

## **NARUC Innovation Webinar**

### Coordinating Federal Energy Efficiency Funding with Regulated Utility Programs October 26, 2023

Thank you to the U.S. Department of Energy Office of Electricity for their support of this event

### ABOUT NARUC

- The National Association of Regulatory Utility Commissioners (NARUC) is a non-profit organization founded in 1889.
- Our Members are the state utility regulatory Commissioners in all 50 states & the territories. FERC & FCC Commissioners are also members. NARUC has Associate Members in over 20 other countries.
- NARUC member agencies regulate electricity, natural gas, telecommunications, and water utilities.





### THE NARUC CENTER FOR **PARTNERSHIPS & INNOVATION**

### **Background & Focus**

- NARUC staff dedicated to providing technical assistance to members.
- CPI identifies emerging challenges and connects state commissions with expertise and strategies to inform their decision making.
- CPI builds relationships, develops resources, and delivers trainings.
- All CPI support is federally funded via cooperative agreements with DOE and NIST.



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www.naruc.org/cpi | Last updated February 202

- (Eeb 2023
- Energy Resilience Reference Guide: Chapters 1 & 2 (Jan & Feb 2023)
- Potential State Regulatory Pathways to Facilitate Low-Carbon Fuels (Dec 2022) Digitalization in Electric Power Systems and Regulation: A Primer (Dec 2022)
- Interoperability for Electric Vehicle Charging: A Case Study (Dec 2022) erations for Utility Regulators (Nov 2022)
- Models for Incorporating Equity in Transportation Ele ation (Nov 2022)
- Grid Data Sharing: Brief Summary of Current State Practices (Nov 2022) Regulator's Financial Toolbox Briefs: Community Solar for LMI Customers;
- se Energy Resilience Resources Guide & FAQ for Commissioners (Oct 2022) Workforce Development Toolbox: Recruitment Templates and Social Media En

#### Upcoming Virtual Learning Opportunities

nent. March 8: Next in the virtual int address PUC questions on DER technical capabilities, deployment concerns, and benefits, Contact Jeff Resilience for Regulators Webinar Series. March 9: Climate Informed Mitigation Strategies. Find past p

Forthcoming Publication

Energy Resilience Reference

Programmatic, and Regulato

Considerations of Advanced Nuclear in Resource Planning

newable Energy Microgrid

Guide Chapter 3: Climate

Black Sky Playbook

State Microgrid Polic

- n critical infrastructure resilience, climate resilience, defense energy resilience, and more. Cont
- On-Demand, Video-Based Learning Modules. Dozens of training videos in English and Spanish on electro planning, distribution systems and planning, smart grid and EV interoperability. Contact Daniell Upcoming In Person Events Travel stipends available
- Cybersecurity Training, Indianapolis, IN. March 22-24: Experts will provide the lens of utility regulators with presentations, engaging activities, and more. (Commissioners and staff) Contact Lyn Nuclear Energy Partnership Pacific Northwest National Lab Site Visit, April 25-28: Tour PNNL and NW nuclear sites.
- Advanced Nuclear State Collaborative kickoff workshop will also take place. (Commissioners and staff) Contact Kiero Natural Gas Partnership Site Visit, Savannah, GA. May 2023: Tour the Elba Island liquefied natural gas export facility, Port of Savannah compressed natural gas fueling station, and more. (Commissioners only) Contact I
- More Info Available Soon: Energy Justice Midwest Regional Workshop (early May); Grid Data Sharing Collaborativ Demonstration Workshop (mid-May in Washington, DC): Resilience Planning Regional Workshops
- Join a Member Working Group! For Commissioners and Commission Staf
- followed by questions and facilitated discussions among members. Six sessions: Feb 27 Jun 12. Contact Jeff
- NARUC-NASEO Advanced Nuclear State Collaborative. Exchange guestions, needs, and challenges relating to the
- NARUC-NASEO Microgrids State Working Group. Explore capabilities, costs, I nicrogrids with PUCs and State Energy Offices. Contact Kiera
- Electric Vehicles State Working Group. Learn and discuss regulatory questions around transportation electrification including charging infrastructure buildout, rate design, equity considerations, V2G, and more. Contact Daniello ance-Based Regulation State Working Group. Examine approaches to performance-based regulation and
- alternative ratemaking across states in a collaborative peer group setting. Contact Ellin i2X Working Groups. DOE/National Lab effort for commissions and stakeholders to identify grid
- challenges and discuss solutions. Contact Jeff Workforce Development Peer Advisory Group. Supporting recruitment & retention for commissions. Contac

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Management Nuclear Energy Natural Gas\* Hydrogen Off-Shore Wir Utility-Scale

Renewables Cybersecurity for Utility Regulators Energy Emergency Preparedness

ect us to join a members-only group on this topic for regular learning and pee

ign up for the CPI Ne<u>wsletter</u> for monthly updates about new resources and fortho

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|  |   |

Newly updated CPI fact sheet with recent publications, upcoming events,

new member working groups located under Quick Links at: www.naruc.org/cpi

| ility within a Performance-Based Regulatory Framework     |
|---|
| ustice Roundtable Series: Customer Affordability and Arro |
| Decision Making; Energy Justice Metrics (Feb 2023)        |
| PUCs and the Investment Community (Feb 2023)              |

# **NARUC Innovation Webinar Series**

One webinar most months

All NARUC members and stakeholders are invited

The Energy-Transportation Nexus: Solar Highways and the Road to a Cleaner Grid

November 9, 2023 | 3:00 – 4:00 PM EST

Powering the Future: Transforming Energy Distribution with Artificial Intelligence

December 14, 2023 | 3:00 – 4:00 PM EST

https://www.naruc.org/cpi-1/innovation-webinars/

NARUC thanks the U.S. Department of Energy for its support of this series.



### **UPCOMING IN-PERSON EVENTS**



2023 NARUC Annual Meeting and Education Conference CONNECTING THE DOTS

Innovative/Disruptive Technology and Regulation NOVEMBER 12-15, 2023 · LA QUINTA, CALIFORNIA

NARUC-DOE Transportation Electrification Planning Workshop

NARUC Grid Data Sharing Framework Simulation



### DISTRIBUTION SYSTEM AND RESILIENCE PLANNING TRAINING

- November 29-30, 2023, Washington, DC (Registration now open!)
- Week of January 22, 2024, Orange County, CA (Registration coming soon)
- Week of March 18, 2024, Nashville, TN (Registration coming soon)



Distribution System Planning and Resilience Planning Trainings in 2023-2024



### **KEY IRA REBATE PROVISIONS**

- Section 50121: Home Energy Performance-Based, Whole House Rebates
  - "Home Efficiency Rebates" (HOMES)
  - All households eligible, but bonuses for LMI
- Section 50122: High-Efficiency Electric Home Rebate Program
  - "Home Electrification and Appliance Rebates"
  - AKA "High-Efficiency Electric Home Rebate Act (HEEHRA)"
  - Limited to households <150% AMI

https://www.energy.gov/scep/home-energy-rebates-frequently-asked-questions



### FEDERAL TAX CREDITS AMENDED BY IRA

### • Energy Efficiency Home Improvement Credit

- Typically 30% of costs, with some individual limits
- \$1,200 aggregate yearly tax credit maximum for building envelope
- Separate \$2,000 aggregate yearly credit limit for appliances
- Residential Clean Energy Property Credit
  - Typically 30% of costs
  - No limit





### Moderator: Commissioner Jeffrey Hughes North Carolina Utilities Commission

Speakers:

Jennifer Amann, ACEEE Laura Schauer, Illume Advising LLC Rebecca Foster, Vermont Energy Investment Corporation

# Increasing Deep Retrofits & Electrification with IRA Funding

Jennifer Amann, ACEEE Better Buildings Residential Network Peer Exchange webinar October 12, 2023





### **About ACEEE:**

The American Council for an Energy-Efficient Economy (ACEEE), is a nonprofit research organization that develops policies to reduce energy waste and combat climate change. Its independent analysis advances investments, programs, and behaviors that use energy more effectively and help build an equitable clean energy future.

Learn more at aceee.org



**Deep Retrofits' Energy and Carbon Savings (by climate zone)** 

A robust package of retrofit measures can cut a home's energy use by 58% to 79% and its carbon emissions by 32% to 56% depending on the home's age and regional climate.

Costs range from \$35k to \$57k

How do we increase consumer interest and participation?



Pre-1950s home **Energy savings: 79% Carbon emissions reductions: 49%** 1970s home **Energy savings: 74% Carbon emissions reductions: 41%** 

**BALTIMORE, MD** Pre-1950s home **Energy savings: 79% Carbon emissions reductions: 56%** 1970s home **Energy savings: 74% Carbon emissions reductions: 49%** 

# Breaking retrofit packages into stages can help customers manage costs and better meet their needs



- Retrofit B: prioritizes envelope upgrades in the first phase. Older homes in the heating-dominant cold, mixed-humid, and marine climate regions benefit the most from comprehensive envelope upgrades, which account for most energy savings.
- Retrofit C: combines some envelope efficiency measures with priority equipment replacement. This approach may be especially appealing to customers in the hot-humid and hot-dry regions, which have milder winters and newer housing stock.
- IRA funding can support staging
  - Home efficiency rebates + 25C tax credits
  - Home electrification and appliance rebates
  - Supplemental financing when needed

#### Drain water heat recovery









#### Air cleaners



#### Video streaming devices



# Ongoing role for existing efficiency programs

- Support participation above and beyond IRA
- Incentivize measures that offer lower cost, less disruption, and greater consumer amenity
  - Alternatives measures that reduce heating, cooling, and water heating loads
  - Supplemental measures to reduce other end-use categories
- Offer financing options
- Market transformation activities

## Financial analysis

Three finance scenarios analyzed for 10and 20-year repayment at 0%, <u>2.5%</u>, and 5% to determine upfront capital/incentive required.

- Cash-flow neutral:
- 10-yr: \$30k-\$47k (65-88% project cost)
- 20-yr: \$17k-\$42k (38-78% project cost)
- Monthly added cost of \$75:
- 10-yr: \$22k-\$39k (48-73% project cost)
- 20-yr: \$3.5k-\$28k (8-52% project cost)
- Monthly added cost of \$150:
- 10-yr: \$14k-\$31k (31-58% project cost)
- 20-yr: \$0k-\$14k (0-25% project cost)

| Climate                   | Project<br>cost | Pre-retrofit costs<br>(\$/month) |           | Post-retrofit costs<br>(\$/month) |          | Savings<br>(\$/month) |
|---------------------------|-----------------|----------------------------------|-----------|-----------------------------------|----------|-----------------------|
|                           |                 | Electric                         | Gas       | Electric                          | Gas      |                       |
| Cold, pre-1950s           | \$ 53,223       | \$ 112.47                        | \$ 203.83 | \$ 187.04                         | \$ 17.69 | \$ 111.56             |
| Cold, 1970                | \$ 53,657       | \$ 131.21                        | \$ 150.29 | \$ 194.49                         | \$ 17.69 | \$ 69.32              |
| Mixed-humid,<br>pre-1950s | \$ 46,569       | \$ 135.21                        | \$ 172.07 | \$ 125.50                         | \$ 13.16 | \$ 168.61             |
| Mixed-humid,<br>1970      | \$ 56,748       | \$ 121.54                        | \$ 141.57 | \$ 125.95                         | \$ 13.16 | \$ 124.01             |
| Hot-humid                 | \$ 45,159       | \$ 143.34                        | \$ 43.98  | \$ 95.43                          | \$ 16.00 | \$ 75.88              |
| Hot-dry                   | \$ 42,582       | \$ 146.70                        | \$ 71.82  | \$ 158.03                         | \$ 8.37  | \$ 52.12              |
| Marine                    | \$ 50,683       | \$ 66.47                         | \$ 133.05 | \$ 96.12                          | \$ 7.59  | \$ 95.81              |



### Home Efficiency Rebates + 25c tax credits

| Modeled Energy Savings   | Measured Energy Saving  |
|--|---|
| Projects must achieve modeled energy savings of at least <b>20 percent</b> to qualify for rebates.         | Portfolios of projects must achieve<br>measured energy savings of <b>15 percent</b><br>across the portfolio to qualify for rebates. |
| Larger rebates are available for projects achieving modeled energy savings of at least <b>35 percent</b> . | Payment rate is per kWh and equal to <b>\$2,000</b> for a 20% reduction of energy use for the average home in the state.            |
| Rebates <b>double</b> for low- and moderate-<br>income individuals.  | Rebates <b>double</b> for low- and moderate-<br>income individuals.   |

Rebates of \$2,000 to \$4,000 depending on savings Double to \$4,000 to \$8,000 for LMI households

| Improvement                  | % of cost | Maximum credit         | Efficiency criteria   |
|------------------------------|-----------|------------------------|-----------------------|
| Home energy audits*          | 30%       | Up to \$150            | Auditor certification |
|                              |           |                        | requirements to be    |
|                              |           |                        | determined by DOE     |
| Heat pumps                   | 30%       | Up to \$2,000 per year | Based on CEE Tiers    |
| Heat pump water heaters      | 30%       | Up to \$2,000 per year | Based on CEE Tiers    |
| Central air conditioners*    | 30%       | Up to \$600            | Based on CEE Tiers    |
| Natural gas, propane, or oil | 30%       | Up to \$600            | Based on CEE Tiers    |
| furnaces, boilers, or water  |           |                        |                       |
| heaters*                     |           |                        |                       |
| Biomass stoves or boilers    | 30%       | Up to \$2,000 per year | Thermal efficiency of |
|                              |           |                        | at least 75%          |
| Electric panel or circuit    | 30%       | Up to \$600            | 200 amps or more      |
| upgrades for new electric    |           |                        |                       |
| equipment*                   |           |                        |                       |
| Insulation materials*        | 30%       | Up to \$600            | Based on 2021 IECC    |
| Windows and skylights*       | 30%       | Up to \$600            | ENERGY STAR Most      |
|                              |           |                        | Efficient             |
| Exterior doors*              | 30%       | Up to \$500 (max of    | ENERGY STAR           |
|                              |           | \$250 for each door)   |                       |

\*Subject to combined cap of \$1,200 per year

\$1,200 per year cap (excluding HP and HPWH)\$2,000 for HP\$2,000 for HPWH (or 30% of cost)



## Home electrification and appliance rebates

- Up to \$14,000 in rebates for low- and moderate-income households
- Prescriptive, point-of-sale rebates
- Supports transition to allelectric homes
- Incentives for contractor participation

|           | Rebate Amount<br>(Maximum)                                   |         |
|-----------|--|---------|
|           | Heat Pump (for space heating<br>and cooling)                 | \$8,000 |
|           | Electric Stove, Cooktop, Range,<br>or Oven, or Clothes Dryer | \$840   |
|           | Heat Pump Water Heater                                       | \$1,750 |
| <i>RO</i> | Electric Wiring  | \$2,500 |
|           | Electric Load Service Center<br>(Breaker Box)                | \$4,000 |
|           | Insulation, Air Sealing, and<br>Ventilation                  | \$1,600 |

### Recommendations

- Standardized (yet flexible) retrofit measure packages
- Staged retrofits to meet customer and program needs
  - Need mechanisms to keep consumer engaged and provide staged financing
  - Leverage remodeling and other projects/transactions
- Consider challenges and opportunities for electrification
- Expand the range of measures and delivery mechanisms
  - Multiple trades, retail, utility marketplaces, direct install, behavioral
- Funding packages that support customers and contractors with mix of incentives and financing
- Fed \$\$ makes things better, but gaps remain still need state and private solutions to meet the need



### Contact

Jennifer Amann jamann@aceee.org

## **Upcoming conferences**

| Energy Efficiency as a Resource                        | October 16–18, 2023  | Philadelphia, PA  |
|--|----------------------|-------------------|
| Behavior, Energy & Climate Change (BECC)               | November 12–15, 2023 | Sacramento, CA    |
| 2024 Hot Water Forum & Hot Air Forum                   | March 12– 4, 2024    | Location TBD      |
| 2024 Summer Study on Energy Efficiency in<br>Buildings | August 4–9, 2024     | Pacific Grove, CA |





# Laura Schauer, Illume Advising LLC

### Evaluation Policies and Considerations



# Our Thinking

### Planning and Approach is Important

#### Thoughtful planning:

Taking time to come together and align on the why, who, what, and again why

#### Measuring and documenting the beginning:

Often a missed opportunity, but we have it now

#### Shifting from a resource acquisition to market transformation mindset:

These take different approaches, and there's been extensive thinking on methodologies to start from

#### A mindset of growth, education, and learning:

Necessary across all of us as we embark on a relatively new path