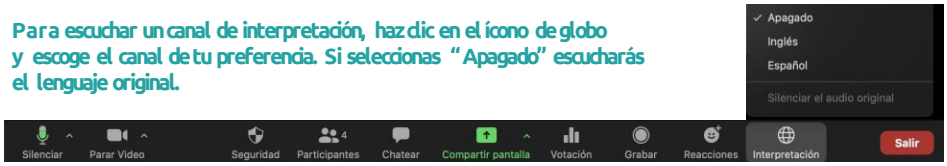
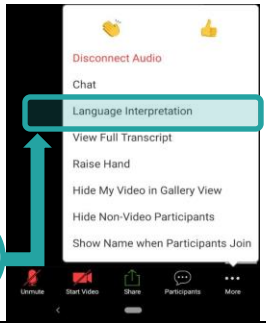
- This webinar introduces the concept of energy equity and gives an overview of how disinvestment in communities has contributed to the problem of inefficient, unhealthy, and expensive-to-operate residential and commercial building stock. Our speakers will offer guiding strategies for choosing your building upgrade zone by prioritizing procedural equity, lived experience considerations, and data availability to decide which buildings or segments of communities to focus on when planning for upgrades. Attendees will also be introduced to several data tools that can assist you in choosing residential and commercial buildings to include in your building upgrade zone.

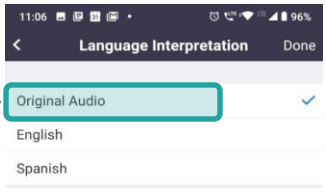
Interpretation

Para escuchar un canal de interpretación, haz clic en el ícono de globo y escoge el canal de tu preferencia. Si seleccionas "Apagado" escucharás el lenguaje original.



To listen to the interpreter, please select the globe icon and choose the language of your preference. If you choose "Off" you'll hear the original language.





Housekeeping Announcements

- We are recording this webinar and will be making it available to all registrants within a few business days.
- To ask a question during the webinar, please submit it via the Q&A button at the bottom of your screen.
- You can upvote questions in the Q&A box that you would like us to prioritize.
- Use the chat to engage in respectful and productive discussion with other participants.
- Code of conduct: R2E2 will not tolerate behaviors that cause harm or disrupt the learning environment. Please direct message Stephanie Sosa-Kalter if you feel unsafe in this space. Disruptive participants may be removed from the webinar.

R2E2
Residential Retrofits for Energy Equity

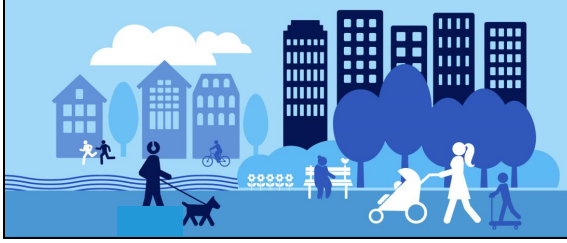
Kassandra (Kassie) Grimes

U.S. Department of Energy Building Technologies Office

The Buildings Upgrade Prize (Buildings UP)

Buildings UP is designed to rapidly scale energy efficiency and efficient electrification building upgrades in communities across the country. The prize is envisioned to consist of four phases over approximately five years.

Application support prizes available for new and under-resourced teams.



Phase 1: Concept

- $22M+ in Prizes to Teams & Technical Assistance
- Applications due by July 18, 2023
- Seeking 20-60 teams to join the "coopetition."

www.heroX.com/buildingsUP

Phase 1: Pathways & Prizes

Equity-Centered Innovation Pathway

$400,000 in cash prizes for each winning team

- Develop replicable, scalable, innovative building upgrade initiatives **in equity-eligible buildings (i.e., 80% equity-eligible).**

Open Innovation Pathway

$200,000 in cash prizes for each winning team

- Develop replicable, scalable, innovative building upgrade initiatives. **May include a focus on equity but are not required.**

Access to Technical Assistance is awarded to winning teams in both pathways.

Equity-Eligible Buildings

Geographic Location
(Justice 40 Census Tracts, Tribal Lands, Territories)

Affordable Housing
(Subsidized, Naturally Occurring)

Underserved Commercial
(including Title 1 Schools, Community Services, Non-profits)

Team-Defined

Additional information is in Section 3.5 of the official rules.

Building Upgrade Zone

1) Geographic boundary around the buildings your initiative will address, such as:

- entire community
- neighborhoods within a community
- a utility service area
- portfolio of geographically dispersed buildings

2) Specific building type(s) to be addressed within the boundary, such as:

- single family homes utilizing fuel oil or propane
- multifamily buildings utilizing inefficient electric or gas heating and/or cooling
- small commercial buildings with roof-top units
- All buildings in the boundary

A strong concept plan will include many buildings in its Building Upgrade Zone.

Example Projects

A **rural electric cooperative** partners with a **local CBO** and **the county** to help **LMI single-family home residents** transition from **propane heat** to **efficient electric heat pumps.**

A **K-12 school district** and an **energy services company** partner to **electrify district buildings**.

A CBO in a midsized town in the southeast partners with the **local government** to bring **heat pumps (and air conditioning!)** to affordable housing buildings throughout the community.

A **national residential property owner** teams up with **multiple local governments** and **utilities** on an initiative to **electrify its properties in three major markets**.

A business improvement district in a large city neighborhood partners with **local houses of worship** to bring efficient electric heating and cooling equipment to small businesses.

+Innovations!

Minimum technologies and strategies teams must include in their initiatives:

- Efficient electric heating and cooling equipment (e.g., heat pumps and/or heat pump water heaters).
- Weatherization and envelope improvements (e.g., insulation, air sealing, window improvements) where needed to reduce energy costs.

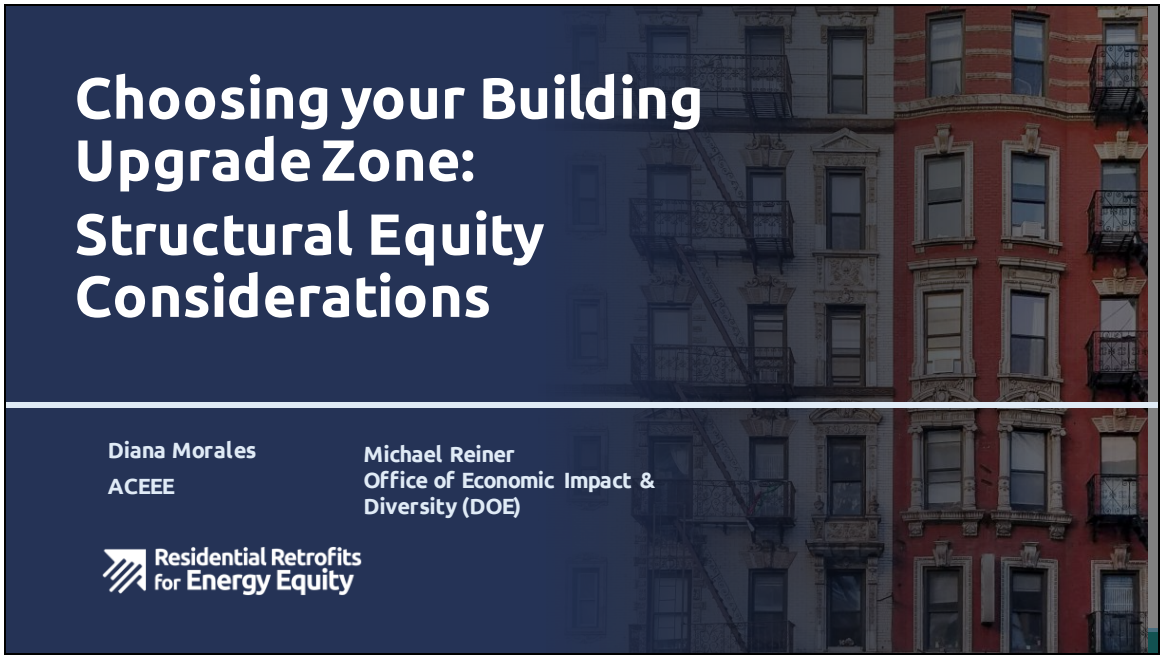
Seeking Innovations to Address Non-Technical Challenges to Widespread Building Upgrades

- **Lack of contractor and occupant familiarity** with technologies
- **High first costs for upgrades**, limited short-term payback
- **Lack of retrofit materials** and equipment
- **Insufficient workforce** to complete upgrades
- **Lack of reach of funding and incentive programs** to historically underserved households and building owners
- **Inconsistent quality of work** and consumer mistrust.

Next Steps for Competitors

- **Follow the prize on HeroX.com**, read the rules, and review the FAQs.
- **Register for an Informational Webinar:** June 13 at 2pm ET
- **Create an account on HeroX** and click on the "Solve this Challenge" button.
- **Team up and submit a Phase 1 "Concept" application** via HeroX by July 18 at 5pm ET.

Follow www.HeroX.com/BuildingsUP
Questions: buildingsUP@nrel.gov


Choosing your Building Upgrade Zone:
Structural Equity Considerations
Diana Morales
ACEEE
Michael Reiner
Office of Economic Impact & Diversity (DOE)
Residential Retrofits for Energy Equity

Meet Your Presenters

Diana Morales
Local Policy Research Analyst
ACEEE

Michael Reiner
Policy Analyst
Office of Economic Impact & Diversity, DOE

R2E2
Residential Retrofits for Energy Equity

Residential Retrofits for Energy Equity (R2E2) is a new nationwide initiative that provides trainings to state, local, and tribal governments as well as community-based organizations and other partners to jumpstart energy upgrades for affordable housing that will lower utility bills, reduce greenhouse gas emissions, improve residents' health, create good-paying local jobs, and help advance racial equity. R2E2 is supporting the Buildings Upgrade Prize by providing training and technical assistance to applicants and awardees.

Welcome icebreaker

In the chat, please respond to the following icebreaker with your name, pronouns, and organization:

What motivates you to keep doing work with housing/buildings and/or energy issues?

Buildings UP Scoring Overview

Criterion 1: Assessing and Prioritizing Challenges

Suggested content team provides:

- Describe the building upgrade zone—the area identified for the initial application of the building upgrade innovation. This may be an entire community, neighborhoods within a community, a utility service area, portfolio of geographically dispersed buildings, or another zone. Describe building type(s) to be addressed within the building upgrade zone and any key characteristics of these buildings.

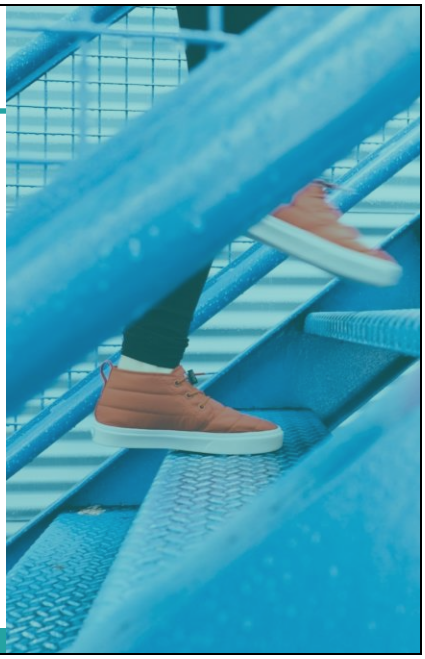
Each statement is scored on a 1–6 scale:

- The team has a clearly defined building upgrade zone and demonstrates an understanding of the buildings to be addressed within it.
- The team demonstrates a comprehensive understanding of the challenges to energy and efficient electrification in the building upgrade zone.
- The team has sought out diverse stakeholder perspectives, including with historically marginalized communities, to assess and understand challenges to building upgrades.

Official Buildings UP Rules:
https://www.herox.com/BuildingsUP/resource/1152

Learning goals and expected takeaways

- Learn about policies that have created housing, zoning, energy, and other inequities
- See how these inequities are present in the geography of communities
- Apply this knowledge to your local context
- Use this knowledge and tools to identify what types of buildings you may want to target for your concept plan.



Agenda

1. Introduction to Justice40 & energy equity
2. Structural inequities through historical policy
3. Choosing your building upgrade zone & applying available data
4. Identifying building upgrade zones through equity considerations
5. Other tools for prioritizing communities or neighborhoods
6. Action items & next steps
7. Resources & Q&A

R2E2

What is the Justice40 Initiative?

Executive Order 14008 – Justice40 – applies certain Federal investments so that 40% of the overall benefits flow to disadvantaged communities

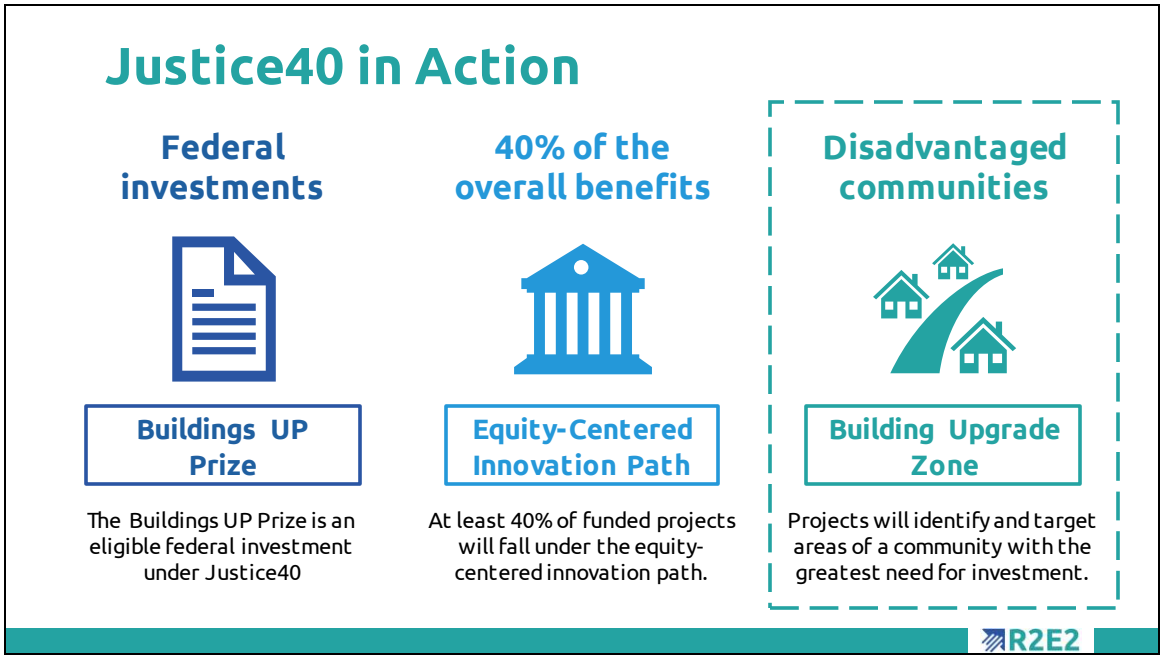
Federal investments

40% of the overall benefits

Disadvantaged communities

R2E2

- The Justice40 Initiative was created via one of the president's first Executive Orders Tackling the Climate Crisis at home.
-
- Justice40 calls for 40% of the benefits of certain federal investments to flow towards disadvantaged communities. In short, the goal is to ensure DOE investments are reaching communities in greatest need.
-
- For the purposes of this webinar, we are really focusing on the 3rd element of J40, identifying communities to prioritize based on need, or disadvantaged-ness.



- Buildings UP is a great example of Justice40 in action.
- Under this framework, the Prize represents the federal investment bucket.
- The 40% of benefits is realized via the two tracks with the goal of having 40% of projects falling into the equity track.
- The final category reflects the building upgrade zone.

Defining Community

The Interim Implementation Guidance for the **Justice40 Initiative** (M-21-28) **provides 2 definitions of "community"**

Community:

- either a group of individuals living in geographic proximity to one another
- a geographically dispersed set of individuals (such as migrant workers or the formerly incarcerated) where either type of group experiences common conditions

Source: Interim Implementation Guidance for the Justice40 Initiative. https://www.whitehouse.gov/wp-content/uploads/2021/07/M-21-28.pdf

R2E2

What does it mean to prioritize disadvantaged communities? Based on the White House guidance, community can be defined in 2 separate ways.

- First is via geographic concentrations of census tracts that experience a certain number of burdens. For instance, areas with high energy costs.
- The second way to interpret community is based on other shared characteristics that may not be geographically defined. For instance, public housing is often dispersed throughout a city.
- For the Buildings UP Prize, we use both definitions as the starting point but welcome applicants to define their own method that best represents their local community.

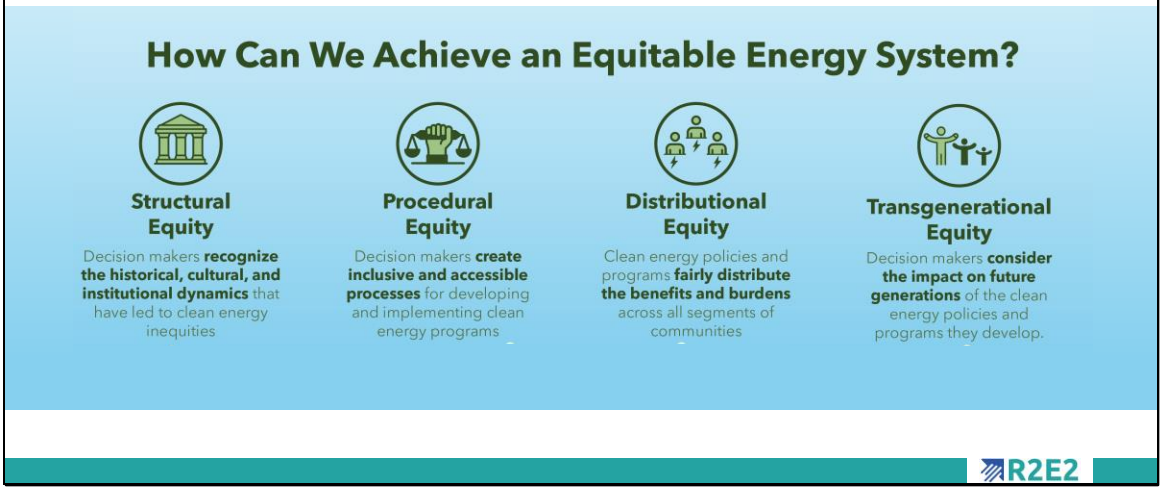
A data-driven, place-based approach to energy justice

- **Supports** equity, justice and democracy; serves as a conduit for community empowerment and self-determination
- **Acknowledges** that complex decision-making processes guide energy choices and cannot be described using a simple rational-economic model
- **Fosters** social connectedness to transform the way people consume energy– relying on group interaction, peer support, and communal resolve to impact behavior
- **Creates** institutional capabilities to effectively deliver services, and recognize, and respond to fluid conditions

R2E2

- Our goal is to follow a data-driven approach towards identifying building zones that could greatly benefit from this prize.
- This framing is intended to foster projects that reflect both the needs and interests of a community.
- The more we can orient building decarbonization around the identify of a community, the more successful we can be.
- To institute actual change and progress, our approach must create local capacity to operationalize action.

What does energy equity have to do with choosing your building upgrade zone?

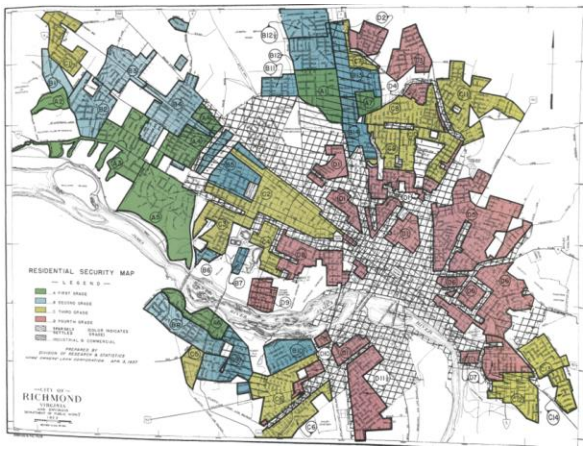


- All 4 pillars are necessary to ensure equitable outcomes and the ways to address each pillar should be considered an iterative process
- There is not a final achievement of equity at the end of any of these dimensions; they should always be considered and updated throughout the development and delivery of programs or policies.
- Achieving or focusing only on one dimension at the expense of others will likely sustain inequities.
- A large part of today's webinar will be focusing on the structural equity pillar and recognizing the role of structural inequities that have led to disinvestment in communities that could benefit greatly from affordable housing and underserved commercial building upgrades.
- Recognizing this pillar, acknowledging the historical processes that have institutionalized inequities, and moving to understanding how these inequities can be addressed and prevented in the future (as a transgenerational form of equity), is an important takeaway for this webinar.
- Another dimension we will touch on later in the presentation is the use of procedural equity to consult community members and Community Based Organizations to prioritize and understand the needs of disinvested communities and supplement quantitative data.

- Taken together, all four of these pillars can help guide and create pathways for equitable outcomes.
- We encourage you to think about what considerations fall under these pillars and why to help think about energy equity in a holistic way and hopefully internalize these pillars in the projects that your team will take on in the future.

Structural inequities through historical policy

- There are numerous examples of policies that were intentionally created to institutionalize racist practices in housing, lending, and zoning include red lining and racial covenants
- Commercial areas have also been impacted by these policies



Source: 'Mapping Inequality', University of Richmond

4. That no building shall be left with paper exposure or with the exterior incomplete.

5. That the said land or buildings thereon shall never be rented, leased or sold, transferred or conveyed to, nor shall same be occupied exclusively by person or persons other than of the Caucasian Race.

Source: Mapping Prejudice, University of Minnesota

R2E2

- For the B-UP, this is an important foundation for demonstrating that you fully understand the challenges to building upgrades in your building upgrade zone, especially for those in the equity track and for teams who have zones with residential buildings composed of underserved communities.
- You will also be required to demonstrate that you've considered potential negative impacts that your plans may have to find ways to mitigate unintended consequences down the line.
- Redlining, which was a practice endorsed by the US government and the Homeowners' Loan Corporation, designated areas where there was a presence of communities of color as bad investments for underwriting mortgages, effectively leading to the disinvestment of entire neighborhoods. Today, there is still a sharp gap in home ownership rates between white and black Americans (Collins and Margo 2011). The map in this slide is a real redlining map that was used to make housing investment decisions. Many of these original maps are available through a project called 'Mapping Inequality' through the University of Richmond.
- Racial covenants were also used to exclude communities of color from buying or occupying land. The excerpt you see at the bottom of the screen is a real racial

covenant clause. According to the University of Minnesota's Mapping prejudice project, which focuses on the impact of racial covenants in real estate: "The families who owned houses with covenants were able to pass that value on to the next generation. This intergenerational transfer of assets continues to drive the racial wealth gap in the United States today (Mapping Prejudice Project, UMN, ND)."

- Some other examples of policies that have impacted housing quality, jobs, and energy and water bills for low-income households and communities of color include: mass incarceration, employment discrimination, and underfunding in schools.
- These policies have fostered inequities in low-income households and communities of color and have resulted the concentration of these communities to be in areas with poor quality housing and infrastructure, greater pollution, presence of food deserts, and fewer opportunities for high quality jobs (Communities in Action: Pathways to Health Equity, 2017).

Energy Burdens

Energy burdens are measured by dividing your annual income by the cost of your annual energy bills, including electricity, natural gas, and other heating fuels. ACEEE's most recent energy burdens report found that:

- National median energy burden is 3.1% and low-income energy burden is 8.1%.
- Low-income, Black, Hispanic, Native American, older adults, and renters, experience disproportionately high energy burdens.
- One-fourth of all US residents have a high burden (> 6%) and two-thirds of low-income households have a high burden.

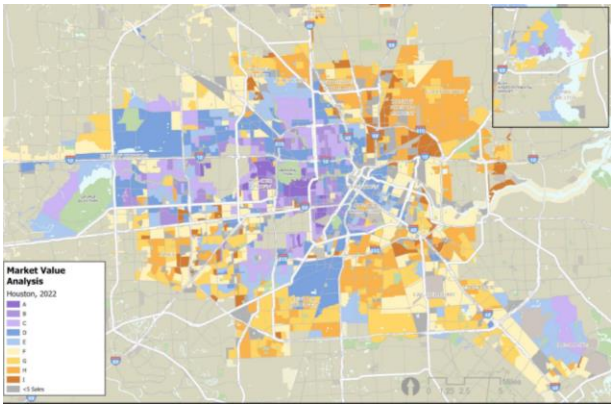
R2E2

ACEEE's most recent energy burdens report estimates that weatherization can reduce low-income energy burdens by about 25%.

Community Disinvestment & Capacity

Community disinvestment may lead to:

- Reduction in tax revenue
- Lack of access to public & essential services
- Departure of commercial businesses
- Loss of jobs and economic opportunity
- Concentrations of inequality



2022 Assessment of Houston's real estate market

Reinvestment Fund. Houston Market Value Analysis. Nov 2, 2022. houstontx.gov/housing/gis/reports/Market_Value_Analysis_Final_Report-110222.pdf

R2E2

We know that the overall health or socioeconomic well-being of a city or community reflects both the needs of both residential and commercial sectors. To understand community investment or disinvestment, its important to recognize that housing and economic opportunity cannot be separated.

Commercial building perspective defined

Building types that provide essential services:

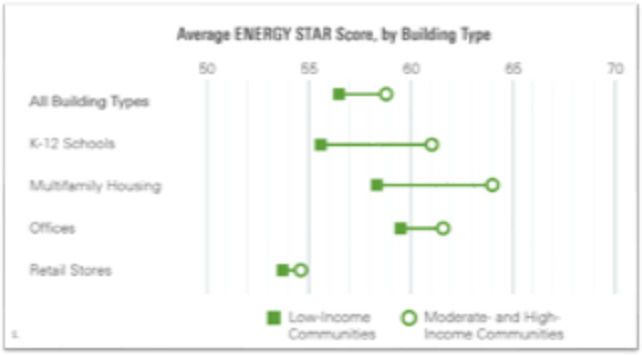
- Healthcare facilities
- Emergency response facilities
- Food markets & restaurants
- Schools & libraries
- Shelters, civic centers, public facilities

Supporting local businesses, enterprise creation, & workforce:

- Minority-owned businesses
- Minority serving institutions (MSIs)
- Local non-profits & community-based organizations

R2E2

How does building energy performance differ across communities?



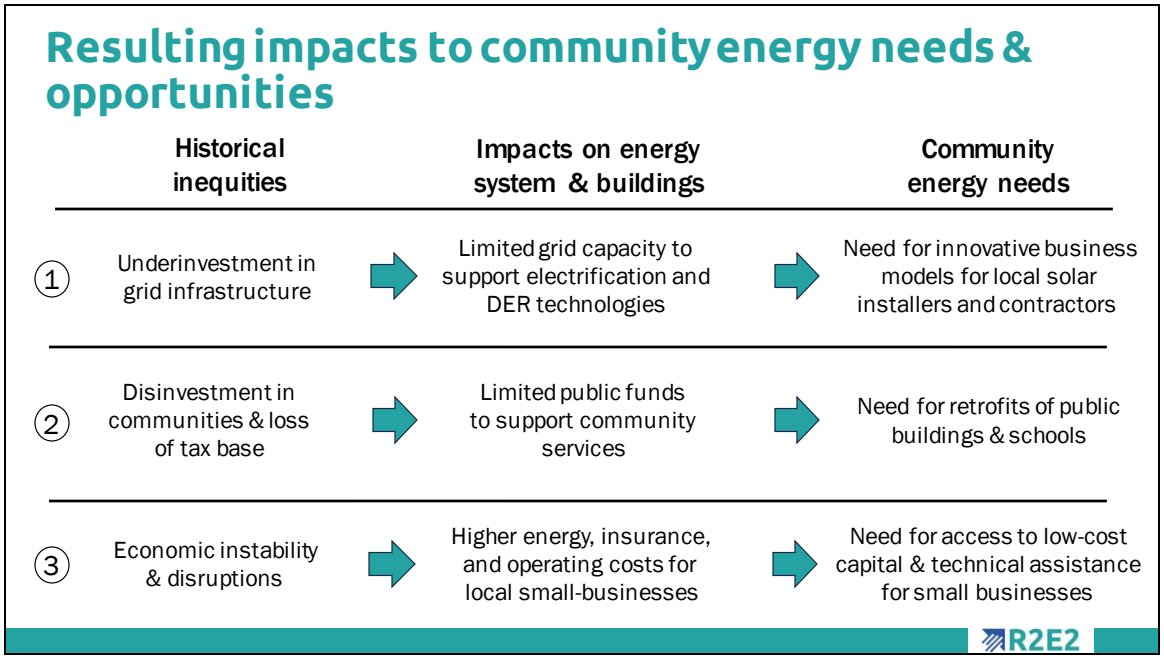
Relative to predominantly white communities, majority non-white communities (>75%) in cold to moderate climates:

- The proportion of all-electric buildings is roughly 50% lower
- The proportion of K-12 schools using heating oil is 2 to 3 times higher

Commercial Buildings in Communities with Different Income and Racial Characteristics A Comparison of Energy Efficiency and Fuel Sources May 2022 https://www.energystar.gov/sites/default/files/tools/DataTrends_race_income.pdf

R2E2

These disparities percolate into building energy performance. EPA recently issued a report using EPA Energy Star data. The analysis reinforced that there are statistically notable differences in energy performance that falls along lines of race or income.



- We know that energy upgrades will not singlehandedly solve systemic inequalities.
- By connecting a path between these underlying challenges, we can better design energy solutions that create deeper impacts.
- These three examples demonstrate how historic investment gaps produce energy challenges for community.
- In the first example, evidence suggests that grid infrastructure investments do not reach all neighborhoods. Because of this, many neighborhoods lack the grid capacity to support the adoption of distributed energy resources such as EVs, rooftop solar, and certain efficiency technologies. These conditions may thereby limit the economic activity of small businesses and contractors.

Opportunities At Hand

- Address housing and energy insecurity
- Address health disparities
- Improve quality of residential housing and commercial buildings
- Include communities in the development of plans and projects that directly affect them
- Promote procurement practices that benefit local, BIPOC, small businesses
- Prevent future harm through creating programs that **do not** raise energy bills or rent, displace community members, or do not center community priorities and needs
- Create programs that directly benefit communities

R2E2

- In scoring criterion 2, you will be asked about your plan to minimize potential negative impacts from your building upgrades.
- The negative impacts will be specific to your communities/building types, but some like displacement or rent increases are likely to be a common negative impact that teams will need to think through. If teams do not think through these potential impacts in an intentional way prior to commencing work, energy efficiency upgrades can lead to increase housing or building costs which can increase housing costs and rents and drive folks out of their communities.
- We encourage teams to think about their programs

in the long term and embed the pillar of transgenerational equity when developing plans to prevent unintentional harm.

Poll: which of issues the following issues do you believe are most important to address for your community through B-UP?

- High energy costs
- Health impacts
- Neighborhood preservation
- Workforce development
- Developing pathways for community engagement

Identify and prioritize communities using data and information

- In the next sections, we will discuss some of the data, tools, and strategies that can be helpful when trying to identify and/or describe communities or buildings in your upgrade zone
- Teams should consider information sources that: have up-to-date data, consider the presence of contextual and historical racist policies, and most importantly, consider lived experience of residents in housing and tenants of commercial spaces

R2E2

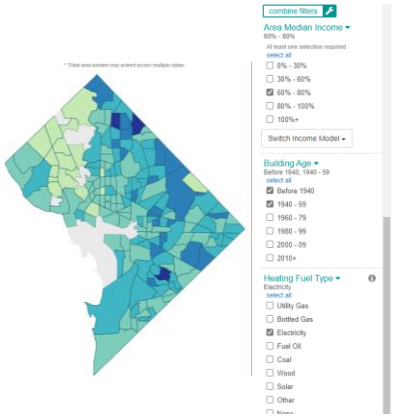
Guiding questions and how to apply available data

- Some questions that may guide fist steps:
  - What geographic areas in my community have high energy burdens or face energy insecurity?
  - What are the ages of the buildings with households with high energy burdens, and what is the fuel being used?
  - What characteristics do these households and/or buildings have in common?
  - What communities face other compounding inequities such as being located near highly polluting sources?
  - What are the unique histories or specific histories of inequitable policy impacts in our upgrade zone?

R2E2

Energy, Environmental, and Building Characteristics Data

- DOE's LEAD Tool: Offers general insights into information on the median energy burden (as a percent of income), median annual energy cost, and housing costs at the county, city, or census tract level.
- NREL's ComStock & ResStock data visualizations: Interactive datasets that provide additional detail on energy usage and building characteristics.
- EPA's EJScreen: displays several indicators associated with environmental justice such as presence of lead, proximity to polluting sites such as incinerators, demographic data, and presence of food deserts for example.

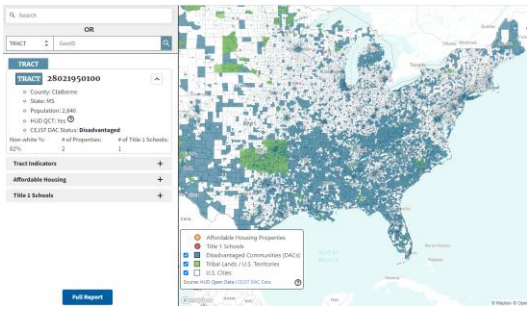


R2E2

- High energy burdens are a huge problem and are closely linked to poor quality housing.
- The LEAD tool offers insights into information on the average energy burden (as a percent of income), average annual energy cost, and housing costs at the county, city, or census tract level. It also has information by housing type, which can be helpful for isolating trends. For example, if you wanted to understand the intersection between energy burdens and income information in manufactured housing, this tool can provide a visualization of their location in addition to identifying specific tracts that might benefit from retrofits. Data values for this tool are derived from a model that uses 2018 PUMS data. This information can be combined with other maps to identify neighborhoods of interest for a given policy or program.
- The tool offers both a geospatial view as well as a chart view. However, the chart view only offers data visualization at the national or state level, not the local level.

Equity-Eligible Buildings Mapping Tool

- **Justice40:** White House Climate & Economic Justice Screening Tool (CEJST) layer of disadvantaged communities
  - Includes additional descriptive indicators relevant to energy systems
- **Affordable Housing Properties:** All publicly subsidized housing (HUD & USDA)
- **Title 1 Schools:** Department of Education data
  - Identifies schools designated as community shelters



https://energyjustice-buildings.egs.anl.gov/

R2E2

Sociodemographic and Housing Data

- US Census Demographic Data Map Viewer: Mapping of key demographic information down to the census tract-level.
- US Housing and Urban Development (HUD) Community Planning & Development Maps: Map and generate reports from a variety of different HUD data sources
- National Housing Preservation Database: Map of publicly subsidized housing properties (data included in DOE new mapping tool)

R2E2

- These are some tools to help teams describe the communities and residents they might be working with to develop their plans.
- The US census has reliable information of demographic data (and more) that can go down to the census tract level. It's always best to be as granular as possible so going down to the census tract level is a good start.
- For housing specific data that could be useful, we list HUD's community planning and development maps, which generate reports from various HUD sources in one resource.
- The national Housing Preservation database provides a map of publicly subsidized housing properties, which is also sourced in the mapping tool we just mentioned if you'd like to use it as a standalone resource.

Local and State Level Data

- List of Minority Serving Institutions (MSI): place to identify potential project partners from local colleges and universities
- Some examples of local data that can be used to identify neighborhoods or blocks to target investments in retrofits for affordable housing:
  - Rental registries and licensing data
  - Benchmarking data (property energy use)
  - Tax assessor data
  - Utility data: these data could be helpful for determining neighborhoods with high energy insecurity or those at risk for energy insecurity
  - State level data
    - Some states such as California have tools like CalEnviroScreen, which is specific to their state and was developed to help "identify California communities that are most affected by many sources of pollution, and where people are often especially vulnerable to pollution's effects"

R2E2

- Perhaps one of the most useful tools in this list is local data. Some localities have data sources that can be especially useful when trying to understand conditions at a neighborhood or local community scale.
- **Tax Assessor parcel and property data & CoStar data:**
  - These two data sources can be used to obtain property-specific information such as total area, number of buildings, dates of construction, and owner names. CoStar, and occasionally tax assessor data, contains additional information such as dates of sale, owner and manager contact information, and green building certifications. These data are often most useful in identifying properties that can potentially participate in voluntary programs, but these data may not always contain adequate information by themselves to facilitate program marketing or other outreach.
- **Benchmarking data and utility data**
  - If your community has a benchmarking ordinance and transparency law, benchmarking data can be a useful way of gaining insight into the energy performance of specific buildings in your community.

Identify and prioritize through procedural equity and lived experience

- Quantitative data doesn't tell the whole story!
- Community engagement is a necessary method for obtaining information that can guide the development of effective and equitable programs.
- Consult Community Based Organizations (CBOs) and community members. These organizations often have on-the-ground, institutional knowledge of underserved communities and know some of their challenges.
- Example: Philadelphia PA used spatial data and focus groups to understand energy burdens.

R2E2

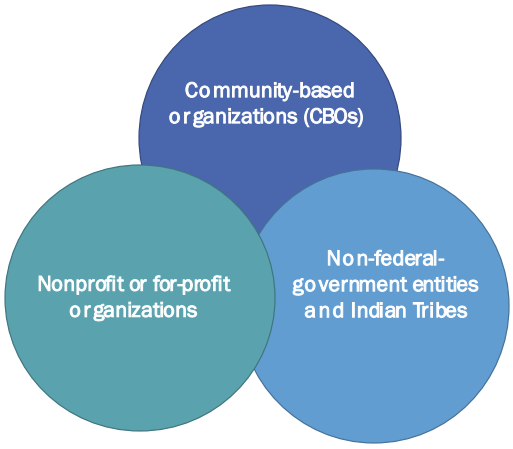
- Working with CBOs to help identify and understand the priorities of disinvested communities can help collaboratively make decisions about the kinds of programs and actions most needed to address inequities.
- CBOs are often well aware of the issues facing the communities they serve and have a good sense of the lived experiences of community members.
- Researchers have described many of the issues within the energy sector as being a problem of distributional equity, because the benefits and burdens of the current energy system are not equally distributed(Reams 2016).
- The problems are also often continued through a lack of procedural equity because communities that are most impacted by decision making are not meaningfully consulted, and no accountability measures are taken to ensure equitable outcomes for disinvested communities.

Question: In the chat, please let us know - How can we improve the utility of this mapping tool to best support your prize application & organization's mission at large?

Feedback can speak to:

- Additional data layers
- Analysis features
- Compatibility with other tools
- More curated information

Action items and potential next steps



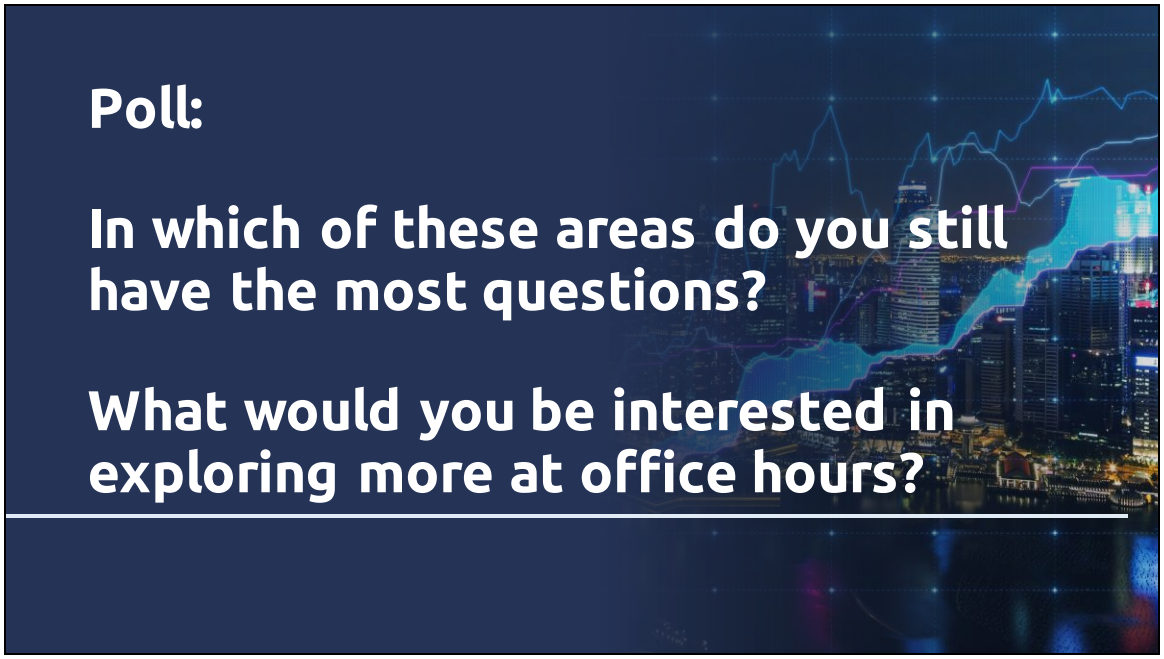
- Partner with different organization type and align goals
- Find data to inform building upgrade decisions and develop strong narratives that demonstrate an understanding of the building types and challenges in your upgrade zone

R2E2

Upcoming Events

- Training Webinar – May 11
  - Building Upgrades: An Opportunity for Workforce Development and Economic Inclusion
- Office Hours
  - May 15
  - **May 31**
- Virtual Teaming Events
  - May 18: West Region
  - May 19: Midwest Region
  - May 22: South Region
  - May 23: Northeast Region
- Prize Overview Webinar – June 13

Scan to view additional details and register for events, or visit herox.com/BuildingsUP


Poll:
In which of these areas do you still have the most questions?
What would you be interested in exploring more at office hours?

Buildings UP

The Buildings Upgrade Prize

AMERICAN MADE
U.S. DEPARTMENT OF ENERGY

Thank You

Follow: www.HeroX.com/BuildingsUP
Questions?: BuildingsUP@nrel.gov

Additional Resources

- Tools to help track and prevent further harm such as displacement (Transgenerational Equity): https://www.urbandisplacement.org/
- Comprehensive toolkits developed to prevent displacement: https://www.policylink.org/resources-tools/tools/all-in-cities/housing-anti-displacement
- Suggestions for decision makers to advance equity (also includes link to strategies to prevent displacement): https://www.aceee.org/sites/default/files/pdfs/leading_with_equity_state_fact_sheet.pdf
- Data on state level rental housing: Harvard University JCHS Rental Housing: www.jchs.harvard.edu/research-areas/rental-housing
- National trends associated with energy burdens: ACEEE's Energy Burden Report: www.aceee.org/energy-burden
- A project to help cities develop actionable and equitable roadmaps and strategies to achieve a zero net carbon building sector by 2050: Zero Cities Project: www.usdn.org/projects/zero-cities-project.html

Citations

- Drehobl, A., L. Ross, and R. Ayala. 2020. How High are Household Energy Burdens? Washington, DC: American Council for an Energy- Efficient Economy. https://www.aceee.org/research-report/u2006.
- Park, A. 2014. Equity in Sustainability: An Equity Scan of Local Government Sustainability Programs. Chicago: USDN (Urban Sustainability Directors Network). usdn.org/uploads/cms/documents/usdn_equity_scan_sept_2014_final.pdf.
- Perry, AM and Harshbarger,D. 2019. America's formerly redlined neighborhoods have changed, and so must solutions to rectify them. Brookings Institute. https://www.brookings.edu/research/americas-formerly-redlines-areas-changed-so-must-solutions/.
- University of Richmond. ND. Mapping Inequality. https://dsl.richmond.edu/panorama/redlining/#loc=5/39.1/-94.58.
- Badger, E. 2017. How Redlining's Racist Effects Lasted for Decades. https://www.nytimes.com/2017/08/24/upshot/how-redlinings-racist-effects-lasted-for-decades.html.
- Townsley. J, Miguel Andres, U and Nowlin, M. 2021. The Lasting Impacts of Segregation and Redlining. https://www.savi.org/2021/06/24/lasting-impacts-of-segregation/.
- Cong, S., Nock, D., Qiu, Y.L. et al. Unveiling hidden energy poverty using the energy equity gap. Nat Commun 13, 2456 (2022). https://doi.org/10.1038/s41467-022-30146-5.
- Hijazi, J. 2020. Policy Can Clash with Affordable Housing. https://www.scientificamerican.com/article/policy-can-clash-with-affordable-housing/.

Citations continued

- The National Low Income Housing Coalition. ND. The Problem. https://nlihc.org/explore-issues/why-we-care/problem.
- Collins, WJ and Margo, R. 2011. Race and Home Ownership from the End of the Civil War to the Present. https://www.aeaweb.org/articles?id=10.1257/aer.101.3.355.
- U.S. Department of Health & Human Services. 2022. Environmental Justice. https://www.hhs.gov/climate-change-health-equity-environmental-justice/environmental-justice/index.html.
- Samarripas, S., and A. Jarrah. 2021. A New Lease on Energy: Guidance for Improving Rental Housing Efficiency at the Local Level. Washington, DC: American Council for an Energy-Efficient Economy. https://www.aceee.org/research-report/u2102.
- Northeast Energy Efficiency Partnerships. Centering Equity with Metrics: How to Incorporate Equity and Justice in Evaluation, Measurement, and Verification. 2022. https://neep.org/sites/default/files/media-files/full_report_equity_metrics.pdf

Citations continued

- Lloyd, A. 2022. Renter activists crashed a DC landlords conference to protest 'corrupt greed' and rising rents. https://www.businessinsider.com/activists-crash-dc-corporate-landlords-meeting-to-protest-rent-increases-2022-9.
- California Office of Environmental Health Hazard Assessment (OEHHA). https://oehha.ca.gov/calenviroscreen/about-calenviroscreen#:~:text=CalEnviroScreen%20is%20a%20mapping%20tool,especially%20vulnerable%20to%20pollution's%20effects.
- Mapping Prejudice. University of Minnesota. ND. https://mappingprejudice.umn.edu/

Appendix: Additional Tools

Tool: Residential Energy Consumption Survey (RECS)

https://www.eia.gov/consumption/residential/

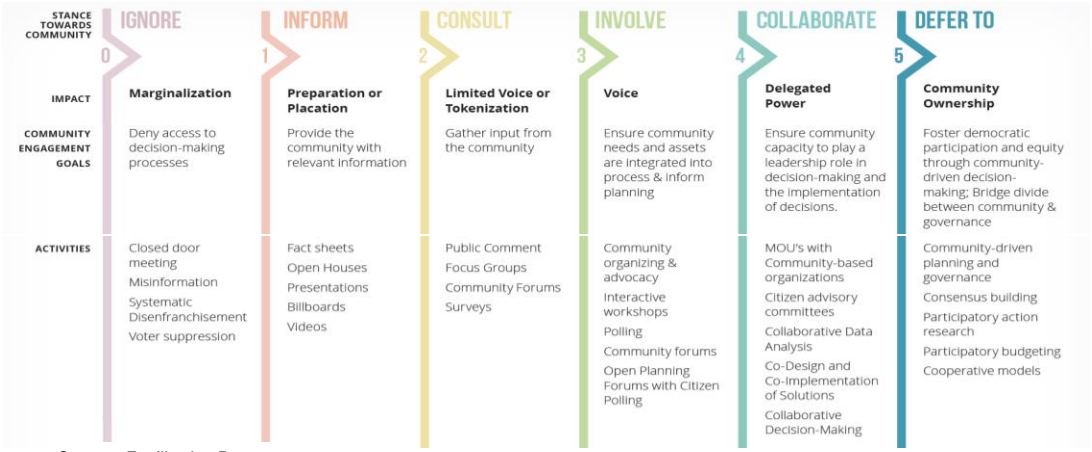
- Data collected by the U.S. Energy Information Administration through a survey that includes many questions about energy usage, behaviors, and related housing characteristics (such as size and age)
- Data on prevalence of energy insecurity by state
- Provides reliable estimates on energy consumption and behavior for states, regions, and the nation
- Information on fuels used and costs

R2E2

- The Residential Energy Consumption Survey (RECS) provides data that can be useful for understanding trends at the state level and may be useful to use alongside the DOE LEAD tool.
- The RECS is administered by the U.S. Energy Information Administration (EIA).
- The RECS collects data from a nationally representative sample of housing units, including household demographics, energy use patterns, and housing unit characteristics (EIA 2022).

Some of the data that can be found in RECs include national level data on:
Fuels and end uses
- Space heating
- Water heating
- And air-conditioning to name a few of the data sets related to housing

Potential next step: community engagement



Source: Facilitating Power

R2E2

- It's very important to **note that the different types and ways to do community engagement are not all equally impactful.**
- The Spectrum of Community Engagement to Ownership is a self-assessment and planning tool created by Facilitating Power. You might need it as one or both.
- Community engagement does not guarantee that historically marginalized groups will have a greater degree of decision-making power over the policies and programs that affect their lives. Without this delegation of power and ownership, community engagement is more likely to limit itself to simply involving community rather than fostering collaboration with and deference to community.
- The more impactful community engagement starts to happen toward 3-4-5 on this spectrum.