SEEA

SOUTHEAST ENERGY EFFICIENCY ALLIANCE

Sharing the Benefits and Costs – Distributional Equity Analysis of Utility Investments

Wednesday December 13, 2023

OUR MISSION

To optimize the use and impact of energy to enhance the quality of life in the Southeast.

OUR VISION

All people in the Southeast live and work in healthy and resilient buildings, utilize clean and affordable transportation, and thrive in a robust and equitable economy.

OUR VALUES

Take Initiative

We take responsibility for realizing a better quality of life in the Southeast.

Value Others

We seek, respect, and promote diverse perspectives.

Earn Trust

We pursue our work with benevolence, competence, and reliability.

Pursue Equitable Solutions

We recognize, acknowledge, and account for a history of prejudice and inequality in Southeastern communities.

Today's Speakers

Wally Nixon

Alice Napoleon

Will Bryan

SEEA
SOUTHEAST ENERGY EFFICIENCY ALLIANCE

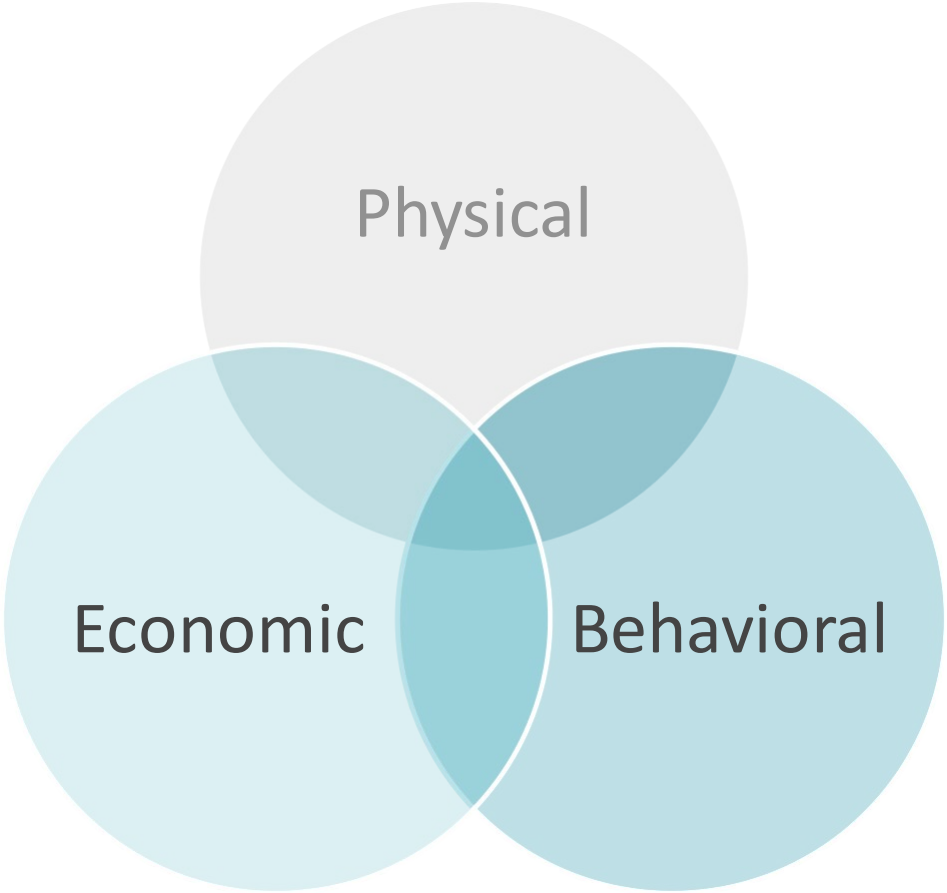
SEEA

SOUTHEAST ENERGY EFFICIENCY ALLIANCE

Energy Insecurity and Distributional Equity in the Southeast

Will Bryan, Ph.D.
Director of Research
wbryan@seealliance.org

One out of every three people in the South faces **ENERGY INSECURITY**, "an inability to adequately meet household basic energy needs" including heating, cooling, and lighting.



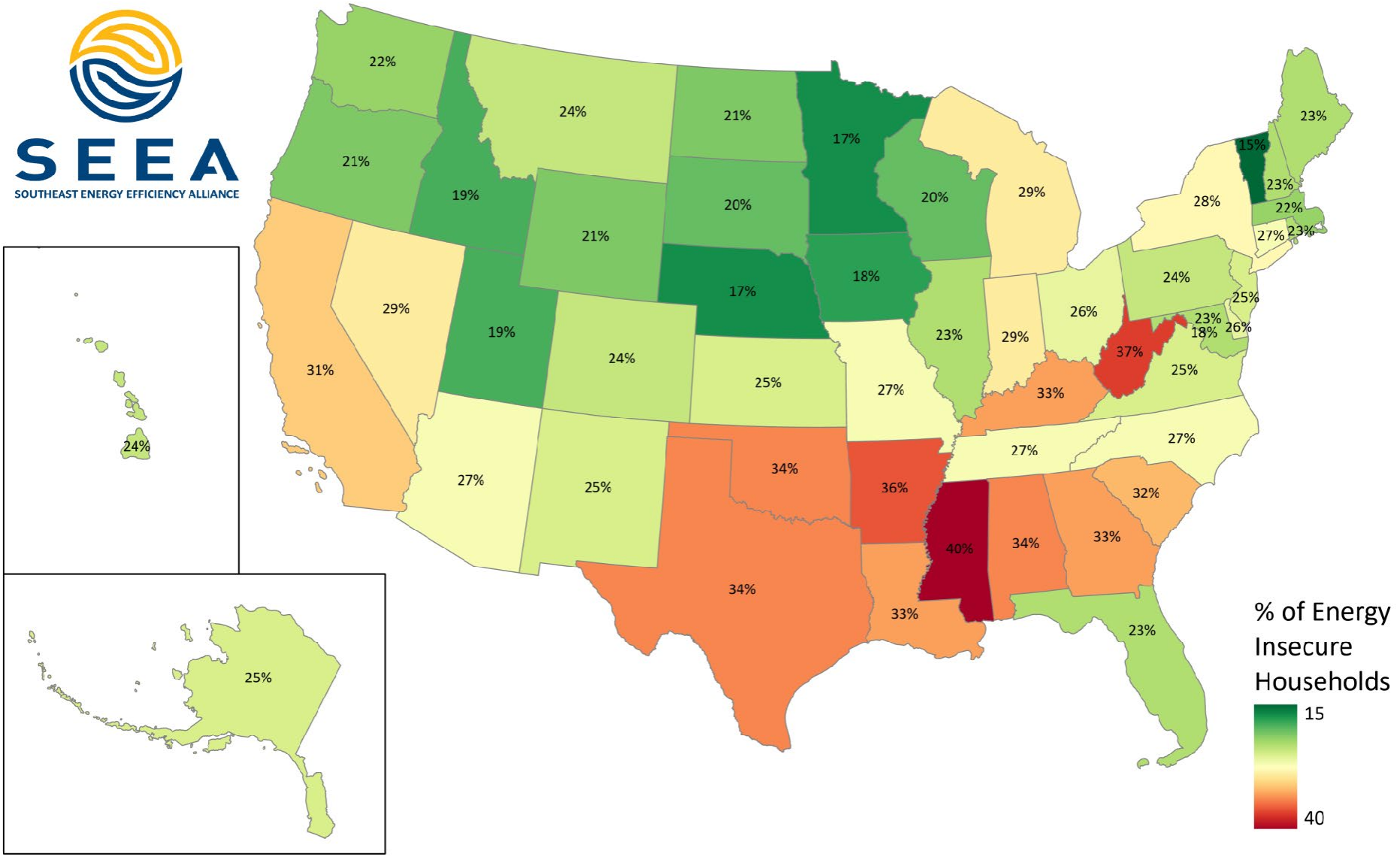
SEEA
SOUTHEAST ENERGY EFFICIENCY ALLIANCE

Elements of Equity

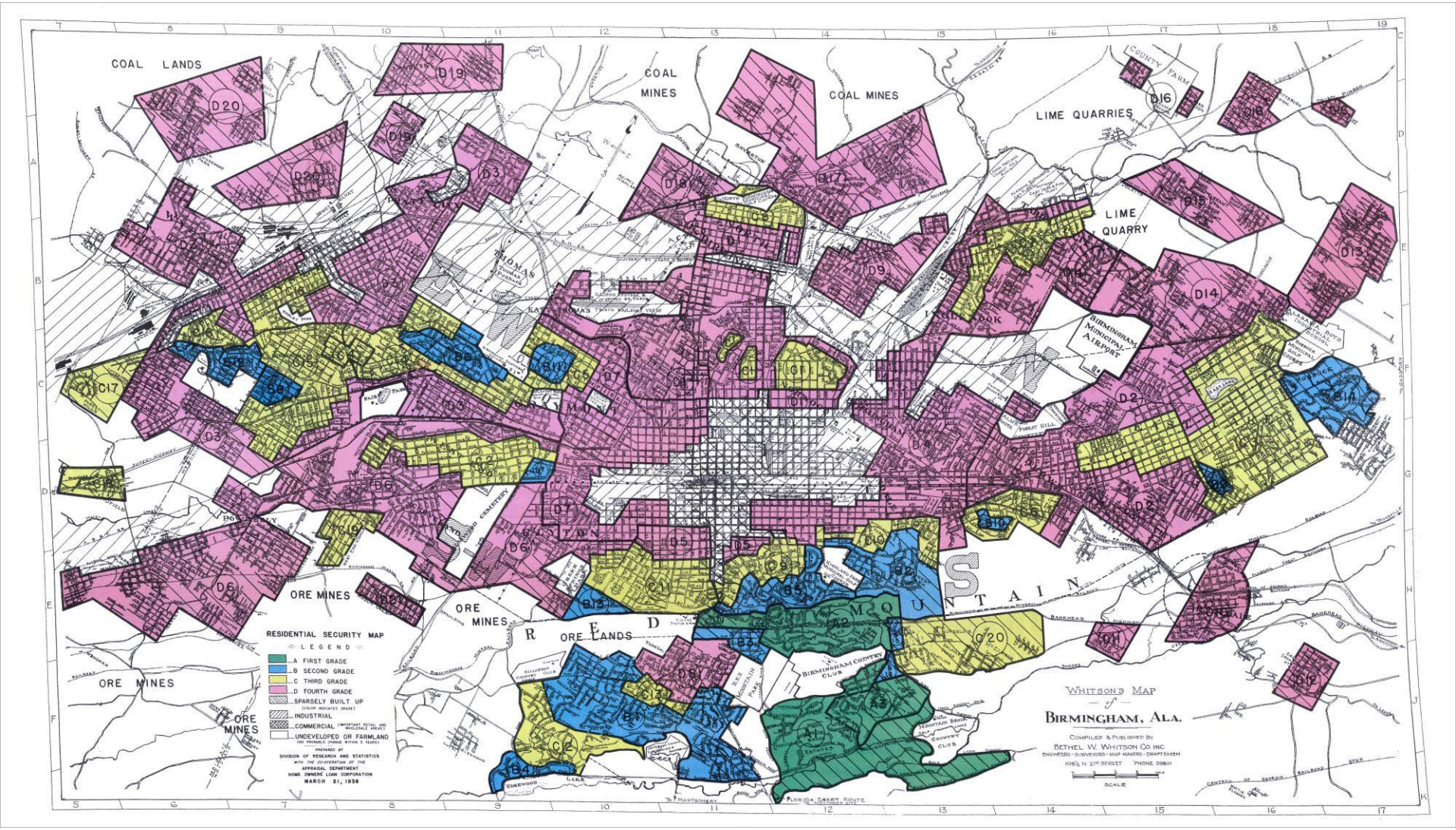
- **Distributional Equity:** equitable distribution of benefits and burdens across all segments of a community and across generations
- **Procedural Equity:** Promoting inclusive, accessible, and authentic engagement and representation when developing or implementing programs and policies
- **Recognitional Equity:** Recognizing the historical, cultural, and institutional dynamics and structures that have led to energy inequities
- **Restorative Equity:** Providing reparations for past inequities, rectifying practices that perpetuate inequities, promoting accountability for key decision-makers

SEEA
SOUTHEAST ENERGY EFFICIENCY ALLIANCE

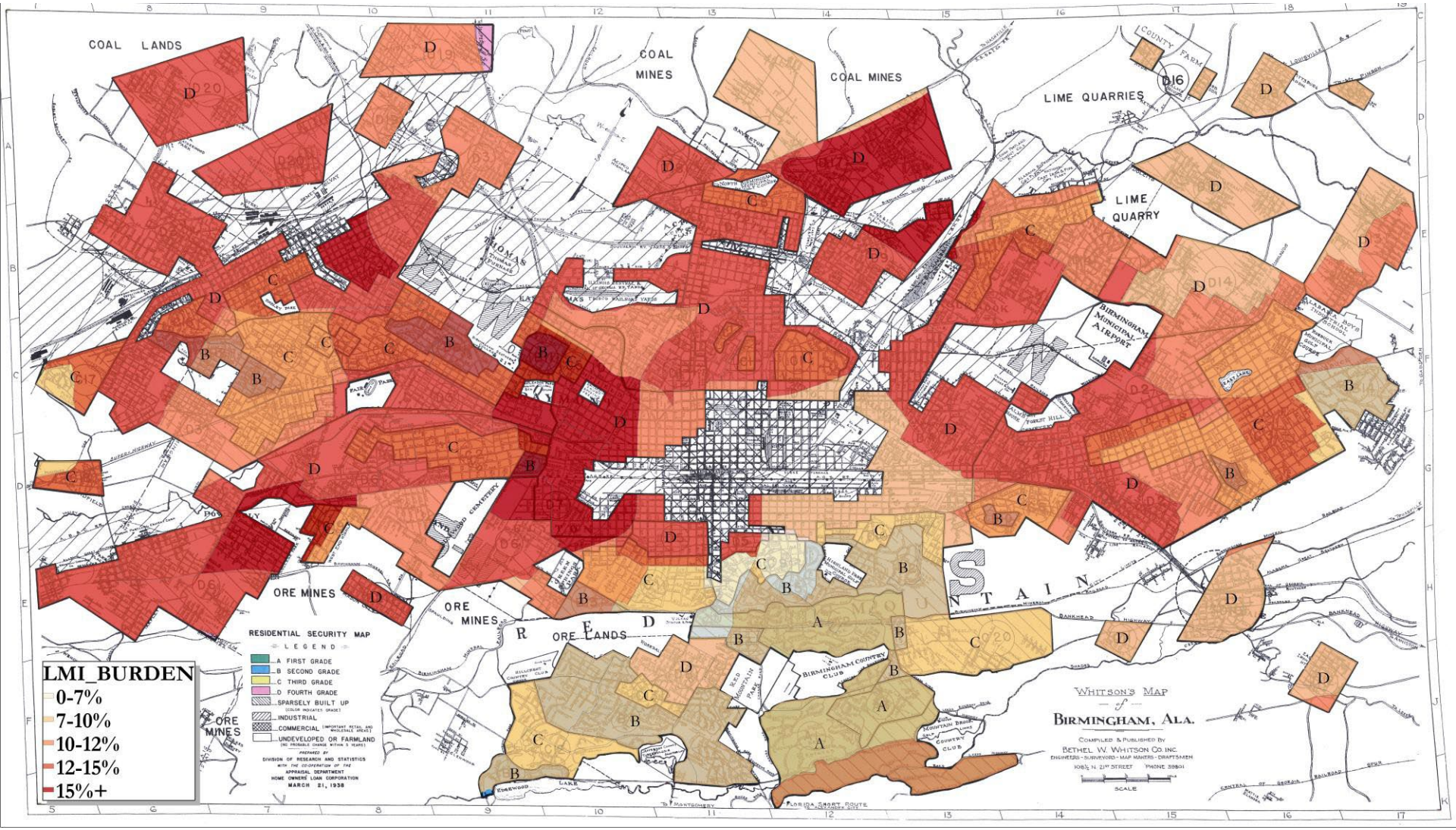
Energy insecurity is most acute in the South



Energy insecurity is rooted in the past.



SEEA
SOUTHEAST ENERGY EFFICIENCY ALLIANCE



SEEA
SOUTHEAST ENERGY EFFICIENCY ALLIANCE

HOLC Map: University of Richmond; Data: U.S. Department of Energy, Low Income Energy Affordability Data (LEAD) Tool. Map: SEEA.

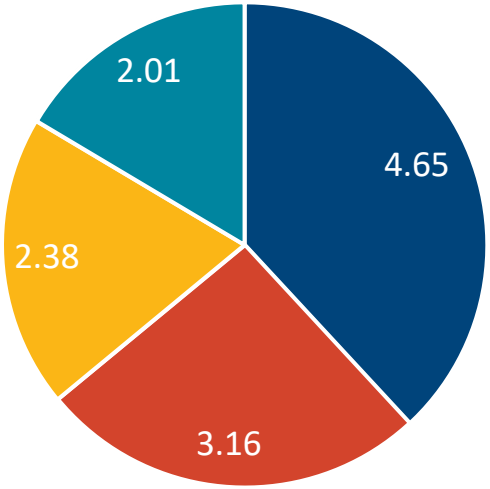
Energy insecurity was common in the South, even before COVID-19.

The **dark blue** section in these pie charts demonstrates the need among Southern households (millions of households.)

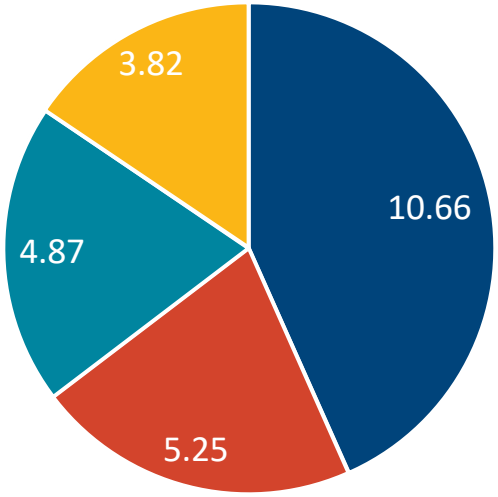
South
West
Midwest
Northeast

SEEA
SOUTHEAST ENERGY EFFICIENCY ALLIANCE

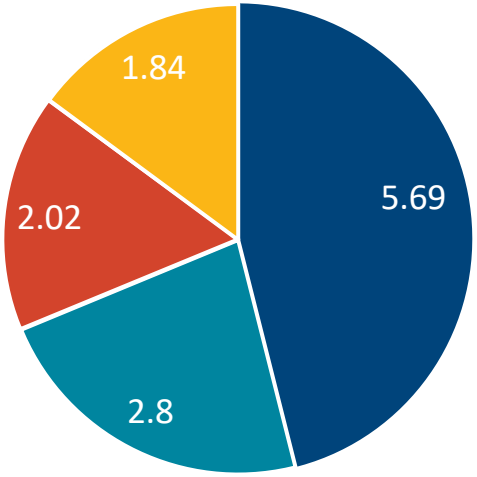
Home at Unhealthy Temperature



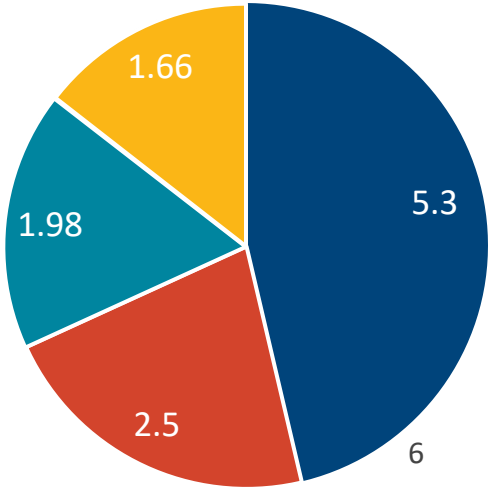
Reduce Food/Medicine



Disconnected/Stop Service Notice

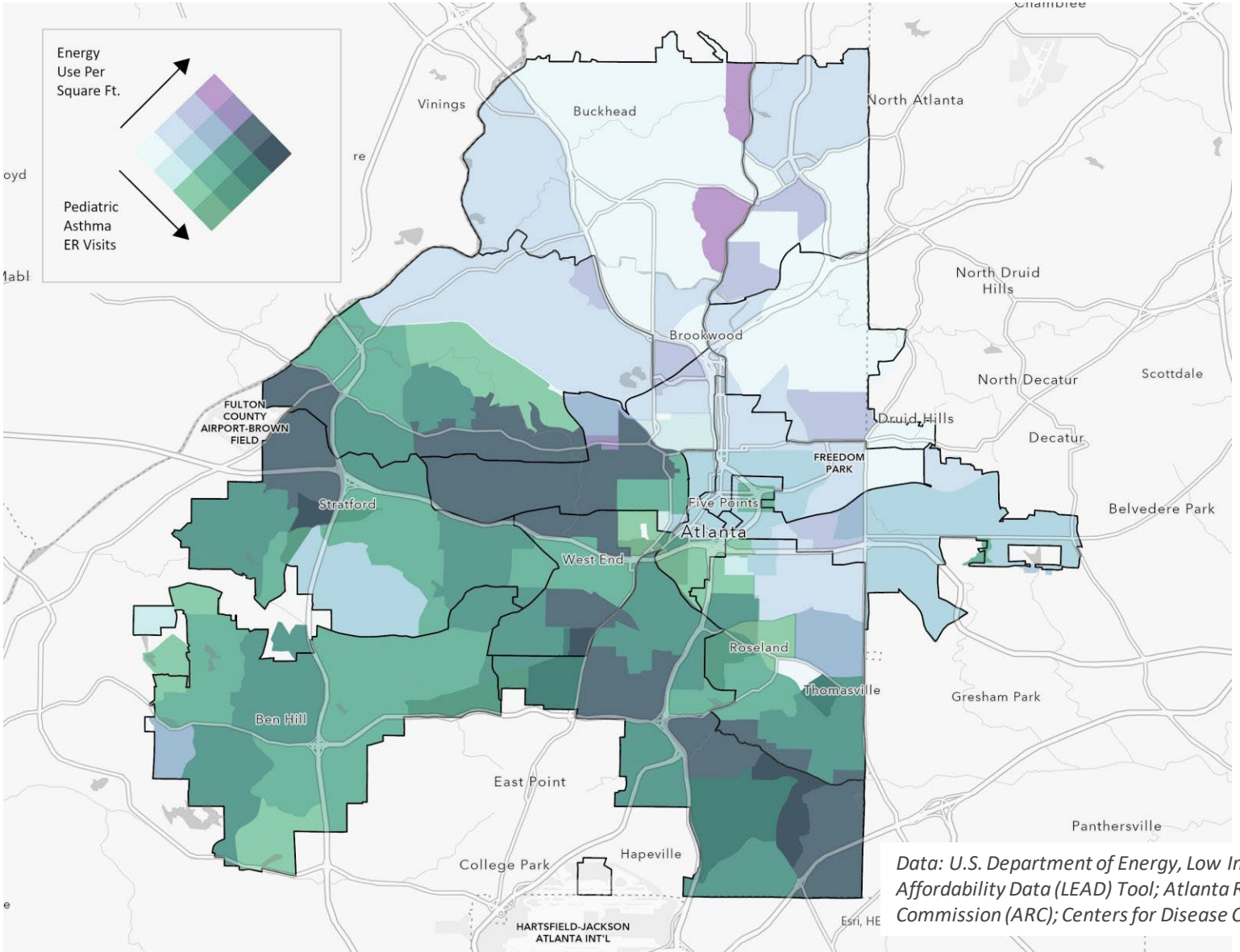


Unable To Use Heat/Cooling Equipment



Data: U.S. Energy Information Agency (EIA), Residential Energy Consumption Survey (RECS)

Unaffordable Homes Are Unhealthy Homes

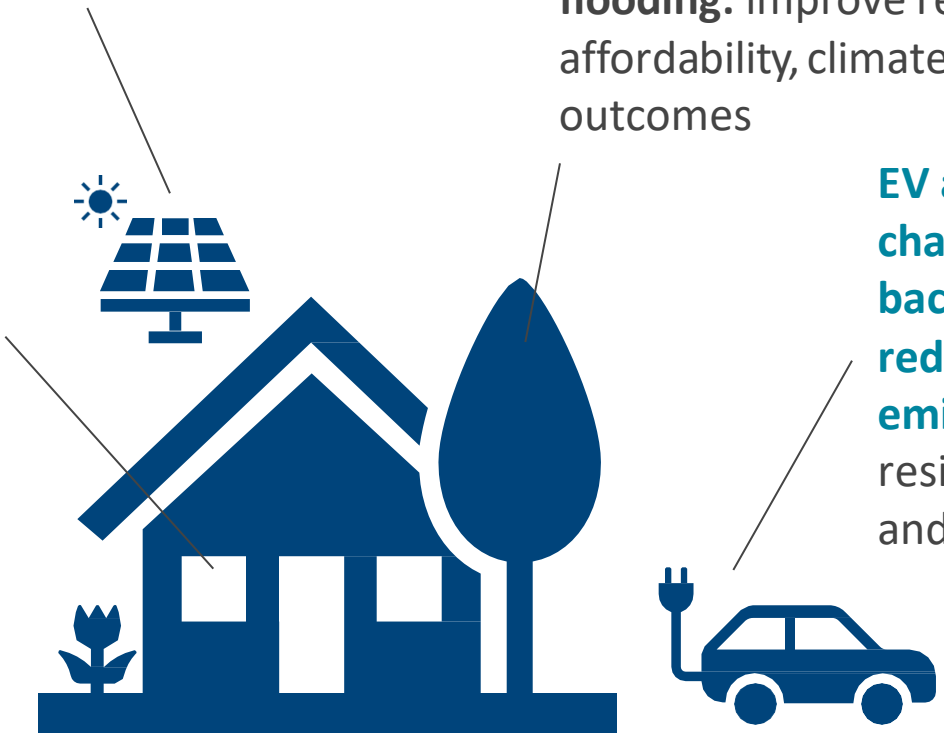


Data: U.S. Department of Energy, Low Income Energy Affordability Data (LEAD) Tool; Atlanta Regional Commission (ARC); Centers for Disease Control.

Housing is infrastructure

Rooftop solar decreases energy expenditures and emissions: improve resilience, affordability, climate, and health

Weatherization improves energy performance and reduces health hazards: improve resilience, affordability, climate, and health outcomes



Expanding greenspace and decreasing impervious surfaces reduce air temperature and flooding: improve resilience, affordability, climate, and health outcomes

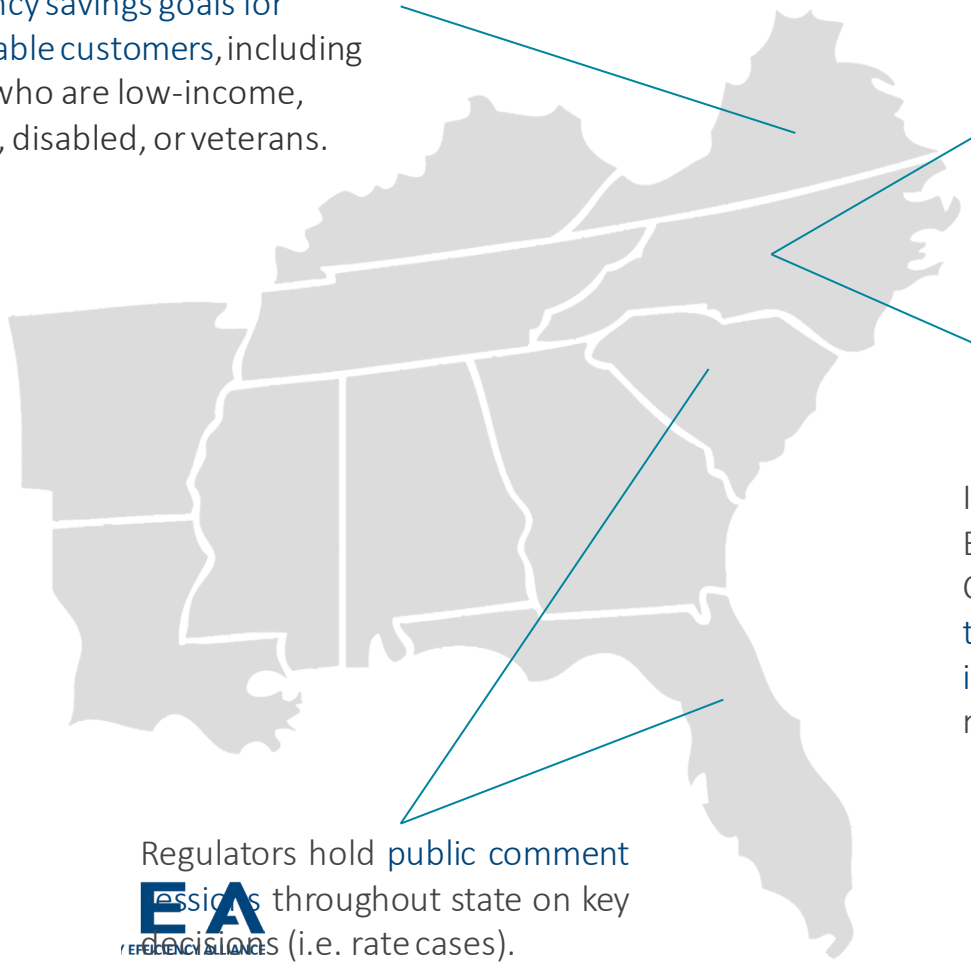
EV access and charging provides backup power and reduces auto emissions: improve resilience, climate, and health outcomes

SEEA
SOUTHEAST ENERGY EFFICIENCY ALLIANCE

Promising Trends

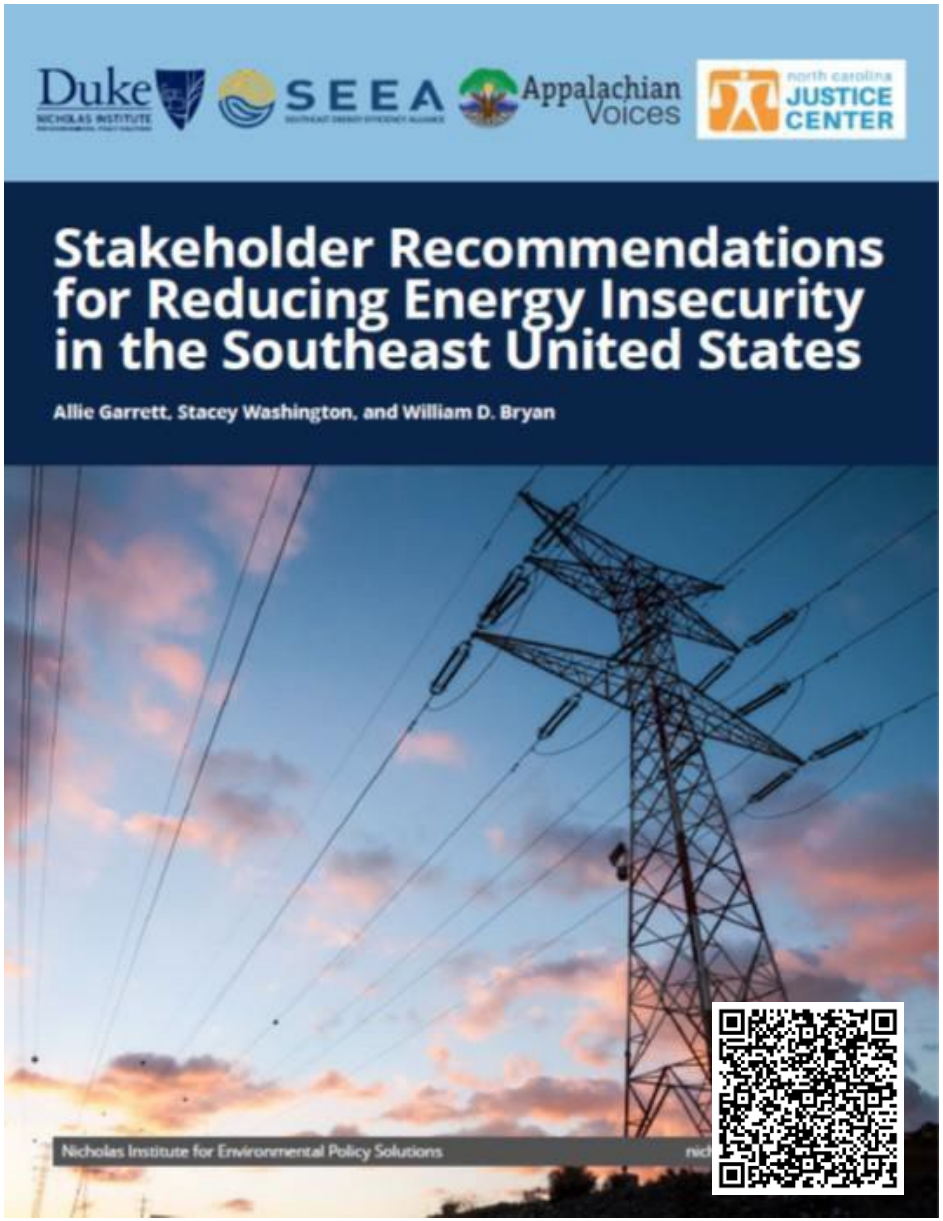
SB1323 (2023) requires the VACC to establish for Dominion Energy Virginia annual energy efficiency savings goals for vulnerable customers, including those who are low-income, elderly, disabled, or veterans.

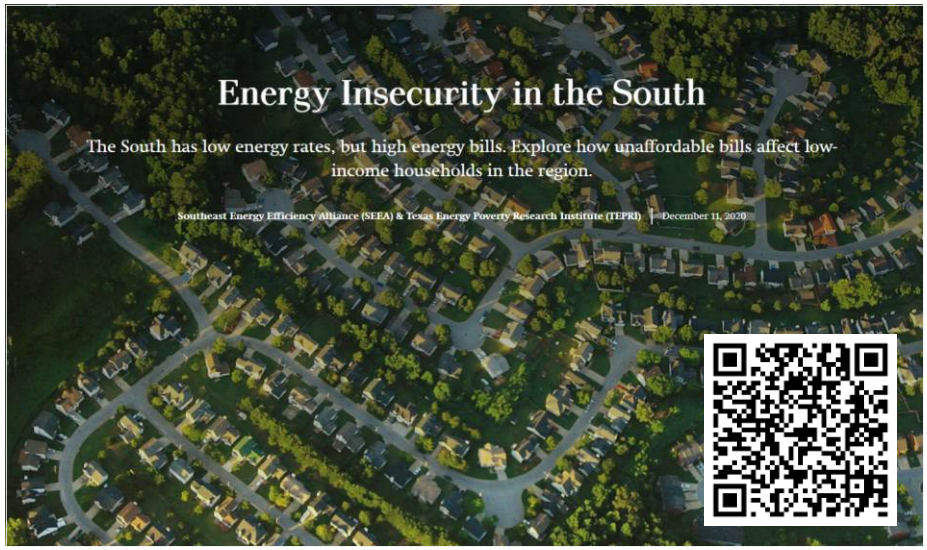
HB951 (2021) requires that the NCUC take reasonable steps to achieve a 70% reduction in emissions of CO2 from electric public utilities from 2005 levels by 2030 and achieve neutrality by 2050, with some equity considerations outlined.

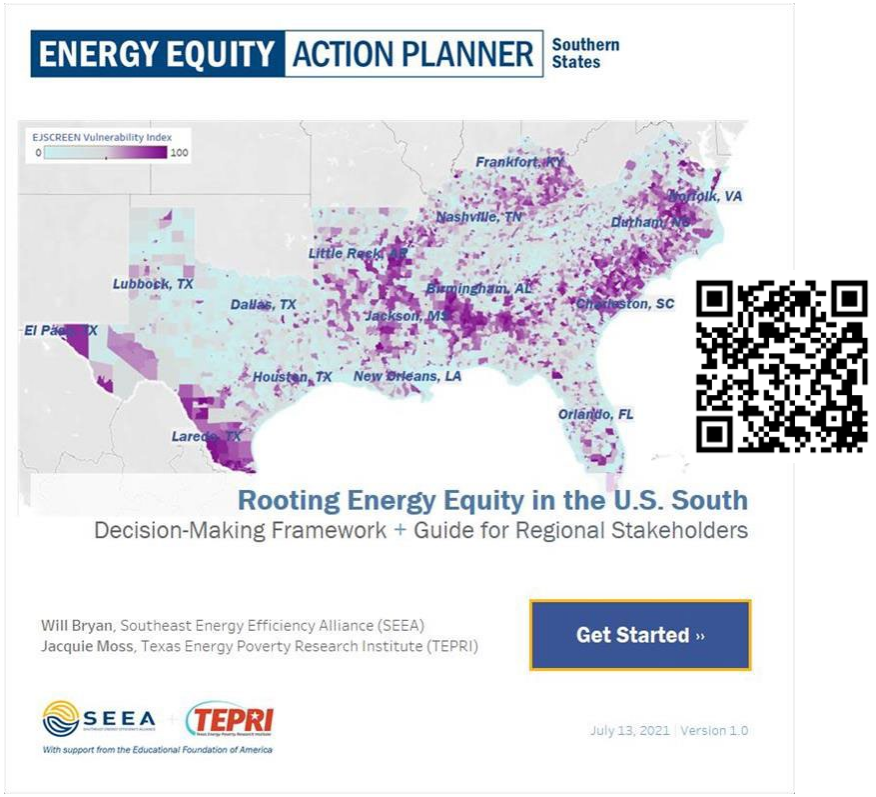


In 2021, the NCUC ordered Duke Energy Progress and Duke Energy Carolinas to engage stakeholders across the state to identify opportunities to improve affordability for low-income residential customers.

Regulators hold public comment sessions throughout state on key decisions (i.e. rate cases).







SEEA
SOUTHEAST ENERGY EFFICIENCY ALLIANCE

Distributional Equity Analysis

SEEA and E4TheFuture Webinar

Sharing the Benefits and Costs

December 13, 2023

Alice Napoleon
Principal Associate
Synapse Energy Economics

 |

Synapse Energy Economics

- Founded in 1996 by CEO Bruce Biewald
- Leader for public interest and government clients in providing rigorous analysis of the electric power and natural gas sectors
- Staff of 40+ includes experts in energy, economic, and environmental topics
- Assists clients with technical and policy analysis of distributed energy resources, energy justice, and other topics

Presentation overview

- Purpose and background
- Distributional Equity Analysis (DEA) stages
  - Establish a community and stakeholder process
  - Articulate the DEA context
  - Identify priority populations
  - Develop DEA metrics
  - Apply DEA metrics to priority populations
  - Present and interpret DEA results
  - Make decisions using DEA and Benefit-Cost Analysis (BCA) results

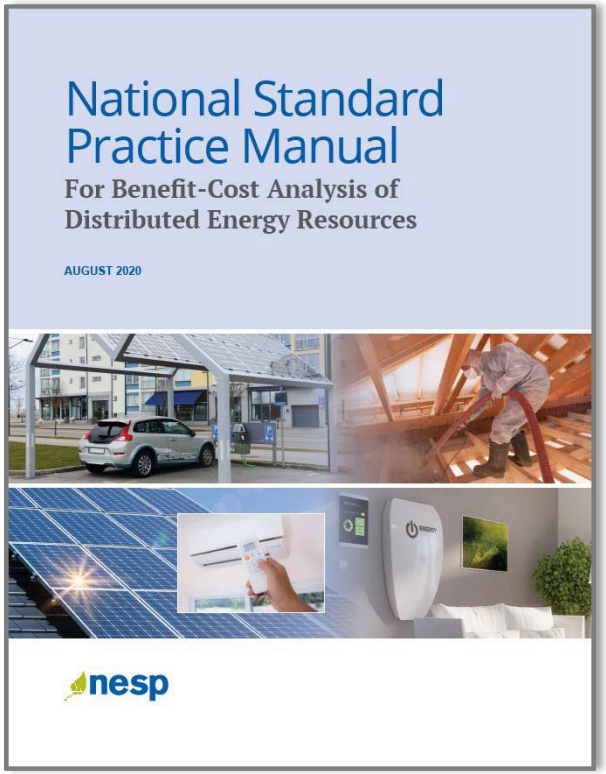
Purpose and background

Purpose

- Customers in a given jurisdiction do not share the burdens of the energy system equally.
- There is a need for a different type of analysis beyond BCA to help decision-makers understand whether their distributed energy resource investments are equitable, and states are poised to give increasing focus to this question.
- The primary purpose of this DEA guide is to answer two key questions:
  - What are the distributional equity impacts from utility DER investments?
  - How can jurisdictions incorporate those distributional equity impacts into their decision-making framework alongside BCA?

The National Energy Screening Project

- A stakeholder organization that works to improve cost-effectiveness screening practices for distributed energy resources (DERs)
  - Managed by E4TheFuture
- Key products to date:
  - National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources Link
  - Methods, Tools, and Resources: A Handbook for Quantifying DER Impacts for Benefit-Cost Analysis Link
  - Database of Screening Practices Link
- These products resulted in many requests for guidance on how to account for equity in BCA.



Project Background

- Funded by
  - US DOE, through Lawrence Berkeley National Laboratory
  - E4TheFuture
- Prepared by
  - Lawrence Berkeley National Laboratory
  - E4TheFuture
  - Synapse Energy Economics
- Overseen by an Advisory Committee made up of experts in energy equity and in energy resource planning and assessment. (See Link for Advisory Committee members).
- Status
  - Advisory Committee has reviewed the complete draft report.
  - Berkeley Lab will publish the final report following review and approval by DOE.
- Additional information
  - https://emp.lbl.gov/publications/distributional-equity-analysis

Distributional Equity Analysis Guidance

- A practical how-to guide on conducting DEAs in combination with BCAs to inform decision- making for utility DER investments.
- "Energy equity recognizes that disadvantaged communities have been historically marginalized and overburdened by pollution, underinvestment in clean energy infrastructure, and lack of access to energy efficient housing and transportation." (U.S. DOE 2023)

Dimensions of equity

Systemwide equity

Recognition	Recognizing the historical, cultural and institutional dynamics and structures that have led to energy inequities
Procedural	Promoting inclusive, accessible, authentic engagement and representation when developing or implementing programs and policies
Distributional	Promoting the equitable distribution of benefits and burdens across all segments of a community and across generations
Restorative	Addressing reparations for past inequities, rectifying practices that perpetuate inequities, promoting accountability for key decision-makers

Differences between BCA and DEA

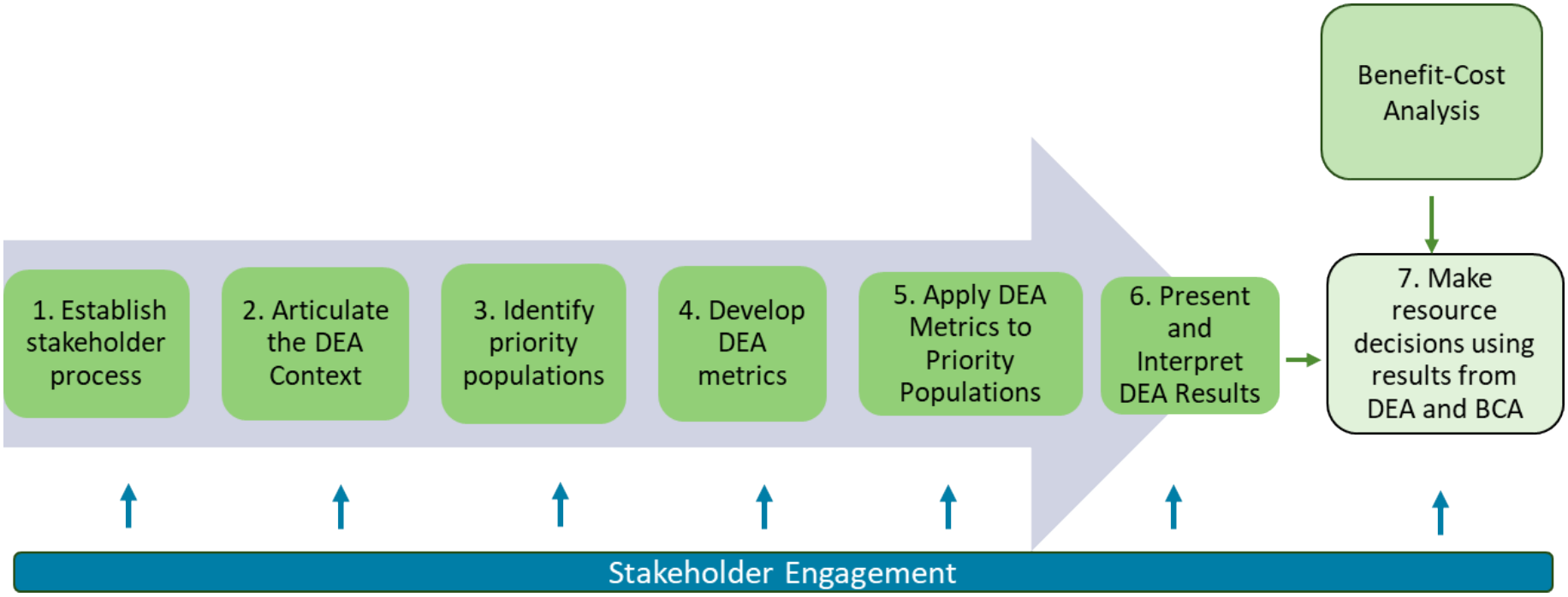
- BCA
  - Compares the total costs and benefits
  - Includes costs and benefits that align with the perspective of the cost-effectiveness test (e.g., a societal cost test would include the costs and benefits from the perspective of society)
  - Results do not show how costs and benefits are distributed

- DEA
  - Compares impacts on distinct populations
  - Includes DEA metrics that are selected because relate to equity
  - Metrics can be in incongruous units (e.g., % participation, change in bills ($), reduction in ER visits for asthma (#))

Together the two analyses can inform decisions about whether and to what extent utilities should invest in DERs.

Distributional Equity Analysis stages

DEA Guidance Document Overview



 |

Articulate DEA Context

- Articulating **DEA goals**, **applications**, and **timeframe** up front is key to ensuring transparency and managing the scope of analysis
- What is the purpose of your DEA?
- Are you looking at the impact of a single program, or are you comparing one portfolio to another to determine the best choice?
- Analyses can be prospective (for planning purposes) or retrospective (for evaluation purposes)

Example: A utility wants to analyze whether its planned electric energy efficiency portfolio will serve a Justice40-defined population equitably compared to other customers. A stakeholder group refined the scope to look at a portfolio of electric energy efficiency programs serving residential customers.

- See Link for more applications and examples

Identify Priority Populations

Steps to identify priority populations

1. Review any existing state definitions already in use (e.g., for environmental justice)
2. Review existing state energy equity goals
3. Review indicators that other jurisdictions have used for priority populations
4. Solicit input from stakeholder representatives
5. Choose a set of indicators based on the previous four steps
6. Conduct "cumulative impact analyses" to identify the most highly impacted customers
7. Consider refinements for the purpose of conducting the DEA

Other terms for priority populations.

- Disadvantaged
- Overburdened
- Marginalized
- Underserved
- Vulnerable
- Environmental justice communities
- Frontline communities
- Highly impacted communities
- Target populations

Develop DEA Metrics

- "**System-wide equity metric**" refers to a broad range of metrics that can be used to address the full range of equity issues.
- "**DEA metric**" refers to a narrower subset of metrics used to determine if costs and benefits of a utility program or investment are equitably distributed between priority populations and other customers.
- DEA Metrics should meet standards for good utility performance metrics:
  - Distributional
  - Discrete
  - Tied to equity goals
  - Impactful

Develop DEA Metrics - Examples

- Utility system impacts
  - Reliability: Change in number/duration of outages
  - Shutoffs: Change in number or frequency of shutoffs
- Host customer impacts
  - Change in lost workdays
  - Change in health, safety, or comfort non-energy impacts
- Societal
  - Workforce development/job training participation
- Rates, bill, participation
  - Change in bills
  - Participation rates

Apply DEA Metrics to Priority Populations

Steps

1. Assess existing data and tools
2. Review data type and resolution
3. Investigate useful tools (mapping tools, screening tools, dashboards, models)
4. Ensure data privacy and equitable data practices
5. Calculate metrics for priority populations and other customers

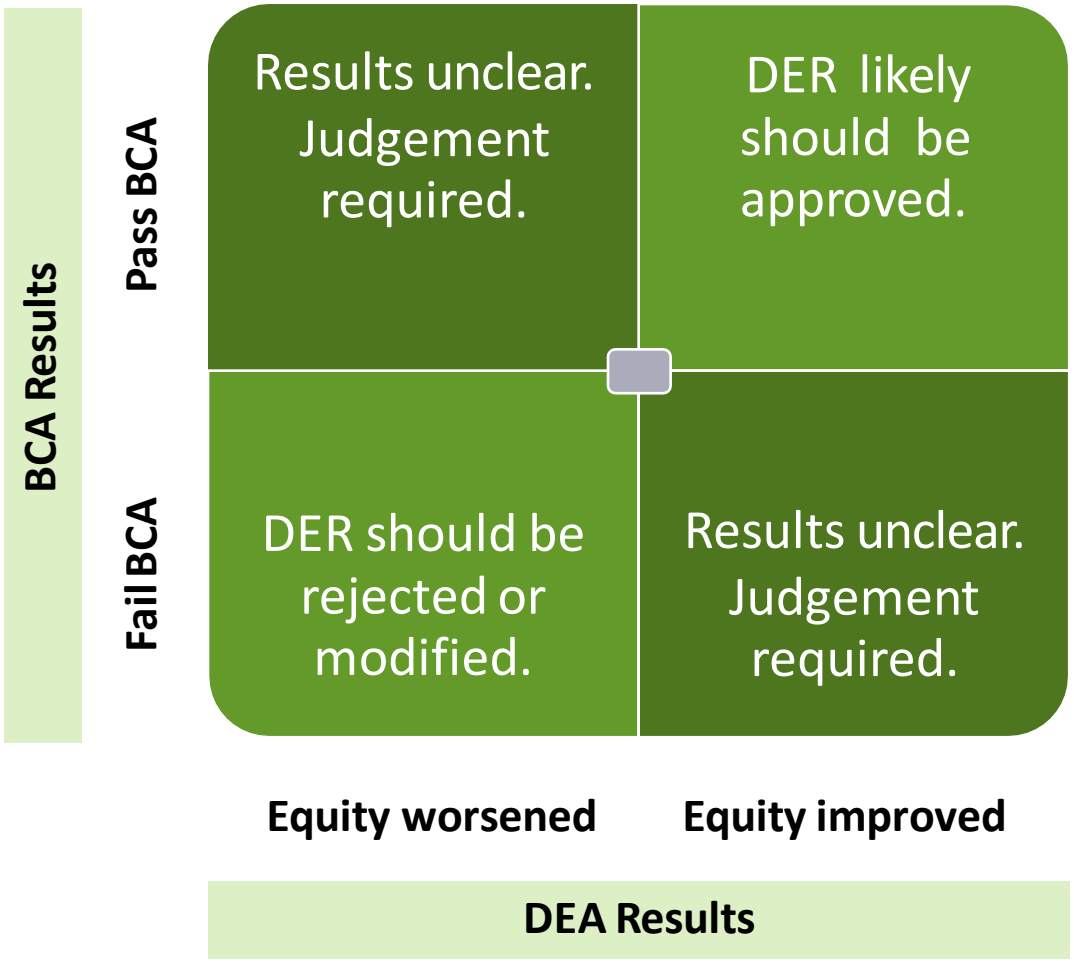
Present and Interpret DEA Results

- **Simple results** - Includes unadjusted results for each DEA metric separately for priority population and other customers.
- **Benchmarked results** - Includes simple results for each metric alongside metric-specific benchmarks.
- **Weighted DEA scores** - Applies multi-attribute analysis (MAA) to benchmarked metrics to calculate DEA scores. Weighted scores for each DEA metric can aggregated to present net scores for priority population and other customers.

Benchmarks are a set of standards or goals by which success can be measured and can be used to draw more informed conclusions. Examples include:

- Targets for participation
- Targets for reducing energy burden
- Caps for reasonable rate impacts

Make Resource Decisions



Establish community & stakeholder process | Articulate DEA context | Identify priority populations | Develop DEA metrics | Apply DEA metrics | Present and interpret results | Make decisions

Questions?

Alice Napoleon
anapoleon@synapse-energy.com

Bonus Slides

Advisory Committee

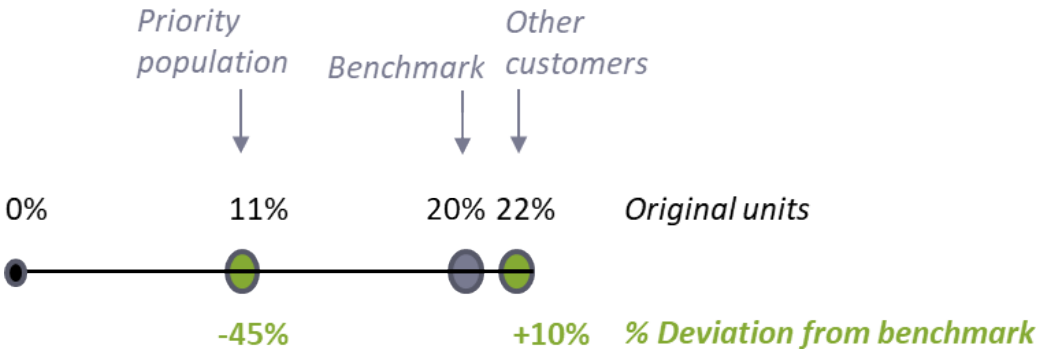
Name	Affiliation	Name	Affiliation
Adam Zoet	Minnesota Department of Commerce	Jeremy Peterson	Xcel Energy
Amanda Best	Maryland Public Service Commission	John Howat	National Consumer Law Center
Amanda Dewey	American Council for an Energy-Efficient Economy	Julia Friedman	Oracle
Ankit Jain	California Public Utilities Commission	Justin Schott	Energy Equity Project
Anne Dougherty	Illume Advising	Kate Strickland	Smart Electric Power Alliance
Aubrey Newton	Northwest LECET | NW Cooperation Fund	Kelly Crandall	Colorado Public Utilities Commission
Bethel Tarekegne	Pacific Northwest National Laboratory	Kelsey Jones	National Association of State Energy Officials
Brad Banks	Michigan Public Service Commission	Liz Doris	US DOE / NREL
Brett Sproul	Maryland Public Service Commission	Logan Atkinson Burke	Alliance for Affordable Energy
Brian Tyson	Puget Sound Energy	Marguerite Behringer	Landis+Gyr
Briana Parker	Elevate Energy	Mohit Chhabra	Natural Resources Defense Council
Burçin Ünel	Institute for Policy Integrity at NYU School of Law	Nancy Seidman	Regulatory Assistance Project
Cathy Reed	National Association of State Energy Officials	Natalia Cardona Sanchez	Vote Solar
Chandra Farley	City of Atlanta	Olivia Patterson	Opinion Dynamics
Chris Coll	New York Dept. of Public Service	Patrick Cicero	Pennsylvania Office of Consumer Advocate
Danilo Morales	Massachusetts Department of Energy Resources	Sarah Moskovitz	Illinois Citizen's Utility Board
David Tancabel	US Environmental Protection Agency	Sonja Berdahl	National Renewable Energy Laboratory
Debra Gore-Mann	Greenlining Institute	Sneha Ayyagari	Greenlining Institute
Divesh Gupta	Baltimore Gas & Electric	Steve Schiller	Lawrence Berkeley National Lab - Advisor
Dylan Voorhees	VEIC	Subin DeVar	Initiative for Energy Justice
Erin Cosgrove	Northeast Energy Efficiency Partnerships	Tanya Paslawski	for Nat'l Assoc. of Regulatory Utility Commissioners
Ezell Watson	Oregon Public Utility Commission		
Gregory Ehrendreich	Midwest Energy Efficiency Alliance	Troy Hutson	Puget Sound Energy
Jean Su	Center for Biological Diversity	Wally Nixon	Arkansas Public Service Commission
Jennifer Yoshimura	Pacific Northwest National Laboratory	Will Bryan	Southeast Energy Efficiency Alliance

DEA Applications and Examples

Applications	Examples
Assess a single DER program serving priority populations	Low-income energy efficiency program, low-income community solar program, low-income microgrid program
Assess a single DER program serving all types of customers	Residential retrofit energy efficiency program, distributed generation net-billing program, distributed storage program
Compare across DER programs	• *Compare same type of DERs*: one energy efficiency program vs. other energy efficiency programs, one distributed generation net-billing program vs. other distributed generation net-billing programs • *Compare different types of DERs*: energy efficiency versus distributed generation; distributed generation versus storage program; demand response versus storage program
Assess a portfolio including programs of the same type of DERs	Portfolio of energy efficiency programs, portfolio of multiple distributed generation programs, portfolio of multiple storage programs
Optimize a portfolio including programs of multiple types of DERs	Portfolio including all types of DER programs (energy efficiency, demand response, distributed generation, batteries, electric vehicles)

Benchmarked results example

- This example translates the simple results for participation rates into unweighted DEA scores.
- The utility uses a benchmark of 20% participation.
- For this metric, scoring higher than the benchmark is a desired outcome.
- The projected priority population participation rate is 11%.
- The other customers' projected participation rate is 22%.
- Applying the formulas on the previous slide, the priority population falls short of the benchmark, resulting in a deviation of negative 45 percent, whereas the other customers exceed the benchmark, resulting in a deviation of +10 percent.

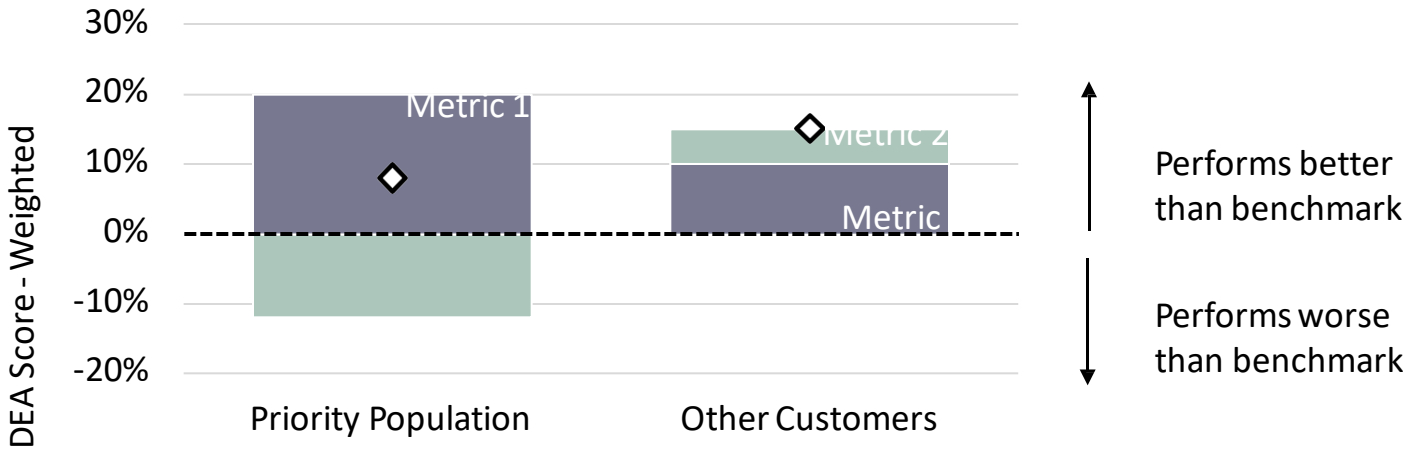


Present and Interpret DEA Results

Assign importance weights and calculate weighted DEA scores

Metric examples	+/- from benchmark		Importance weight		Weighted DEA score	Implication
Metric 1	+50%	X	40%	=	+20%	Metric improved
					+	
Metric 2	-20%	X	60%	=	-12%	Metric worsened
					=	
			Net score		+8%	Net improvement

Present scores for both populations



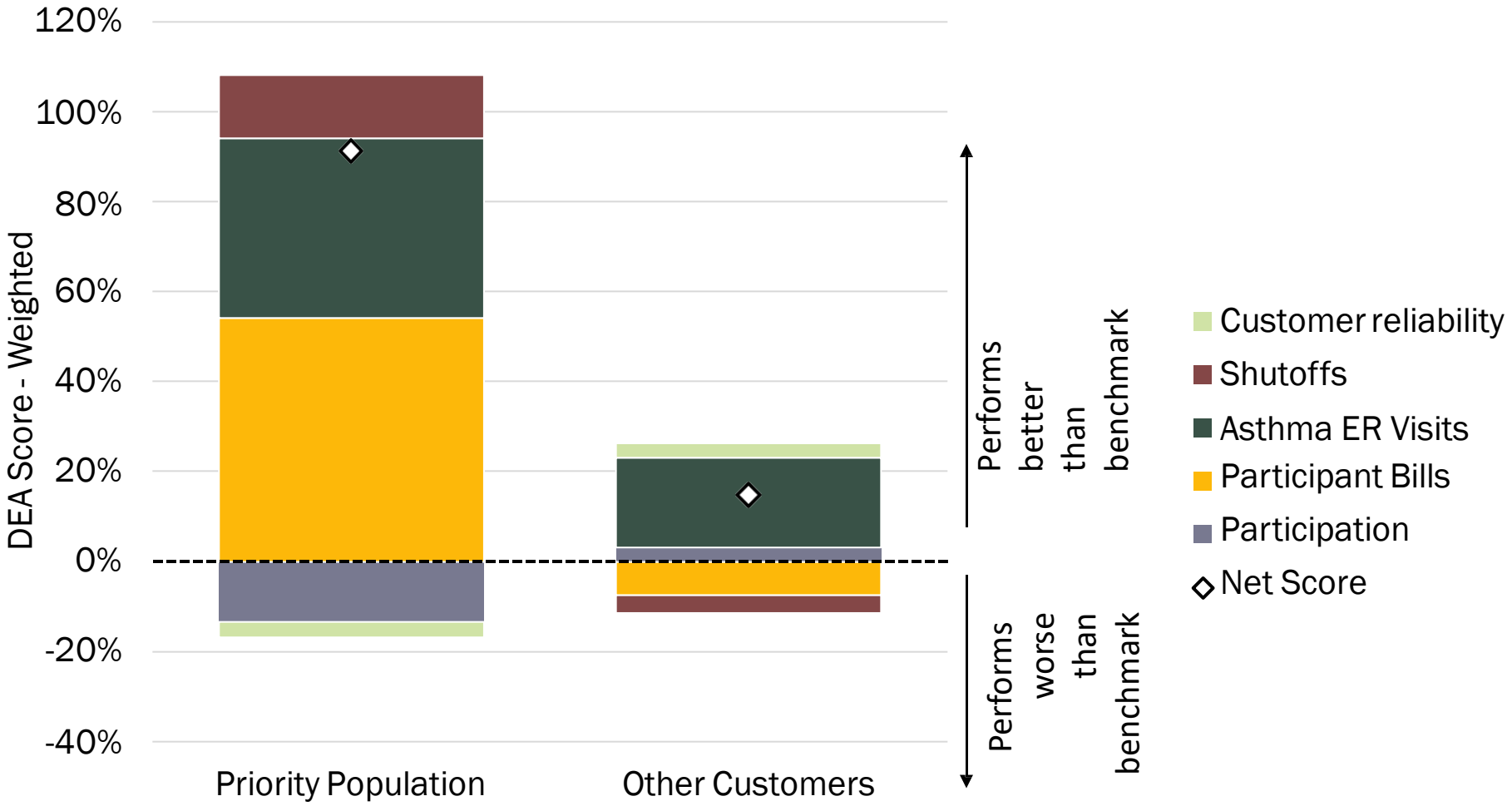
Establish community & stakeholder process | Articulate DEA context | Identify priority populations | Develop DEA metrics | Apply DEA metrics | **Present and interpret results** | Make decisions

Illustrative Example

- Examine whether a hypothetical utility's planned electric energy efficiency portfolio will serve a pre-defined priority population equitably compared to other customers.
- At the direction of a stakeholder group, the utility selects and scores the following metrics.

Metric	Unit	Simple results		Benchmarked results			Importance Weight
		Priority Population	Other Customers	Benchmark	Priority Population	Other Customers	
Participation	% population	11%	22%	20%	-45%	10%	30%
Participant Bills	% change	-5.6%	-1.5%	-3%	-80%	-80%	30%
Frequency of asthma ER Visits	% change	-6%	-4%	-2%	180%	-25%	20%
Frequency of shutoffs	# change	-12	-3	-5	0%	-75%	10%
Customer reliability (CEMI)	% change	-2%	-4%	-3%	-40%	-40%	10%

Illustrative Example



 |

Questions?

Thank you!

We want to hear from you!
Please **take the survey** before you sign off.

Want to get in on the action? Learn more about SEEA's membership and sponsorship offerings at **seealliance.org/membership**.

Sign up to receive SEEA news and announcements at **seealliance.org/updates**. We promise to keep it brief and meaningful.

A special thank you to our partners and members who made today's webinar possible!

SEEA
SOUTHEAST ENERGY EFFICIENCY ALLIANCE

Thank You

SMART ENERGY. STRONG ECONOMY. FOR ALL.

WWW.SEEALLIANCE.ORG