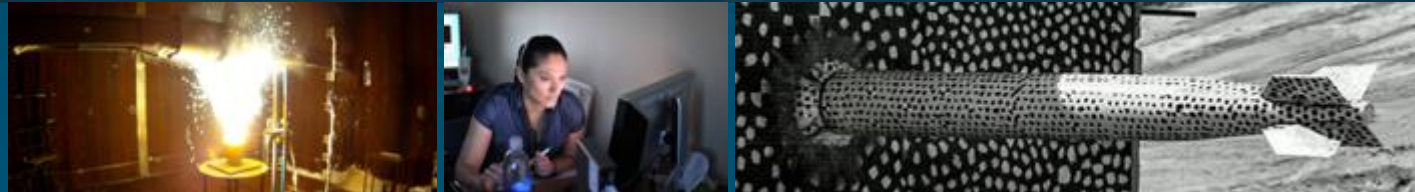


Seeking Equity Through Energy Storage



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2 My agenda for today



1. Discussion of what Equity is and how to define it.
2. Discussion of why Equity considerations are important.
3. Current policy measures at the federal and state levels.
4. Ensuring Equity in Energy Storage, Decarbonization, Resilience, and Electrification
5. Considerations for state regulators
6. Q&A

What is Equity in the E&U sector?



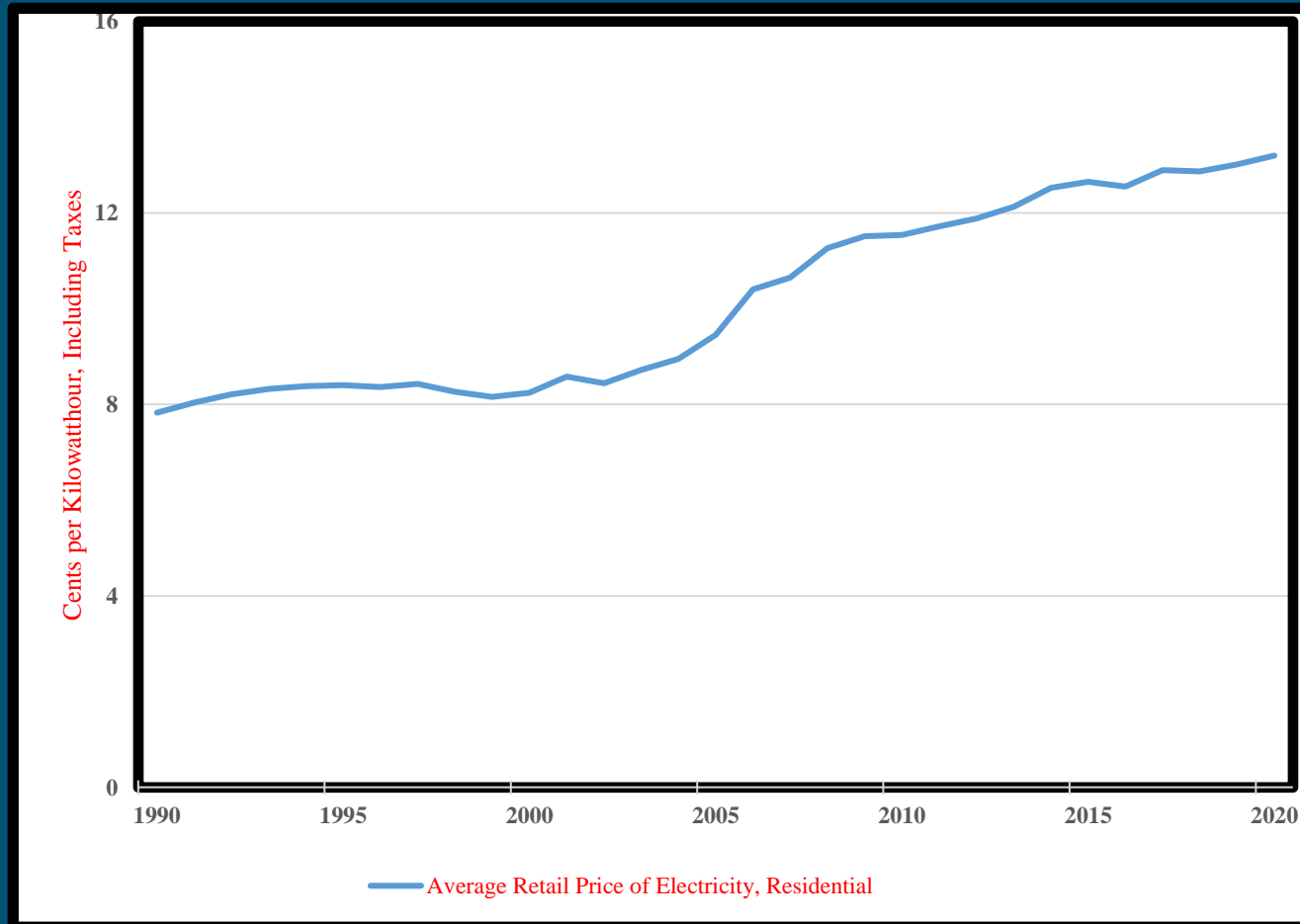
- There are multiple sources that have attempted to define Equity.
- Biden-Harris January 2021 Executive Order 13985, Advancing Racial Equity and Support for Underserved Communities.
 - When applied to the energy & utilities (E&U) sector, "energy equity" refers to the condition in which energy is provided to all in a consistent and systematically fair, just, and impartial manner regardless of race, geography, social standing, or economic position.
 - Moreover, Equity includes policies intended to ensure that underserved communities receive their fair share of the benefits resulting from grid modernization efforts across the electric system, and/or do not disproportionately incur costs, both monetary and non-monetary, to maintain parts of the system that do not result in direct benefits for their communities.

Why are Equity considerations necessary?



- About 50 million households, or 44 percent of the U.S. total, fall into the category of “underserved populations,” also referred to as disadvantaged communities or low-income communities, which are also often heavily populated by communities of color.
- Low-income households spend three-times more of their income on energy costs than more affluent households and yet may still be unable to afford such fundamental services as air conditioning or heating.
- While “affordability” is certainly a dimension of Equity, other dimensions such as resilience and harmful environmental health effects can also disproportionately impact underserved communities.

Underserved communities are hit hard by escalating energy costs.



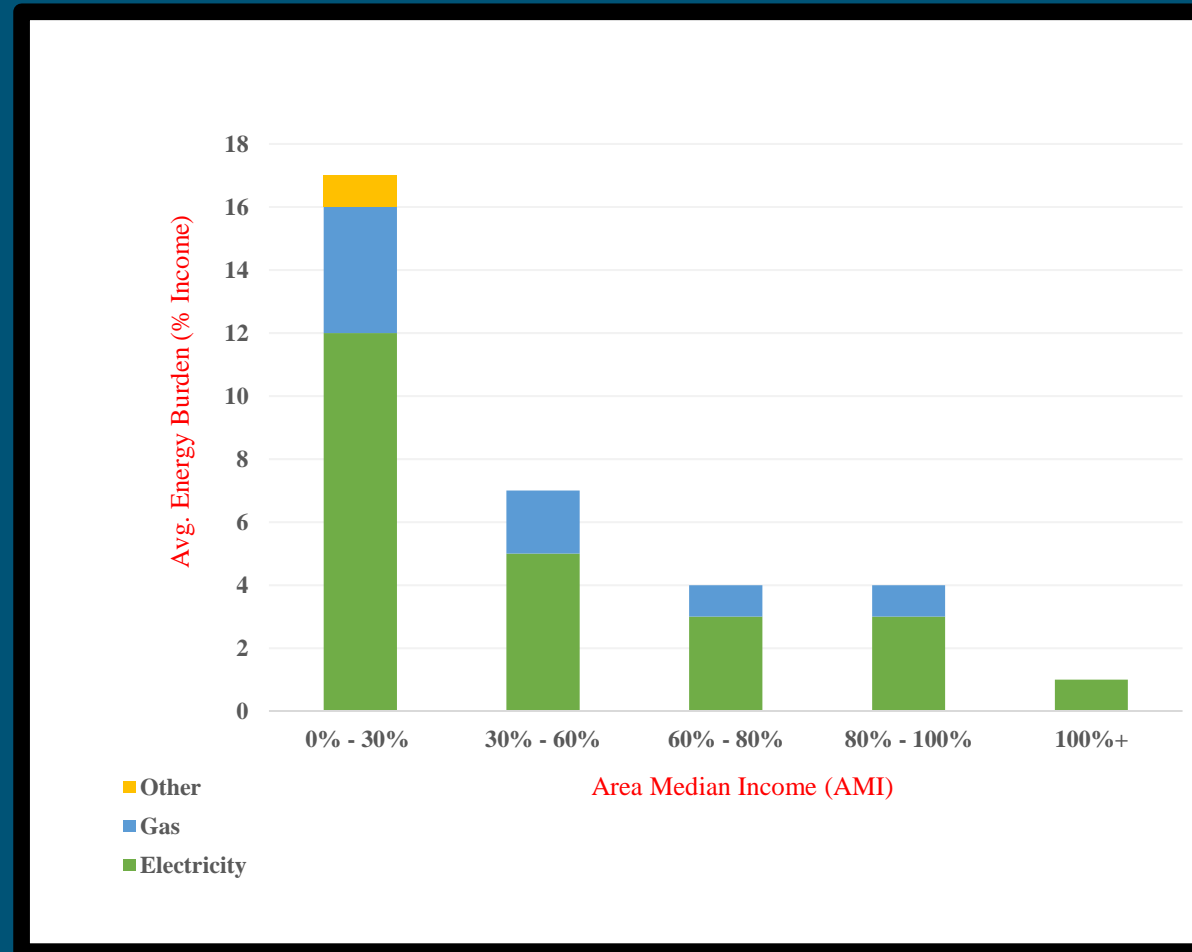
A near doubling of the cents per kWh in the time period of 1990 to 2020.

Average retail prices of electricity in the United States (U.S. Energy Information Administration, 2021)

Equity efforts seek to reverse historic trends.



Average energy burden (% of income) for the U.S. (DOE Office of Energy Efficiency & Renewable Energy, 2020)



Lower-income households end up bearing a greater burden of energy costs associated with maintaining essential services.

As incomes rise, affluent households bear less of this energy burden while still enjoying all of the same essential services.

Often low-income households pay more for service that is unreliable and not resilient.

What are the “real world” impacts?



- Underserved communities suffer the following impacts (Union of Concerned Scientists, 2016):
 - Higher levels of pollution (air, water and land) and related health issues resulting from fossil fuel burning generation assets that are often located in less affluent neighborhoods.
 - An increased number of electrical outages and more prolonged outages.
 - Inability to participate in grid modernization programs (such as electric vehicles, energy storage, etc.) or receive the benefits that these programs deliver to more affluent communities.
 - As noted on the previous slide, energy bills tend to be higher as a percentage of household income for non-white households (Drehobl et al., 2020). This leads to energy insecurity, in which households must consider difficult tradeoffs between personal comfort, health, and economic stability.

How do we achieve Equity in the E&U sector?



- First, it should be noted that Equity considerations are not new to the current age. However, recent environmental disasters (e.g., wildfires, hurricanes, earthquakes) have exposed the disparities of impact between affluent and low-income communities.
- Regulators at the federal and individual state level are increasingly including the consideration of Equity implications across a myriad of issues within the E&U sector.
- Essentially any topic under regulatory consideration that is related to essential services will or should have an Equity component.
- Energy Equity and Environmental Justice are related, but it is difficult to define any hierarchical relationship between the two. There may be significant overlap between the two concepts, and there may be aspects of both that warrant distinct approaches toward evaluation.
 - Increasingly, the term Environmental Justice may be used more broadly to include Energy Equity, although EJ was previously defined under Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, as issued by President William J. Clinton in 1994

Policy precedents can help regulators frame Equity considerations.



- Equity considerations specific to energy storage are rather new and evolving. But existing policy measures intended to ensure that the benefits of solar power are attainable for all customer classes can be useful in formulating a policy to ensure the benefits of energy storage or other technologies are also attainable for all customer classes.
- Equity in solar energy policymaking is especially relevant given that millions of energy customers across the U.S. will never be able to host their own solar arrays because they lack suitable rooftop space or rent their homes, or simply cannot afford the steep upfront costs associated with a solar system installation.
- Community solar programs, adopted at the state level, are broadly defined as a project where multiple participants own or lease shares in a mid-sized solar facility, usually between 500 kW and 5 MW, and receive credits that lower their monthly utility bills based on how much power the facility delivers to the grid.
- To address this equity issue, about 16 states have adopted “community solar” (sometimes called “shared solar”) policies through legislation and regulatory actions.

Current Energy Equity Policymaking



- The specific policy initiatives to be pursued to address energy equity vary across states, utility commissions, and utilities.
- As of May 2021, there are a number of initiatives at the state level that have the potential to include provisions related to serving disadvantaged communities. From this activity, some trends are emerging that, when examined as a whole, provide a blueprint for how Energy Equity policymaking may evolve.

Procurement Mandates	Financial Incentives	Ownership Policies/ Community Programs	IRPs & Pilot Programs	Resilience	Long-Duration Energy Storages
Specific carve-outs or requirements for low-income communities.	Explicit requirements for an increase in the amount of the tax credit for projects in underserved communities.	Shared storage, community solar initiatives	No state (that we are aware of) presently requires Equity to be considered within utility IRPs.	Equitable resilience planning does not frequently occur within common electric utility business models.	LDES supports 100% clean energy or 100% renewables goals. LDES policy can have a direct impact on energy equity policy, and vice versa.

CALIFORNIA

- ES procurement mandate includes an additional requirement of 500 MW of distributed (behind-the-meter) storage aimed at serving the public sector and low-income customers.
- Legislation (the Clean Energy and Pollution Reduction Act of 2015 (Senate Bill 350) called upon the CPUC to help improve air quality and economic conditions in communities identified as "disadvantaged."

MASSACHUSETTS

- The Solar Massachusetts Renewable Target (SMART) program includes adders for solar projects in low-income communities and a separate, stackable adder for projects including ES.

NEW JERSEY

- Legislation requires the Department of Environmental Protection to evaluate environmental and human health impacts of overburdened communities when reviewing and approving permits for a number of polluting facilities (NJ Legis., 2020a).
- Creation of an Energy Equity Office.

Considerations for State Regulators



- The Union of Concerned Scientists developed a solid roadmap to ensure that ES policies are equitable, and which is summarized here (Union of Concerned Scientists, 2019):
 1. Actively identify and address barriers to participation among low-income and otherwise disadvantaged individuals and communities;
 2. Require regulated utilities to consider ES and to evaluate equitable outcomes in their IRPs.
 3. Design ES applications designed for specific community-benefiting outcomes (e.g., reducing local emissions; generating community wealth; replacing fossil fuel peakers / reducing harmful emissions; and improving resilience in specific communities;
 4. Combine different policy mechanisms to achieve intended outcomes—including carve-outs, incentives, and financing mechanisms aimed at ensuring that underserved communities share in the benefits of storage deployment—and ensure these policies are aligned with other clean energy incentives for those communities;

Considerations for State Regulators



- The Union of Concerned Scientists developed a solid roadmap to ensure that ES policies are equitable, and which is summarized here (Union of Concerned Scientists, 2019):
 5. Include an equity focus within efforts to improve resilience, whether in grid modernization proceedings, implementation of resilience-enhancing tariffs, integrated resource planning, or other processes. Ensure that the specific needs and abilities of more vulnerable populations are reflected in grid resilience planning processes.
 6. Combine storage deployment policies with ambitious targets for renewable energy and energy efficiency, and other policies to reduce emissions that drive climate change; and
 7. Ensure that all consumers benefit from ES projects, emphasizing benefits to low-income consumers and enabling community ownership of projects.



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Knowledge is also gained and shared among our team of colleagues at Sandia.

Collectively we work to support Sandia's role in Advancing Energy Storage on the Grid:

- Improving Safety and Reliability
- Engineering Analysis and Project Support
- Policy Analysis and Regulatory Outreach
- DOE Supported Demonstration Projects
- Industry Outreach



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