FREE TO USE DATASETS AND TOOLS TO BENCHMARK RATES AND ANALYZE AFFORDABILITY

INNOVATION WEBINAR

March 26, 2026
4:00 to 5:00 p.m. ET

Free & open to the public!

NARUC CPI Innovation Webinar

***Moderator*: Hon. Kristy Nieto,**
Public Service Commission of Wisconsin

Daniel Zimny-Schmitt,
National Laboratory of the Rockies

Thomas Bowen,
National Laboratory of the Rockies

About NARUC

- Founded in 1889, the National Association of Regulatory Utility Commissioners (NARUC) is a non-profit organization dedicated to representing the state public service commissions who regulate the utilities that provide essential services such as energy, telecommunications, power, water, and transportation.

- NARUC's members include all 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands.

- Our mission is to serve the public interest by improving the quality and effectiveness of public utility regulation.

- For more information, visit: www.naruc.org

About NARUC CPI

- The NARUC Center for Partnerships & Innovation (CPI) builds relationships, develops resources, and delivers training to assist state commissions contending with complex current and emerging issues.

- CPI is funded by cooperative agreements with the U.S. Department of Energy (DOE) and the National Institute of Standards and Technology (NIST).

- CPI conducts work across five key energy areas and many topics within each: generation; transmission; distribution; customers; and critical infrastructure preparedness, response, and resilience.

- Among other events, CPI hosts a monthly innovation webinar series on a wide range of timely topics.

- For more information, visit: www.naruc.org/cpi

Upcoming Events

Virtual Events:

- **Bulk Power System Virtual Training Series:** April 2, April 16, April 30, 2:00 10 4:30 p.m. ET
- **Distribution System Planning Peer Webinar Series:** May 14, June 22, August 13, 3:00 to 4:30 p.m. ET
- **May Innovation Webinar:** May 28, 3:00 to 4:00 p.m. ET.

Upcoming In-Person Events:

- **NCEP Annual Meeting:** May 5 to 6, 2026, Charleston, SC
- **NARUC Summer Policy Summit:** July 19 to 22, Minneapolis, MN

See the full list of events and access registration links at: www.naruc.org/events/event-list/

Today's Speakers

NARUC CPI Innovation Webinar

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NATIONAL LABORATORY OF THE ROCKIES

Free to Use Datasets and Tools to Benchmark Rates and Analyze Affordability

Daniel Zimny-Schmitt & Thomas Bowen

NARUC Innovation Webinar Series

March 26th, 2026

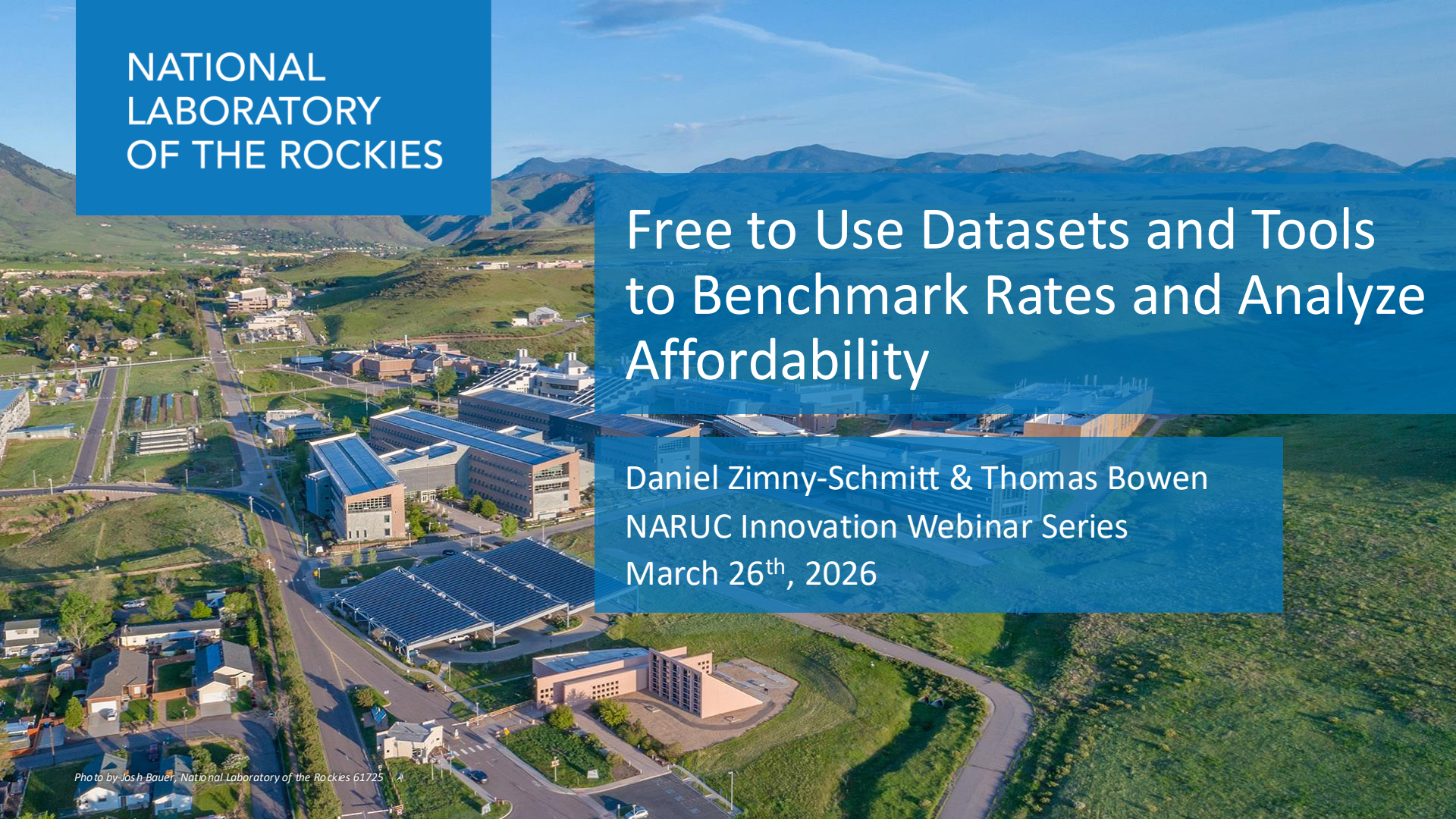


Photo by Josh Bauer, National Laboratory of the Rockies 61725

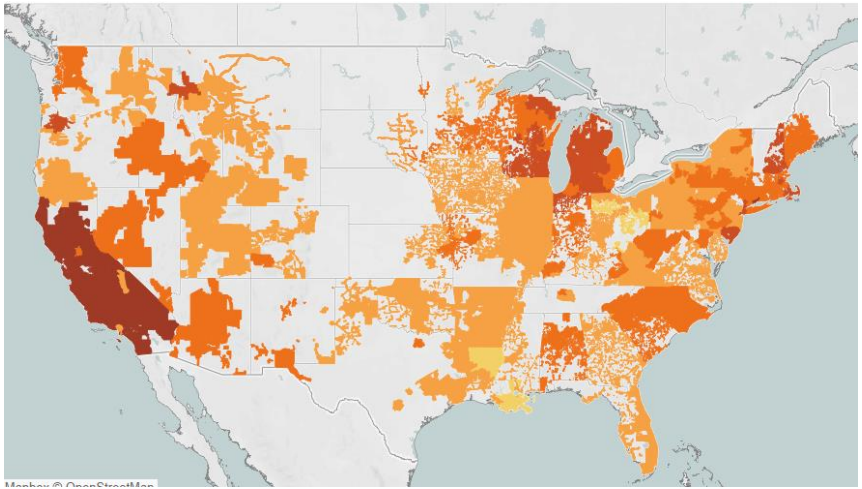
Contents

U.S. Utility Rate Database

Daniel Zimny-Schmitt

Utility Rate DATABASE

- Electricity rates for 3,000+ U.S. utilities
  - Investor-owned (IOUs)
  - Cooperative
  - Municipal
- All customer classes & rate types
  - Residential
  - Commercial & Industrial
  - EV-specific
  - Pilot rates
  - Agricultural & special rates



Annual updates are made for 75% of total U.S. electricity load, with a focus on IOUs

Utility Rate DATABASE

- Detailed breakdown of each tariff
- Hosted and maintained by NLR
- Freely accessible online
- Users can lookup rates by utility, zip code, county
- Integrated with NLR modeling tools (e.g. System Advisor Model, REopt)
- Historical rate data is retained (with limitations)

URDB User Metrics

2025 stats:

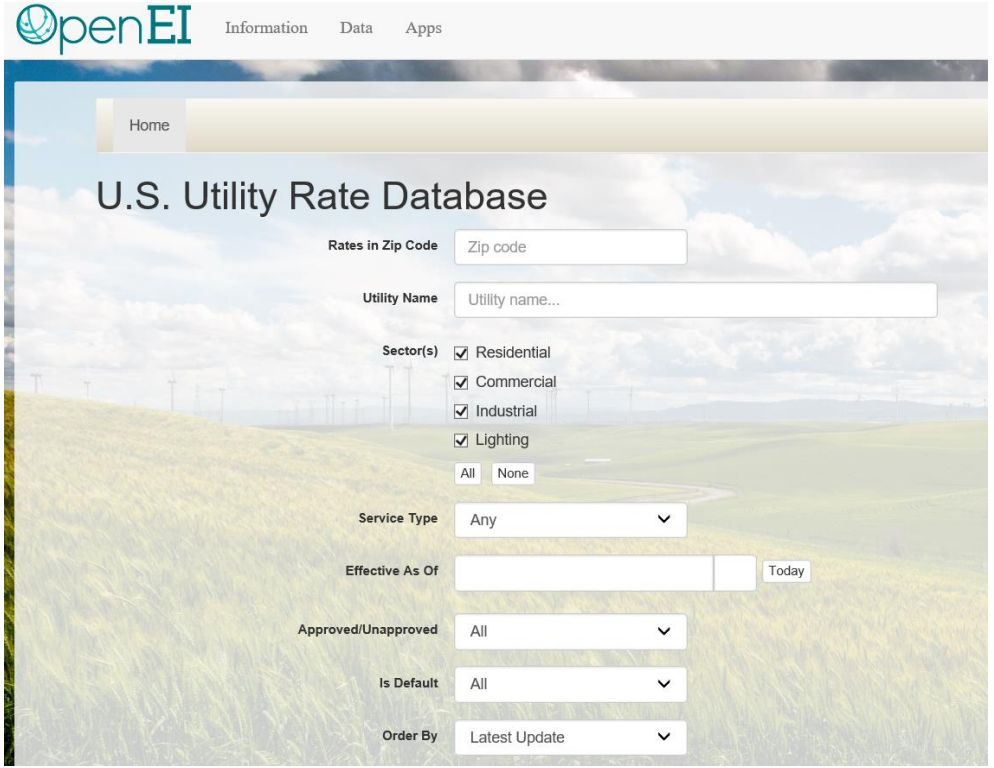
- 165,000 views from 19,000 distinct users on URDB web app
- 13.8M hits and >620 users on URDB API

Last 30 days:

- 21,223 views from 4,476 distinct users on URDB web app

Accessing the Data

- Can be accessed via website interface (shown here), and API
- Features are downloadable in machine-readable formats including JSON and CSV
- URDB data is an important component of SAM, REopt, and other NLR tools

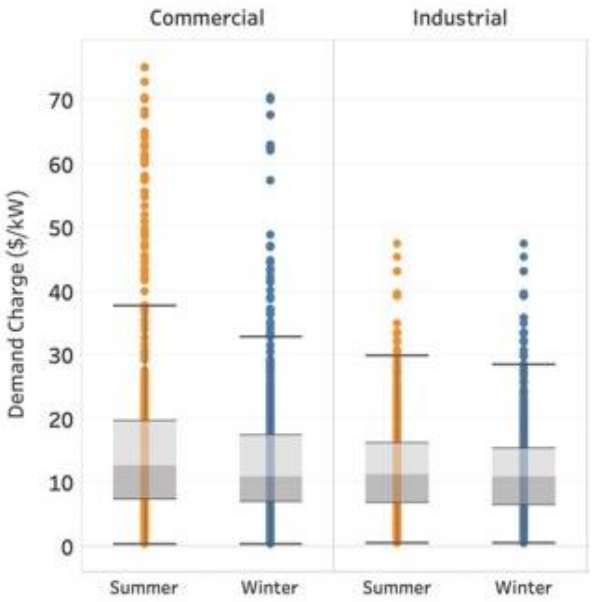


The URDB and Rate Transparency

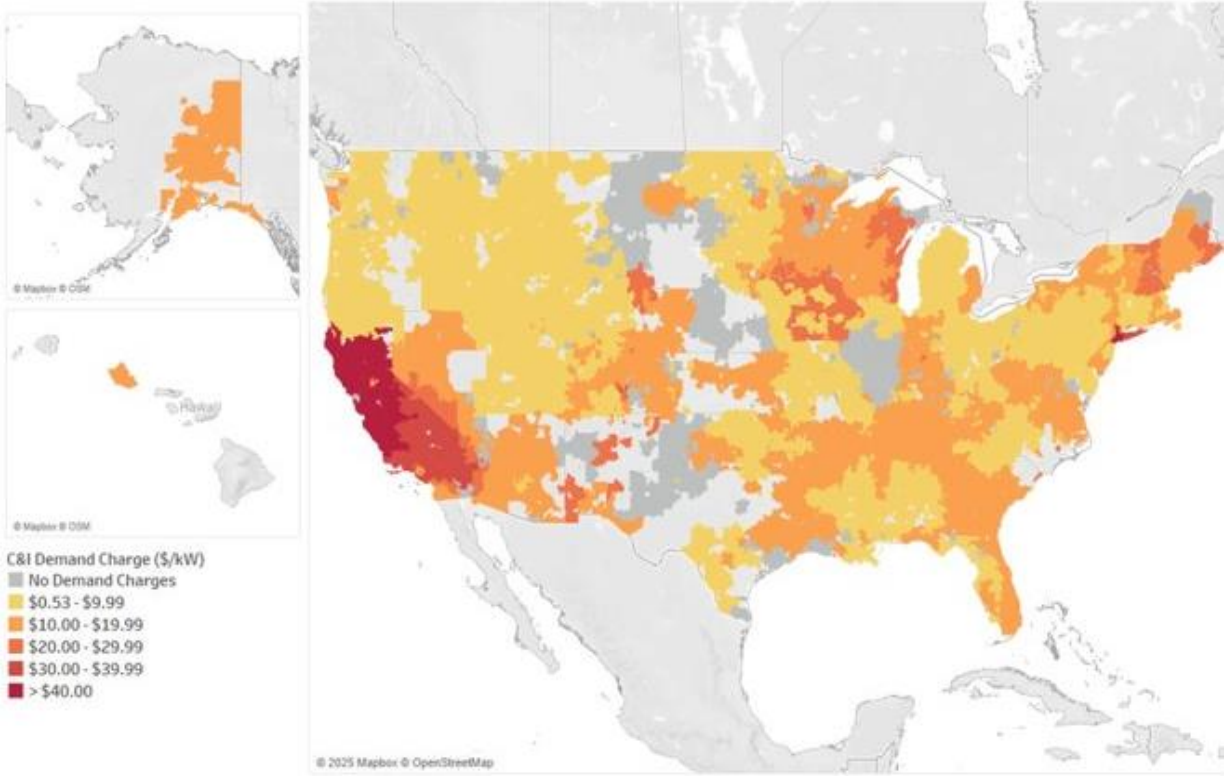
- Well-designed rates are critical elements of a reliable and affordable electricity system.
- Rates are the primary means by which people interact with the electricity system.
  - For **commercial and industrial customers**, rates impact economics and drive business decisions.
  - For **residential customers and consumer advocates**, rates impact energy affordability and household energy burden.
  - For **regulators & utilities**, well-designed rates enable accurate cost recovery and efficient customer response.
- Decision makers need tools to evaluate and design rates that accurately respond to the quickly changing conditions of the electricity system, including the impacts of load growth and advanced energy technologies.
- Traditional rate design methodology has been slow to respond to changing conditions.

Case Study: Demand Charges

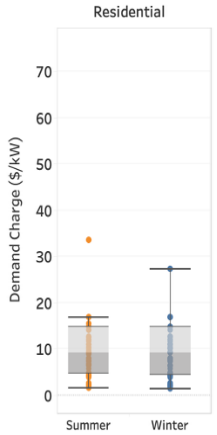
On-peak demand charges per tariff by sector and season



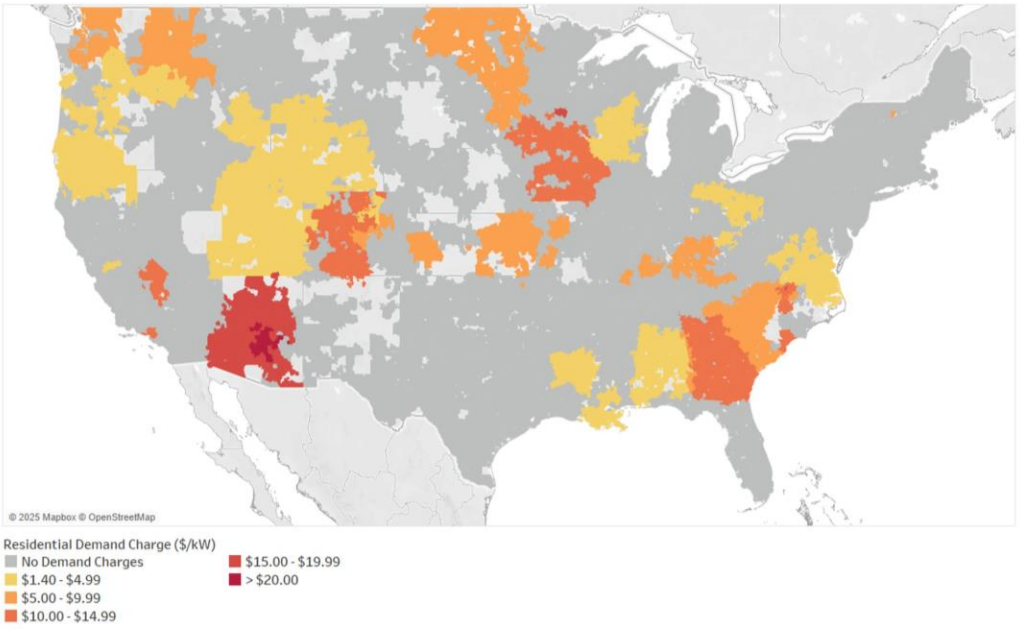
Commercial and Industrial Demand Charges, Summer Months



Residential Demand Charges



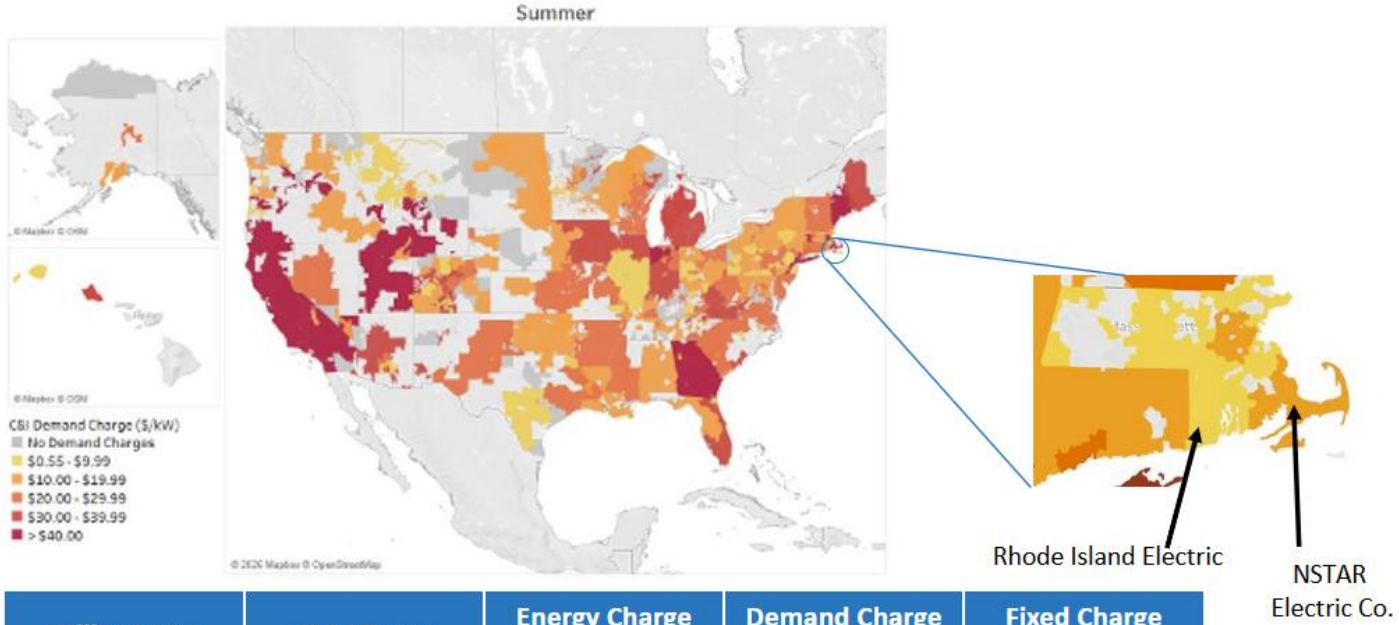
Residential Demand Charges, Summer Months



Name of Utility	Percent of Residential Customers With Demand Charges
Arizona Public Service Co	17.6%
Avista Corp[i]	4.5%[i]
Tucson Electric Power Co	1.6%
Alabama Power Co	<1%
Evergy	<1%
Georgia Power Co	<1%
Kentucky Utilities Co	<1%
Public Service Co of Colorado	<1%
Puget Sound Energy Inc	<1%
South Carolina Electric & Gas Co	<1%
Wisconsin Power & Light Co	<1%

i. The data for Avista includes approximately 16,000 customers on a "Residential and Farm General Service" rate, and it is unclear whether these customers would be categorized in the residential service class in other jurisdictions.

Comparing Charges in Adjacent Service Territories



Utility Name	Rate Name	Energy Charge ($/kWh)	Demand Charge ($/kW)	Fixed Charge ($/month)
Rhode Island Electric	General C&I Rate	$0.059	$13	$145
NSTAR Electric Co.	General Service	$0.042	$22	$18

Customer Affordability, Incentives, and Rates Optimization Tool

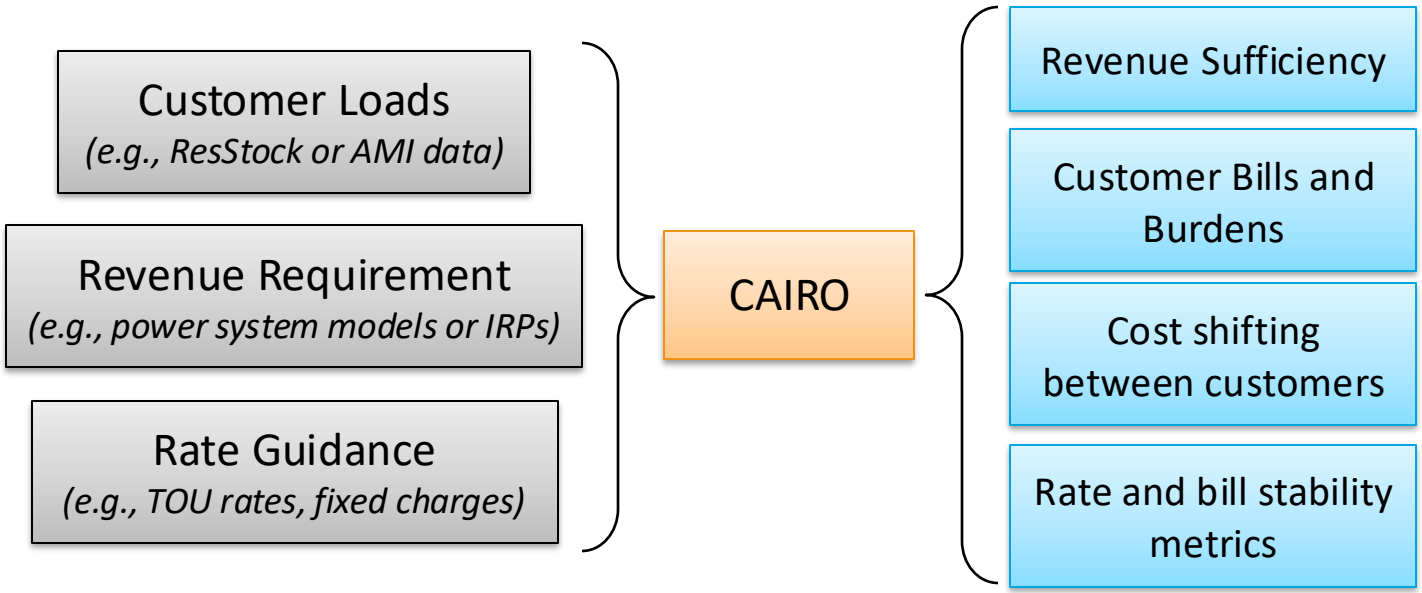
CAIRO – Thomas Bowen

Customer Affordability, Incentives, and Rates Optimization Model

CAIRO estimates the impact of utility rate and program design decisions using future power system scenarios to identify tradeoffs aligned with traditional regulatory principles such as **affordability**, **economic efficiency**, **revenue adequacy**, and **consumer cross-subsidization**.

Translates:
Customer loads, regulatory guidance on rates, utility revenue assumptions…

Into:
Utility revenue requirements, multiple rates designs, customer demand response, customer bills, cost-shifting between customers.



Adapted from: McLaren & Speetles (2025)

What questions can CAIRO help answer?

- Evaluate rates
  - Do they recover the necessary revenue?
  - How do they impact solar PV adopters vs. non-adopters?
  - Do they exacerbate cost shifting?
- Evaluate affordability strategies
  - How do energy efficiency solutions compare to traditional bill assistance programs?
- Others:
  - How do rates need to evolve to reflect costs in a changing power system?
  - How might customers shift load in response to time-varying rates?

Assessing affordability options

- Worked with utility to assess energy affordability under future power system scenarios
- Tested various methods to improve affordability
  - On-bill tariff financing of energy efficiency
  - Income-based fixed charges
  - Increases to bill assistance program

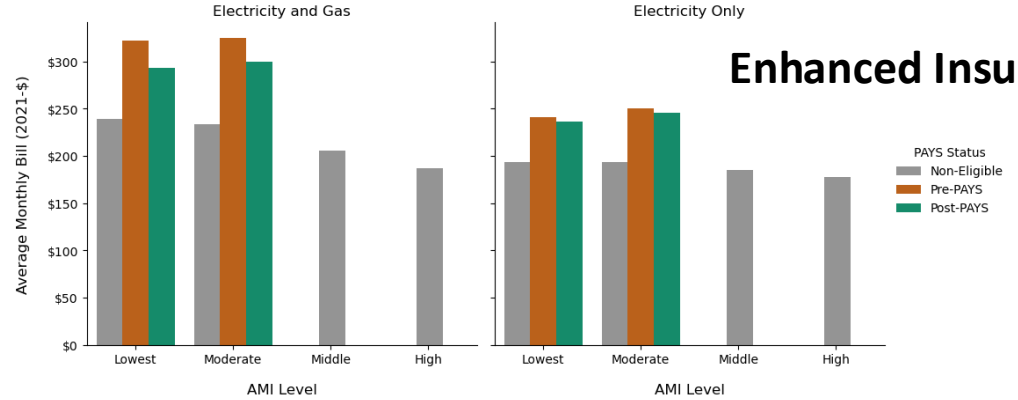
Example Results:
Los Angeles Department of Water and Power

Rate Equity Metric	2019 LADWP Baseline w. EZ-SAVE	2035 LADWP BAU w. EZ-SAVE	2035 LADWP BAU w. CARE & FERA	2035 Simplified Tiers w. CARE & FERA	2035 Simplified Tiers w. IBFC
Avg. Monthly Bill (All Households)	$105	$188	$188	$188	$188
Avg. Monthly Bill (Low-Income, 0-50% AMI)	$83	$193	$151	$138	$81
Average Annual Electricity Burden for:					
All Households	3.7%	7.3%	6.4%	6.0%	3.8%
Low-Income, 0-50% AMI	7.8%	16%	13%	12%	5.9%
Moderate-Income, 50-80% AMI	2.1%	4.0%	4.3%	4.1%	3.4%

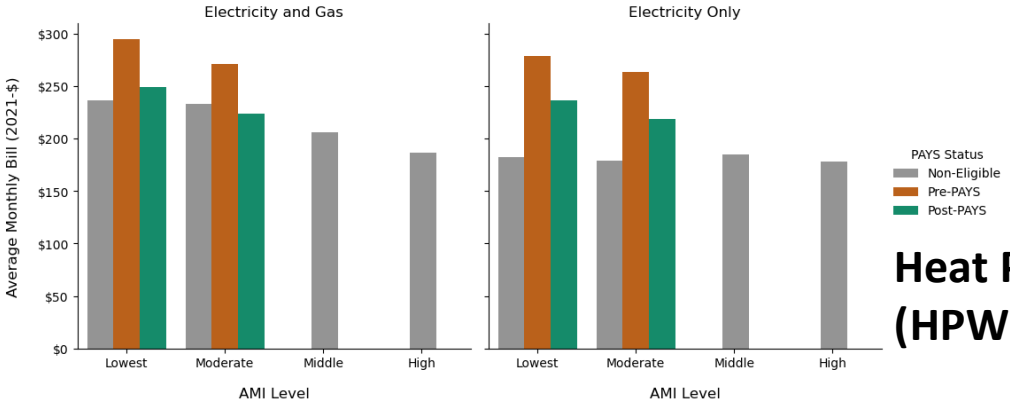
Baseline | More Affordable ⟷ Less Affordable | No Change

Image source: Bowen et al. (2023)

Assessing affordability options (cont.)



Enhanced Insulation



	Enhanced Insulation	HPWH
Technical Potential (Customer Count)	72,000	154,000
Program Bill rider*	$17 / month	$17 / month
Average Bill reduction	9%	16%

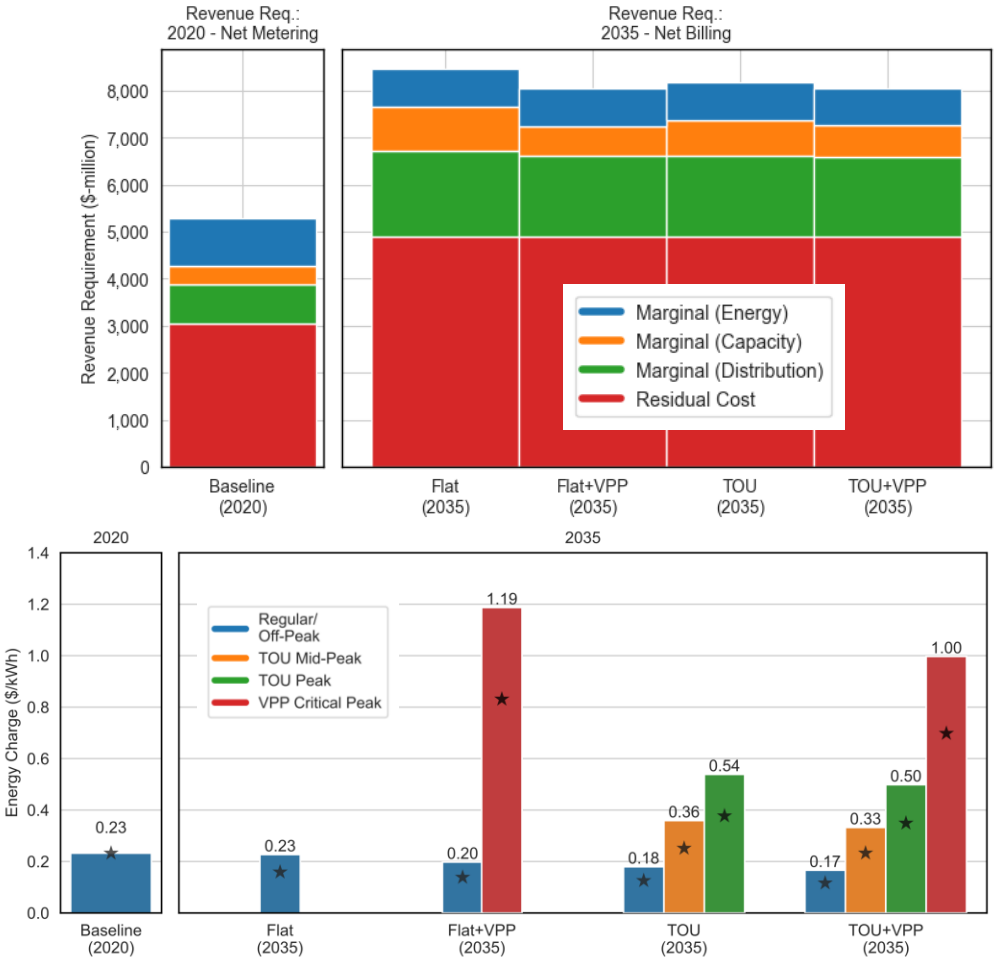
**: On-bill financing of efficiency measures recovers the initial investment and installation costs through riders on customers' bills. Analysis modeled then-extant rebates for efficiency improvements.*

Heat Pump Water Heaters (HPWHs)

Adapted from: Bowen (2024)

Evaluating cost savings and cost shifting

- Future high variable renewable energy, high DER power system in Massachusetts
- Evaluating potential for DER + time-varying rates to reduce power system costs
- Tracking cost-shifting between customers as they respond to retail rate price signals



DER: Distributed Energy Resource

Image source: Bowen et al. (2026)

Evaluating cost savings and cost shifting (cont.)

- Most flexible customer found to be able to avoid most costs, even as they reduced overall system costs
- Bill Alignment Test (BAT) used to compare customer bills to the costs they cause → measure of cost-shifting

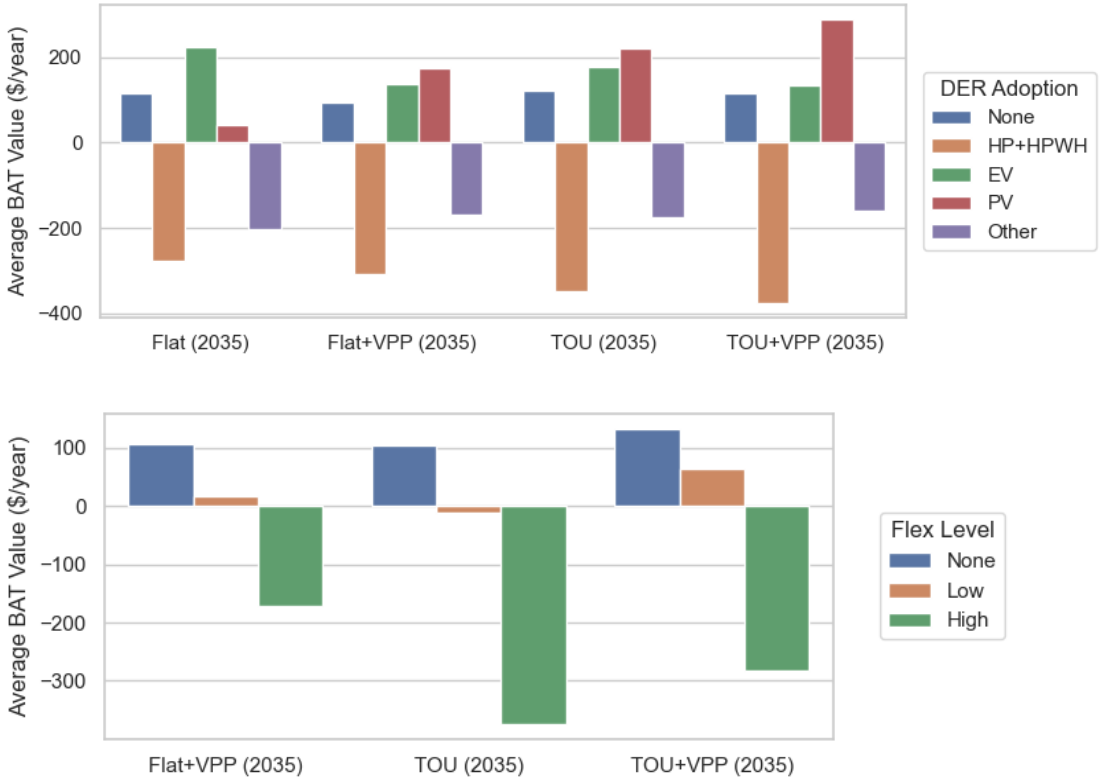


Image source: Bowen et al. (2026)

Other (ongoing) work

- In Guam (GPA) to:
  - Evaluate customer impacts (and potential system cost reductions) from TOU rates
  - Test if solar PV customers sufficiently contributing to fixed costs
- In New Jersey to:
  - Evaluate affordability impacts of data centers under future build out scenarios
  - Evaluate approaches to mitigate affordability impacts

Thank you!

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More Resources & References

- Tools access:
  - **URDB**: https://apps.openei.org/USURDB/
  - **CAIRO**: https://github.com/NatLabRockies/CAIRO
- Additional Information:
  - **CAIRO**: https://www.nlr.gov/grid/cairo

- References:

  - Bowen, T. (2024, April 4). *Low-income energy bill stability strategies: Inclusive Utility Investments*. SEPA Inclusive Utility Investment Task Force, Remote Monthly Meeting. https://sepapower.org/inclusive-utility-investment-task-force/
  - Bowen, T., Blonsky, M., Simeone, C., McIlmoil, R., Alberg, A., & Estreich, E. (2026). Design trade-offs for residential retail tariffs and virtual power plants. *Applied Energy*, *407*, 127339. https://doi.org/10.1016/j.apenergy.2025.127339
  - Bowen, T., Simeone, C., Stenger, K., Liu, L., Day, M., Sandoval, N., Panda, K., Zimny-Schmitt, D., & Reyna, J. (2023). *Chapter 5: Low-Income Energy Bill Equity and Affordability* (LA100 ES). NREL. https://www.nrel.gov/docs/fy24osti/85952.pdf
  - McLaren, J., & Speetles, B. (2025, November 6). *Tools to Tackle Affordability and Cost Allocation in Electricity Rate Design*. Clean Energy States Alliance, Washington D.C. https://www.cesa.org/event/affordability-cost-allocation-rate-design/
  - Speetles, B., LeBel, M., Nelson, R., McLaren, J., Zimny-Schmitt, D., & Stright, D. (2026). *The Evolving Role of Demand Charges in Retail Electricity Rates.* NLR. https://docs.nlr.gov/docs/fy26osti/90964.pdf