RMI presents the Energy Poverty Policy Simulator

NASUCA Mid-Year Meeting

June 11, 2025

Team introductions

Joe Daniel

Joe is a principal in RMI's Electricity team, where he leads the development and deployment of quantitative tools that help accelerate a more affordable and equitable energy transition. He also serves on the Board of Directors of CUB Ohio.

Maria Castillo

Maria is a senior associate on RMI's Electricity Team where she focuses on energy poverty. She leads the development of low-income energy affordability quantitative tools, thought leadership, and technical assistance.

Carina Rosenbach

Carina is a senior associate with RMI's Electricity team, where she supports regulators and advocates in advancing policies that lower systemwide costs and mitigate energy poverty.

David Valdes

David is an Associate on RMI's Electricity team, where he supports research and tool development on energy affordability and rural electric cooperative energy buildout.

RMI’s Energy Affordability Work

RESEARCH AND ANALYSIS >> ELECTRICITY >> MIND THE REGULATORY GAP

REPORT | 2024

Mind the Regulatory Gap

How to enhance local transmission oversight

By Claire Wayner, Chaz Teplin, Kaja Rebane

DOWNLOAD THE REPORT BELOW

RESEARCH AND ANALYSIS >> ELECTRICITY >> A STRATEGIC FRAMEWORK FOR UTILITY COST CONTROL

REPORT | 2025

A Strategic Framework for Utility Cost Control

How to promote cost-efficiency through the energy transition.

By Cara Goldenberg, Kaja Rebane, Gennelle Wilson, Xavier Zheng

DOWNLOAD THE REPORT BELOW

Sections

- Introduction
- Rate Regulated Entities
- Why the Return on Equity Matters
- Details About the Rate of Return in Utility Regulation

Rebalancing “Return on Equity” to Accelerate an Affordable Clean Energy Future

By updating how to determine ROE, stakeholders can incentivize grid investments that are more affordable for customers, improve grid resilience, and maintain reliability.

February 21, 2025

By Joe Daniel, Ryan Foelske, Steve Kihm, CFA, Narrative804

ELECTRICITY >> SMART COST ALLOCATION: THE SECRET INGREDIENT TO AFFORDABLE ELECTRICITY IN A NEW ERA OF LOAD...

Smart Cost Allocation: The Secret Ingredient to Affordable Electricity in a New Era of Load Growth

RMI’s Optimus tool can help design cost allocation solutions to support affordability during rapid load growth.

February 21, 2025

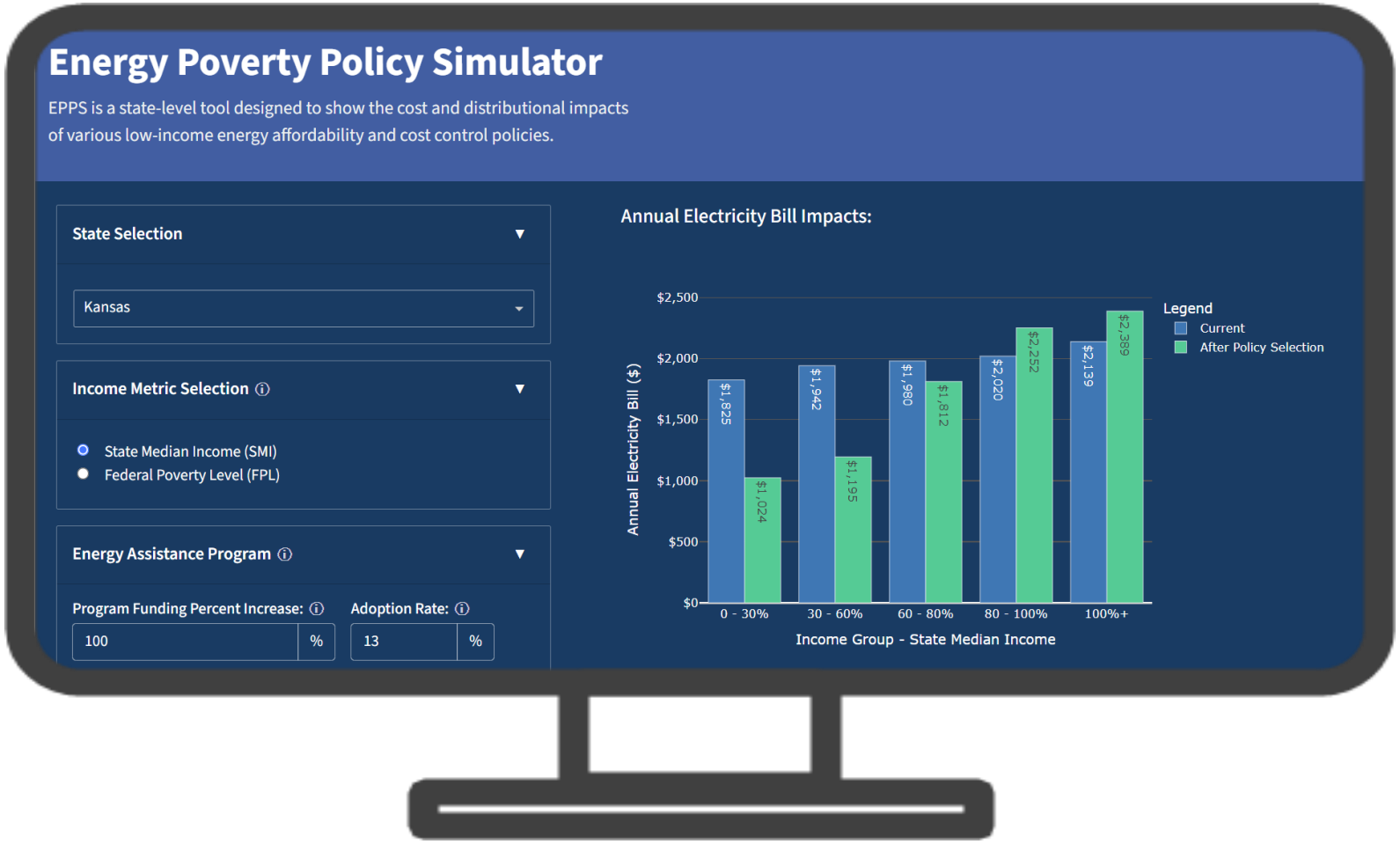
By Diego Angel Hakim, Jacob Becker, Joe Daniel

Energy Poverty Policy Simulator: Measuring the impact of policy on addressing energy burden.

Calculates the relative impact that different policies will have on energy burden and energy poverty. The tool includes a range of policies that address affordability and measure the distributional effects of those policies under user generated assumptions including how to pay for the policy.

The tool is designed to serve multiple purposes:

- *Start policy conversations*
- *Guage relative cost efficacy*
- *Measure cross subsidization*



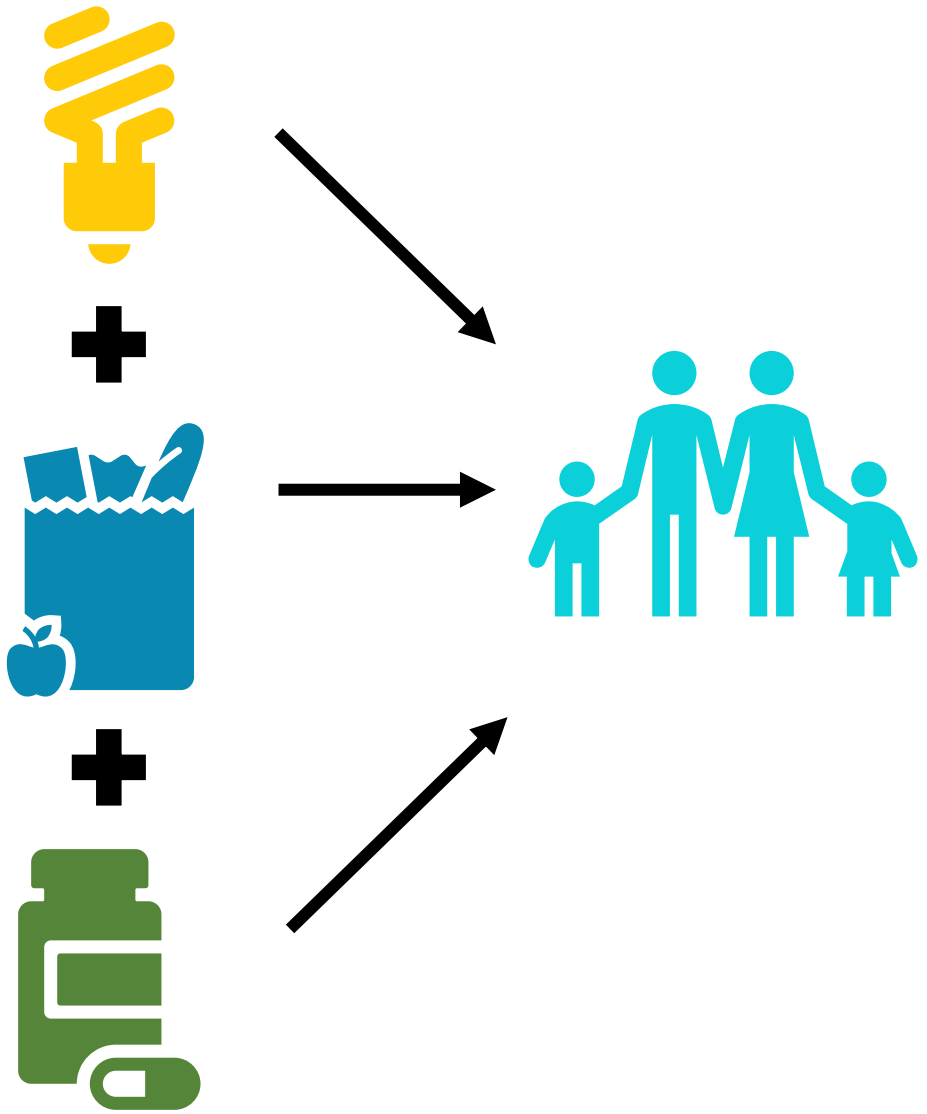
Agenda

- **Overview of RMI's work on energy poverty**
- **The landscape of energy poverty in the US**
- **Landscape of safeguard policies that address energy burden**
- **Energy Poverty Policy Simulator**
  - Tool overview and demo
  - Q&A session
  - Individual exploration of tool

Landscape of energy poverty in the US

Every household deserves affordable energy

Energy affordability is the ability of a household to pay for their energy use while also paying for other basic living expenses **without forgoing basic necessities or risking health and safety.**



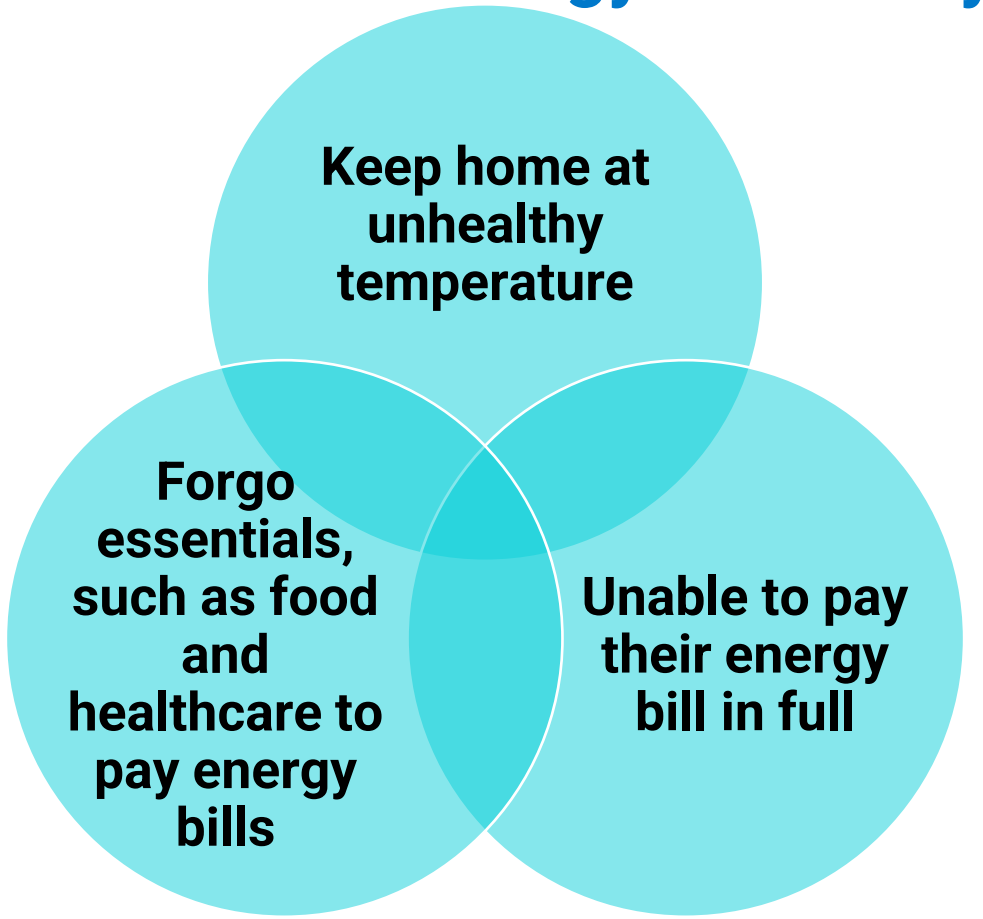
Households paying a significant share of their income on energy are more likely to face a form on energy insecurity

Energy Burden

% of household income spent on energy

Energy burden	Household classification
< 4%	Non energy burdened
4-6%	Energy stressed
7-10%	Energy burdened
10%+	Energy impoverished

Hallmarks of Energy Insecurity

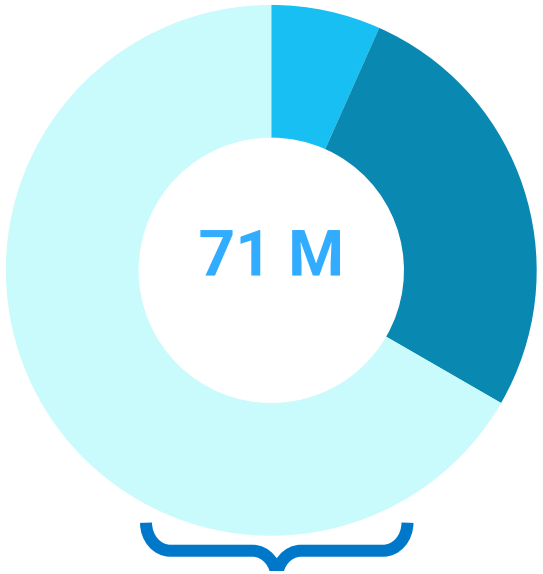


Source: Cook and Shah: Reducing energy burden with solar: Colorado's strategy and roadmap for states, *National Renewable Energy Laboratory* (2018)

Nearly one in three households nationwide reported experiencing a form of energy insecurity in the past year

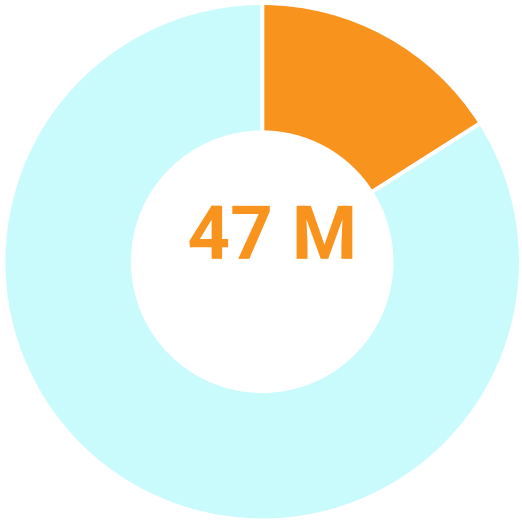
Energy insecurity is the inability of a household to meet its basic household energy needs.

34% of households forwent expenses, such as food or healthcare, to pay energy bill

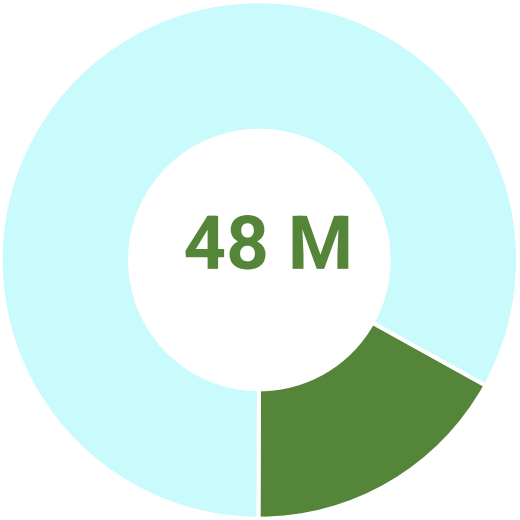


Nearly ¼ of families that forewent expenses had to do so nearly every month.

22% leave home at an unsafe or unhealthy temperature

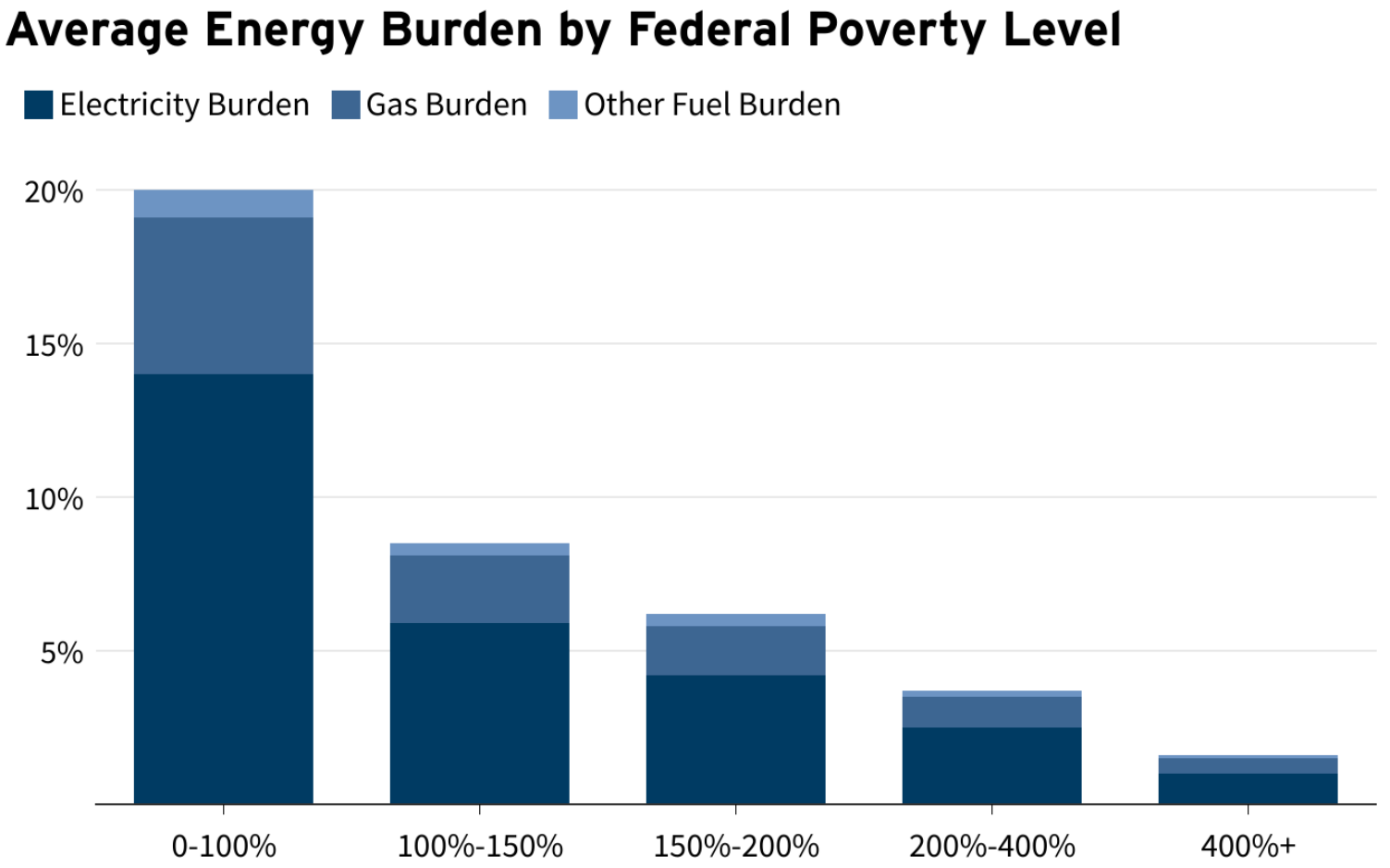


23% unable to pay their energy bill in full



Source: US Census Bureau, Census Household Pulse Survey (2024)

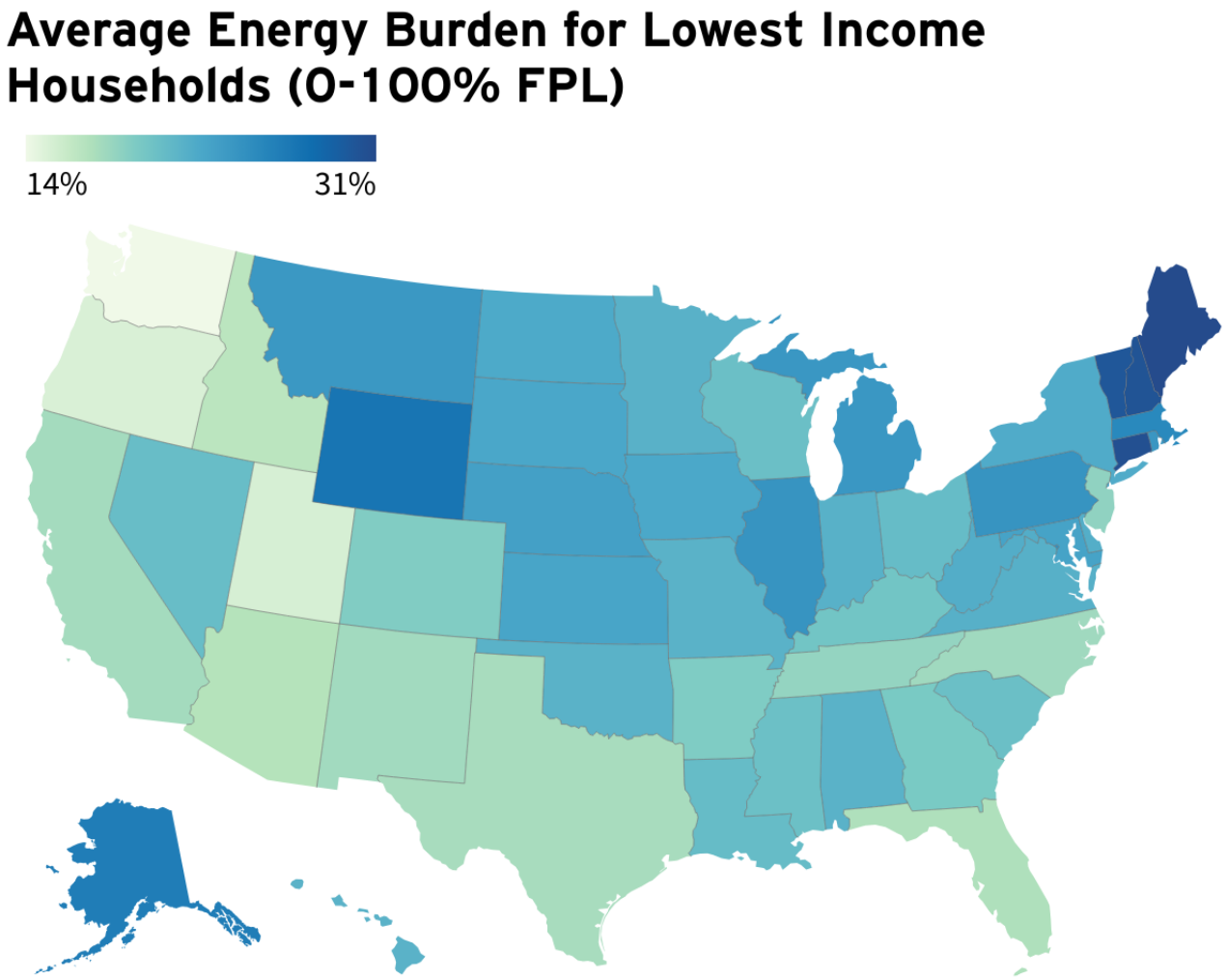
Lowest income households have an energy burden that is 10x higher than non-low-income households



Energy burden is the share of a household's income spent on energy. The income groups shown on the x-axis are categories of Federal Poverty Level (FPL). Typically, households between 0-200% of the FPL are considered low-income.

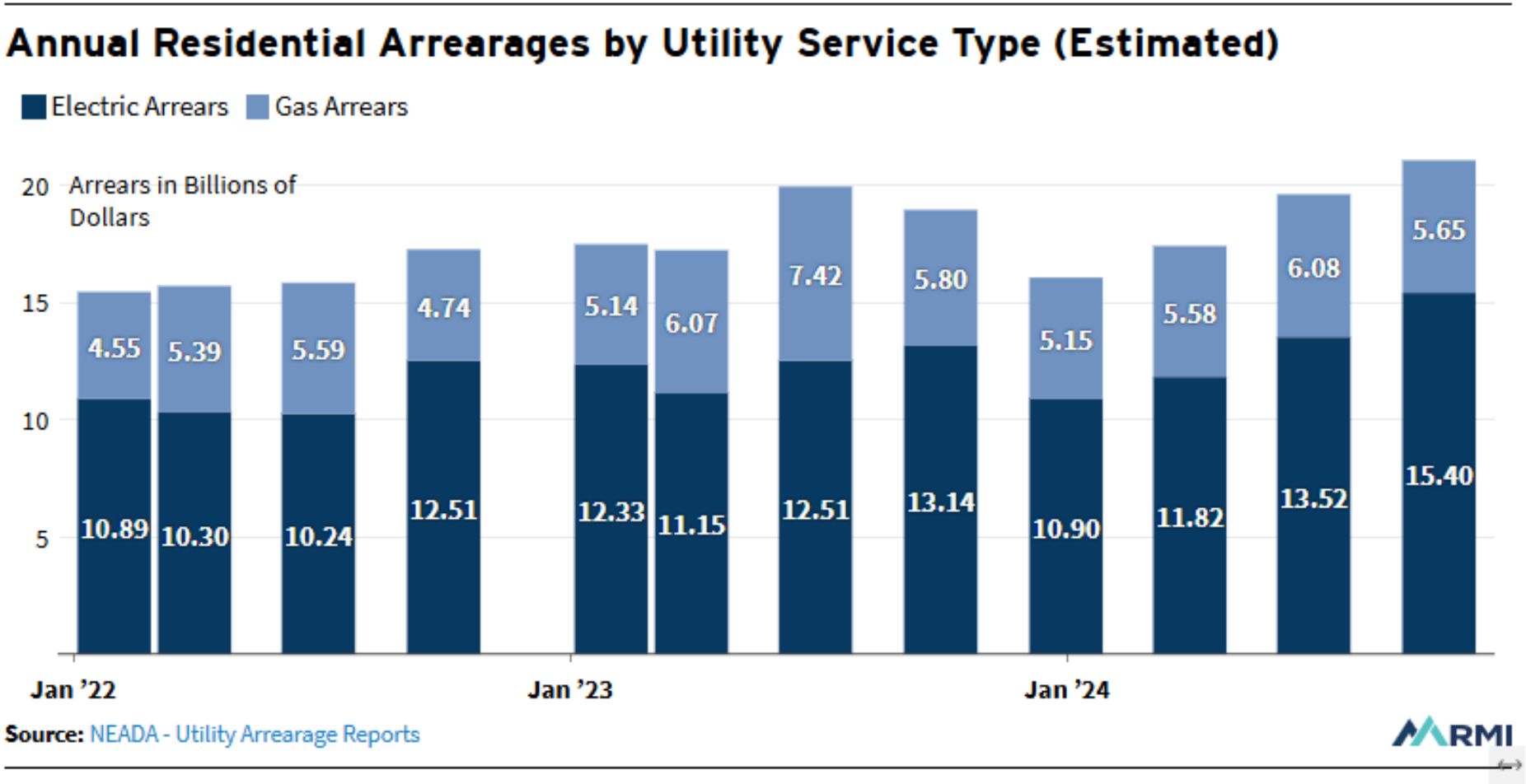
Source: Department of Energy, Low-Income Energy Affordability Data Tool (2022 Update)

Across various states, the lowest income households can experience energy burdens as high as 30%

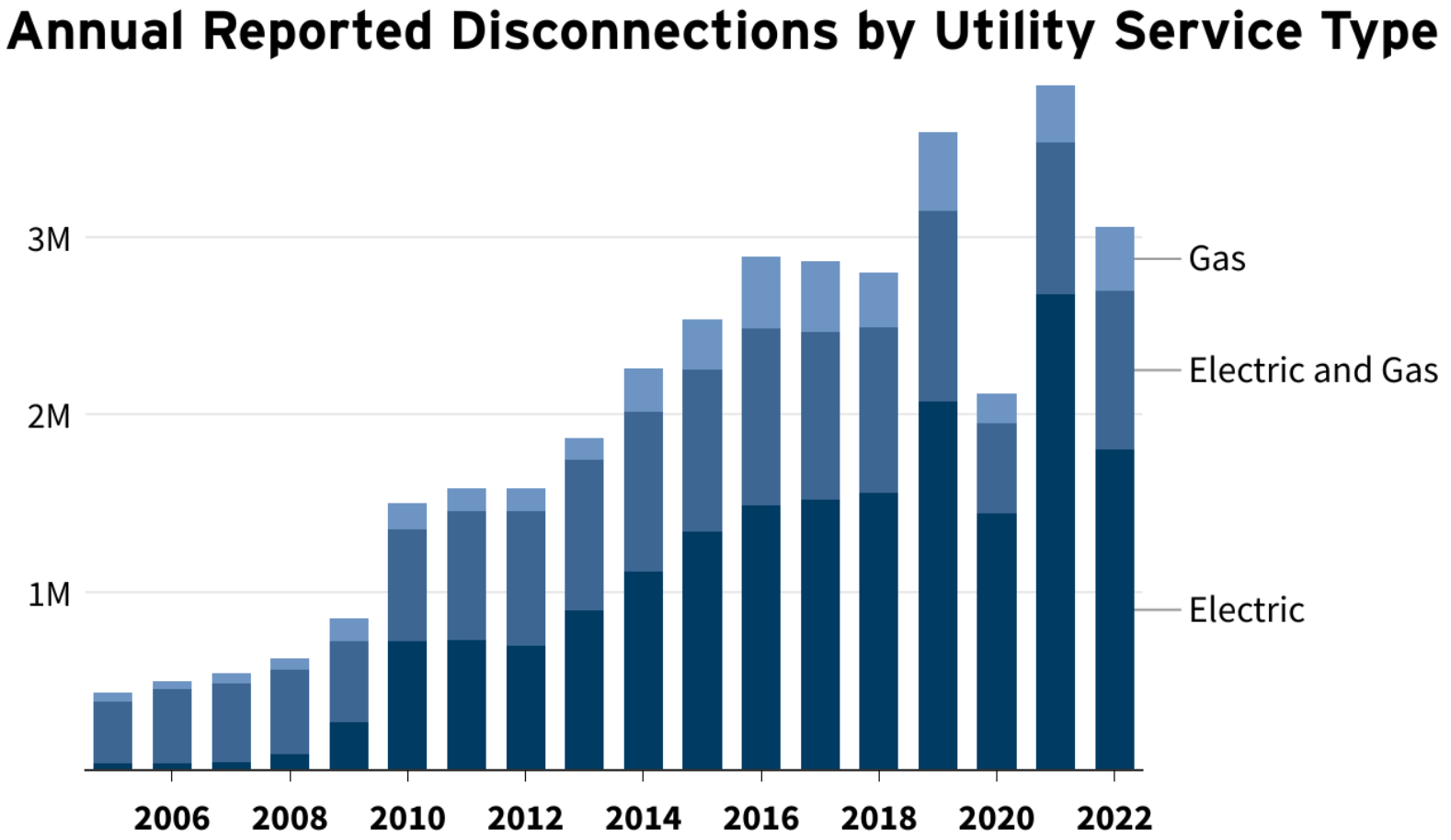


Source: Department of Energy, Low-Income Energy Affordability Data Tool (2022 Update)

Arrears reached over $20 billion at the end of last year



Disconnections are reaching pre-pandemic levels, nearing 3 million in 2022



New data sources have been added to the database each year, which likely accounts for part of the increase in total disconnections.

Source: RMI Analysis of Energy Justice Lab's Disconnection Dashboard

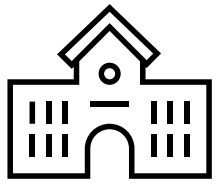
Disconnecting a household's electricity deeply destabilizes vulnerable households

Health

Higher likelihood of sickness, hospitalization, developmental delays, and medical emergencies; life threatening for those on medical devices that require electricity

Finances

Disconnected customers may resort to risky and/or predatory loans to pay past-due bills (e.g., payday loans); disconnection and reconnection fees can further increase debt burden



Safety

Potential to jeopardize a child's healthy living environment; may lead to eviction or foreclosure and unconventional, potentially unsafe means of lighting, heating, and cooling

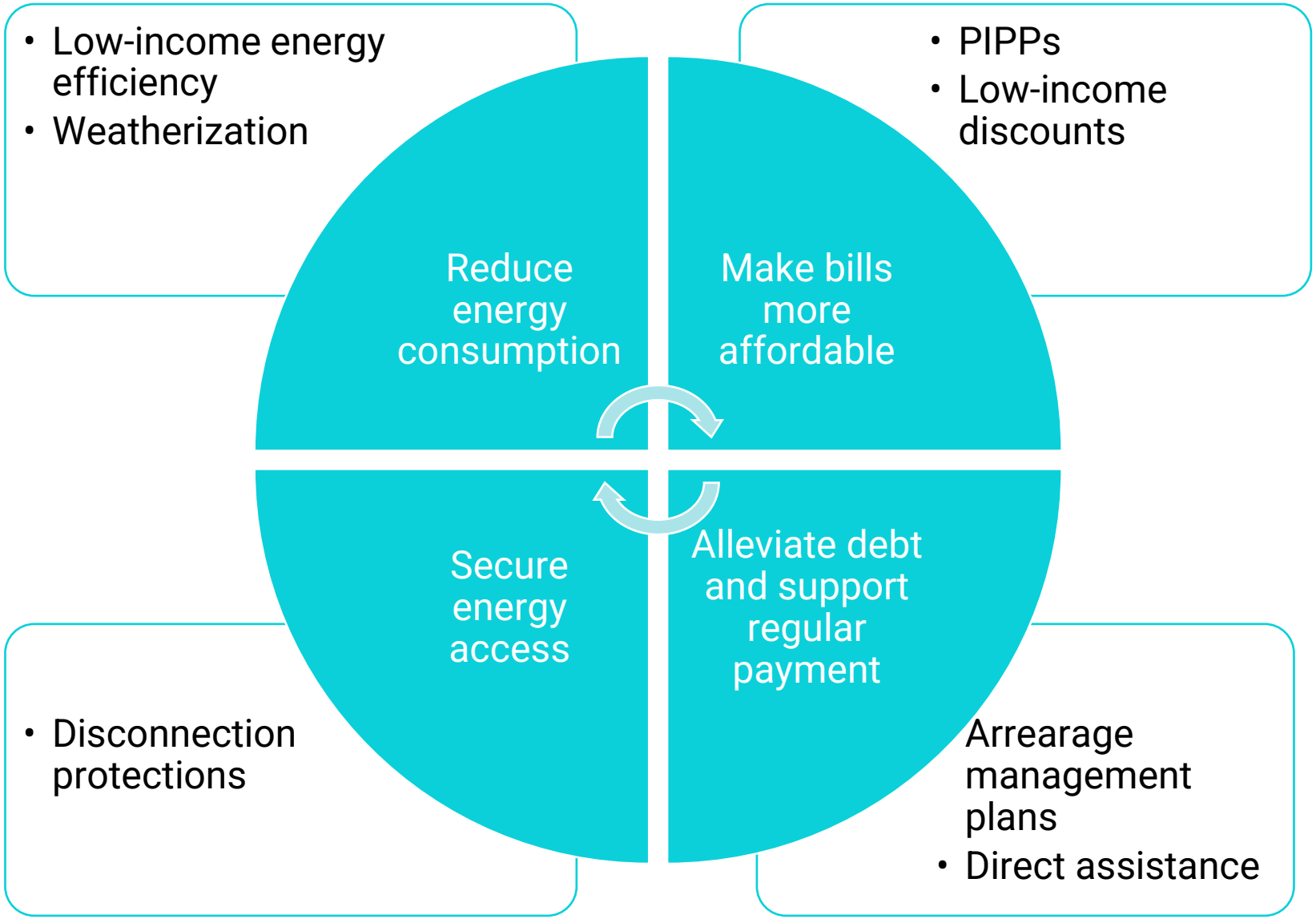
"I went without electricity for 2 days. I used candles so I could see at night... I ended up having to take out a payday loan. I felt bad and frustrated that I couldn't pay for something that, to me, is a basic necessity." – Marcela, San Diego

Source: Living without Power – Health Impacts of Utility Shutoffs in California, *The Utility Reform Network (2018);*
Surviving a Shut-Off: U.S. Households at Greatest Risk of Utility Disconnections and How They Cope, *American Behavioral Scientist (2021)*

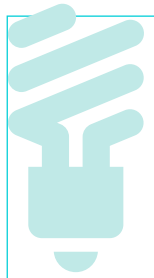
Landscape of safeguard policies

The Safeguards Toolkit: A portfolio approach to affordability

To comprehensively address energy poverty, regulators can consider employing a portfolio approach.



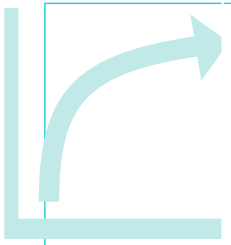
Each policy has its benefits and drawbacks, depending on design



Low-Income Energy Efficiency Programs – Most states offer EE programs for low-income customers

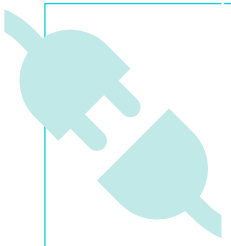
LIHEAP – Federal program that applies to all states

Low-Income Discounts – 14+ states



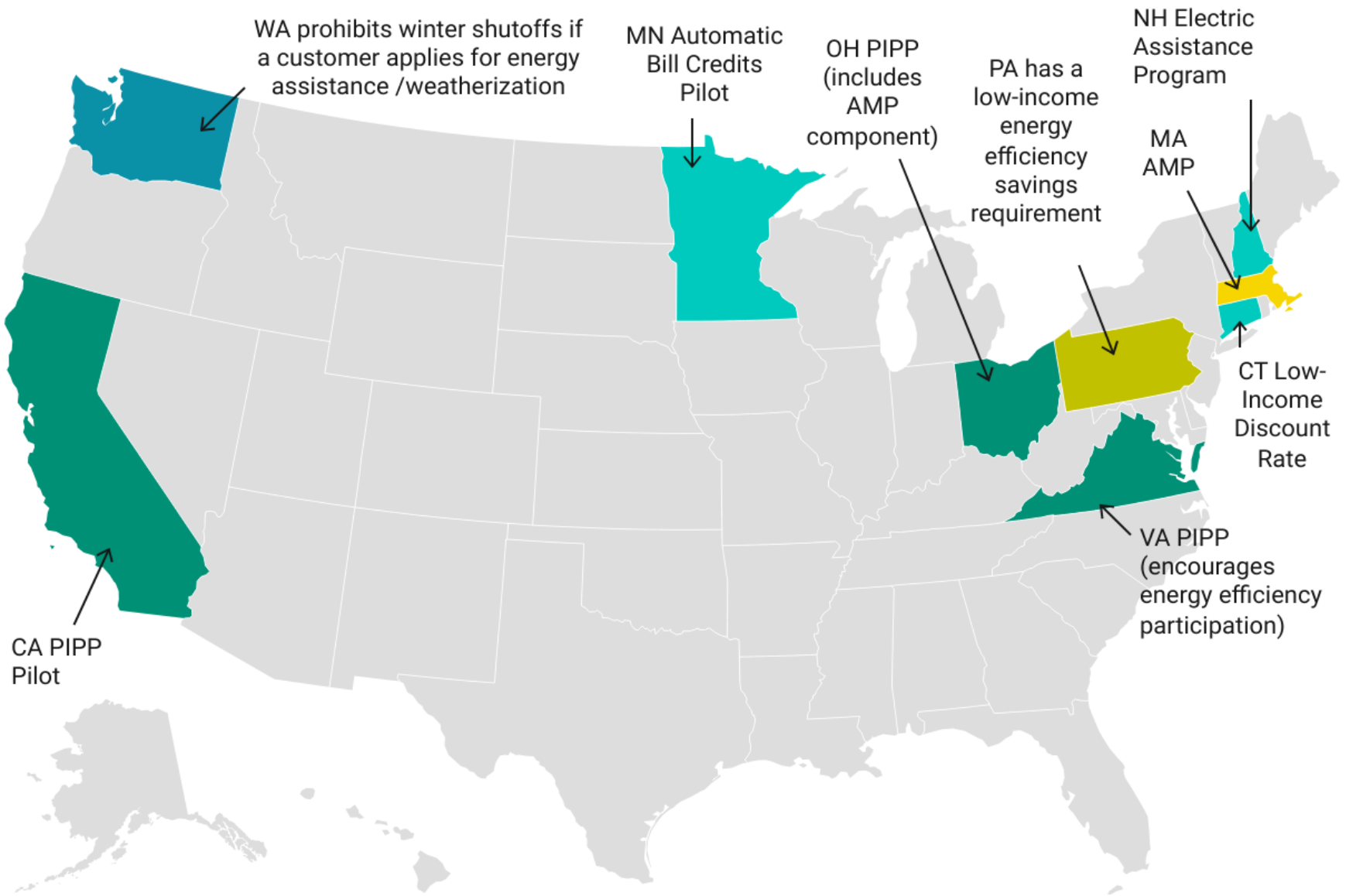
Percentage of Income Payment Plans (PIPPs) – 9+ states

Arrearage Management Plans – 10+ states



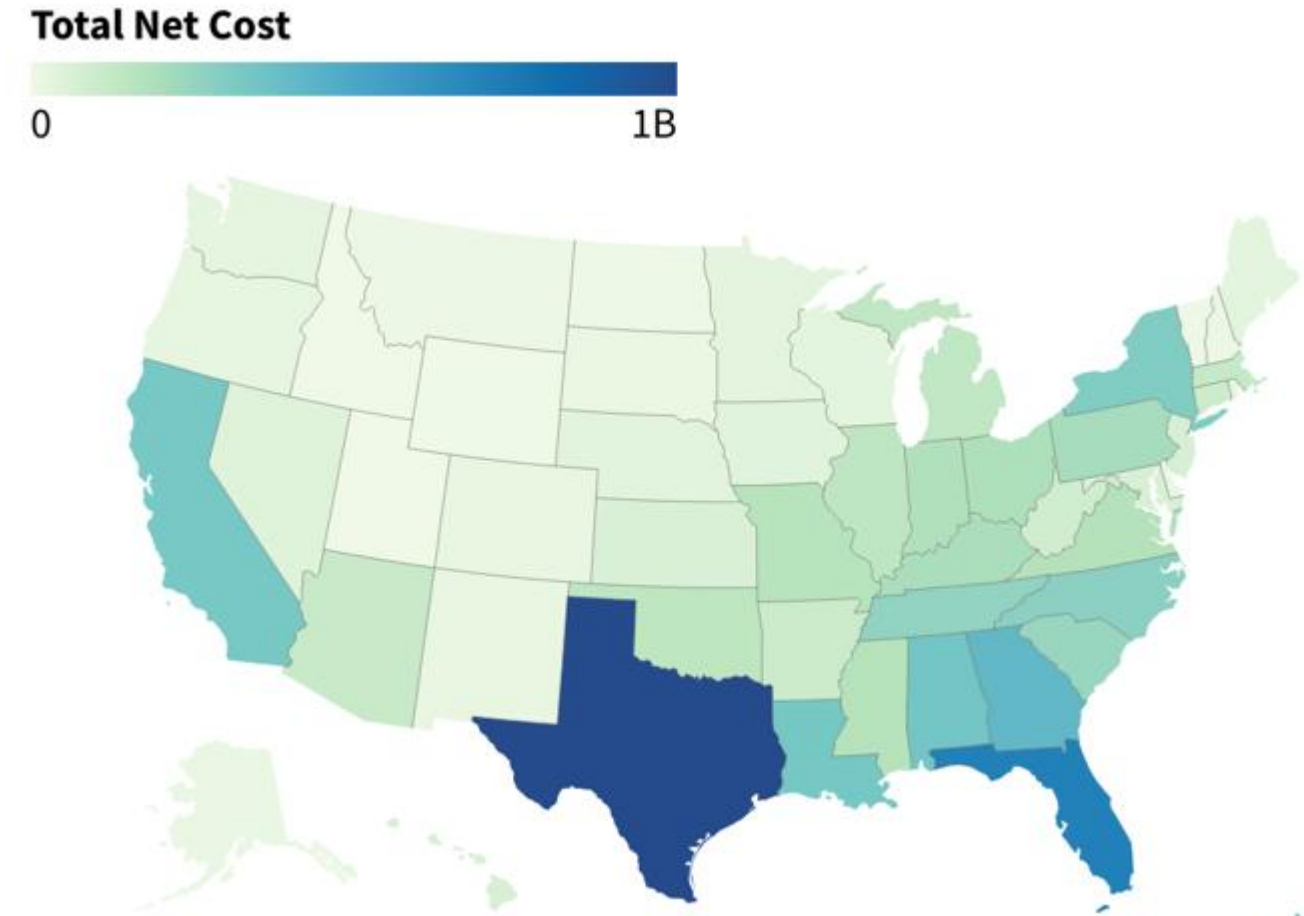
Disconnection Protections – Most states offer some protection

Examples of safeguard policies across the country



It would cost $9.3B annually to effectively end energy poverty in the electric sector.

Using EPPS, RMI modeled the costs of extending a universal PIPP that would cap electricity bills at 4% of household income in every state.



Source: RMI

Energy Poverty Policy Simulator

RMI’s Energy Poverty Policy Simulator

The Energy Poverty Policy Simulator (EPPS) is a state-specific tool built to support policymakers, regulatory staff, consumer advocates, and researchers to better understand the costs and impacts attributable to policies designed to limit energy poverty and reduce energy system costs.

EPPS Tool Setup

Bill and Burden Reduction + Cost and Funding Model Outputs

State and Income Metric Inputs

Energy Poverty Policy Simulator

EPPS is a state-level tool designed to show the cost and distributional impacts of various low-income energy affordability and cost control policies.

- State Selection
- Income Metric Selection

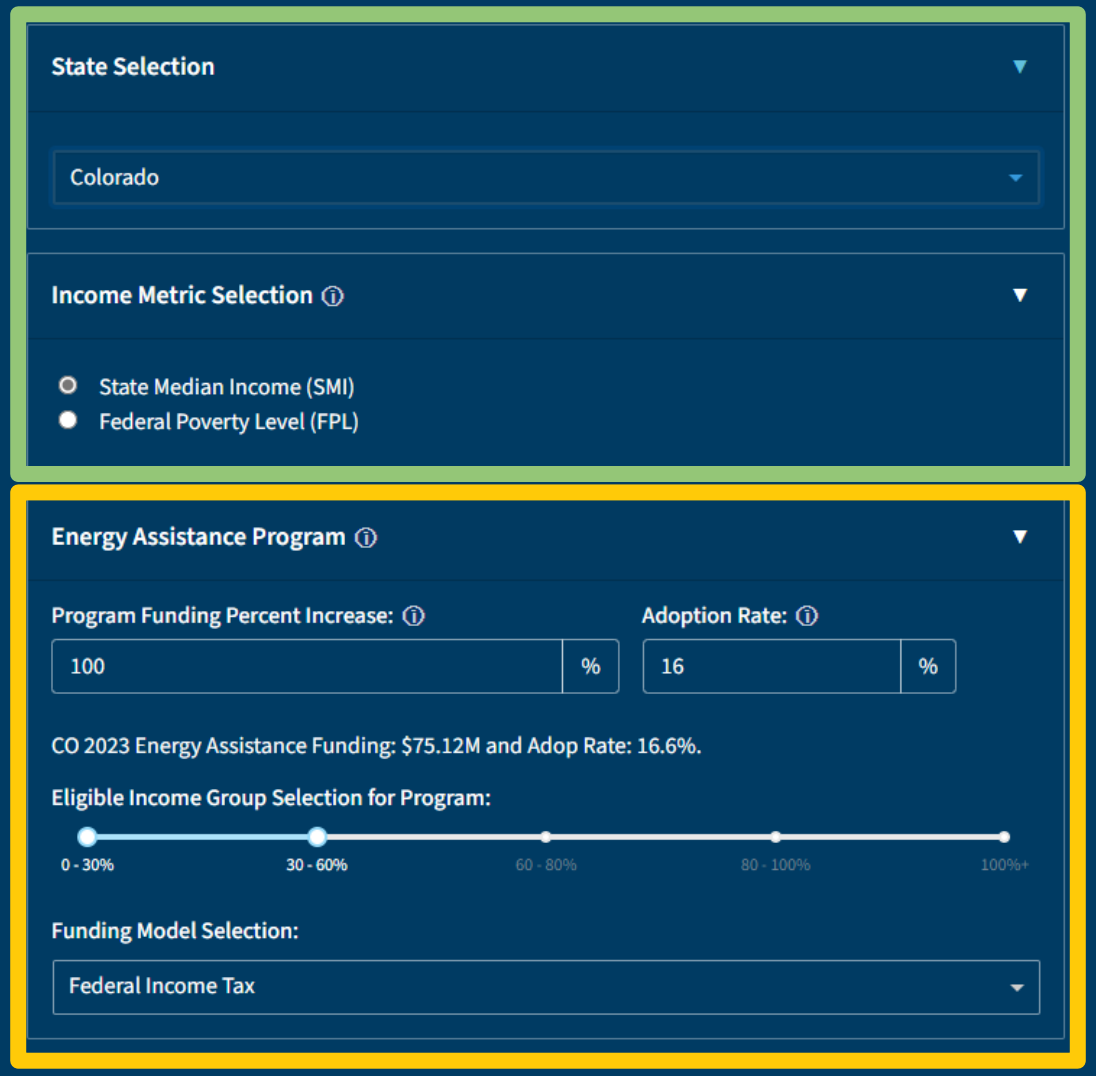
- Energy Assistance Program
- Low-Income Energy Efficiency Program
- Flat Discount Rate
- Tiered Discount Rate
- Percentage of Income Payment Plan (PIPP)
- Arrearage Forgiveness Program
- Cost Control Policies

Update Outputs

Collapsible Energy Poverty and Cost Control Policies

When you're done adding inputs, this button generates new outputs

EPPS Tool Setup



All policies use the state selection and/or the income metric selection.

All energy poverty policies are collapsible, and when you open them up there's a handful of inputs you typically find, including:

- Primary Policy Input
- Adoption Rate
- Eligible Income Groups
- Funding Model Selection

Policies and funding models included in EPPS

Energy poverty policies: Energy Assistance Program, Low-Income Discount Rates, Percentage of Income Payment Plans, Low-Income Energy Efficiency, Arrearage Forgiveness Program

Note: Energy poverty policy impacts are reflected across both bill/burden impacts AND cost results

Cost control policies: Clean Repowering, ROE Reform, Economic Dispatch

Note: Cost control policies do not show up in cost results – only reflected in bill and burden charts. EXCEPTION – ROE reform is reflected in the Shareholder funding model chart

Funding models: Ratepayer, Shareholder, and Federal Income Tax

Outputs: Bill and Burden Impacts, Bill Discount by Policy, Total Costs Chart, Funding Model Charts

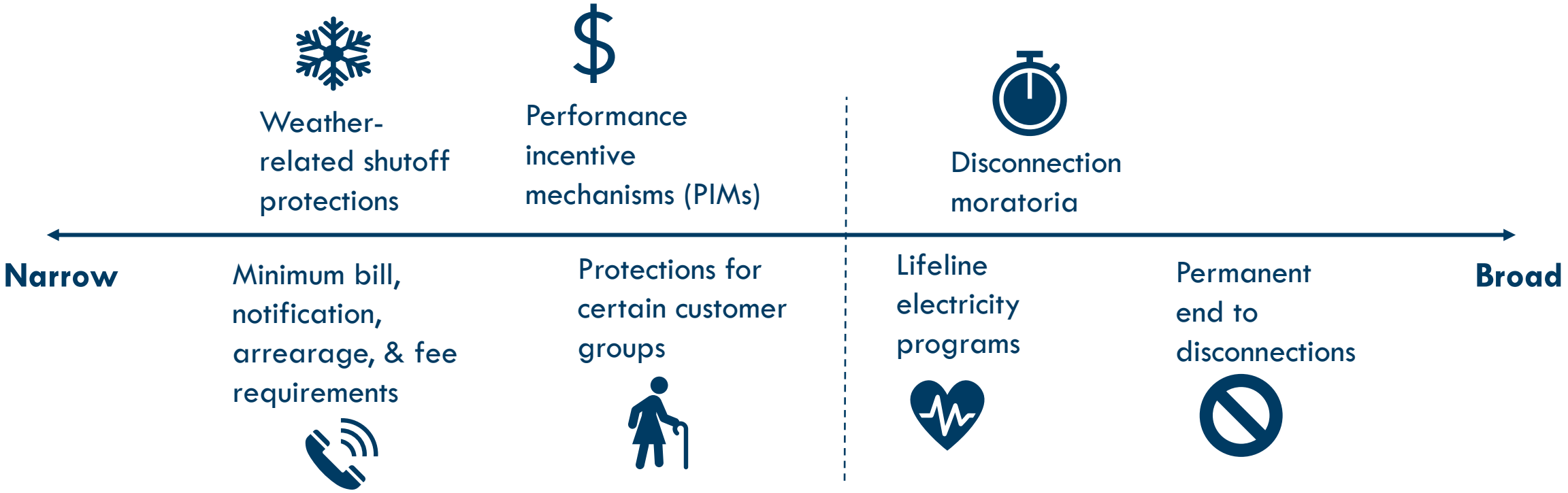
https://utilitytransitionhub.rmi.org/energy-poverty-policy-simulator/

Thank you!

Appendix

There are a number of options to reform disconnection

Spectrum of disconnection options (illustrative)*



* In practice, the design and impacts of these policies vary significantly across jurisdictions. The above graphic is based on the typical level of protection from disconnection and the number of customers protected by the policy.

New Hampshire and Connecticut provide example structures for tiered LI rate design

State	New Hampshire	Connecticut
Name of Program	Electric Assistance Program (“EAP”)	Low-Income Discount Rate (“LIDR”)
Discount	Discount rate is sliding scale between 5% to 86% depending on household income	Five-tiered structure ranging from 5% to 50%
Eligibility	Households <200% of the FPL	100% to 275% FPL
Cost Recovery	Funded through System Benefits Charge on monthly customer utility bills	Funded through System Benefits Charge on monthly customer utility bills
Notable Features	• Monthly usage cap at 750 kWh of consumption • Statewide program for all 4 utilities in the state, meaning that cost recovery is distributed more widely across customers of all service territories	• Program updated after data sharing with DSS resulted in enrollment of 2x the number of low-income customers

California and Virginia provide example structures for PIPP design

State	California	Virginia
Name of Program	Percentage of Income Payment Plan Pilot	Percentage of Income Payment Program
Cap	4% of household income	• 6% of household income for those with non-electric heating • 10% of household income for those with electric heating
Eligibility	CARE customers who are either located in one of the zip codes with the highest rates of disconnections, or who have experienced 2+ disconnections during the year prior to the moratorium	<150% of the FPL
Cost Recovery	PPPC. Estimated total bill subsidy costs of $23 million and administrative costs of $15 million.	Universal service fee on non-participating customers' bills (~79¢ monthly surcharge)
Notable Features	• The pilot, launched in 2021, aims to enroll 15,000 participants across CA's major IOUs	• Requires reduction in energy consumption through weatherization or energy efficiency programs

Massachusetts and Ohio provide example AMPs

State	Massachusetts	Ohio
Name of Program	Arrearage Management Program (National Grid)	PIPP Plus
Eligibility	Customer must be enrolled in the utility's low-income discount rate and have an account balance of at least $300 & 60 days overdue	Household income at or below 175% FPL
Level of debt forgiveness	1/12 of past-due balance is forgiven for each timely, full payment of a new bill, up to a maximum of $12,000 forgiven each year	1/24th of past-due balance is forgiven for each timely, full payment of a new bill (all arrearages forgiven after 24 straight on-time, full payments)
Cost Recovery	Funded through the Residential Assistance Adjustment Factor ("RAAF"), which is paid by all rate classes	Funded through universal service fund rider, which is paid by all rate classes
Notable Features	• Customers actively enrolled in the PIPP are protected from service disconnection	• For electric customers, PIPP caps bills at 10% of household income or $10 (whichever is greater)

States have adopted various strategies to target energy efficiency (EE) benefits to low-income customers

Strategy	Examples
Low-income goal or requirement	The Pennsylvania PUC mandates that at least 5.8% of each utility's total consumption reduction target must come from the low-income sector.
Cost-effectiveness rules that enable low-income EE	Kentucky exempts low-income EE programs from cost-effectiveness screening. Nevada applies an automatic 25% non-energy benefits adder to low-income programs in cost-effectiveness assessments.
Tradeoff between deep savings and broader reach	With limited budgets, certain program administrators prioritize deep savings (e.g., retrofits) while others prioritize maximizing participation (e.g., low-cost measures). Some administrators include both approaches in their overall low-income portfolio.
Performance incentive mechanisms (PIMs) tied to low-income EE	At least 5 states have adopted PIMs that require energy efficiency program administrators to dedicate a portion of total savings or spending specifically to low- to moderate-income customers.

Électricité de France (EDF): French utility provides "lifeline" electricity to ensure basic access

What it is	• A permanent end to disconnections for all customers, with a limited guaranteed amount of power (1 kVA) for customers in arrears that would have otherwise been disconnected (1 kVA is enough for lighting, internet, device charging, water heating, and even a small refrigerator)
How it was initiated	• EDF initiated the reform, having already been in the practice of limiting power to 1 kVA in cases of nonpayment for several years prior and finding that **it did not increase the average time to settle arrears** • Several prominent advocates and government officials had advocated for the reform

Impacts	• BENEFITS FOR ARREARS REDUCTION (from EDF survey)
	  • Allows EDF "to **solve 8 cases out of 10** and to find financial solutions to bring back customers to regular contract"
	  • **Household debt overall improved** for 7 out of 10 customers with debt being reduced for 42% of customers and completely eliminated for 29% of customers
	  • Most customers have their power limited for 11 days before their cases are resolved (e.g., median power limitation of 11 days)
	• COSTS
	  • Unclear, but likely relatively low given the observed collection rate and arrears reduction from the program

Additional context:	• EDF is a state-owned utility • A winter moratorium on disconnections applies, so that customers retain access to enough power for home heating from Nov 1 to Mar 31

LADWP: Disconnections ban for low-income and elderly customers

What it is	• A permanent ban on disconnections for low-income and elderly customers enrolled in assistance programs (EZ-SAVE and Lifeline programs)
How it was initiated	• LADWP Board of Commissioners adopted the reform after reviewing data showing low-income customers enrolled in assistance programs paid their bills at the **same rate or higher than all other customers** during the COVID-19 moratorium • Data also showed that the lowest-income households & majority-Black and majority Latino communities were > 2x as likely to be shut off compared to higher-income & white households • LADWP partnered with academic and advocate groups in developing this reform
Impacts	• COSTS • Unclear. However, customers enrolled in the protected programs represented 7.9% of energy revenues when the reform was adopted in 2022.
Additional context:	• The shutoffs ban was paired with increased efforts to secure utility debt relief and improve affordability as the city decarbonized – as well as a shutoff ban for all customers during times of extreme weather

Energy Poverty Policy Simulator

EPPS is a state-level tool designed to show the cost and distributional impacts of various low-income energy affordability and cost control policies.

State Selection

Ohio

Income Metric Selection ⓘ

- State Median Income (SMI)
- Federal Poverty Level (FPL)

Energy Assistance Program ⓘ

Program Funding Percent Increase: ⓘ 25 %

Adoption Rate: ⓘ 20 %

OH 2023 Energy Assistance Funding: $251.30M and Adop Rate: 20.5%.

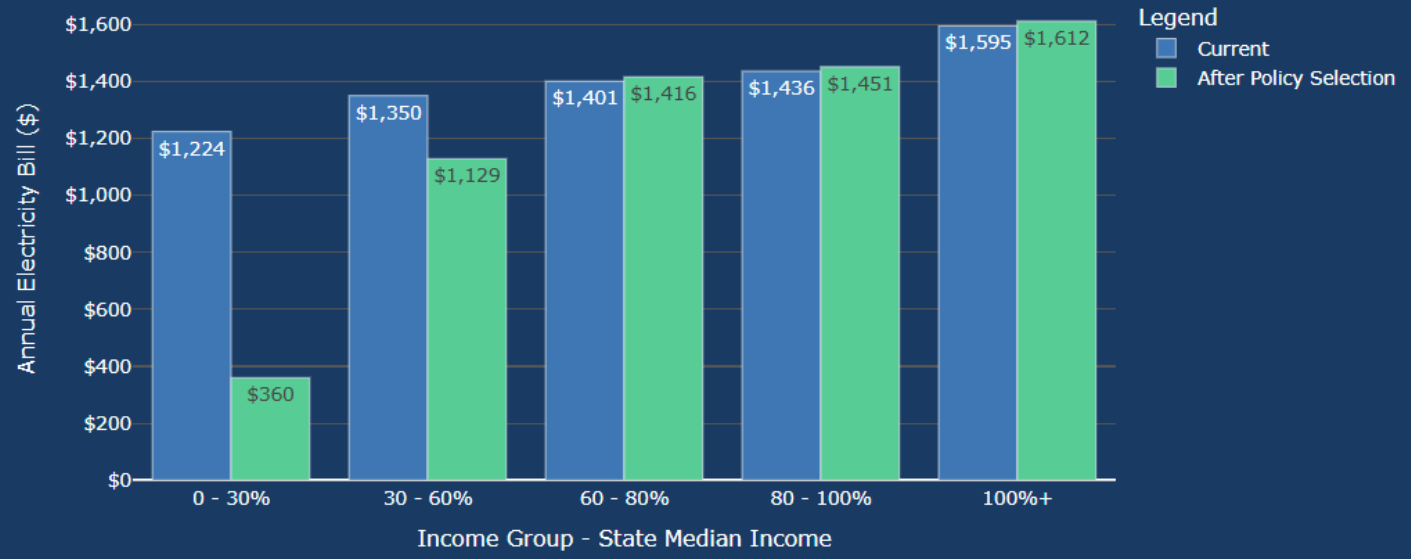
Eligible Income Group Selection for Program:

0 - 30% | 30 - 60% | 60 - 80% | 80 - 100% | 100%+

Funding Model Selection:

Federal Income Tax

Annual Electricity Bill Impacts:



Annual Electricity Burden Impacts:

Eligible Income Group Selection for Program:

0 - 30% | 30 - 60% | 60 - 80% | 80 - 100% | 100%+

Funding Model Selection:

Federal Income Tax

Low-Income Energy Efficiency Program ⓘ ▶

Flat Discount Rate ⓘ ▼

Flat Discount Rate: ⓘ 70 %

Adoption Rate: ⓘ 75 %

Eligible Income Group Selection for Flat Discount Rate:

0 - 30% | 30 - 60% | 60 - 80% | 80 - 100% | 100%+

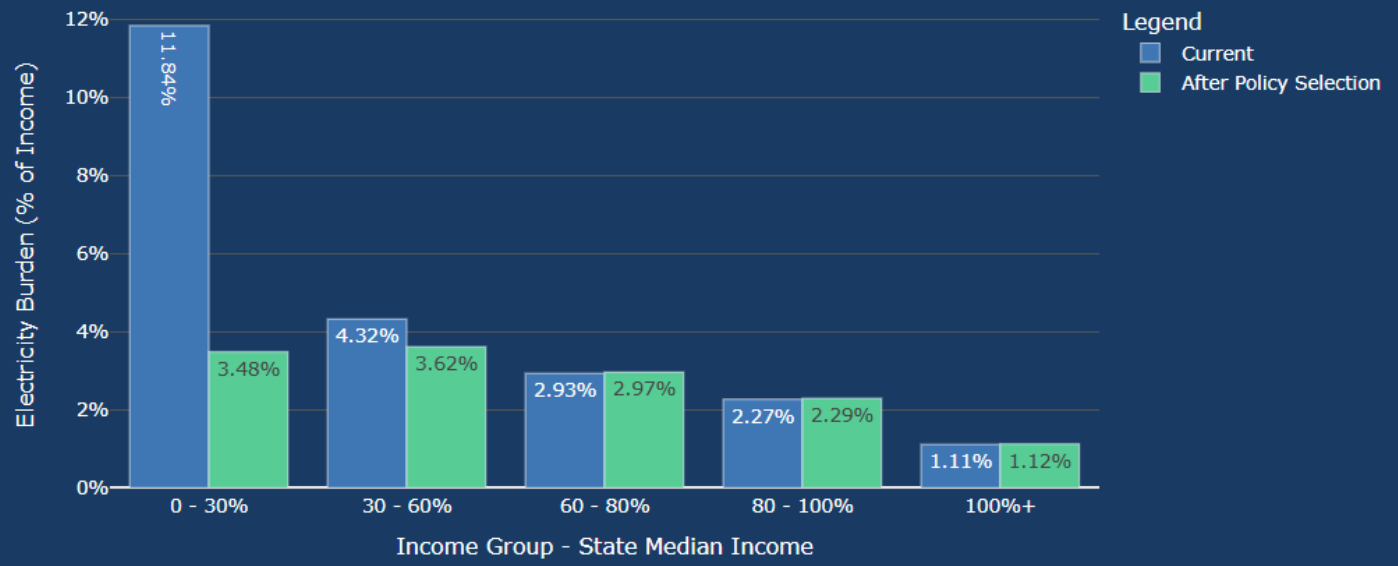
Funding Model Selection:

Ratepayer: All Customers

Tiered Discount Rate ⓘ ▶

Percentage of Income Payment Plan (PIPP) ⓘ ▶

Annual Electricity Burden Impacts:



Annual Bill Discount by Policy and by Income Group:

Funding Model Selection:

Ratepayer: All Customers

Tiered Discount Rate ⓘ ▶

Percentage of Income Payment Plan (PIPP) ⓘ ▶

Arrearage Forgiveness Program ⓘ ▶

Cost Control Policies ⓘ ▼

☑ ROE Basis Point Reduction

The basis point reduction will be the value subtracted directly from the current state average ROE. ⓘ

75

OH current average state ROE: 10.23%.

☐ Clean Repowering

Description: ⓘ

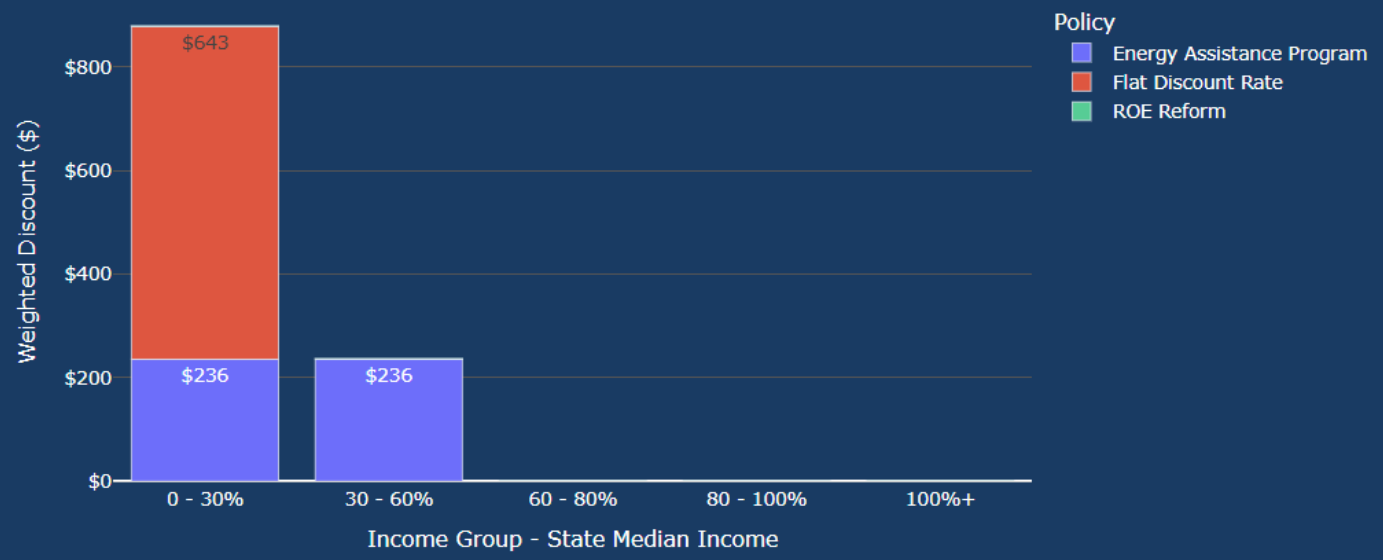
RMI analysis shows that OH currently does not have Clean Repowering opportunities - bill and burden impacts are zero.

☐ Economic Dispatch

Description: ⓘ

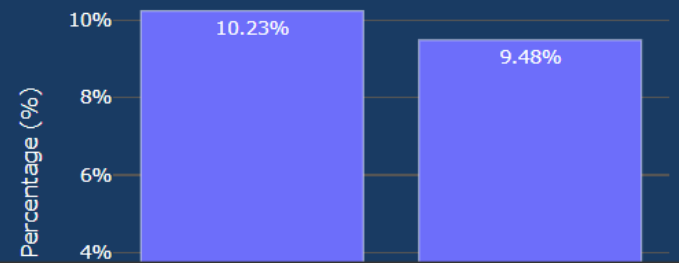
RMI analysis shows that OH currently does not have Economic Dispatch opportunities - bill and burden impacts are zero.

Annual Bill Discount by Policy and by Income Group:



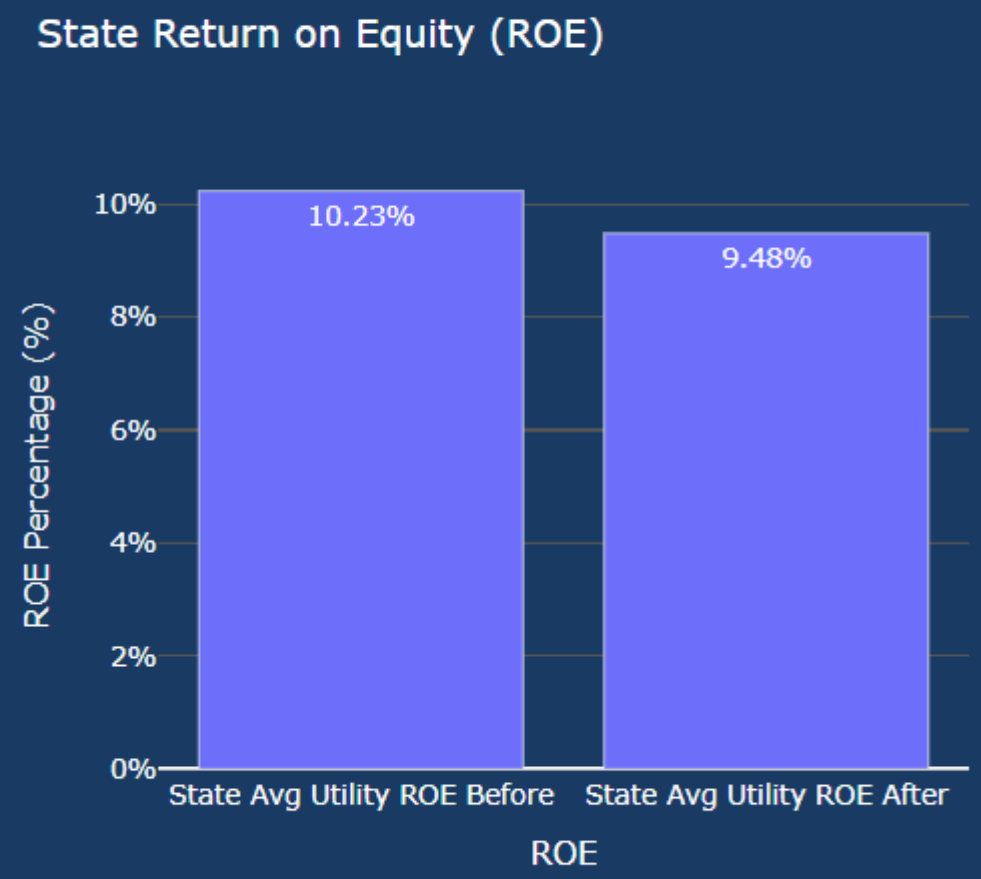
Cost Results:

State Return on Equity (ROE)

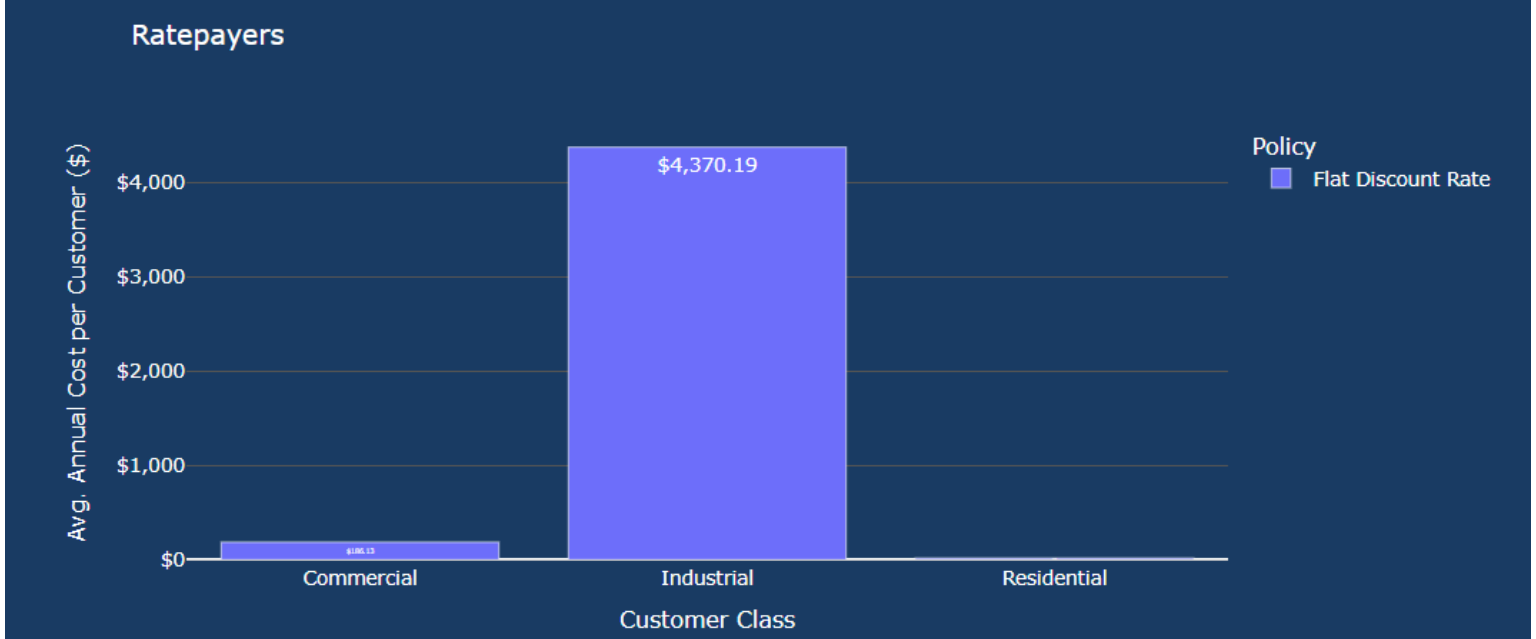


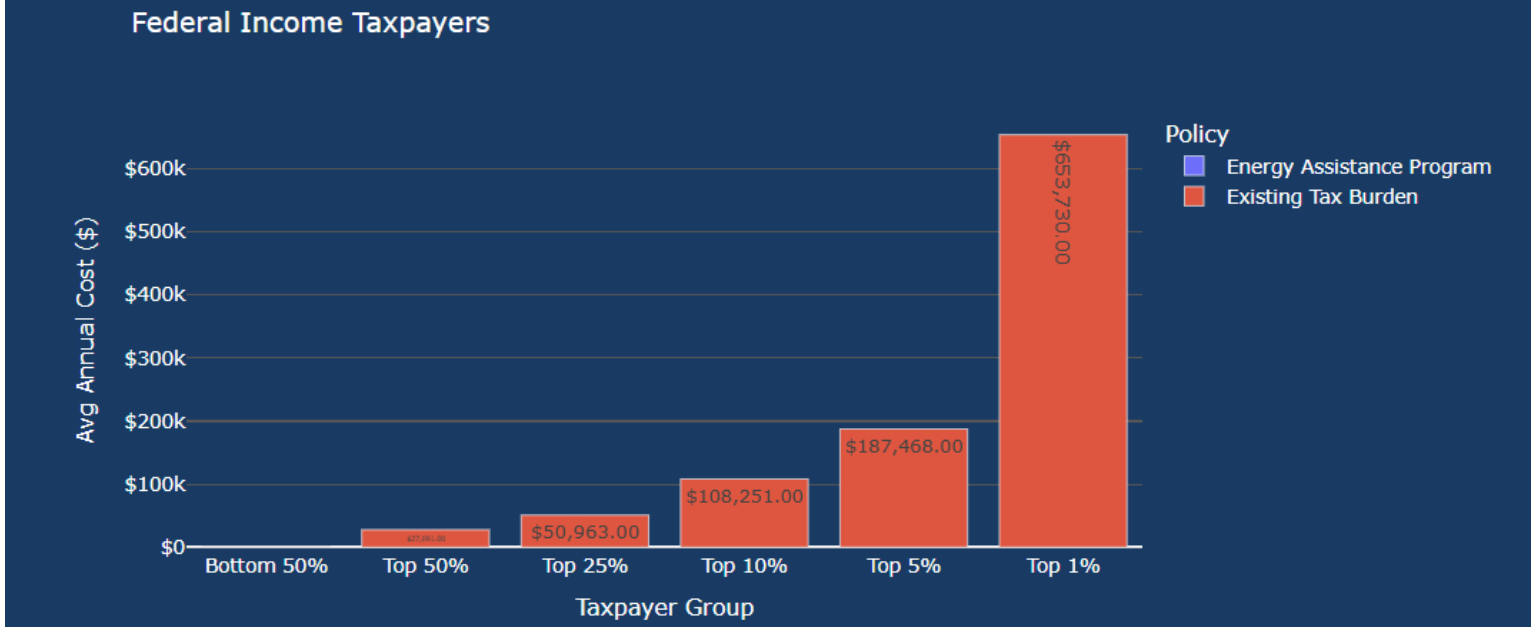
State	Policy	Cost
OH	Flat Discount Rate	$376.7M
OH	Energy Assistance Program	$329.8M
OH	Savings from Avoided Arrears	$-337.3M

Cost Results:



State	Policy	Cost
OH	Flat Discount Rate	$376.7M
OH	Energy Assistance Program	$329.8M
OH	Savings from Avoided Arrears	$-337.3M
OH	Total Cost of All Policies	$369.3M


Ratepayers
Avg. Annual Cost per Customer ($)
$4,000
$3,000
$2,000
$1,000
$0
$4,370.19
Commercial
Industrial
Residential
Customer Class
Policy
Flat Discount Rate


Federal Income Taxpayers
Avg Annual Cost ($)
$600k
$500k
$400k
$300k
$200k
$100k
$0
$653,730.00
$187,468.00
$108,251.00
$50,963.00
Bottom 50%
Top 50%
Top 25%
Top 10%
Top 5%
Top 1%
Taxpayer Group
Policy
Energy Assistance Program
Existing Tax Burden

Icon Library

(with editable color fills)