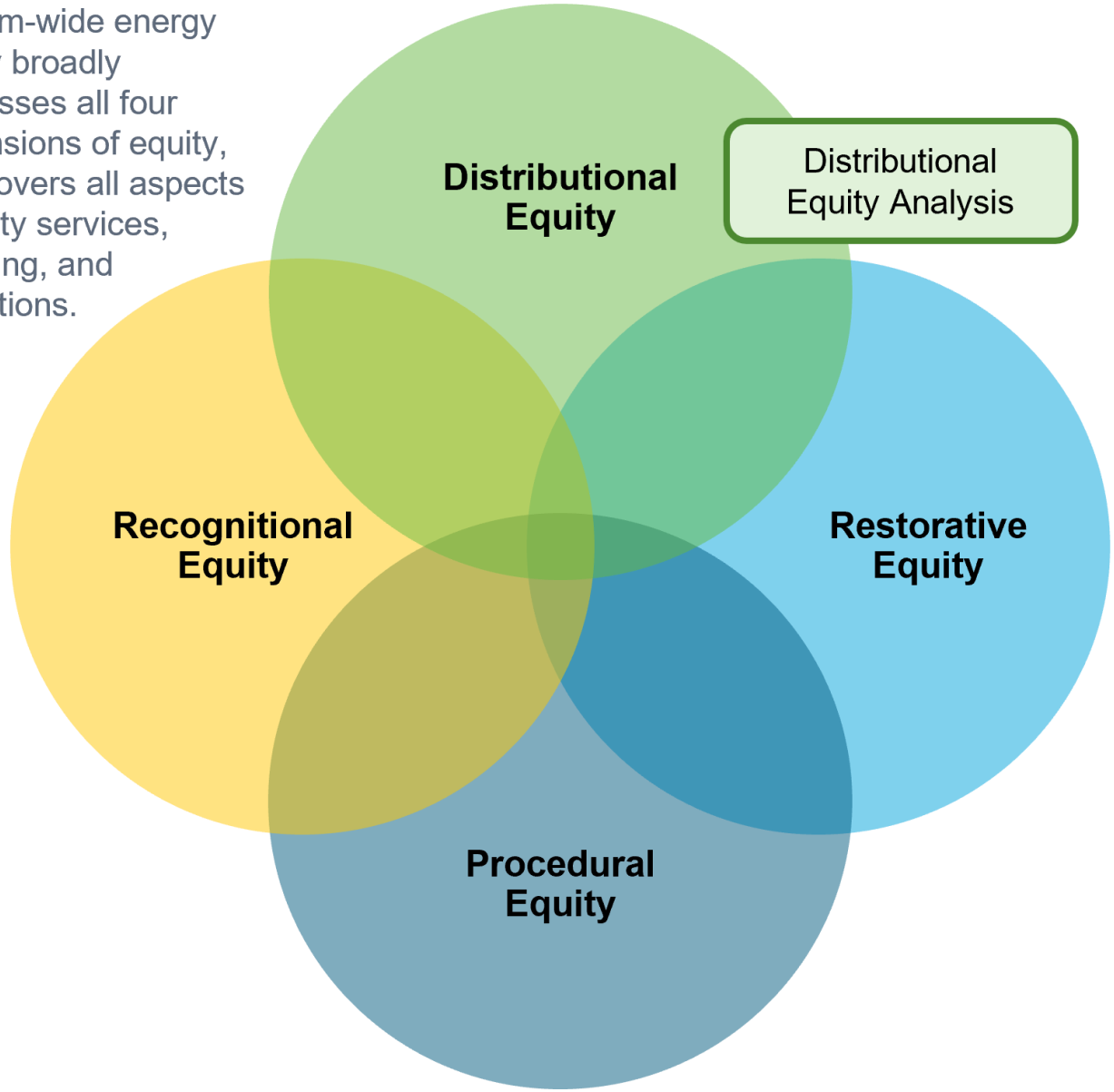


Background Slides

Urban Areas in Illinois



System-wide energy equity broadly addresses all four dimensions of equity, and covers all aspects of utility services, planning, and operations.



Distributional Equity Analysis + Benefit Cost Analysis

DEA and BCA address one aspect of distributional equity:

What are the distributional equity impacts of utility resource investments?

Eligibility Verification for ComEd's EE Programs

- Low-income customers (income-qualified)
  - Income-qualified multifamily customers – income below 80% of Area Median Income – can verify eligibility through:
    - Showing participation in an affordable housing program or weatherization assistance program
    - Submittal of a Rent Roll documentation or tenant information showing income
    - Located in a Low-Income Census tract
    - Demonstrate participation in disaster relief program or local/community-based assistance programs
  - Income-qualified single family customers - income below 80% of Area Median Income – can verify eligibility through
    - Showing participation in a weatherization assistance program, energy assistance program (such as Low Income Home Energy Assistance Program (LIHEAP) or the Percentage of Income Payment Plan (PIPP), other income eligible programs like the Supplemental Nutrition Program (SNAP),
    - Being located in a census tract identified as low-income (using the U.S. Department of Housing and Urban Development (HUD) annually published "qualified census tracts")
    - Self-certification process

Source: https://www.ilsag.info/wp-content/uploads/IL_EE_Policy_Manual_Version_3.0_Final_11-3-2023.pdf

Eligibility Verification for Ameren's BE Programs

- Eligible BE program participants are those located in:
  - an Environmental Justice Community
  - Restore, Reinvest, Renew (R3) Community
  - Low-income community

- Eligible BE program participants are also individual customers who:
  - Lives in an EJC, R3, or LI community
  - Is low-income, meaning:
    - A member of a household at or below 80% of the latest median household income as reported by the United States Census Bureau for the most applicable community or county;
    - A member of a household at or below 150% of the federal poverty level;
    - A person who is eligible for the Illinois Low Income Home Energy Assistance Program (LIHEAP) as defined in the Energy Assistance Act;
    - A person who is eligible to participate in the Percentage of Income Payment Plan (PIPP or PIP Plan) as defined in the Energy Assistance Act; or
    - A person who is eligible to receive Lifeline service as defined in the Universal Service Telephone Service Protection Law of 1985.

Source: https://www.icc.illinois.gov/docket/P2024-0494/documents/352385/files/616708.pdf