

# Painting the U.S. Energy Affordability Landscape:

Opportunities for Alleviating Fuel Poverty with  
Energy Efficiency

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Ariel Drehabl ([adrehobl@aceee.org](mailto:adrehobl@aceee.org))  
Khalil Shahyd ([kshahyd@nrdc.org](mailto:kshahyd@nrdc.org))

# American Council for an Energy-Efficient Economy

- Nonprofit organization focusing on end-use efficiency in Industry, Buildings and Equipment, Utilities, Transportation, Economic Analysis, Behavior, & Finance



# Energy Efficiency for All (EEFA)

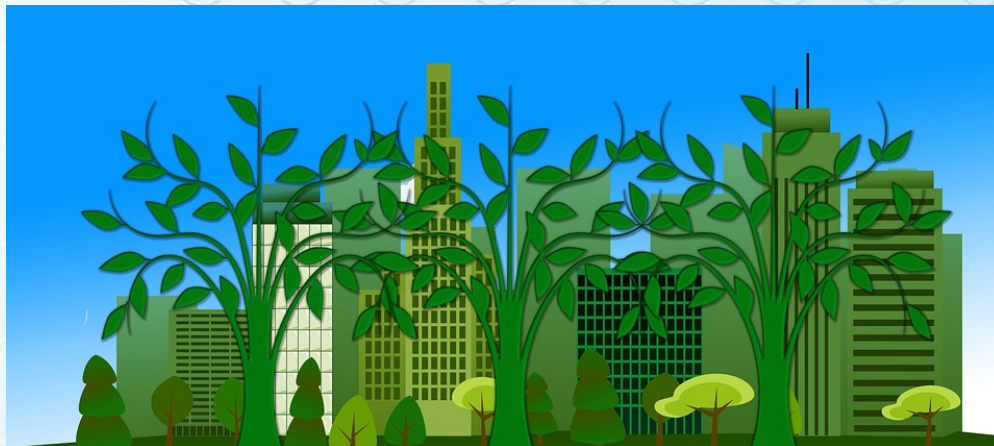
Ensure housing and energy policies provide sufficient resources to advance investments in energy efficiency in affordable multi-family housing, which will combat climate change, improve public health, increase energy affordability and support environmental justice.



# Why Energy Efficiency?

Energy efficiency...

- Is the cheapest, lowest risk energy resource
- Creates jobs and avoids price volatility
- Provides benefits beyond energy savings (e.g. health)
- Acts as a community resiliency strategy
- Helps make energy more affordable for low-income households





# Lifting the High Energy Burden in America's Largest Cities:

How Energy Efficiency Can Improve Low  
Income and Underserved Communities

Ariel Dreihobl and Lauren Ross



# What is energy burden?

- The proportion of total household income that goes towards home energy bills, which includes electricity, natural gas, and other heating fuels
- All households have energy burdens
- For metropolitan households in the US, the median burden is 3.5%
- Researchers identify 6-11% as the initial indicator of a high energy burden
- State example: NY state goal of 6% energy burden





# How does energy burden impact families?



# Drivers of household energy burden

| Type of driver | Examples   |
|----------------|--|
| Physical       | Inefficient and/or poorly maintained HVAC systems  |
|                | Heating system and fuel type   |
|                | Poor insulation, leaky roofs, and inadequate air sealing   |
|                | Inefficient large-scale appliances (e.g., refrigerators, dishwashers) and lighting sources   |
| Economic       | Weather extremes that raise the need for heating and cooling   |
|                | Chronic economic hardship due to persistent low income   |
|                | Sudden economic hardship (e.g., severe health event or unemployment)   |
| Policy         | Inability or difficulty affording the up-front costs of energy efficiency investments  |
|                | Insufficient or inaccessible policies and programs for bill assistance, weatherization, and energy efficiency for low-income households  |
| Behavioral     | Certain utility rate design practices, such as high customer fixed charges, that limit the ability of customers to respond to high bills through energy efficiency or conservation |
|                | Lack of access to information about bill assistance or energy efficiency programs  |
|                | Lack of knowledge about energy conservation measures   |
|                | Increased energy use due to age or disability  |



# How we measured energy burden



Households included in study if they:

- Pay for their electricity
- Pay for their main heating fuel
- Report a positive household income

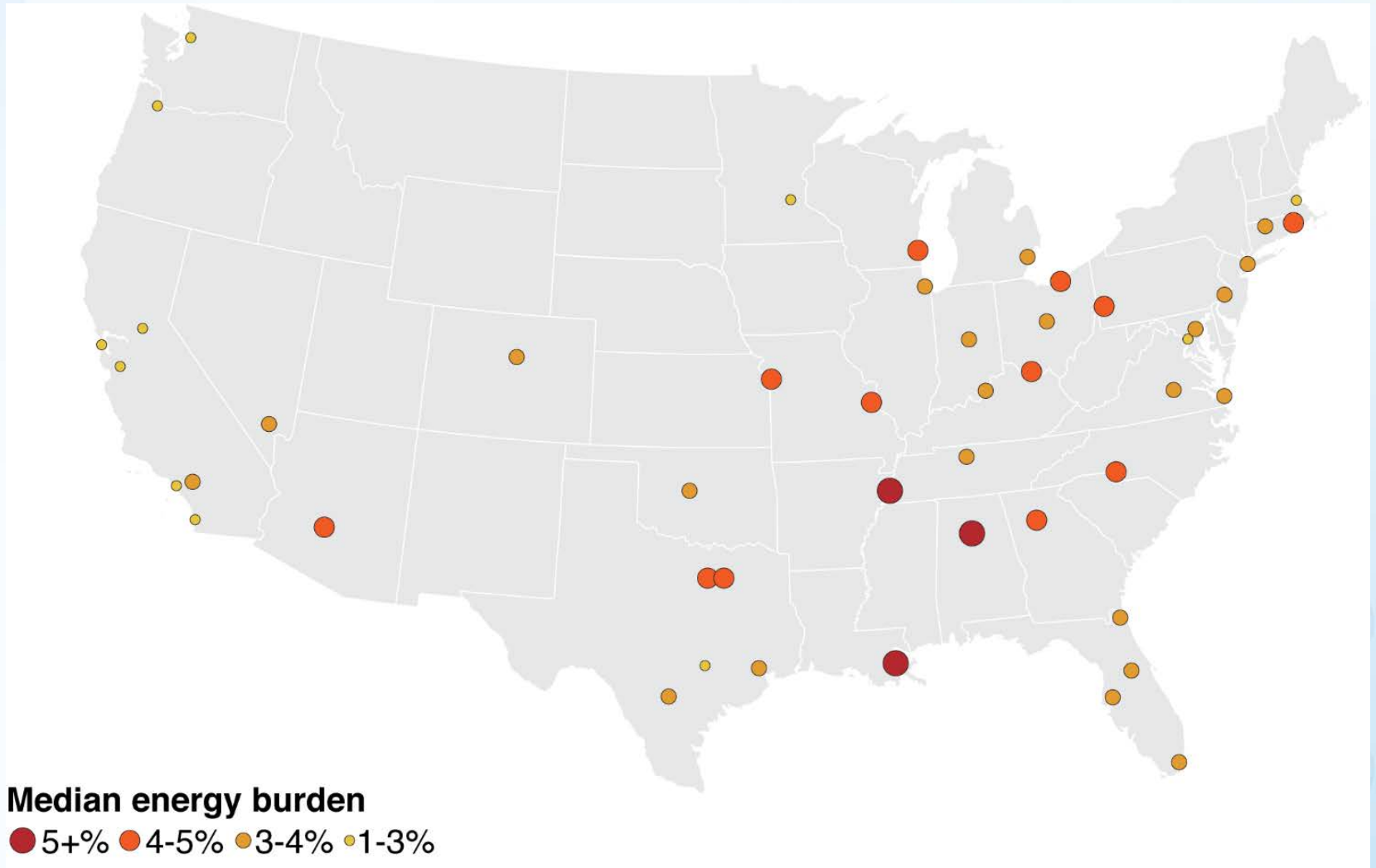
For main subgroups:

- Low-income (80% Area Median Income [AMI])
- Communities of color (African American and Latino)
- Low-income multifamily (80% AMI & 5+ units)
- Renters

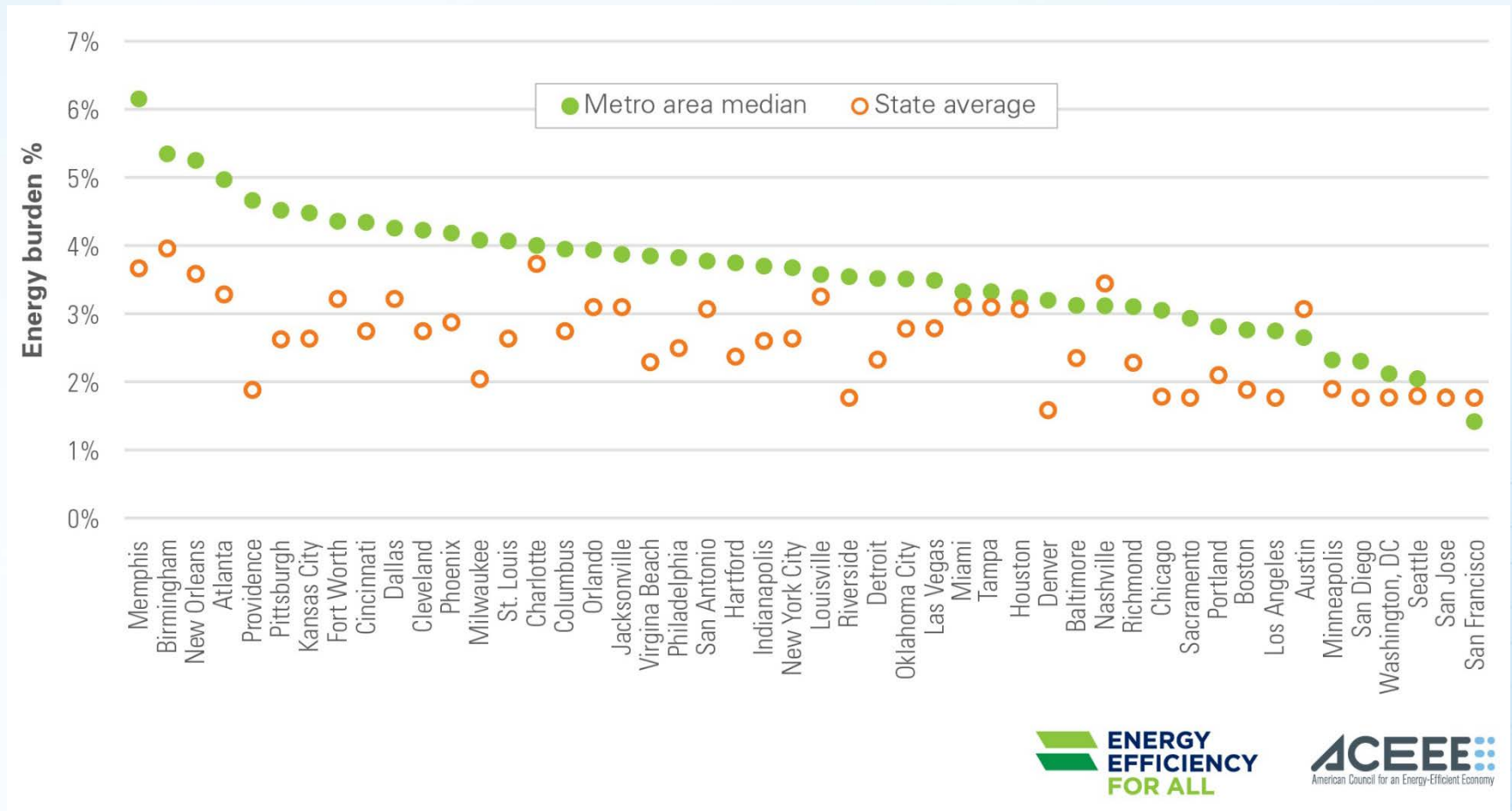
Trends by region:

- Northeast, Southeast, South Central, Southwest, Midwest, Northwest, California

# Energy burdens in US cities



# Energy burdens in cities vs. states

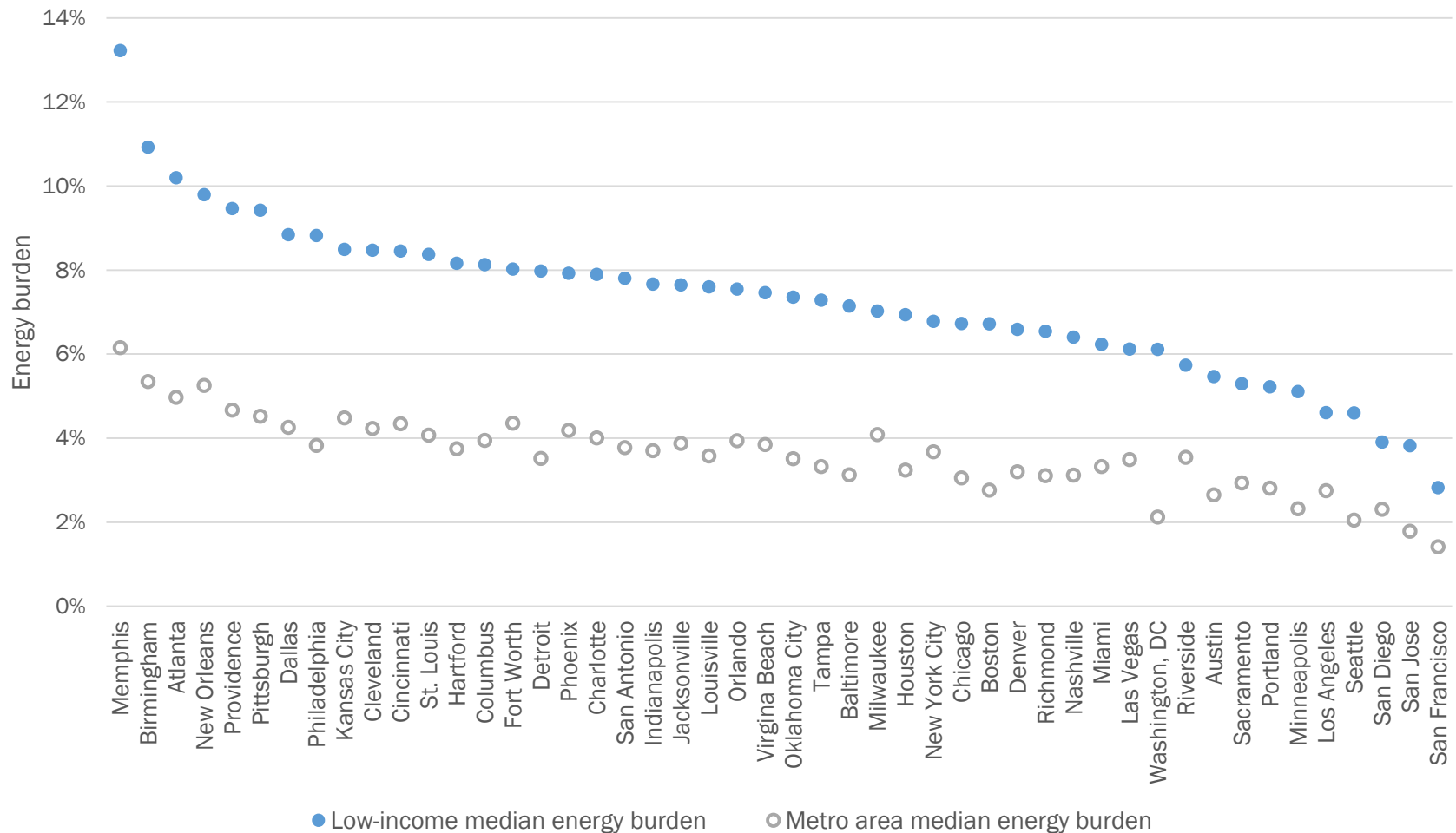




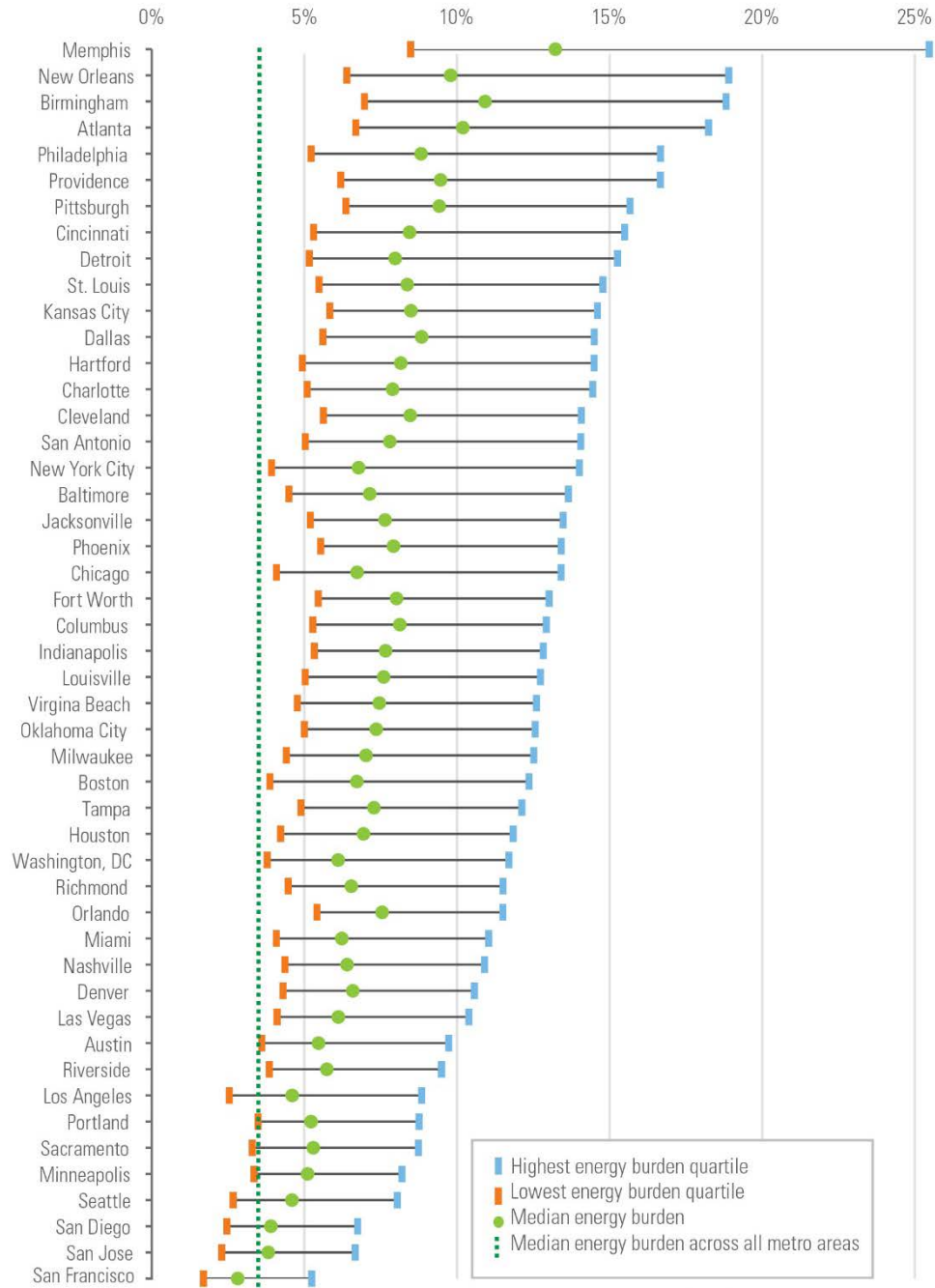
# National energy burden trends

|                        | Household type                    | Median annual income | Median size of unit (square feet) | Median annual utility spending | Median annual utility costs per square foot | Median energy burden |
|------------------------|-----------------------------------|----------------------|-----------------------------------|--------------------------------|---|----------------------|
| Income type            | Low-income (≤80% AMI)             | \$24,998             | 1,200                             | \$1,692                        | \$1.41                                      | 7.2%                 |
|                        | Non-low-income                    | \$90,000             | 1,800                             | \$2,112                        | \$1.17                                      | 2.3%                 |
|                        | Low-income multifamily (≤80% AMI) | \$21,996             | 800                               | \$1,032                        | \$1.29                                      | 5.0%                 |
|                        | Non-low-income multifamily        | \$71,982             | 950                               | \$1,104                        | \$1.16                                      | 1.5%                 |
| Building ownership     | Renters                           | \$34,972             | 1,000                             | \$1,404                        | \$1.40                                      | 4.0%                 |
|                        | Owners                            | \$68,000             | 1,850                             | \$2,172                        | \$1.17                                      | 3.3%                 |
| Head-of-household race | White                             | \$58,000             | 1,600                             | \$1,956                        | \$1.22                                      | 3.3%                 |
|                        | African-American                  | \$34,494             | 1,290                             | \$1,920                        | \$1.49                                      | 5.4%                 |
|                        | Latino                            | \$39,994             | 1,200                             | \$1,704                        | \$1.42                                      | 4.1%                 |
| All households         | N/A                               | \$53,988             | 1,573                             | \$1,932                        | \$1.23                                      | 3.5%                 |

# Median energy of low-income households compared to the overall median for each city

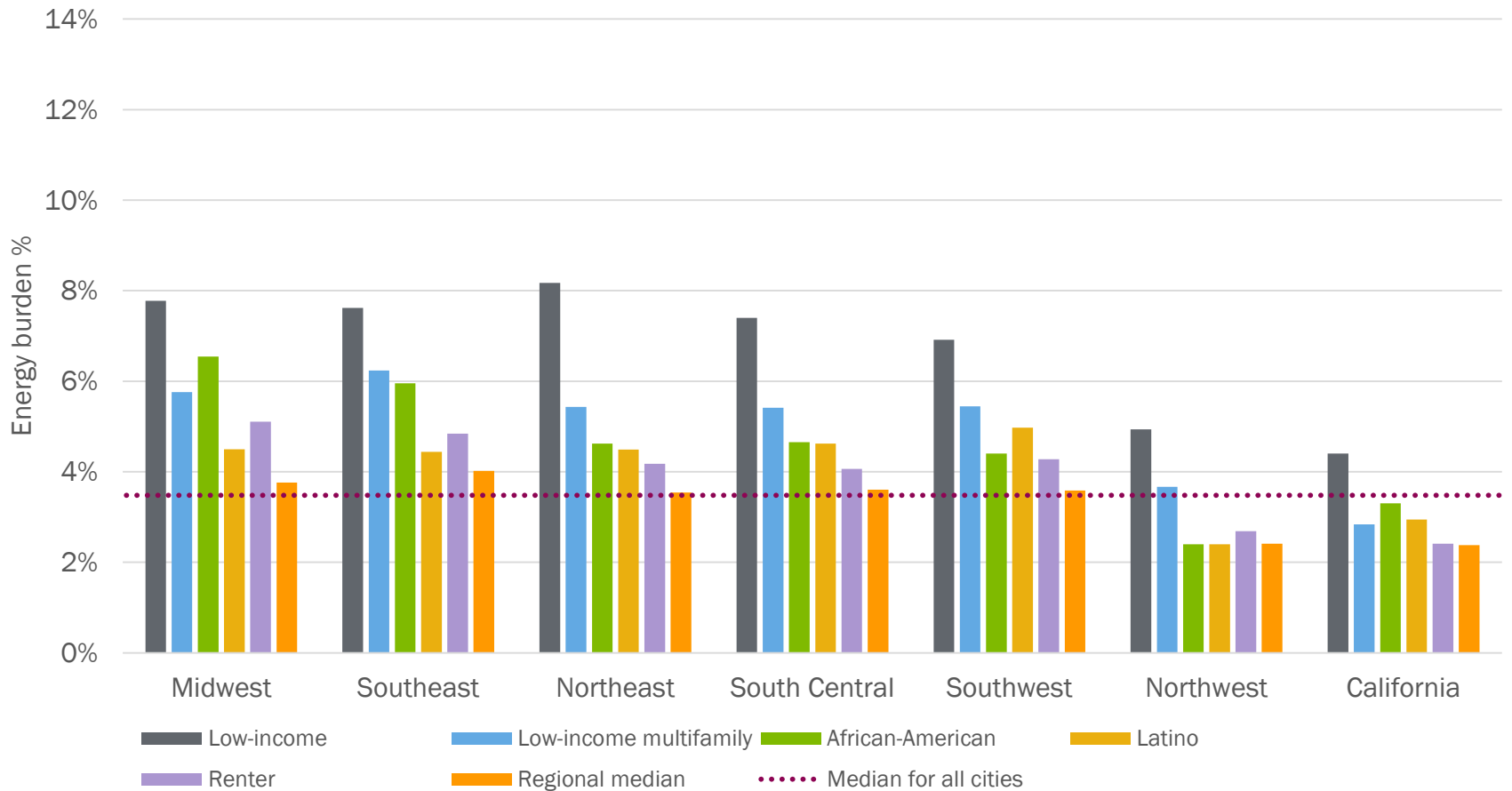


# Range of energy burden quartiles for low-income households





# Regional energy burden trends



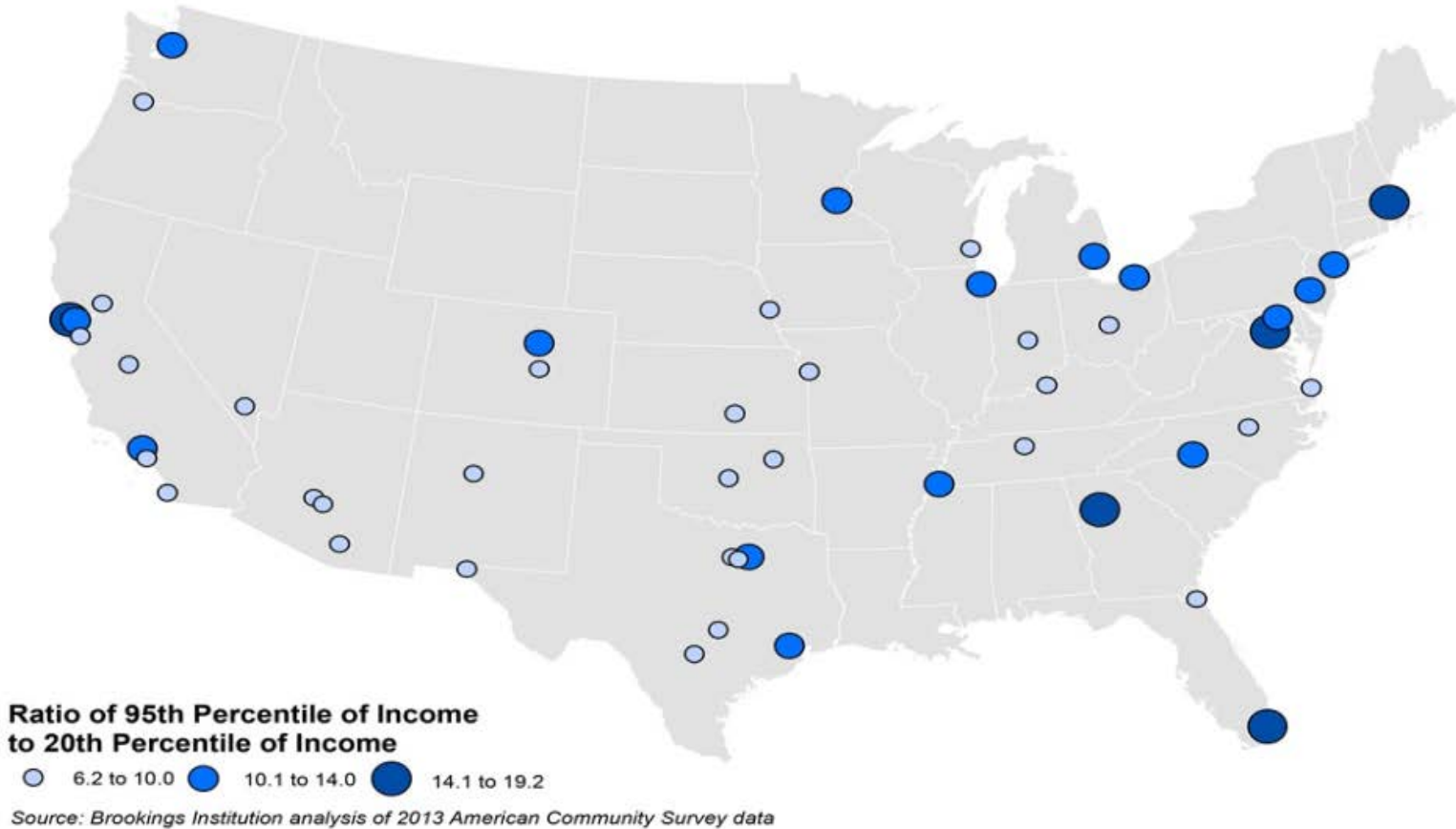
# Misconceptions about high energy burdens

- Higher energy burdens are not simply determined by high energy prices and lower incomes
- Other important factors:
  - Income equality
  - Inefficient housing stock
  - Utility and public benefit energy efficiency programs/investments



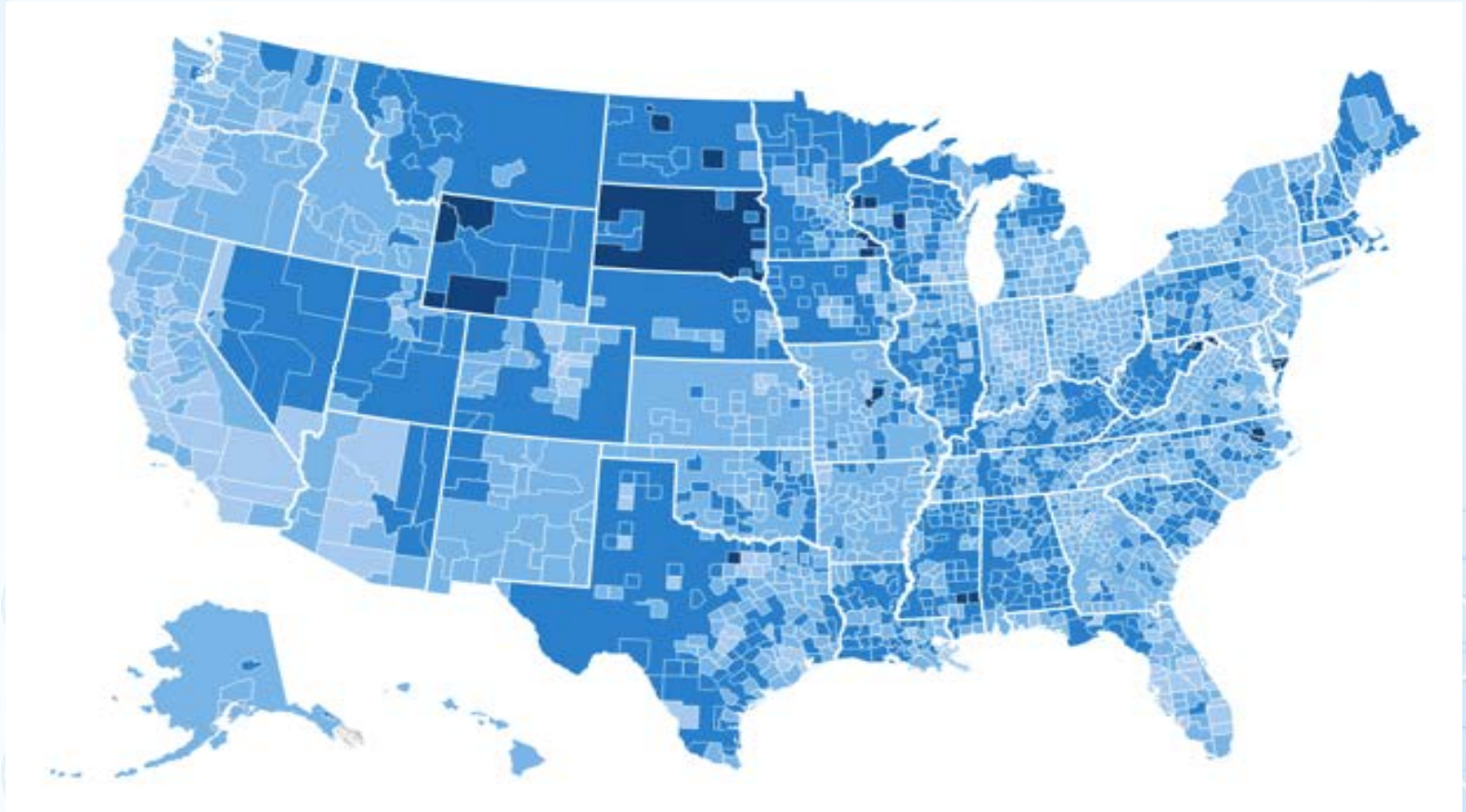
# Cities are home to the highest rates of income inequality in the country...

Figure 3. Levels of City Inequality Vary Considerably Across Regions





# Only 28 of every 100 extremely low-income families could afford their rental homes



# A focus on multi-family housing

- Multifamily buildings represent
  - approximately one-fourth of all the housing units in the U.S.
  - and 20 percent of the energy consumed by all housing
- Low income MF housing represented the second highest energy burden in every region of the nation... except California and the Midwest

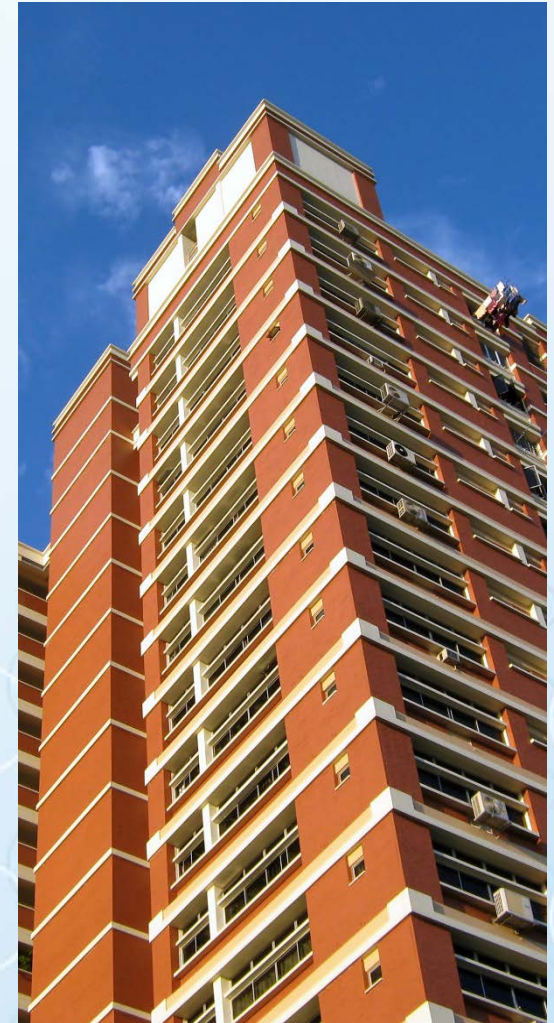




# A focus on multi-family housing (cont.)

- Energy expenditures run 37% higher per square foot than in owner-occupied multifamily units (i.e. condos or cooperatives),
  - 41% higher than in renter-occupied single family detached units, and
  - 76% higher than in owner-occupied single family detached units.
- From 2001 to 2009, while average rents in multifamily housing increased by 7.5%, energy cost for these renters increased by nearly 23%.
- For these low-income renting families, 97% of the excess energy burden was due to inefficient homes
- Bringing low income and low income multifamily housing stock up to the efficiency of the median household in these large cities would eliminate at least 35% of the excess energy burden.
- Those are real and critical dollars—the average family could save as much as \$300 annually on utility bills.

*Data source:* Pivo, G. “Energy Efficiency and its Relationship to Household Income in Multifamily Rental Housing.” [https://www.fanniemae.com/content/fact\\_sheet/energy-efficiency-rental-housing.pdf](https://www.fanniemae.com/content/fact_sheet/energy-efficiency-rental-housing.pdf)



# Policies and programs to address high energy burdens

| Program type      | Program   | Funding source                            |
|-------------------|---|---|
| Bill assistance   | Low Income Home Energy Assistance Program (LIHEAP)                            | Federal and state taxpayers               |
|                   | Other low-income bill assistance programs                                     | Utility ratepayers; private contributions |
|                   | Modified rate design, rate discounts or waivers, and modified billing methods | Utility ratepayers                        |
| Weatherization    | Weatherization Assistance Program (WAP)                                       | Federal and state taxpayers               |
| Energy efficiency | Low-income energy efficiency programs   | Utility ratepayers                        |



# Multiple benefits of energy efficiency for low-income households

- **Lower monthly bills (residents)**
  - Examples: more disposable income, reduced stress, more money spent in local economy
- **Improved housing (residents)**
  - Examples: better health and safety, increased property value, lower maintenance costs, greater housing satisfaction
- **Local economic development (community)**
  - Examples: more local jobs, improved quality of life, increased property values
- **Less power used (utilities and community)**
  - Examples: reduced environmental pollutants, improved public health, avoided excess costs of increased generation, capacity, and transmission investments



# Strategies for improving energy efficiency in low-income communities

1. Improve and expand low-income utility programs
2. Collect, track, and report demographic data on program participation
3. Strengthen policy levers and more effectively leverage existing programs
4. Utilize the Clean Power Plan to prioritize investment in low-income energy efficiency



# Improve and expand low-income utility programs

- Incorporate best practices in single and multifamily energy efficiency programs
- Include multiple benefits of low-income energy efficiency programs in cost-benefit testing (e.g. CT, CA, NH, CO)
- Provide financing options to households and multifamily building owners with strong consumer protections





# Collect, track, and report demographic data on program participation



Collect and use data on household demographics to ensure that programs are reaching the target households

Examples of important demographics:

- Income level
- Renter versus owner
- Multifamily versus single family
- Race/ethnicity
- Language-spoken



# Strengthen policy levers and leverage existing programs

- Set policy directives to support utility energy efficiency programs, with separate goals for delivery of low-income programs
- Advocate to the Public Utility Commission for strong low-income savings targets and programs
- Set policies to require energy usage reporting and benchmarking for multifamily buildings
- Prioritize investment in low-income energy efficiency through the Clean Power Plan



# Final thoughts and next steps

- The overwhelming majority of low-income and households of color in major US cities experience higher energy burdens
- We encourage cities and other stakeholders to use the data from this report and the recommendations as they work to address high energy burdens in their communities



# ACEEE Resources

Building Better Energy Efficiency Programs for Low-Income Households:  
[aceee.org/research-report/a1601](http://aceee.org/research-report/a1601)

Lifting the High Energy Burden in America's Largest Cities: How Energy Efficiency Can Improve Low Income and Underserved Communities:  
[aceee.org/research-report/u1602](http://aceee.org/research-report/u1602)

Apartment Hunters: Programs Searching for Energy Savings in Multifamily Buildings: <http://aceee.org/research-report/e13n>

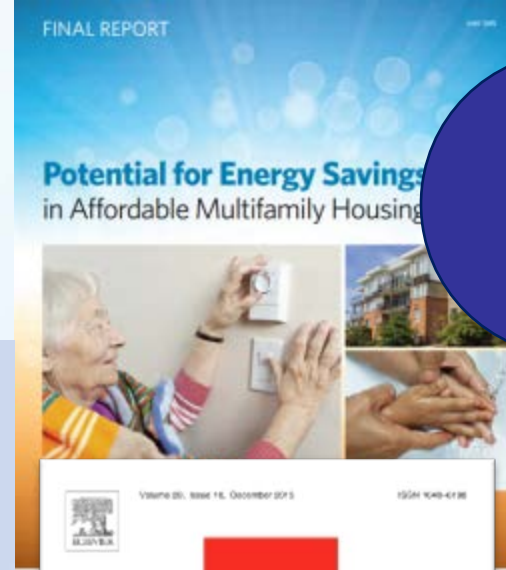
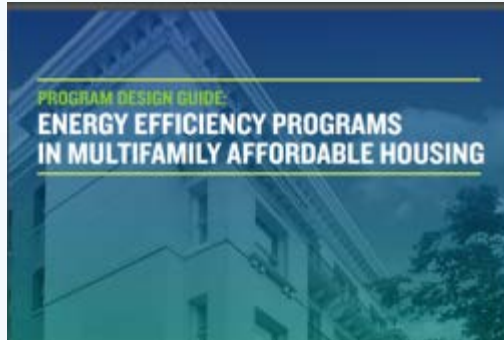
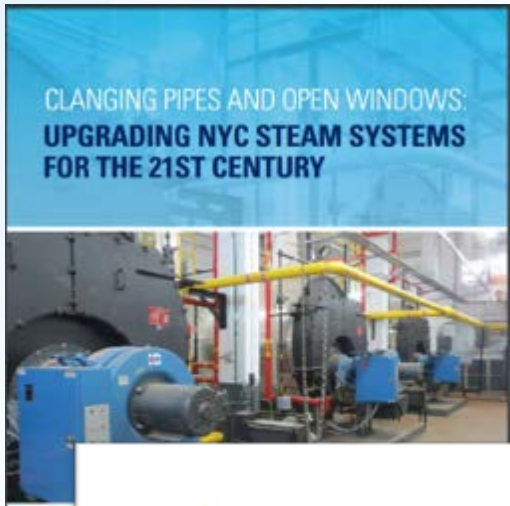
Low-Income Energy Efficiency Programs: Best Practices and Clean Power Plan Compliance: <http://aceee.org/white-paper/cpp-low-income>

Clean Power Plan Opportunities for Energy Efficiency in Affordable Housing: A Primer for the Affordable Housing Community:  
[energyefficiencyforall.org/sites/default/files/CPPBrief.pdf](http://energyefficiencyforall.org/sites/default/files/CPPBrief.pdf)

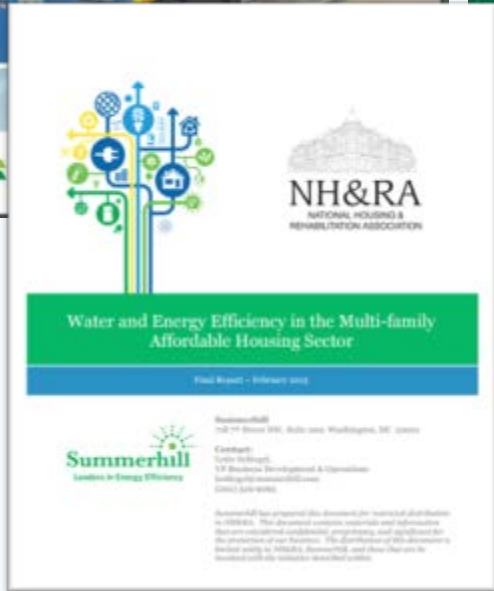
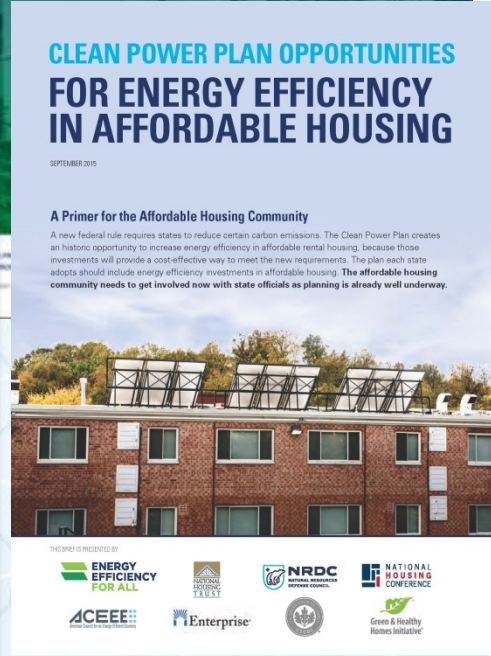
Clean Power Plan Resources Page: [aceee.org/topics/clean-power-plan](http://aceee.org/topics/clean-power-plan)



# New Research



Now  
with  
CO<sub>2</sub>





# Thank you for your attention!

Questions and comments:

Ariel Drehabl, [adrehobl@aceee.org](mailto:adrehobl@aceee.org)

Khalil Shahyd, [kshahyd@nrdc.org](mailto:kshahyd@nrdc.org)