

SUMMER 2020

Utilities *101*

*A guide to the basics of the
electric utility industry with a
focus on justice*

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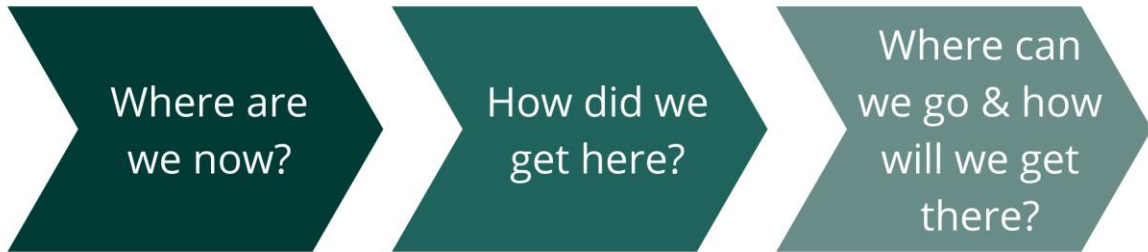
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Utilities 101 Guide

Overview

Electricity. We all use it, but many Americans are left wondering how exactly they get their electricity, and what exactly they are paying for when they pay their electric bills. This guide was created to break down the basics of the electric utility industry with a focus on justice. To do this, the guide is broken into three sections. The first section gives readers an idea of what the current electric utility landscape looks like in the United States. The second section covers the evolution of utilities and electrification to give some background about how we got to where we are today. The third and final section delves into the future of electric utilities, and how we can work to make them more just and equitable.



Where are we now?

First things first: what is an electric utility? You might recognize them from your electric bills. **Electric utilities are companies that generate and distribute electricity.**

To aid the public in understanding this, the Energy Information Administration has [created a video](#) that explains how electric utilities fit into the larger energy system here in the United States.

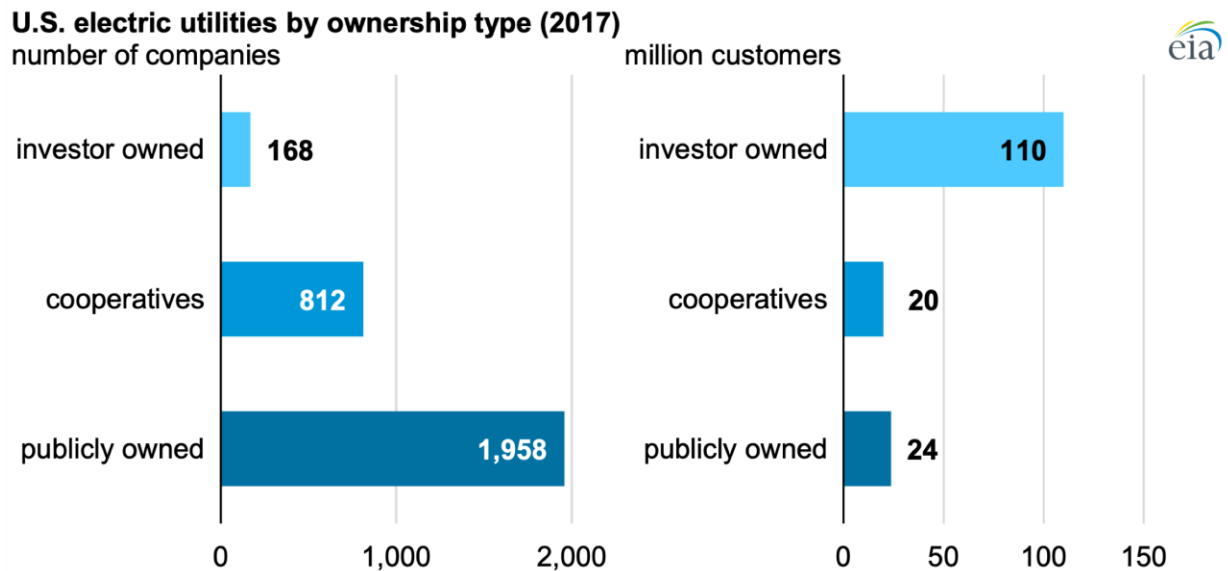
This may seem pretty straightforward, but there are actually several different kinds of utilities that exist in the United States today: Investor-Owned Utilities, Cooperatively-Owned Utilities, and Publicly-Owned Utilities. Below is a table that identifies the three types of utilities, defines them using definitions from the Energy Information Administration (EIA), and outlines the basic financial and management model.

Types of Utilities in the United States (table)¹

Type of Utility	Definition from EIA	Financial/Management Model
Investor-Owned Utility (IOU)	Large electric distributor that issues stock owned by shareholders	Private company owned by stakeholders and managed by a board-appointed team of private sector employees GOAL: optimize return on investment for stakeholders
Cooperatively-Owned Utility (Co-ops)	Not-for-profit, member-owned utilities that are most common in rural areas	Member-owned and managed, not-for-profit GOAL: optimize benefits for local customers
Publicly-Owned Utility (POU)	Federal-, state-, or municipal-run utility	Owned by local gov't and/or customers of the utility. Managed by local officials or employees GOAL: optimize benefits for local customers

¹ Energy Information Administration. "Investor-Owned Utilities Served 72% of U.S. Electricity Customers in 2017." Today in Energy, August 15, 2019. <https://www.eia.gov/todayinenergy/detail.php?id=40913>.

Investor-Owned utilities serve the greatest number of people (72% of total energy consumers in the United States), even though they make up the smallest number of electric utilities in the United States. The chart below from the Energy Information Administration illustrates the number of each type of utility that exist and the number of customers that are served by each type of utility.



In its current state, the United States' energy system fails to provide safe and equitable access to energy for all Americans. This results in a phenomenon called Energy Injustice: **the lack of equity in both social and economic participation in the energy system that reinforces the social, economic, and health burdens produced by the energy system.**²

Everyone has a right to safe and affordable energy, but when our system doesn't deliver on that right, **the burdens and benefits of the energy system are not equitably distributed.** These burdens include financial, environmental, social, and health costs, which disproportionately impact Black, Indigenous, Latinx, and low-income communities.³

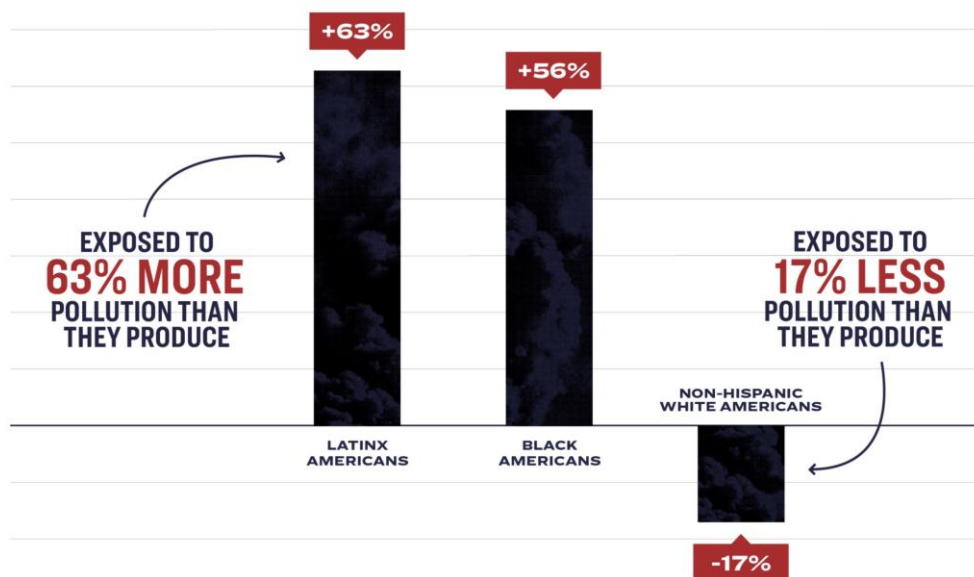
One way that energy injustice manifests itself is with pollution. Our current energy system is based on fossil fuel infrastructure, and while this has provided communities with energy for decades, it has also burdened many communities with health challenges. Communities near fracking sites and coal-fired power plants, for example, often suffer from serious health issues like asthma, cancer, and respiratory disease. Most of these affected communities are communities of color or low-income communities. Over the past several decades, about 68% of African Americans live or have lived within a 30-mile radius of a coal-fired power plant, and statistics show that African Americans live near power plants more than any other demographic

² Initiative for Energy Justice. "The Energy Justice Workbook." Initiative for Energy Justice, 2020. <https://iejusa.org/section-1-defining-energy-justice/>.

³ NAACP. "Just Energy Policies & Practices," 2020. <https://www.naacp.org/climate-justice-resources/just-energy/>.

group in the United States.⁴ This clearly illustrates a complicated, yet profound, series of health injustices associated with our current fossil-fuel-based energy system.

POLLUTION EXPOSURE BY POPULATION (2003–2015)



Source: Christopher W. Tessum et al., "Inequity in consumption of goods and services adds to racial-ethnic disparities in air pollution exposure," Proceedings of the National Academy of Sciences (March 2019).

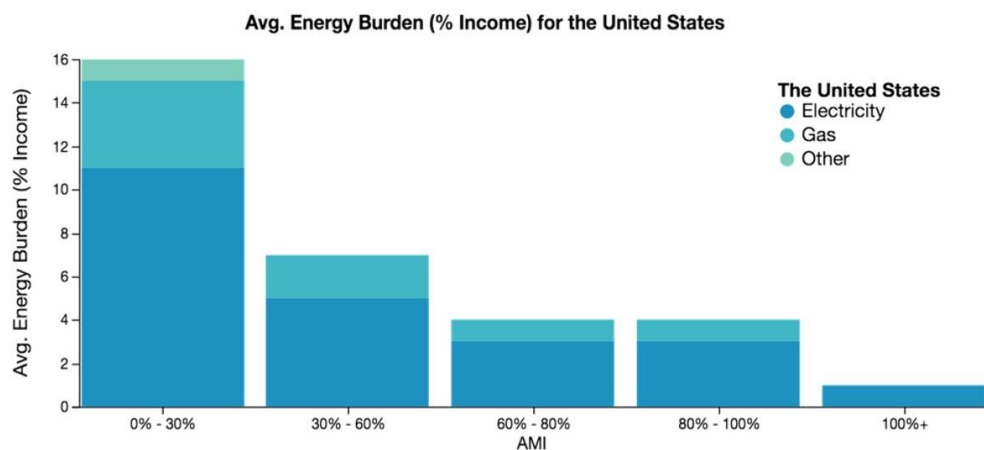
High levels of energy burden and energy insecurity are two other important symptoms of energy injustice. **Energy burden is the percentage of household income that goes towards energy costs.**⁵ The lower your income, the more you spend on energy, so high energy costs disproportionately impact low-income communities. **Energy insecurity is lacking reliable access to uninterrupted energy sources at an affordable price.**⁶ Energy insecurity connects intimately to energy burden.

⁴ NAACP. "Just Energy Policies & Practices," 2020.

⁵ Mitchell, Patrick. "Report: 'Energy Burden' on Low-Income, African American, & Latino Households up to Three Times as High as Other Homes, More Energy Efficiency Needed." aceee.org, April 20, 2016. <https://www.aceee.org/press/2016/04/report-energy-burden-low-income>.

⁶ International Energy Agency. "Energy Security," 2020. <https://www.iea.org/topics/energy-security>.

This graph below⁷ shows energy burden data by income levels in the United States. Households making only 0-30% of the area median income end up spending 16% of their income on utilities including electric and gas, which illustrates the disproportionate financial burden that low income families bear when paying for utilities. Even when not compared against AMI, on average, low-income households still pay 7.2% of their household income on utilities – more than 3 times the percentage that higher income households pay (2.3%).⁸ When we look at actual dollars, households that earn more than \$50,000 a year have residential energy costs that come out to just 3% of their average after-tax income. In households that make less than \$10,000 a year, average energy costs are 33% of their take-home income.⁹



When households spend more than 6% of their income on energy, they face an undue energy burden.¹⁰ This is a social and public health concern – individuals facing increased energy burdens and energy insecurity also often suffer from heat and cold stress, hazardous exposures like gas leaks, chronic stress, and residential instability.¹¹ It is important to note that energy burdens are exacerbated for low income households, but also for Black and Native American households especially.¹²

⁷ Department of Energy. “Low-Income Energy Affordability Data Tool Chart Export.” Exported on June 8, 2020. <https://www.energy.gov/eere/slsc/maps/lead-tool>.

⁸ Mitchell, Patrick. “Report: ‘Energy Burden’ on Low-Income, African American, & Latino Households up to Three Times as High as Other Homes, More Energy Efficiency Needed.” aceee.org, 2016.

⁹ Hernández, Diana. “Energy Insecurity: A Framework for Understanding Energy, the Built Environment, and Health among Vulnerable Populations in the Context of Climate Change.” *American Journal of Public Health* 103, no. 4 (April 2013): e32-34. <https://doi.org/10.2105/AJPH.2012.301179>.

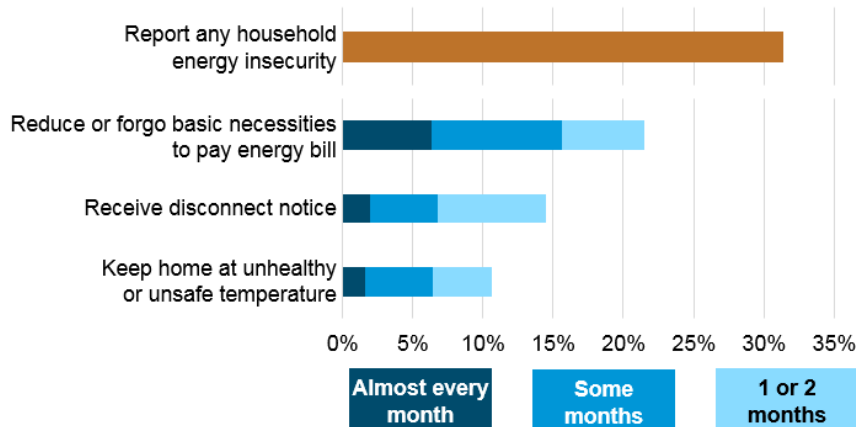
¹⁰ Council for an Energy Efficient Economy. “Understanding Energy Affordability.” aceee.org, September 2019. <https://www.aceee.org/sites/default/files/energy-affordability.pdf>.

¹¹ Hernández, Diana. “Understanding ‘energy Insecurity’ and Why It Matters to Health.” *Social Science & Medicine* (1982) 167 (2016): 1–10. <https://doi.org/10.1016/j.socscimed.2016.08.029>.

¹² Sen, Basav. “The Inequality Crisis Hiding Behind High Utility Bills,” August 27, 2018. <https://ips-dc.org/the-inequality-crisis-hiding-behind-high-utility-bills/>.

This graph below shows that in 2015, over 30% of American households experienced some sort of household energy insecurity. Over 20% of households had to reduce or forgo basic necessities to pay their energy bills, and nearly 15% of households received a disconnect notice at least once or twice a year. This energy insecurity has serious health implications too, as evidenced by the fact that over 10% of households keep their home at an unhealthy or unsafe temperature for at least one or two months a year.

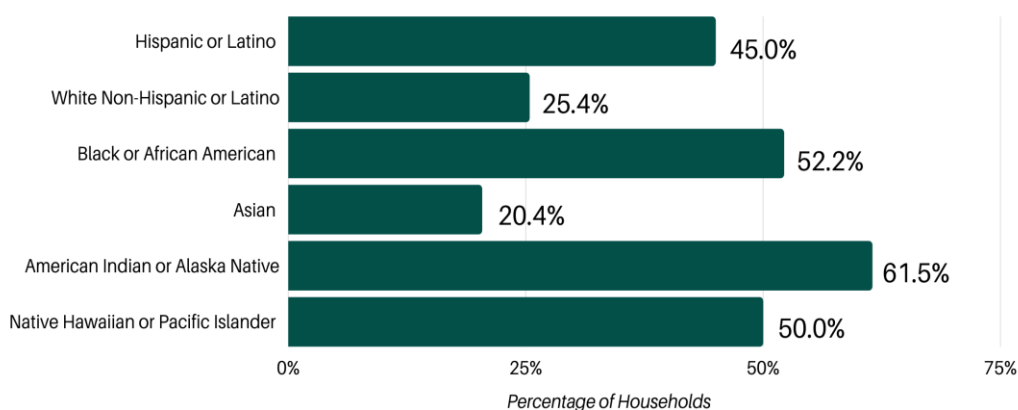
Households experiencing household energy insecure situations, 2015
percent of households



Source: U.S. Energy Information Administration, Residential Energy Consumption Survey 2015

Race plays an important role in the energy insecurity landscape here in the United States. 25% of white, non-Hispanic households experience energy insecurity, but 45% of Latinx households and over 50% of Black or African American households are energy insecure. That number is even higher for American Indian and Alaska Natives, of which 61.5% are energy insecure. The graph below illustrates this trend.

Share of Households by Race Experiencing Energy Insecurity, 2015¹³



¹³ Basav Sen, Cynthia Bird, and Celia Bottger. "Energy Efficiency with Justice." Institute for Policy Studies, August 9, 2018. <https://ips-dc.org/report-energy-efficiency-with-justice/>.

In sum, IOUs currently dominate the energy landscape in the United States. Low income and communities of color bear disproportionate negative impacts from our current energy system. These negative impacts include environmental and health impacts, energy burdens, and energy insecurity. The bottom line is, the current utilities system is rife with energy injustice.

How did we get here?

When the United States began the process of electrification, it quickly became apparent that the energy system that was being built displays “economies of scale.” Economies of scale reduce system costs by increasing production; the bigger, the better—or cheaper. Examples of economies of scale include a home builder buying all of the supplies she needs to build a community of homes in bulk rather than piece by piece; it’s cheaper for her to buy everything at once, and the more she buys, the more she saves. Because this new energy infrastructure like steam turbines and transmission lines relied on economies of scale, it didn’t make sense to have multiple competing investments in energy infrastructure. This would be wasteful and prevent customers and utility companies from receiving the benefits of economies of scale. The result is that utilities became natural monopolies.¹⁴ Like the home builder example, a utility company could reduce its costs by buying everything required to operate the energy system within a certain area.

Monopolies were unpopular, and many people across the country were skeptical about the power and lawlessness of an electricity monopoly. To appease skeptics, the regulatory compact was put into place. The regulatory compact is an agreement between utilities and consumers that regulates utilities that operate as monopolies. It was designed to safeguard against runaway utility profits, but also incentivize utilities to perform a vital public service, namely, providing electricity. Here’s how the regulatory compact works:¹⁵

- In a service area, a utility is granted a monopoly to provide reliable service at an affordable price;
- The utility must make investments to ensure that reliable, low-cost electricity is available to all in the area;
- Customers pay the utility the cost of that investment plus a reasonable rate of return; and
- A public utility commission (PUC) monitors the utility and signs off on its rates; provided that the utility has met its service obligations.

In sum, under the regulatory compact, utilities make investments and we, ratepayers and end-users of electricity, pay for them. This arrangement is meant to keep utilities in the electricity generation business by minimizing their economic risk.

The regulatory compact allows utilities to make most of their money from receiving returns on investments. If a utility builds more power plants and power lines, it makes more money. Contrary to popular belief, utilities don’t make most of their money from generating electricity

¹⁴ Roberts, David. “Utilities for Dummies: How They Work and Why That Needs to Change.” *Grist.org*, May 21, 2013. <https://grist.org/climate-energy/utilities-for-dummies-how-they-work-and-why-that-needs-to-change/> <https://energycentral.com/c/iu/understanding-regulatory-compact>.

¹⁵ <https://energycentral.com/c/iu/understanding-regulatory-compact>

– most of the money actually comes from returns on infrastructure investments.¹⁶ We also know that the regulatory compact allows utilities to operate as monopolies. For this reason, many utilities do not fear competition. They know that their customers cannot live without their product or get it through another utility, so their profits are virtually guaranteed as long as they can justify their rates to a PUC.¹⁷

Since the inception of steam turbines and transmission lines, a lot has changed. One key change is reduced demand for electricity. The primary concern of utilities and customers was once expanding electrification. Now, a variety of factors are causing the demand for energy to plateau or even fall. These factors include energy efficiency, demand response (a strategy for managing and reducing energy use during time periods of especially high demand), and distributed generation (generating electricity on-site rather than relying on large-scale centralized generation at a power plant). Because the IOU business model is fueled by expansion, a decrease in demand for energy is a threat to profits. Reduced demand is necessary to protect our communities and the environment, but the Investor-Owned model disincentivizes it. It's time to explore other options.

¹⁶ Roberts, David. "Utilities for Dummies: How They Work and Why That Needs to Change." 2013.

¹⁷ Roberts, David. "Utilities for Dummies: How They Work and Why That Needs to Change." 2013.

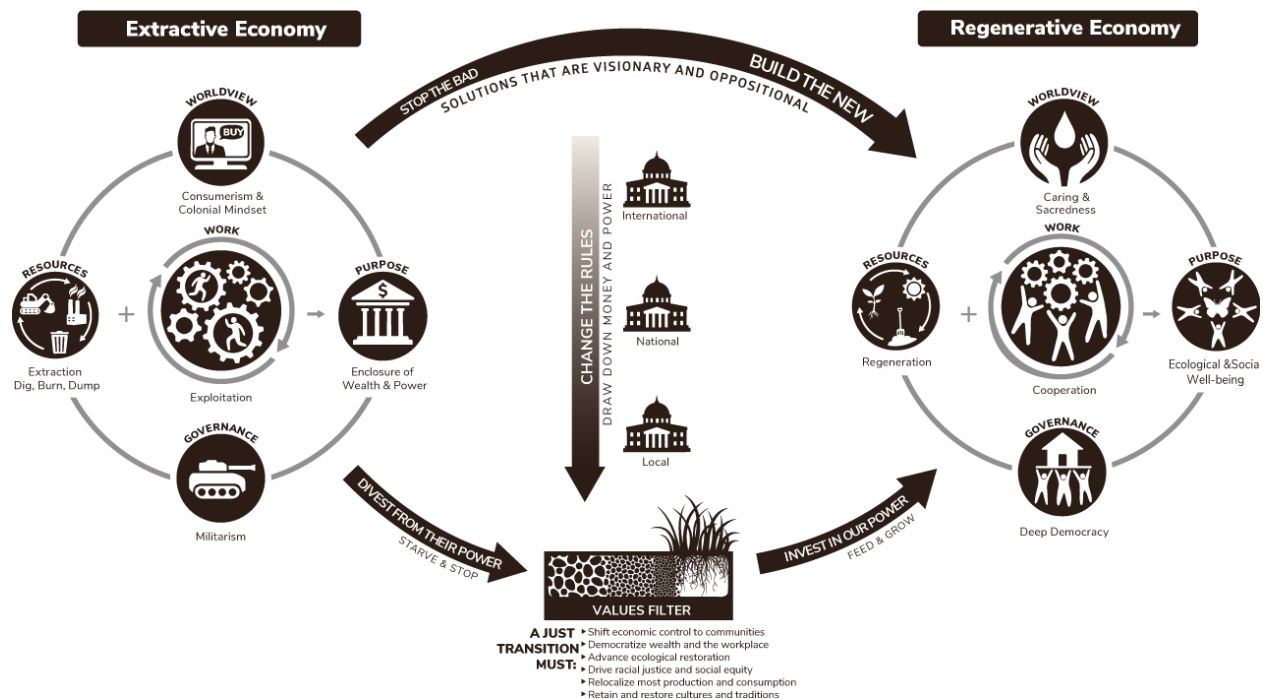
Where are we going? How will we get there?

To create a just energy system, we must focus on a **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”.¹⁸

This includes transitioning the power and control over the means of energy production into the hands of the community. It also involves ensuring fair and equitable distribution of the benefits and burdens of energy production activities and centering the concerns of marginalized communities.¹⁹

The visual below, which comes from Movement Generation and the Climate Justice Alliance’s Our Power Campaign, illustrates what a just transition could look like. It shows us moving away from the extractive energy economy that we currently have towards a regenerative energy economy that provides better economic, health, and environmental outcomes for all.

The Just Transition Framework²⁰



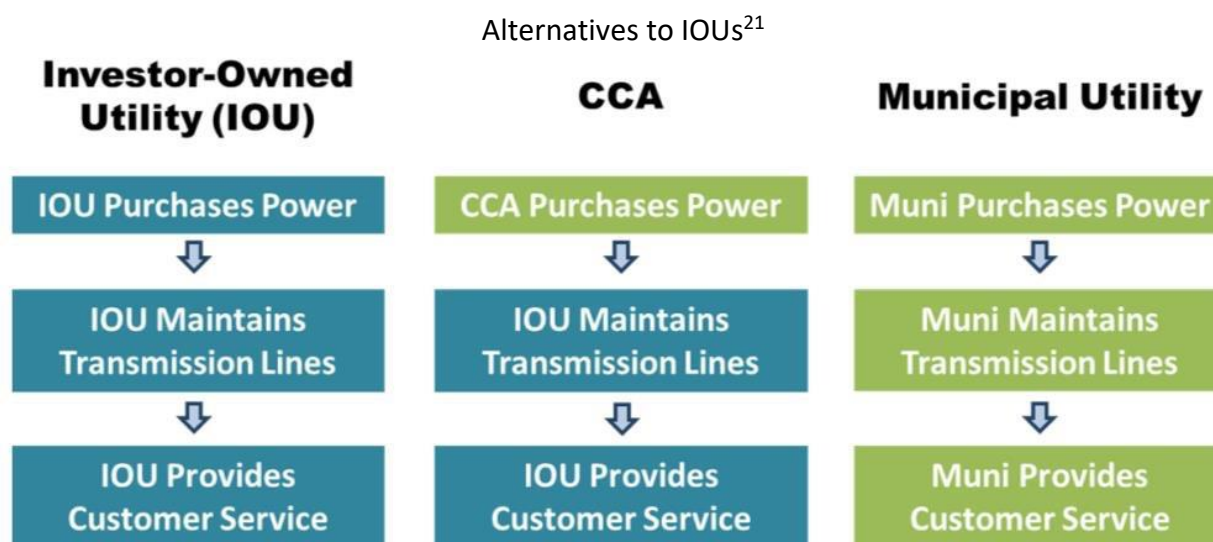
¹⁸ Initiative for Energy Justice. “The Energy Justice Workbook.” 2020.

¹⁹ Climate Justice Alliance. “Just Transition: A Framework for Change.” climatejusticealliance.org, 2020.
<https://climatejusticealliance.org/just-transition/>.

¹⁴ American Public Power Association. “Public Power for Your Community,” 2016.
https://www.publicpower.org/system/files/documents/municipalization-public_power_for_your_community.pdf.

²⁰ Climate Justice Alliance. “Just Transition: A Framework for Change.” 2020.

The investor-owned utility incentive structure is conducive neither to equity nor environmental responsibility, so a just transition requires us to seek alternatives, the most common being Community Choice Aggregation (abbreviated as CCA) and Public Power Utilities (shown here as Municipal Utility). The chart below compares CCAs and Municipal Utilities to IOUs, and it shows who would control power purchasing, transmission, and customer service under each of these systems. Under both alternatives, the governance structure lends itself to greater transparency and accountability, as well as a focus on community preferences concerning clean energy.



Community Choice Aggregations (CCAs) are programs through which consumers “aggregate” their buying power, often through their local government, to purchase energy from an alternative supplier. This allows communities to have increased choice in the generation of their electricity, leading to lower rates and greener choices. The existing IOU continues to manage transmissions and distribution for the community. CCAs are sometimes referred to as “Muni-Lite” because they municipalize a portion of the energy system while leaving transmission and distribution in private hands. While CCAs seem like a good way to democratize the energy system, they are often formed by wealthy communities, not the low-income communities that might benefit the most from lower rates and cleaner energy. Additionally, energy consumers that remain with the utility bear the costs that CCA consumers do not pay. These factors must be considered in the implementation of a CCA to ensure that justice is centered in these energy system innovations.

²¹ Mow, Benjamin. “Community Choice Aggregation (CCA) Helping Communities Reach Renewable Energy Goals.” *Nrel.org* (blog), September 19, 2017. <https://www.nrel.gov/state-local-tribal/blog/posts/community-choice-aggregation-cca-helping-communities-reach-renewable-energy-goals.html>.

There are currently only eight states which have authorized the formation of CCAs: California, Illinois, Massachusetts, New Jersey, New York, Ohio, Rhode Island, and Virginia. Still, the momentum is building; multiple other states are in the process of establishing authorization. The map below illustrates this progress.²²

Authorized in 8 States:

- California
- Illinois
- Massachusetts
- New Jersey
- New York
- Ohio
- Rhode Island
- Virginia

Legislation Introduced:

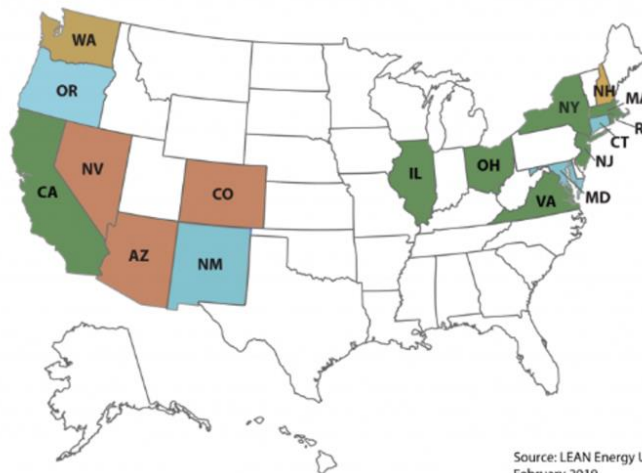
- Connecticut
- Maryland
- New Mexico
- Oregon

Watch List/Potential:

- Arizona
- Colorado
- Nevada

Inquiries Received:

- New Hampshire
- Washington



Another common alternative to IOUs is **public power utilities**. These are utilities that are owned and operated by a state or local municipality. When public power is implemented on the local level it is referred to as **municipalization**, which is the replacement of an investor owned utility with a public utility owned by the municipality.²³ Unlike IOUs, municipal utilities are not-for-profit, owned by the communities they serve, and managed democratically through a city council or an elected or appointed board.²⁴

Public power carries many benefits such as local control, affordability, reliability, community investment, environmental responsibility, and increased choice.²⁵ As a whole, public power utility residential customers pay 11% less than those of investor-owned utilities and are likely to experience shorter outages.²⁶ Unlike IOUs, which are responsible for paying dividends to investors, revenue from municipal utilities is invested directly back into the community through payments (often to a general fund), providing local jobs, energy discounts, and supporting

²² EnergySage. "Where is community choice aggregation available?" energysage.com, 2020. <https://www.energysage.com/other-clean-options/community-choice-aggregation/where-are-ccas-available/>.

²³ American Public Power Association. "Municipalization." publicpower.org, 2020. <https://www.publicpower.org/municipalization>.

²⁴ Ursula Schryver, and Barry Moline. "Municipalization: Setting the Record Straight." *American Public Power Association* (blog), November 12, 2019. <https://www.publicpower.org/blog/municipalization-setting-record-straight>.

²⁵ American Public Power Association. "Public Power for Your Community," 2016.

²⁶ American Public Power Association. "Public Power Stats and Facts." publicpower.org, 2020. <https://www.publicpower.org/public-power/stats-and-facts>.

community organizations.²⁷ Even if a municipalization effort fails, it is often still beneficial to the community as it pushes the incumbent IOU to improve service, lower rates, and listen to its customers.

While municipalization is gaining traction, it is not new. Already more than 2,000 cities and towns across the country get their energy from a public utility.²⁸ Some of these utilities have been public from their formation, while other communities have bought their power back from an incumbent IOU, and still others have opted to duplicate existing infrastructure and set up a competing public utility.²⁹ If you want a deeper dive into these exciting success stories, check out our upcoming Utility 201 content on public power.

There are a [number of innovations](#) that fall outside of community choice aggregation and public power that also further the goal of a just transition. **Microgrids**, localized grids that can operate autonomously, are one such innovation. Microgrids improve energy resilience because they can operate independent from the larger grid, which is especially helpful when there are disruptions in the larger grid.^{30 31} **Community solar** is another promising development towards a just transition. With community solar, local solar facilities are shared among community subscribers who receive credit on their electricity bills for the energy generated.³² Community solar can also allow communities to own energy produced right in their own communities. Both models expand access to solar, while also ensuring economic returns for the community subscribers.³³ Clean, local solar energy also offers the co-benefits of community health and a clean environment.

How is COVID-19 Affecting Utilities?

COVID-19 has changed a lot about how we have lived our lives, and it has also had a profound impact on utilities. The COVID-19 pandemic and its economic consequences have left many unable to pay their electricity bills. Across the country, many PUCs have issued orders suspending shutoffs for customers who cannot pay their electricity bills. Other states are relying on utilities to take this step voluntarily.³⁴ A primary concern for utilities is recovering revenue

²⁷ American Public Power Association. "Public Power Stats and Facts." 2020.

²⁸ Ursula Schryver, and Barry Moline. "Municipalization: Setting the Record Straight." 2019.

²⁹ Ridder, Kevin. "Forming a Municipal Utility." *The Appalachian Voice*, December 19, 2018. <https://appvoices.org/2018/12/19/forming-a-municipal-utility/>.

³⁰ Microgrid Knowledge Editors. "How Microgrids Help Businesses Reach Cost, Resilience and Climate Goals." Microgrid Knowledge, February 25, 2020. <https://microgridknowledge.com/microgrids-businesses/>.

³¹ Department of Energy Office of Electricity. "The Role of Microgrids in Helping to Advance the Nation's Energy System." Energy.gov, 2020. <https://www.energy.gov/oe/activities/technology-development/grid-modernization-and-smart-grid/role-microgrids-helping>.

³² Solar Energy Industries Association. "Community Solar." seia.org, 2020. <https://www.seia.org/initiatives/community-solar>.

³³ ConEdison Solutions. "Community Solar." conersolutions.com, 2020. <https://www.conedsolutions.com/community-solar-simplified/>.

³⁴ National Association of Regulatory Utility Commissioners. "Map of Disconnection Moratoria." naruc.org, 2020. <https://www.naruc.org/compilation-of-covid-19-news-resources/map-of-disconnection-moratoria/>.

that will be lost over the course of the COVID State of Emergency, while customers, advocates, and some regulatory bodies are searching for solutions for those who are unable to pay. The pandemic raises important questions about the equitable treatment of utility customers, particularly lower-income customers who *already* faced disproportionate energy burdens.

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