

NCF-Envirothon 2024 New York
Current Issue Part A Study Resources

Key Topic #5: Local Action and Energy Equity

19. Identify actions that can be taken on the individual and local level to support renewable energy.
20. Define Energy Justice, and describe its connection to environmental justice and climate justice.
21. Explain the components of Energy Justice and how these interact with the transition to renewable energy.

Study Resources

Resource Title	Source	Located on
How Expensive is it to Switch to Lower-Carbon Energy in My Own Home?	<i>Kathryn Tso – Ask MIT Climate, 2020</i>	Pages 176 - 177
Planning for Home Renewable Energy Systems	<i>US Department of Energy – Office of Energy Efficiency and Renewable Energy, 2023</i>	Pages 178 - 181
Residential Consumers Can Drive Demand for Green Power	<i>US Department of Energy and US Environmental Protection Agency, 2018</i>	Pages 182 - 184
VIDEO: Using Indigenous Knowledge to Tackle Climate Change (2 minutes)	<i>CBC News – The National, 2022</i>	Page 185
Community Ownership of Renewable Energy: United States	<i>Institute for Human Rights and Business, 2022</i>	Pages 186 - 189
The Energy Justice Workbook	<i>Initiative for Energy Justice, 2019</i>	Pages 190 - 199
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How Expensive is it to Switch to Lower-Carbon Energy in My Own Home?

By Kathryn Tso – Ask MIT Climate – December 1, 2020

If you can afford to make some investments upfront, you may actually save money in the long run by using lower-carbon energy.

If you own your own home and car, you might be looking for big ways to lower your carbon footprint. Solar panels and electric vehicles are two of the most popular, but these are large pieces of high-tech hardware that might seem unaffordable at first glance. But in fact, investments like these could potentially save you money in the long run, says Dr. Apurba Sakti, a research scientist at the MIT Energy Initiative who studies economic and technological aspects of energy storage systems. It's important to "really just look at your options and see what the actual costs would be for making the switch."

First, let's talk about buying clean power directly from the electric grid. Many electric utilities let their customers choose to buy low-carbon electricity from renewable energy sources, often marketed as "green power." Depending on where you live, this can be quite cheap: in 2016, the average added cost was about \$16.25 a month to power an average-sized home.¹ Even if your utility doesn't give you that option, you can buy "renewable energy certificates" that fund the building of new solar farms and wind turbines.

But these options will always cost at least a little more than your normal electricity bill. Remember, utilities are already trying to make power as cheaply as possible: if adding more solar or wind is cheaper than your normal energy mix, your utility will make those investments on its own. So if you want to lower your carbon footprint while also lowering your electric bill, you may need to install solar panels.

The cost of making energy with solar panels has dropped by roughly 90% since 2011, making this a much more accessible option than it used to be for ordinary homes.² "Research and global market size are two main factors driving down the cost," says Sakti. Solar cell research has led to more efficient panels that can make much more electricity from the same amount of sunlight. And as solar panels have grown in popularity, more factories invest in manufacturing them, making them cheaper for buyers.

Buying solar panels is still a large upfront expense, but there are ways to offset that cost. For anyone considering solar panels, either to lower their electricity costs or to help combat climate change, Sakti recommends "looking into local incentives and checking how wide the range of options is." Everyone in the U.S. can claim a 26% federal tax credit for the price of installing solar panels, and many states offer additional state tax credits. If that still doesn't bring the cost down to a point you can afford, there is also the option of leasing solar panels instead of buying them outright. "You'll just pay the company a monthly rate for electricity, which is usually lower than what you already have," Sakti says.

Electric vehicles (EVs) are also beginning to fall in price. Many models now sell in the \$30,000 range, even before tax credits. This might still be more than you're used to paying for a car, especially if you normally buy used. But you'll also save money on less maintenance, and the fact that electric charging stations are less expensive than filling gas. One factor to keep in mind,

says Sakti, is the source of the electricity you're charging your electric vehicle with. "EVs can have a lower carbon footprint compared to internal combustion engine vehicles, depending on whether the electricity used to charge the batteries come from lower-carbon sources," says Sakti. In other words, if the electricity in your home still comes from coal power, an electric vehicle might not be the right choice to lower your personal carbon emissions.

Solar panels and electric vehicles are only expected to become more efficient and cheaper in the future. Other potential low-carbon hardware to look into includes electric heat pumps, which can heat your home without natural gas or oil, and home battery systems, to make the most of rooftop solar panels even when the sun isn't shining.

Planning for Home Renewable Energy Systems

US Department of Energy – Office of Energy Efficiency and Renewable Energy – 2023

Planning for a home renewable energy system is a process that includes analyzing your existing electricity use, looking at local codes and requirements, deciding if you want to operate your system on or off of the electric grid, and understanding technology options you have for your site.

Maybe you are considering purchasing a renewable energy system to generate electricity at your home. Although it takes time and money to research, buy, and maintain a system, many people enjoy the independence they gain and the knowledge that their actions are helping the environment.

A renewable energy system can be used to supply some or all of your electricity needs, using technologies like:

- Small solar electric systems
- Small wind electric systems
- Microhydropower systems
- Small hybrid electric systems (solar and wind)

Planning for a home renewable energy system is a process that includes analyzing your existing electricity use (and considering energy efficiency measures to reduce it), looking at local codes and requirements, deciding if you want to operate your system on or off of the electric grid, and understanding technology options you have for your site.

If you're designing a new home, work with the builder and your contractor to incorporate your small renewable energy system into your whole-house design, an approach for building an energy-efficient home.

Analyzing Your Electricity Loads

Calculating your electricity needs is the first step in the process of investigating renewable energy systems for your home or small business. A thorough examination of your electricity needs helps you determine the following:

- The size (and therefore, cost) of the system you will need
- How your energy needs fluctuate throughout the day and over the year
- Measures you can take to reduce your electricity use

Conducting a load analysis involves recording the wattage and average daily use of all of the electrical devices that are plugged into your central power source such as refrigerators, lights, televisions, and power tools. Some loads, like your refrigerator, use electricity all the time, while

others, like power tools, use electricity intermittently. Loads that use electricity intermittently are often referred to as selectable loads. If you are willing to use your selectable loads only when you have extra power available, you may be able to install a smaller renewable energy system.

To determine your total electricity consumption:

- Multiply the wattage of each appliance by the number of hours it is used each day (be sure to take seasonal variations into account). Some appliances do not give the wattage, so you may have to calculate the wattage by multiplying the amperes times the volts. Generally, power use data can be found on a sticker, metal plate, or cord attached to the appliance.
- Record the time(s) of day the load runs for all selectable loads.

Considering energy efficiency measures in your home before you buy your renewable energy system will reduce your electricity use and allow you to buy a smaller and less expensive system. For information about determining the overall energy efficiency of your home, see energy assessments.

Local Codes and Requirements for Small Renewable Energy Systems

Each state and community has its own set of codes and regulations that you will need to follow to add a small renewable energy system to your home or small business. These regulations can affect the type of renewable energy system you are allowed to install and who installs it. They can also affect whether you decide to connect your system to the electricity grid or use it in place of grid-supplied electricity as a stand-alone system.

A local renewable energy company or organization, your state energy office, or your local officials should be able to tell you about the requirements that apply in your community. If you want to connect your system to the electricity grid, these groups may also be able to help you navigate your power provider's grid-connection requirements. Here are some of the state and community requirements you may encounter:

- Building codes
- Easements
- Local covenants and ordinances
- Technology-specific requirements

Electrical and building inspectors ensure that your system complies with standards. Building inspectors are interested in making sure the structure you are adding is safe. Your system may be required to pass electrical and/or plumbing inspections to comply with local building codes.

Many building code offices also require their zoning board to grant you a conditional-use permit or a variance from the existing code before they will issue you a building permit. Check with

your building code office before you buy a renewable energy system to learn about their specific inspection requirements.

You are most likely to gain the inspector's approval if you or your installer follow the National Electrical Code (NEC); install pre-engineered, packaged systems; properly brief the inspector on your installation; and include a complete set of plans as well as the diagrams that come with the system. In addition, you should be sure your system is composed of certified equipment, and that it complies with local requirements and appropriate technical standards (the links at the bottom of the page provide more information on technical standards).

Easements

Some states permit easements, which are a voluntary, legally binding agreement between owners of adjacent land regarding use of the land. For example, you might seek an easement specifying that no structure which blocks the renewable resource necessary to run a renewable energy system will be built. These agreements are binding regardless of changing land ownership. In addition, you may want to do a title search of your deed to determine if any prior easements or other agreements exist that could prevent you from adding a renewable energy system to your own property.

Local Covenants and Ordinances

Some communities have covenants or other regulations specifying what homeowners can and can't do with their property. Sometimes these regulations prohibit the use of renewable energy systems for aesthetic or noise-control reasons. However, sometimes these regulations have provisions supporting renewable energy systems. Check with your homeowners association or local government for details. In addition, you may want to discuss your intentions with your neighbors to avoid any future public objections.

Grid-Connected or Stand-Alone System

Some people connect their systems to the grid and use them to reduce the amount of conventional power supplied to them through the grid. A grid-connected system allows you to sell any excess power you produce back to your power provider.

For grid-connected systems, aside from the major small renewable energy system components, you will need to purchase some additional equipment (called "balance-of-system") to safely transmit electricity to your loads and comply with your power provider's grid-connection requirements. This equipment may include power conditioning equipment, safety equipment, and meters and instrumentation.

Other people, especially those in remote areas, use the electricity from their systems in place of electricity supplied to them by power providers (i.e., electric utilities). These are called stand-alone(off-grid) systems.

For stand-alone systems, balance-of-system components include batteries and a charge controller in addition to power conditioning equipment, safety equipment, and meters and instrumentation.

Choosing the Right Renewable Energy Technology

To begin choosing the right small renewable electric system for your home, you will need a basic understanding of how each technology works, as well as:

- Renewable energy resource availability
- Economics and costs
- System siting
- System sizing
- Codes and regulations
- Installation and maintenance considerations

Remember that all of these technologies can be used by themselves, combined, or used in conjunction with a fossil fuel system. When these technologies are combined or used with a fossil fuel generator, the result is a hybrid system.

Technology options include solar, wind, microhydropower, and hybrid electric systems (solar and wind).

- Small solar electric systems -- A small solar electric or photovoltaic system can be a reliable and pollution-free producer of electricity for your home or office. Small photovoltaics systems also provide a cost-effective power supply in locations where it is expensive or impossible to send electricity through conventional power lines.
- Small wind electric systems -- Small wind electric systems are one of the most cost-effective home-based renewable energy systems. They can also be used for a variety of other applications, including water pumping on farms and ranches.
- Microhydropower systems -- Microhydropower systems usually generate up to 100 kilowatts of electricity, though a 10-kilowatt system can generally provide enough power for a large home, small resort, or a hobby farm.
- Small “hybrid” solar and wind electric systems -- Because the peak operating times for wind and solar systems occur at different times of the day and year, hybrid systems are more likely to produce power when you need it.

Residential consumers can drive demand for green power

Residential electricity consumers looking to reduce their environmental impacts and increase the demand for cleaner sources of power can contribute to the growing green power industry. Depending on their location, there are several ways that residential electricity consumers can purchase green power and drive demand-side change on the grid.

Renewable Energy Certificates (RECs) are used in the United States to track the delivery and consumption of renewable energy and substantiate all green power generation and use claims, something that would otherwise not be possible on a shared distribution network or utility grid. Each REC represents the environmental attributes associated with one megawatt-hour (MWh) of renewable energy generation, and can be sold together with or separately from physical electricity. These energy attribute certificates include the location and type of generation (e.g. wind, solar, geothermal, hydropower) and any emissions associated with generation source. In aggregate and over time, RECs allow electricity consumers to choose renewable energy, which can drive change in the electricity market through the increased development of renewable energy source to meet increasing REC demand.

All green power purchasing options must include RECs in order for consumers to claim the environmental attributes and use of green power and to have an impact on transforming the market towards cleaner sources of energy. The options below allow consumers to purchase green power from the electric grid without having to install renewable generation equipment themselves, such as rooftop solar photovoltaic panels.

Purchasing Options for Residential Consumers

Purchasing green power through a retail electricity supplier

In some areas of the U.S., residential customers may be able to sign up for an optional green power service to procure a bundled electricity and REC product from their utility or default service provider. These types of default utility provider supply options are called “green pricing programs” and are often structured in a range of ways to include a small premium of up to a few cents per kilowatt-hour above the utility’s standard electricity service, be sold in blocks of kilowatt-hours or as a percentage of the consumer’s total electricity use at a fixed cost.

In other areas of the country, some residential customers have the option to choose an electricity provider who may not always be their local distribution utility. Consumers that can competitively choose a retail supplier who is not their local distribution utility do so through “green power marketing programs.” Consumers will often pay a premium for green power marketing products, though in some regions, competitive green power products may be price competitive with default electricity options.

In either case, suppliers will often offer a range of green power products, allowing customers to choose levels of renewable energy often up to 100% green power. In either case, all green power products involve renewable energy certificates. Many consumers will seek out suppliers and products that are third-party certified (see below).

Receiving green power through a community choice aggregation

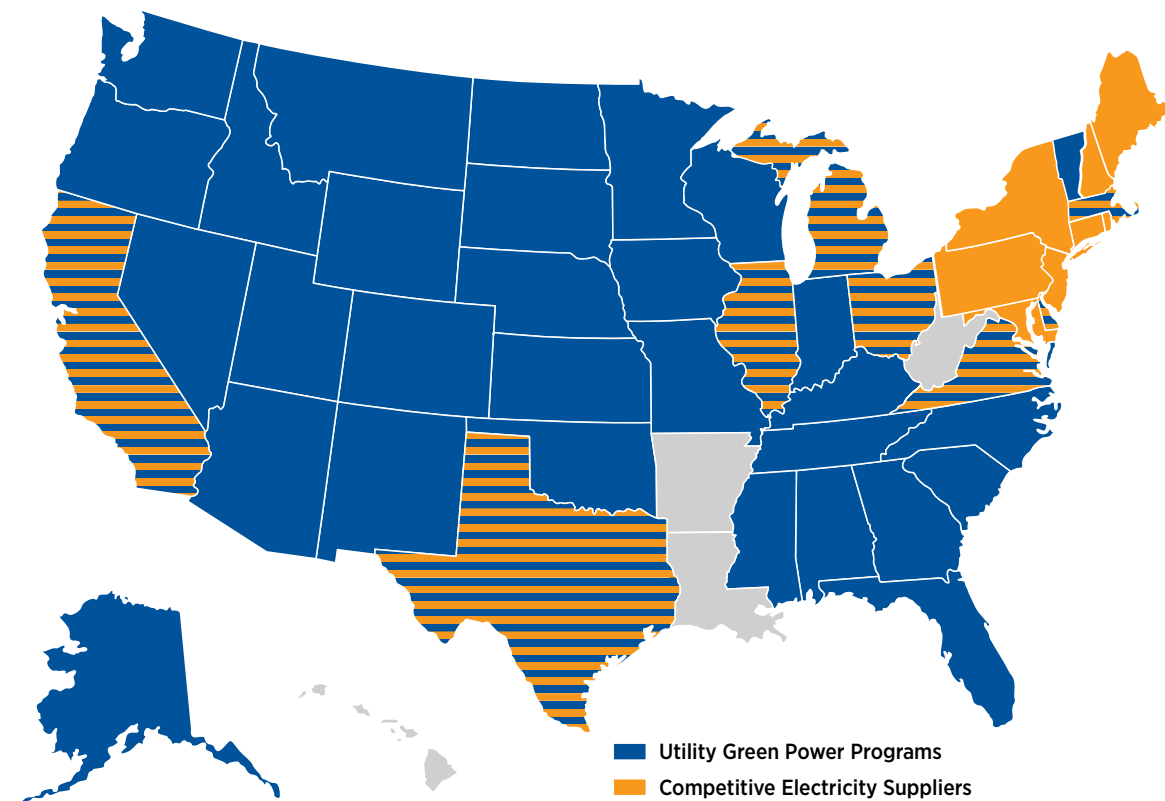
Some residential customers may be automatically enrolled in a green power option that has formed under a “community choice aggregation.” This occurs in a few states where policy or legislation have authorized community choice aggregation, which allows a municipality or local jurisdiction to purchase green power on the behalf of the community at-large. Community choice aggregations are generally structured as an “opt-out” option for residential customers, meaning that residential consumers will receive green power unless they choose to not participate, which tends to be uncommon. Due to the ability of community choice aggregations to drive scale, some customers may receive their green power service at or below standard electricity rates. Residential consumers generally have little to no control

over the green power selected under a community choice aggregation approach, including the ability of the consumer to choose the resource type or location.

Direct Purchase of Renewable Energy Certificates

All electricity consumers have the option to purchase renewable energy certificates as a stand-alone product that are unbundled, or sold separately, from the physical electricity delivered to the consumer over the grid. Because RECs can be unbundled from the underlying electricity at the point of generation, RECs can be sold and consumed anywhere within the U.S. electricity market. REC instruments help solve the challenge of knowing the origin or source of the electricity delivered over the grid, since physical electricity is undifferentiated (e.g., it all looks the same). REC instruments are used to assign ownership to generation delivered to the grid, while offering consumers the flexibility to specify among other things, exactly what type of resource and the location of the generator they prefer to have serving their demand. Buying RECs separately does not affect the consumer’s existing utility service relationship, but does result in two separate billings from both their electricity and REC suppliers, unlike retail utility supply options that involve bundled products. Consumers that buy RECs as a green power product can legally claim to be using renewable electricity based on the attributes conveyed by the RECs and the generator that produced them to meet demand. All green power supply options include RECs, so there is little difference if you purchase the REC bundled or unbundled from the underlying electricity.

Figure C-1. U.S. Residential Green Power Purchasing Options



Notes

- 1. Unbundled Renewable Energy Certificates (RECs) are available nationally
- 2. Community Choice Aggregation (CCA) programs are available in CA, IL, MA, NJ, NY, OH, and RI
- 3. Not all indicated options are available statewide

Verification and Certification

Because voluntary sales and purchases of renewable energy are not subject to governmental oversight, it is important that residential customers look for green power options that are certified by an independent third party. The non-profit Center for Resource Solutions developed the Green-e standard and certification program to help consumers identify high quality renewable energy products. Green-e verifies that all green power product sales are substantiated with RECs and that ultimately each REC is only issued to one buyer or consumer. This also involves making sure that RECs purchased by voluntary residential consumers are also not counted towards a mandate, which gives consumers assurances that their purchase goes above and beyond what would otherwise have occurred due to regulation (also known as regulatory surplus). Finally, Green-e requires that customers receive accurate and transparent disclosures about what they are purchasing (including resource types and facility locations). Additionally, Green-e conducts regular reviews of marketing and promotional materials for truth in advertising by certified suppliers. It is considered a consumer best practice to seek out third party certified green power products from eligible suppliers. To learn more about Green-e or find a certified product in your area, visit <http://www.green-e.org>.

Green Power Purchasing Preferences

Residential customers may express preferences for certain green power options and products in terms of the following:

- Resource Type – for example, generation from solar, wind, geothermal, or low-impact hydropower.
- Resource emissions rate – for example, a resource type that generates electricity at a low or zero emissions rate.
- Facility Location – for example, a specific project, generation from the same state, a certain region of the country, or national (no preference).
- Facility Age – for example, generation from facilities that were built in the last 5 to 10 years or that are new or yet to be built.
- Facility Size – for example, generation from large, utility-scale facilities vs. small, distributed generation.
- Length of Commitment – for example, enrollment in a utility program to pay monthly with the option to opt out at any time vs. entering into a 5-year purchase contract vs. making a one-time purchase of unbundled RECs.
- Other Considerations – for example, supporting generation from renewable facilities that may have broader system effects such as job, security, and reliability benefits. Some buyers may choose to support local renewable facilities or facilities in regions where the grid is considered to be more polluting.
- Cost – the cost of green power will vary based on all of the preferences listed above, as well as other factors.

Residential consumers may also find some of the information in the Guide to Purchasing Green Power useful when selecting a supply option despite the Guide being focused on non-residential consumers.

Using Indigenous Knowledge to Tackle Climate Change

CBC News – The National, 2022

Video: https://youtu.be/SjSzx0_7yPY



Community Ownership of Renewable Energy: United States

Institute for Human Rights and Business, 2022

Climate Ambition

- The current administration has established the goal of 100% clean electricity by 2035 and net-zero greenhouse gas (GHG) emissions no later than 2050.
- It also announced a 2030 aim of reducing net GHG emissions by 50-52% from 2005 levels.
- The United States (US) has committed to deploying 30 gigawatts of offshore wind by 2030 and a target goal of permitting at least 25 gigawatts of onshore renewable energy by 2025.
- Renewable energy has seen rapid growth in recent years due to low costs and policy support.
- The International Renewable Energy Agency (IRENA) notes that the US has the technical potential to increase its share of renewables in the US energy mix to 27% by 2030. By way of illustration, about 20.1% of the nation's utility-scale electricity production in 2021 came from renewable energy sources.

Renewable Sources

- Wind power offers the greatest potential for renewables growth in the US and is currently the largest renewable energy generator, accounting for around 43% of all renewable energy in 2020. Texas has the highest installed wind power potential, followed by Iowa and Oklahoma.
- Wind energy is predicted to increase from 63 GW (in 2014) to 314 GW by 2030.
- Hydropower is the largest source of renewable power generation in the US, but IRENA predicts limited potential for large-scale developments.
- Solar power resources vary across regions in the US, but IRENA predicts that the total installed capacity of solar photovoltaics (PV) could reach 135 GW by 2030.
- Biomass and biogas technologies also have significant potential in the US, with a possible 84 GW by 2030.

Indigenous People & Culture

There are around 5.2 million Native Americans (including American Indians and Alaska Natives) making up 2 percent of the U.S. population. Of this number, 78% reside in small towns or rural regions outside reservations, primarily in California, Arizona, and Oklahoma. There are presently 574 federally recognised Nations and the largest are the Navajo Nation and Cherokee Nation.

Since the United States was founded, Native Americans have faced atrocities and dispossession as part of settler colonialism. It forcibly drove them away from their native homelands, and they encountered unfair agreements and government actions that later centred on forced assimilation.

Although Native Nations have long been acknowledged as sovereign, they continue to face barriers in obtaining political and legal autonomy to define and enforce institutions such as property law in Indian country.

Legal Framework and Institutions

At the domestic level, The United States recognises the inherent sovereignty of tribal communities and the United States Code has a section which governs the relationship between the United States and all the federally recognised Nations. The Indian Reorganisation Act (IRA) created the formal infrastructure to recognise Native Nations and the parameters within which Native Nations could write their own constitutions. In this sense, the US is the only country in the world which provides “legibility and visibility” to Native Nations within its domestic law.

However, the United States Congress and the Supreme Court have the power to limit (or even divest) tribal sovereignty. The Court has historically sanctioned the dispossession of Indian lands, the exploitation of Indian resources by outsiders and the curtailment of tribal government. With respect to property rights, tribal lands or reservations are held “in trust” by the United States government for the use of specific Nations (which includes approximately 56.2 million acres of land). This means that the majority of Native Americans cannot sell the natural resources that the land holds and have limited control over leasing out or encumbering tribal territory. Native Nations cannot secure environmental and cultural preservation, engage in development and management choices, or negotiate favourable conditions.

At the international level, The United States has adopted the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), recognising the rights of indigenous peoples to free, prior and informed consent (FPIC), land, and resources. However, UNDRIP is not binding law in the United States and the right to FPIC is not properly implemented in practice. Similarly, the American Declaration on the Rights of Indigenous Peoples was adopted by the Organisation of American States (OAS) in 2016. Similar to UNDRIP, it is a human rights document that upholds the right to self-determination, self-government, cultural expression, land areas, territories, and natural resources.

Challenges and Opportunities for Indigenous Ownership of Renewable Energy

Indian tribes rely on the development of the reservation’s natural resources as one of the primary means of economic development. Despite this importance and the extensive mineral resource base on tribal lands, tribal control over the development and use of such resources has historically been limited. While decision-making power for tribes has increased in recent decades, tribal sovereignty (both practical and political) remains fragile.

At the policy level, the United States Department of Energy (DOE) Office of Indian Energy supports indigenous energy and economic infrastructure through policies and programs by offering funding through grants, technical support, training, and capacity building. DOE has contributed over \$114 million since 2010 to approximately 200 indigenous energy projects spread across the United States. The Obama administration made many pledges to indigenous

clean energy through financial and technical support programs and capacity-building training for Native Alaskan and American Indian communities.

At the legal level, the Indian Tribal Energy and Self-Determination Act (ITEDSA) of 2008 offers Native Nations the power to make the ultimate decision about specific development activities, including the development of renewable energy sources such as wind. While this is a positive development, ITEDSA does not address tribal concerns such as enhancing their access to financial, technical and scientific resources to ensure that tribes approach negotiations with businesses on an equal footing. Furthermore, Native Nations are still required to engage in a public consultation process with government officials, which dilutes and contradicts the sovereignty of the Nations. From a practical perspective, energy development in the native territory has also been hampered by government departments' poor administration, long review periods and other bureaucratic hurdles. Such issues lengthen the development process and result in missed opportunities and income. Tribes also do not have access to the financial resources and incentives currently accessible to private companies and local governments.

Profile Cases

The Oceti Sakowin Power Project in South Dakota

To produce renewable energy and become self-sufficient, six Sioux tribes in South Dakota—the Cheyenne River, Flandreau Santee, Oglala, Rosebud, Standing Rock, and Yankton Sioux—have established their wholly-owned multi-tribal power authority, known as Oceti akowi (OSPA). OSPA created the largest native wind projects in the United States in a cooperative venture with a wind developer, Apex Clean Energy.

OSPA has a majority stake in the company and participates actively in decisions to ensure a longer-term view and meaningful aligned with native teachings. While Apex assisted with necessary federal criteria and standards for approving the wind farms and power connections, OSPA provided its strong expertise and understanding in acquiring land, cultural and ecological concerns, and local legislation.

The wind farms' construction, operation, and funding were done jointly by OSPA and Apex. To retain tribal ownership, financing was secured through the issuance of utility revenue bonds, aimed at institutional investors. The Bush Foundation, the Clinton Global Initiative, and the Northwest Area Foundation are some of the partners.

In addition to creating jobs, sustainable development, and a prosperous future for the Native Nations, the project aims to promote Tribal self-sufficiency. The Sioux will equally split the financial gains from selling power to the Southwest Power Pool. It is estimated that the project could bring in \$20 million in tax and fee revenue for the tribes which OSA and its member Tribes will reinvest in other communities for the planning, financing, ownership and management of community-scale renewable energy projects.

“Our dream is that this [wind project] will bring income to our people where we can be more self-sufficient.” - Faith Spotted Eagle, a member of OSPA’s Council of Elders.

(<https://www.apexcleanenergy.com/insight/apex-clean-energy-recognized-best-largest-pipeline-wind-projects-u-s-2/>)

“We want to use our revenue to invest back into the wind farms, so we can retain more ownership and more control of our projects,” Lyle Jack, Chairman of the Oceti Sakowin Power Project. (<https://www.lakotatimes.com/articles/oceti-sakowin-wind-power-project/>)

Fire Island Wind Project in Alaska

The Fire Island Wind Project in Anchorage is owned and run by Fire Island Wind LLC, a subsidiary of Cook Inlet Region, Inc. (CIRI). With assets amounting to almost a billion dollars and approximately nine thousand stockholders representing the Alaska Native cultures, CIRI is one of the Alaska Native corporations formed by Congress.

CIRI now owns 75% of the property on Fire Island. The project encountered several difficulties, took seven years to complete, and required 120 permits to be built. However, the project was completed eight months after the Regulatory Commission of Alaska authorised the 25-year power purchase deal with Chugach Electric Association, the biggest electric cooperative in Alaska. In 2012, the project started supplying up to seven thousand houses across Anchorage with clean energy.

The Chaninik Wind Group in Alaska

In 2005, the four Native tribes of Kongiganak, Kwigilliingok, Tuntutuliak, and Kipnuk came together to create the Chaninik Wind Group. The organisation wanted to build renewable energy and smart infrastructure, including wind energy, to combat growing fuel prices and provide Native communities with economic independence and income through employment and revenues. The organisation created the necessary technical competence to carry out the projects independently with the aid of regional utility managers and energy specialists. Federal funding was provided to the organisation to set up smart grid equipment and track the village's power consumption. The completed projects have lowered the cost of residential home heating and decreased their reliance on fossil fuels.

The Energy Justice Workbook

Introduction

Around the country, states have begun to act in the absence of clear federal guidance on climate. We are witnessing a sea change through a suite of policy actions, from ambitious renewable energy targets, to rooftop solar programs, community energy legislation, and market innovations such as community choice aggregation. In the face of this rapidly-evolving landscape, those disproportionately harmed by the fossil-fuel based energy system (“frontline communities”) and more broadly, marginalized communities (including, but not limited to, environmental justice communities, indigenous communities, low-income and working-class communities, and communities of color)—seek to place equity and distributive justice at the heart of new policies addressing the transition away from fossil fuels to clean and renewable energy sources. As noted by industry observers and community activists alike, this energy transition offers an opportunity to reshape the socio-economic relationships created by energy policy choices. It creates an opening to center the concerns of frontline communities in the creation of energy policy. For example, the energy transition offers an opportunity for communities to own and control clean energy resources while reducing localized environmental and health impacts associated with the burning of fossil fuels.

Energy justice has emerged as both a field of study and practice to guide the energy transition, but the inconsistency surrounding definitions and use threatens the coherency of the field and the ability to advance clear policy guidance actually rooted in energy justice. Scholars in both social science and law have begun to grapple with the theoretical aspects of energy justice as well as its practical applications. In parallel, advocates have also begun to engage in a diversity of activities connected to energy justice and its corollaries, energy equity and energy democracy. Although scholars and practitioners frequently rely on energy justice and energy equity to animate parallel strands of study and practice, these two constituencies are not in active conversation and these parallel strands rarely, if ever, intersect. In light of the varied landscape, we choose to use the term, “energy justice” because we find it to be the most unifying terminology for this overarching concept that can synthesize and lift up both the traditions of justice-based scholarship, and recent activist practice around energy equity and energy democracy.

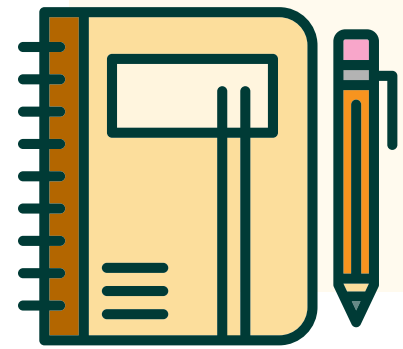
Taking advantage of the opportunity for structural transformation in our energy system requires that equity be placed at the center of emerging policy frameworks; however, community participants in policy debates concerning the energy transition often lack concrete details for energy policies that actually do place equity at the center. Similarly, policymakers lack theoretical grounding and practical frameworks to create and implement equity-centered energy policy. This Workbook addresses these gaps, and builds a bridge between theories and practices of energy justice to facilitate operationalizing energy justice through energy policy. The key audiences for this Workbook include community advocates and policy makers. The Workbook should serve as a guide for activists and advocates on the ground working for energy justice at the state level, and to assist policymakers seeking to understand how to incorporate energy justice into their emerging energy policy frameworks.

How to use this Workbook

The pages that follow provide a broad overview of “energy justice,” synthesizing energy justice (and similar terms) as framed by practitioners in the field, as well as by scholars explicitly writing about energy justice.

The Workbook proceeds in four sections. Section 1 provides an overview and synthesis of energy justice, as discussed by frontline advocates, social scientists, and legal scholars. The section ends with a summary of the key energy justice principles that should animate transitional energy policy. Section 2 lays out an energy justice scorecard that may be used by advocates and policymakers to evaluate and design transitional energy policy. Section 3 uses the scorecard developed in Section 2 to evaluate emerging community energy policy in California and New York. We have also included a Glossary and Appendix for easy access to commonly used terms and the data we’ve relied on in our analysis.

The energy policy landscape is dynamic, and energy justice is context specific. However, basic principles of justice endure. We designed this Workbook to be highlighted, dog-eared, and referenced as the policy landscape evolves. The framework provided herein should be used to provide key benchmarks to guide energy policy discussions. We also designed this Workbook to address the question that frequently arises in the context of equity and energy policy: **What is energy justice?**



Section 1

Defining Energy Justice: Connections to Environmental Justice, Climate Justice, and the Just Transition

Summary: **Energy justice** refers to the goal of achieving **equity** in both the **social** and **economic** participation in the energy system, while also **remediating** social, economic, and health **burdens** on those historically harmed by the energy system (“frontline communities”). Energy justice explicitly centers the concerns of **marginalized communities** and aims to make energy more accessible, affordable, clean, and democratically managed for all communities. The practitioner and academic approaches to energy justice emphasize these process-related and distributive justice concerns.

Energy justice connects to, and builds upon, the deep scholarly and grassroots traditions of the environmental justice and climate change movements.¹ Those involved in the movement for the transition away from fossil fuels to renewable energy often frame energy justice, energy equity, and energy democracy as a part of a broader “**just transition**” to a low-carbon regenerative economy that will remedy the injustices of the fossil-fuel energy system and extractive economy across multiple sectors.² Advocates engaged in just transition work, through the leadership of the Climate Justice Alliance and the support of Movement Generation, have adopted the following model to reflect their efforts.



A STRATEGY FRAMEWORK FOR JUST TRANSITION RESIST — RETHINK — RESTRUCTURE

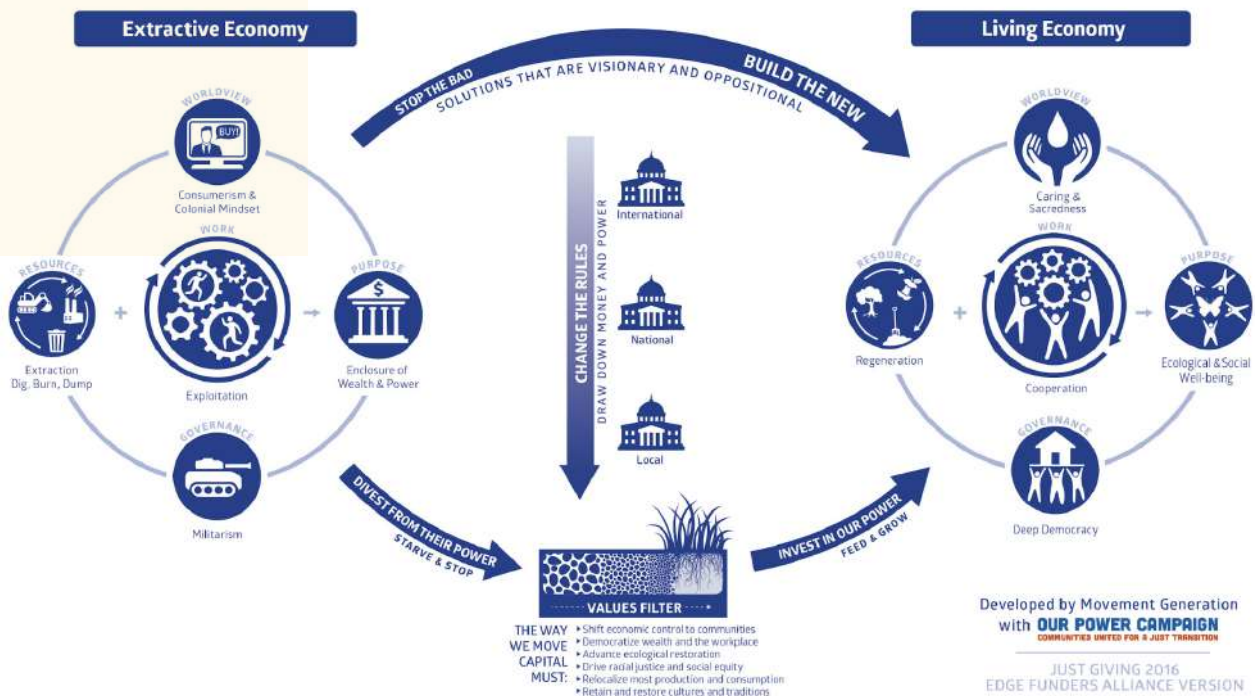


Diagram 1: Movement Generation Just Transition Framework ³

Energy justice (also referred to as “energy equity”) is integral to the just transition, as it addresses fairness and equity concerns within the current, extractive energy system, and incorporates aspects of “deep democracy,” cooperation, and regeneration that feature in the just transition frame. Energy justice has several dimensions, including:

- **energy burden**, which refers to the expense of energy expenditures relative to overall household income;⁴
- **energy insecurity**, which refers to the hardships households face when meeting basic household needs;
- **energy poverty**, which refers to a lack of access to energy itself;⁵ and
- **energy democracy**, the notion that communities should have a say and agency in shaping their energy future.⁶

Issues of racial, economic, and social justice are not new aspects of political discourse in the United States; however, their nexus with issues of energy and the environment is a relatively recent phenomenon. Furthermore, the focus on “equity” within the energy justice frame indicates that policy approaches should work to level the playing field for those long disadvantaged under the existing energy system, rather than simply provide for “equal” opportunities for all under the new system.

Diagram 2 illustrates the framing of energy justice within the broader movement for a just transition, as well as how the component parts of energy justice fit together.

What is the origin of energy justice?

Energy justice closely connects to terms familiar to both practitioners and scholars in the field: **environmental justice** and **climate justice**. Environmental justice emerged in the early 1980’s as both an activist practice and field of scholarship in the wake of damning evidence that communities of color often faced disproportionate environmental burdens, and that the suite of recently passed environmental laws did little to protect such communities from environmental harm.⁷ Eventually, in response to a mounting body of evidence produced by activists⁸ and academics alike,⁹ in 1994, President Bill Clinton issued Executive Order 12898 directing federal agencies, to “the greatest extent practicable and permitted by law . . . make achieving environmental

justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States. . . .”¹⁰ Although some scholars have questioned the efficacy of the environmental justice movement, as well as its utility as a policy tool,¹¹ others have noted the importance of relying on the environmental justice movement to inform the current transition away from fossil fuels.¹² In any case, environmental justice spawned the climate justice movement, which addresses the acute climate change issues facing communities of color and working class communities.

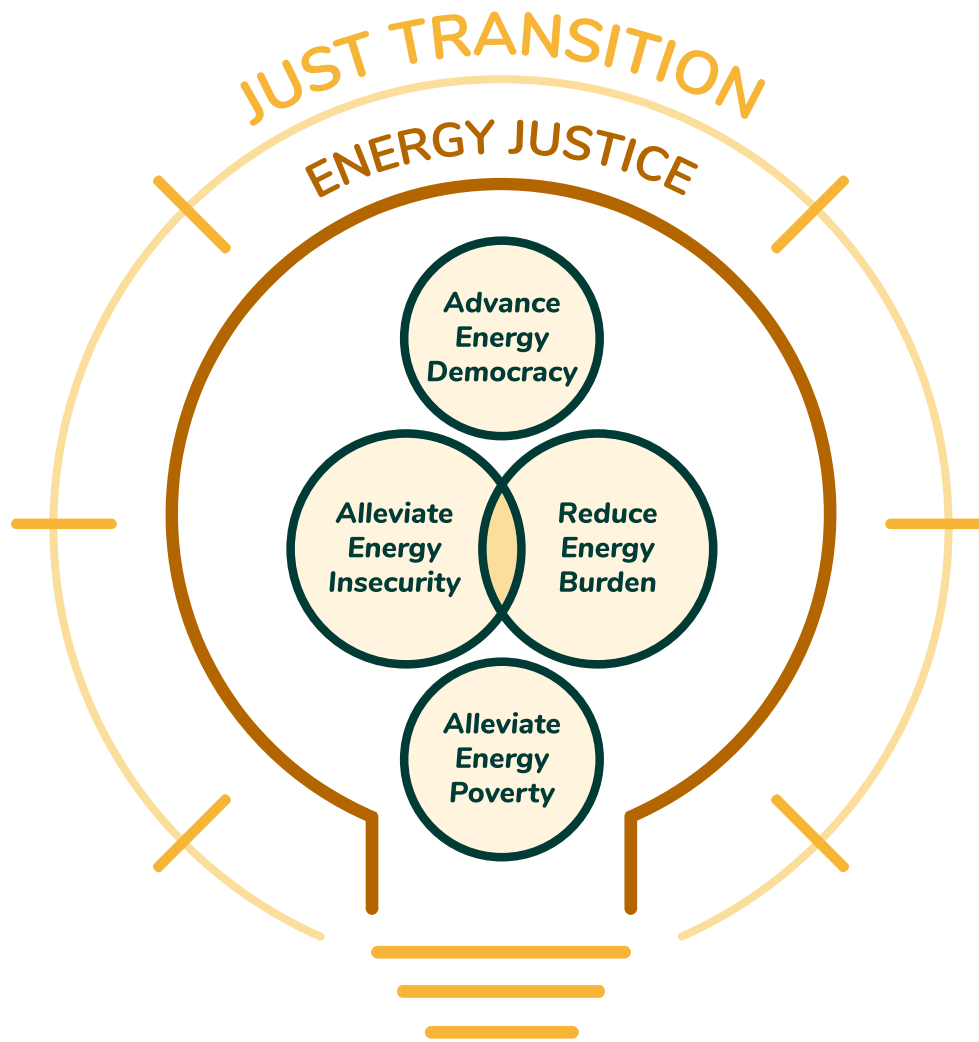


Diagram 2: The Goals of Energy Justice

While environmental justice might be seen as more of a domestic, United States-centric, movement focused on local concerns,¹³ climate justice is decidedly global in scope. The movement emerged in the late 1990’s and 2000’s in light of the recognition that climate change would disproportionately affect those in the Global South, who did very little to contribute to creating the problem of climate change in the first instance.¹⁴ Around the world, those with the least ability to respond to the impacts of climate change—the poor and people of color, including island nations and indigenous peoples—would bear the brunt of its effects. In the United States, climate justice advocates broadly recognize that the poor and people of color in this country will suffer the deepest impacts of climate change, given legacies of legalized segregation, redlining, and disinvestment that have left communities of color and the poor on land and in economic circumstances that make them the most vulnerable to climate change impacts. Moreover, such communities lack the economic resources to easily “bounce back” from climate change related events.¹⁵

High water marks of the climate justice movement include:

- **2010:** The creation of the People’s Agreement in Cochabamba, Bolivia in 2010, where participants called for the creation of an International and Climate Environmental Justice Tribunal with the legal capacity to “prevent, judge, and penalize States, industries and people that by commission or omission contaminate and provoke climate change.”¹⁶ The People’s Agreement was the product of the People’s Conference on Climate Change and the Rights of Mother Earth after the disastrous 2009 United Nations meeting in Copenhagen to address climate change;
- **2014:** The People’s Climate March organized by activist groups, where 400,000 people gathered in New York City to center “the leadership of Indigenous communities, communities of color, and working-class white communities” in the climate movement;¹⁷ and
- **2019:** In the summer of 2019, a coalition of environmental justice organizations and national organizations aligned to create an “Equitable and Just National Climate Platform” which set forth a “bold national climate policy agenda” to advance “economic, racial, climate, and environmental justice.”¹⁸ The Platform calls for a commitment to limit global warming to 1.5 degrees Celsius through the mobilization of community, government, science and research, and industry resources “toward the development of just, equitable, and sustainable long-term comprehensive solutions” that “acknowledge and repair the legacy of environmental harms on communities inflicted by fossil fuel and other industrial pollution.”¹⁹ The Platform further argues for new leadership to “advance solutions in ways that meaningfully involve and value the voices and positions of [environmental justice communities].”²⁰



Both environmental justice and climate justice weave together the requirements of procedural and substantive (or distributive) justice. In the case of environmental justice, key principles of the movement include fair distribution of the burdens of development, and involvement in all aspects of “the development, implementation and enforcement of environmental laws, regulations and policies.”²¹ Climate justice proponents, on the other hand, argue for policies that address the disproportionate burdens that will be borne by vulnerable communities due to climate change, even going so far as to argue for distributive justice in the form of reparations.²² Further, as noted by the Climate Justice Alliance, actual climate justice requires that voices of communities of color, indigenous peoples, and the working-class be placed at the forefront of discussions concerning climate.²³

Energy justice emerges from this rich history. As Eleanor Stein elegantly summarizes, the general view of scholars is that an energy just world involves equitable sharing of benefits and burdens involved in the production and consumption of energy services.²⁴ It is also one that is fair in how it treats people and communities in energy decision-making.²⁵ Further, key concerns of the field are:

- issues of access,
- distribution of harms,
- fairness of energy decision-making to ensure that decisions do not infringe on human rights and civil liberties, and
- informed participation.²⁶

Sections 1.1 and 1.2 provide an in-depth review of the conceptual underpinnings of energy justice theory and practice. **Diagram 3** illustrates the environmental justice, climate justice, and energy justice movements, as well as the primary claims within each. As the diagram reflects, the movements and analytical frameworks are rooted in similar ideologies and goals. Moreover, they run on parallel and overlapping paths.

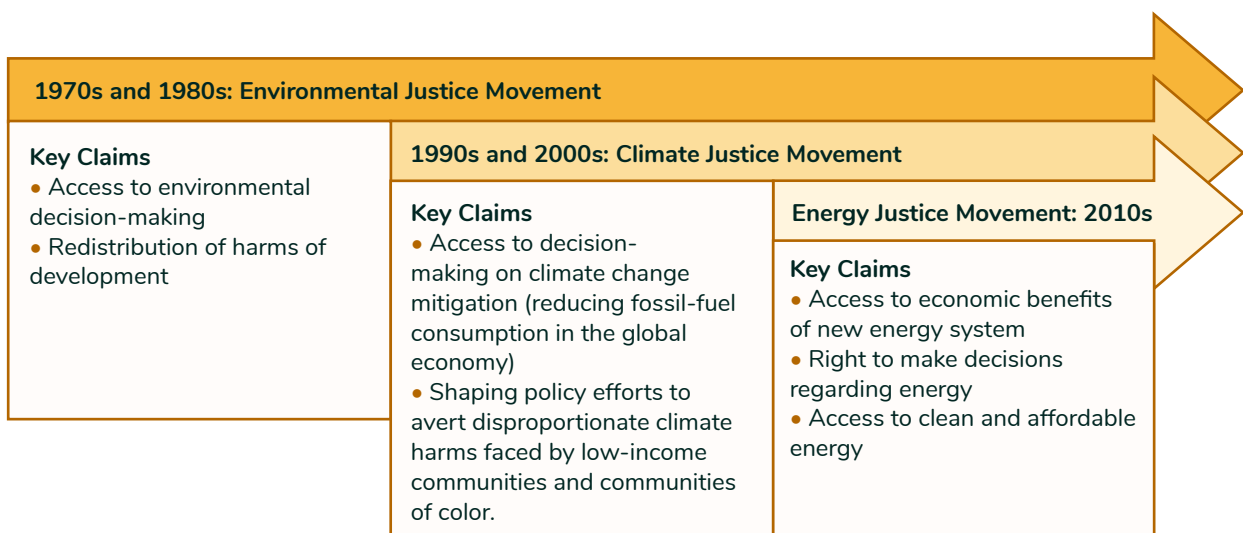


Diagram 3: Movements for Environmental Justice, Climate Justice, and Energy Justice

The following Section discusses how “energy justice” and the range of terms associated with it are used in practice as well as in academic circles (mainly social scientists and legal scholars). Before that discussion, however, we offer a synopsis of terms used in this section and the sections that follow:

Frequently Used Terms	Definition
Climate Justice	Remediation of the impacts of climate change on poor people and people of color, and compensation for harms suffered by such communities due to climate change. ²⁷
Energy Burden	Amount of overall household income spent to cover energy costs. ²⁸
Energy Democracy	The notion that communities should have a say and agency in shaping and participating in their energy future. ²⁹

Frequently Used Terms	Definition
Energy Insecurity	“The inability to meet basic household energy needs” ³⁰ due to the high cost of energy.
Energy Justice (and Energy Equity)	The goal of achieving equity in both the social and economic participation in the energy system, while also remediating social, economic, and health burdens on those historically harmed by the energy system.
Energy Poverty	A lack of access to basic, life-sustaining energy.
Environmental Justice	Recognition and remediation of the disproportionately high and adverse human health or environmental effects on communities of color and low-income communities. ³¹
Just Transition	A transition away from the fossil-fuel economy to a new economy that provides “dignified, productive, and ecologically sustainable livelihoods; democratic governance; and ecological resilience.” ³²

Section 1.1 - Energy Justice In Practice

In *Framing Energy Justice: Perspectives from Activism and Advocacy*, Sara Fuller and Darren McCauley interrogate energy justice in the context of activist and advocacy movements, seeking to illuminate for the scholarly community the ways that energy justice is defined by those on the ground and the communities that experience the direct impacts of the energy system from “cradle to grave.” The authors observed “energy justice on the ground,” and found no consistent, “single energy justice frame.” Instead, they found “the existence of multiple and diverse mobilizations around energy justice[,]” and localized expressions of justice. Rather than attempt to explain practitioner and advocate approaches to energy justice using tools designed by scholars, this Workbook acknowledges the unique perspectives and understandings of energy justice as defined by those engaged in the work on the ground. This expertise, grounded in the lived experiences of advocates, provides an invaluable perspective to inform equity-centered energy policy.



Our Approach

Summary: We reviewed the public-facing statements of practitioners and advocates engaged in advocacy work around energy policy. We also met with frontline leaders and organizations engaged in energy policy efforts. With a few notable exceptions,³³ practitioners and advocates tend to rely less on “energy justice” and more on terms like “energy equity” and “energy democracy” in their work. Although the terminology differs, the usage commonly focuses on frontline-led approaches to energy policy that center the economic, social, and health concerns of marginalized communities.

Our Survey of the Field

Energy justice mirrors the distributive and procedural justice demands of the environmental justice and climate justice movements, and encompasses several goals including:

- Transitioning the power and control over the means of energy production into the hands of the community,
- Ensuring fair and equitable distribution of the benefits and burdens of energy production activities, and
- Centering the concerns of marginalized communities.

To gain an understanding of existing community-based approaches to and understandings of energy justice, we relied mainly on a review of advocacy statements concerning “energy justice.” Our own experiences working with frontline organizations around the country also informed our understandings of energy justice practice. Our approach to understanding what was happening in the field began with a simple, internet-based search to cast a wide net for activist groups using the terms “energy justice,” “energy democracy,” or “energy equity” in their mission statements. The search was then narrowed to groups that specifically defined these terms in a way that creates a framework for their mission. Additional sources were found by looking at sources cited in academic papers about community activism and energy justice frameworks. Another key search method was working from a list of known organizations based on past association with the authors of this Workbook, which helped to fill in gaps in regional representation.

Originally, our search included only those organizations that specifically used the term “energy justice” in their work. However, many advocacy groups favor the phrase “energy democracy” when talking about issues pertaining to developing energy transition frameworks with a social and environmental justice focus. We then expanded the search to include this terminology, as well as the phrase “just transition,” which is also used to describe the transition away from an extractive economy to a regenerative one. The use of these terms – energy justice, energy democracy, and just transition – provides much the same frame for advocacy groups as the phrase “energy justice” provides for academic investigations. The resulting list, further discussed in Appendix B, represents a nation-wide survey of U.S. organizations.

Our own experience in the field mirrors what we found in the written material. As a whole, practitioners and advocates at nonprofit organizations we work with don’t use the term “energy justice” in common practice, but show general receptivity toward it. This includes individuals we know in different regions around the country, including the South, Northeast, Midwest, and West. Some advocates occasionally use the term energy justice themselves, and others are part of alliances that have member organizations within their alliance that use the term. Some colleagues use the term “energy justice” interchangeably with a “just energy system,” while others use “just energy” but not “energy justice.”

Many of our partners use the term “energy equity” in a way that is either entirely or substantially interchangeable with how we define energy justice in this Workbook. Some practitioners use the term equity when talking about energy, though not necessarily “energy equity” as a phrase. For example, some use specific phrases such as “equitable deep decarbonization” and “equitable energy system.”

Despite the work of organizations clearly falling under the umbrella of “energy justice,” this term is almost never used in their mission statements or writing. Generally, the word “justice” is used only to incorporate a social, racial, or environmental justice approach to the energy transition framework, rather than to aid in the development of a new framework specifically for the just energy transition. Therefore, while activist groups are clearly contributing to the dialogue on what achieving energy justice looks like, they are currently not working with the vocabulary utilized within the academic community. This disconnect threatens the efficacy of scholarship to reach practitioners, and could lead to broader confusion concerning the meaning of energy justice among policymakers.

“The disconnect between practice and academia could lead to broader confusion concerning the meaning of energy justice among policymakers.”

Prevalence of “Energy Democracy”

With respect to our analysis of practitioner approaches, the term most often used to describe the missions of organizations engaged in equity-based energy policy work is “energy democracy.” Based on our research, it seems that “energy democracy” is especially favored among groups in the U.S. advocating for a community-empowerment component to energy transition activities. The use of the term “democracy” within the U.S. context could serve two strategic purposes within the movement.

First, energy democracy might portray the importance that involvement from the community plays in these groups’ vision for just energy systems. It is clear that these organizations feel that justice in energy generation, distribution, and transition activities will be achieved only if the decision-making power and control over the systems lies in the hands of the community affected by that system.³⁴ A way of accomplishing that goal is by putting that system under democratic control and allowing for social and economic participation in that system. Further, as emphasized by Denise Fairchild and Al Weinrub in *Energy Democracy*, “deep democracy,” meaning, centering the engagement of poor people, people of color, and groups traditionally marginalized within energy transition policy discussions, goes further than mere economic and social participation in the energy system.³⁵ Under the Fairchild and Weinrub analysis, energy democracy requires not only basic participation in the design of the new energy system, but a deeper structural transformation of the social and economic structures underpinning the energy system.³⁶

The second purpose of using “energy democracy” could relate to the long, and frequently problematic, history of the term “democracy” in the American context. Democracy is a core value in American political and social systems, and linking this concept, which evokes feelings of patriotism and equity, to the energy transition movement is likely to yield more positive outcomes than linking the movement to “social justice” or “racial justice”, which can evoke a more negative, or polarized, response. The use of patriotic phrasing could therefore be strategically important in policy advocacy efforts, where public and political support is crucial.³⁷

Groups using the term “energy democracy” tend to include the following concepts of community empowerment in their work.



- **Community Ownership:** the community owning and controlling the sources of energy production;
- **Community Decision-making:** community having a democratic say in the means of energy production and distribution; and
- **Power Decentralization:** Empowerment of those closest to the means of production, geographically, socially and economically.

These concepts indicate a desire to redistribute economic and political power away from centralized energy producers to smaller subsections of society. Advocates press for meaningful community involvement to eradicate many of the inequalities and injustices that currently plague the energy system, such as the disproportionate ecological, economic, and social harms that currently affect low-income communities and communities of color.³⁸

A significant number of nonprofit professionals we work with also use the term energy democracy. Most appear to view energy democracy as meaning something at least slightly distinct from energy justice or energy equity. Some view energy democracy as a component within a larger frame of energy equity. More specifically, some view energy democracy as focusing on ownership of distributed generation, while energy equity considers the entire energy system, including utility-scale generation and transportation energy. Others consider energy democracy as describing the tangible objectives within the broader, intersectional vision of energy equity.

While energy democracy appears to be the most commonly used term among those working at the intersection of equity and energy, many use energy equity to mean something slightly broader in scope than energy democracy: using energy policy to actually center the concerns of those harmed by the existing energy system. Some advocates either use or resonate with energy justice as perhaps a more holistic and compelling frame.

In the advocacy sphere, advocates place less emphasis on a uniformity of terminology describing the work than scholars of energy justice and, appropriately, more emphasis on the outcomes associated with the work. What is echoed among all of the groups we reviewed is a desire for upheaval in the current energy system, a shift towards more democratically controlled systems, and a new emphasis on social inclusiveness and equity.

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Advocates are also concerned about the impacts of the energy system and focus on the following key concepts:

- **Equitable Distribution of Benefits and Harms:** Equitable distribution of both the benefits and harms of the energy system, which again relates to alleviating the pressure that currently disproportionately affects low-income communities and communities of color;
- **Economic Benefits:** Some groups believe allowing frontline communities to economically benefit from the new energy system could remedy many of the social issues currently being experienced by such communities³⁹ and lead to social and political empowerment through job creation and local control of economic resources. Moreover, improving energy efficiency can lower the overall cost of living.
- **Decreasing Pollution:** Other distributive concerns include limiting pollution to decrease negative health impacts.
- **Centering Frontline Voices and Control:** Another method of ensuring this equity is by putting the power in the hands of the people most affected by the decisions.⁴⁰ The idea is that these groups will be most motivated to responsibly manage the benefits and risks of energy production and distribution.

These distributive and procedural justice frames are echoed throughout the social science and legal literature as well.

Energy Justice and the Energy Transition

May 30, 2022 – National Conference of State Legislatures

Introduction

Energy justice is an emerging topic that is receiving attention at the federal and state levels. The U.S. Department of Energy is actively working to implement the Biden administration’s Justice40 Initiative, a goal that 40% of the overall benefits from federal investments in climate and clean energy flow to disadvantaged communities. At the state level, some state legislatures have considered measures related to energy justice. Building off the tenets of environmental justice, energy justice refers to the concepts of equity, affordability, accessibility and participation in the energy system and energy transition regardless of race, nationality, income or geographic location.

Advocates for energy justice promote policy measures aimed at reducing energy costs and burdens on low-income customers, avoiding disproportionate impacts and ensuring the equitable distribution of the benefits of energy generation, transmission and transition, access to reliable and clean energy, and participation for communities in energy sector decision-making and development. This paper will examine recent state policy related to energy justice, including energy affordability, infrastructure siting, community renewable energy development, and the incorporation of energy justice considerations into broader emissions reduction and renewable energy programs.

Energy Affordability and Access

The affordability of and access to reliable energy is at the heart of energy justice. Referred to as an “energy burden,” studies have shown that communities of color and low-income families pay a significantly higher share of their income in energy costs. National data show that on average, low-income households pay nearly 9% of their income in energy costs—three times more than non-low-income households. An estimated 25% of households have a high energy burden, considered to be above 6% of household income. An additional 13% of American households have a severe energy burden of paying more 10% of their income on energy. The energy burden has been an issue for communities and legislators for decades and is the impetus behind federal programs such as LIHEAP and other state programs that provide direct financial assistance for low-income families’ energy bills.

Siting of Infrastructure / Participation in Development

Energy justice advocates are also concerned with the siting of energy facilities and infrastructure. Borrowing from decades of environmental justice advocacy, energy justice is concerned with potential pollution, noise or health impacts from energy generation or transmission facilities. On the other hand, communities may benefit in some ways from the siting of certain energy facilities. For example, some states are pursuing the transition away from coal facilities by siting

solar (Illinois) or nuclear power (Wyoming) on those former coal sites in an effort to keep jobs and economic development in the community.

Regardless of the impacts associated with the siting of infrastructure within low-income or marginalized communities, participation and representation in the decision-making process surrounding the siting of energy infrastructure is a major tenet of energy justice. Many states have been pursuing legislation that promotes community participation or the consideration of energy justice issues during energy facility siting decisions.

Some states, such as New York, have established councils or task forces aimed at including energy justice and other equity issues in decisions surrounding the state's energy transition. The state's Climate Justice Working Group is comprised of representatives from "environmental justice communities" that advise the state regarding the economic and environmental impacts of the state's transition to clean energy, including clean energy development, energy efficiency programs and low-income energy assistance.

New Jersey enacted SB 232 in 2020 to require the state's Department of Environmental Protection to evaluate environmental and public health stressors for "overburdened communities" when issuing permits or licenses for regulated activities and facilities. Applicants must submit an environmental justice impact statement for any new or expanded facility, which would include certain energy facilities and infrastructure.

Virginia enacted SB 851 to promote a clean energy transition that benefits low-income and historically economically disadvantaged communities. There are numerous provisions addressing energy justice issues in the bill, including an expansion of the state's PIPP to reduce energy costs. Notably, the bill also requires the state PUC to ensure the development of new or expanding energy facilities does not have a disproportionate impact on historically economically disadvantaged communities. Additionally, the commission should consider whether the placement of renewable energy facilities provides benefits to those communities and displaced fossil fuel workers.

Community Solar

The Biden Administration announced the national community solar partnership to make rooftop solar more accessible and affordable and create \$1 billion in energy cost savings by 2025. Community renewable energy can promote energy justice by making clean energy more affordable and accessible, and by giving power and ownership of energy generation to members of disadvantaged communities. Many states are enabling or expanding their community renewable energy policies to focus on benefits and accessibility for low-income customers.

Colorado, one of the nation's leading community solar states, has developed policies around ensuring that low-income customers can realize the benefits of community solar. For example, The state's community solar statute requires the state PUC to develop policies that encourage the use of community solar gardens for low-income customers. Colorado also enacted HB 1003 in 2019 to expand the generation capacity limits for community solar arrays from 2 MW to 5 MW and remove certain siting requirements to allow more customers access to community solar services.

Sen. Chris Hansen, a primary sponsor of HB 1003 (2019), says the bill “demonstrates the continued efforts by Colorado to address energy and environmental justice by expanding access to community solar gardens.” Before the enactment of HB 1003, community solar gardens in Colorado had to be located in the same or adjacent county as the subscribers they served. By removing those siting requirements, Colorado residents now have a “greater opportunity to invest in clean energy generation while also realizing the financial benefits afforded to them by community solar gardens.” Hansen also notes that the bill allows customers who “do not own a home or have the right configuration for rooftop solar to participate and enjoy the benefits of the clean energy transition.”

Similarly, Massachusetts’ community solar program incentivizes community solar access for low-income customers by providing “adders” to the base rates that utilities pay for electricity. Under the Solar Massachusetts Renewable Target (SMART) program, utilities in the state must purchase a certain amount of their electricity from solar facilities developed under this program, including community solar facilities. The base rate at which utilities purchase electricity from SMART facilities is higher than the typical retail rate, thereby incentivizing solar developers to build solar arrays. To incentivize the build out of community solar facilities in low-income areas, the state has established “adders” on top of the base SMART rate. These adders provide developers with an additional financial compensation on top of the base SMART rate for solar facilities with certain characteristics. For instance, a community solar facility in a low-income area sells its electricity at a rate \$0.06 higher than the base SMART rate.

New Mexico established their community solar program in 2021 by enacting SB 84. The bill provides incentives for community solar facilities that serve low-income and tribal customers. There is a carve-out that requires 30% of the electricity produced from each community solar facility to be reserved for low-income customers; the state PUC plans to track and evaluate low-income customer participation in the community solar programs.

A handful of other states have also enacted legislation that aims to promote community solar access for low-income or disadvantaged communities. Maryland enacted HB 473 which allows community solar subscribers to maintain their subscription despite a change of address, a provision that is particularly useful to customers who rent homes. New York’s SB 3521A specifically addresses low-income customers’ access to the state’s community solar program by allowing customers who live in one utility territory to subscribe to community solar facilities in different utility areas. This encourages more people to access community solar, particularly those living in New York City, where land and property to build community solar arrays is scarce. Virginia’s HB 573 established a low-income community solar pilot program. The bill requires each electric utility participating in the state’s community solar program to locate at least one generation facility in a low-income community.

Equity and Broader Clean Energy Legislation

States including Illinois, Oregon, North Carolina, Washington, New York and Virginia have enacted broad clean energy or emissions reduction legislation in the past few years. As states pass these large energy bills, they often consider issues of energy justice and equity.

California was one of the first states to consider issues of energy justice in broad energy and emissions reduction legislation. In 2012, California enacted SB 535, which added certain provisions to its Global Warming Solutions Act of 2006. Those amendments included consideration of disadvantaged communities when distributing funds under the bill. SB 535 requires that 25% of available funds benefit disadvantaged communities and that 10% of those funds are used for projects that are specifically located in those communities.

New York's major energy transition and emissions reduction legislation (SB 6599) focuses on many equity and justice issues. For instance, it directs the state to invest 40% percent of the overall benefits of spending from the bill to disadvantaged communities. This includes investment in clean energy and energy efficiency programs, low-income energy assistance, pollution reduction and workforce development. Colorado's Renewable Portfolio Standard also has a requirement that utilities prioritize at least 40% of their expenditures on renewable energy investment to address historical equity issues concerning access by low-income customers to renewable energy.

Similarly, Washington's Climate Commitment Act enacted in 2021 set the state's climate and emissions goals. That legislation, Washington SB 5126, establishes a carbon trading market for the state. Termed as a "cap-and-invest" program, the state will take proceeds from the auction of emissions credits and invest in community programs that address energy justice issues in overburdened and tribal communities.

Illinois enacted the Climate and Equitable Jobs Act in 2021. SB 2408 is a comprehensive and ambitious clean energy and emissions reduction bill that considers many equity and justice issues. Illinois Senate Deputy Minority Leader Sue Rezin touts the bill's commitment to a carbon-free future while ensuring that the state did not lose vital energy sector jobs. Rezin notes that SB 2408 is "landmark legislation that could serve as a model for the nation" and that the "new law created not only a realistic path to 100% carbon-free energy in Illinois but also preserved [the] state's nuclear fleet and saved thousands of good-paying jobs." Workforce development issues, many of which are synonymous with energy justice issues, can sometimes be overlooked in broad clean energy transition policies, but those issues were a central component to the enactment of SB 2408.

For instance, it provides over \$180 million to support clean energy workforce development, including a Clean Jobs Workforce Network Hub to establish 13 "hub" sites that are aimed at providing resources, information and support to workers and communities impacted by the clean energy transition. SB 2408 also establishes incubator programs designed to provide capital and financial support for community-owned renewable energy projects and environmental justice projects. There are also numerous provisions designed to lower costs for low-income utility customers, such as the elimination of late fees and deposit requirements for those customers, and a study of whether current low-income discount rate programs are accurate and effective.

Oregon adopted HB 2021, the nation's most ambitious clean energy legislation, which aims for 100% emissions-free energy production by 2040. Equity issues and environmental justice are a primary concern throughout the bill; the state hopes to achieve its clean energy targets in a manner that minimizes burdens for environmental justice communities. As utilities submit plans to reach Oregon's clean energy targets, they must convene a Community Benefits and Impact Advisory Group that includes members from environmental justice and low-income communities to assess the impacts of the utility's proposed plan. Additionally, the bill establishes grants for

community renewable energy projects which seek to provide benefits such as energy resilience, cost savings and economic development to disadvantaged communities by involving community groups in decisions regarding the siting, planning and design of community renewable energy projects.

Conclusion

Issues of energy affordability, access and infrastructure development will continue to be concerns for legislators as the country undergoes an energy transition over the coming years. Energy justice is a complex issue with economic, racial, geographic and social implications. As such, it is unlikely that these issues will be resolved through a singular policy or approach but may be considered in the context of many energy-related policies. The Biden administration is prioritizing energy and environmental justice issues through federal action, and state legislatures are likely to continue to consider whether and how to address these issues over the course of the ongoing energy transition.