PECAN STREET

The Race and Energy Nexus

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Pecan Street Inc.'s mission is to leverage big data and innovation for leapfrog advances in emissions reductions, climate resiliency, resource conservation, and quality of life. Founded in 2010, our model for change remains globally unique. Pecan Street is a proven leader in accelerating the development of innovative solutions for the climate crisis, and our success is grounded in the communities that partner with us to provide data, information and insights. These communities work hand-in-hand with university researchers, companies and advocacy partners to develop solutions that work in our complex world.

Our entire country is engaged in a broad and long-overdue examination of the roles that race and racism play in our society – our legal system, workforce, communities, politics, schools and more.

Race also plays a role in energy – who has access to it, how much they pay for it, who works in the energy industry, who lives near our power plants, and who has a seat at the table to determine energy choices that town, city, state and federal governments make on our behalf.

We know that communities of color will bear a disproportionate share of the impacts of climate change, and that if climate solutions are not implemented with equity in mind, they, too, could further widen the equity gap.

Pecan Street's Center for Race, Energy & Climate Justice was developed to bring our organization's unique data and research capabilities to this critical and complicated issue.

We will not solve this issue alone. But with our partners, we aim to leverage our decade of energy and water data collection and analysis experience to highlight areas of concern and opportunity that will be key in achieving fairness and equity in an area that plays such a central role in our lives.

You can learn more about Pecan Street's Center for Race, Energy & Climate Justice at www.pecanstreet.org/justice. If you would like to donate to the center or other Pecan Street program work, please visit www.pecanstreet.org/donate.

The Race and Energy Nexus

This paper examines how race impacts an individual's ability to benefit from a modern electric grid and industry and the likelihood of bearing a disproportionate burden of direct and externalized costs of energy generation and distribution.

Introduction

Access to energy – fuels and electricity – is a foundational component of modern society and is essential for personal and community health, well-being and economic growth. But the benefits and externalities of the United States' robust energy sector fall disproportionately along racial lines. Jobs and wealth from the energy sector disproportionately favor white households, and the economic and health impacts of facilities that produce fossil-fuel-based power are shouldered disproportionately by BIPOC (Blacks, Indigenous and People of Color) communities.

Long-lasting impacts from discrimination in labor and housing have segmented BIPOC communities and made it more difficult for households of color to count on steady and sufficient income and access to more efficient – and therefore, less costly – homes. Though the energy sector is not solely responsible for the economic burden born by BIPOC communities, addressing the racial inequities in this sector are necessary to overcome the legacy of systemic racism that pervades all aspects of American society.

The transition to clean energy addresses some of the legacy of systemic racism within the fossil fuel industry, but troubling trends are being replicated within the clean energy sector, such as a lack of racial representation in the workforce, lack of investment in entrepreneurs of color, and siting of large-scale power generation and transmission infrastructure in low-income communities.

Clean energy will be a critical component in mitigating climate change and addressing environmental injustice. The clean energy sector is one of the fastest growing areas of the energy economy and a focus of significant global investment from the public and private sectors.

This momentum makes it clear that, for the next 100 years, clean energy – and clean electricity in particular – will be a stronger driving economic force than the fossil fuel industry. It's important that equity becomes a driving priority in this emerging economy.

A suite of initiatives announced in early 2021 by the Biden administration have the potential to address systemic racial equity on many fronts, including energy. The president has pledged to place equity at the heart of his COVID relief plan, infrastructure plan, and climate plan. As the administration and others pursue climate-focused policies, it is critical that we undertake the transition to a low- or no-carbon economy in a way that is just and equitable and does not perpetuate the racial inequities that resulted from the growth of fossil fuels.[1]

To help guide policymakers and regulators in building an equitable clean energy future, we need to first identify and understand how the energy sector intersects with racial justice. Once we know where we're starting from, it's easier to plot a course to where we want to go. To that end, this paper examines three broad categories of the race-energy nexus:

1. Jobs and economic opportunity
2. Energy affordability and insecurity
3. Power generation and other siting

Jobs and Economic Opportunity

The growth of the energy industry in the 20th century was a primary driver of broad national economic growth. However, the direct benefits of the industry's growth (employment and wealth creation) disproportionately flowed to white workers. In 2017, the oil and gas industry generated nearly 8% of the nation's GDP and provided 10.3 million jobs in the United States with an industry average salary of $102,221.[2] In 2017, the median household income for Black Americans was $41,511.[3] Black individuals accounted for 6.8% of the oil and gas industry workforce in 2019[4] and 13.4% of the United States population.[5]

A 2018 report found that African American workers in the oil and gas industry were paid, on average, 23% less than their white counterparts.[6] As reported by U.S. News & World Report in 2018:

> *"Oil and gas is far from the only industry where black workers account for just a fraction of the workforce… But there are elements that make oil and gas unique: Unlike, say, law or finance or even most chemical or engineering firms, the oil and gas sector lobbies hard for tax breaks and environmental exemptions that affect taxpayers' wallets and health, often on the premise that by offering such exemptions, communities will in turn benefit from local jobs. And while there are certainly other sectors of the economy that push for similar subsidies – tech giants, for example, or professional sports teams – few produce the pollution of the oil and gas sector. A history of building refineries and other industrial sites in communities of color has ensured that minorities continue to bear a disproportionate burden from the sector's impacts."*

Though we are only at the beginning of the clean energy revolution, renewable and other low-carbon electricity will be a significant economic force in years to come and has the potential to address some of the economic inequity of the fossil fuel industry. However, equitable employment in the solar industry is only slightly better than in the oil and gas sector. In 2019, only 7.7% of the solar industry's workforce was Black.[8] Such trends suggest that achieving equity through new and emerging energy technology and companies will not occur automatically but will require intentional efforts to address legacy hiring and advancement practices.

Energy Affordability and Security

A household's energy burden is the percentage of household income spent on energy bills and provides an indication of energy affordability. Researchers define an energy burden of 6% or more to be unaffordable.[9] Recent estimates indicate that the national prevalence rate of energy insecurity is as high as 33%, such that 37 million U.S. households are energy insecure.[10] The physical condition of a home, a household's ability to invest in energy-efficient upgrades, the availability of energy efficiency programs and incentives and other factors can all contribute to a higher energy burden.[11]

Energy insecurity – defined as the inability to meet household energy needs due to financial constraints – is more prevalent among BIPOC households than white households. The median energy burden for Black households is higher than for non-Hispanic white households (4.2% versus 2.9%), and the median energy burden for Hispanic households is higher than for non-Hispanic white households (3.5% versus 2.9%).[12] Spatial disparities created by redlining result in higher energy burdens for disadvantaged communities by virtue of costs or inefficiencies.[13]

The legacy of redlining and other discriminatory policies and behaviors that created geographic race segregation and unequal access to property investment opportunities has contributed to a pernicious cycle of energy insecurity for BIPOC households. As a result, Black households are more likely than white households to live in older and less efficient homes that require more energy for heating and cooling.[14] [15]

Over the past five years, research led by Dr. Diana Hernández at NYU's Mailman School of Public Health has

documented the links between energy insecurity and socioeconomic status and race/ethnicity.[16] The authors found that African Americans across the economic spectrum experienced energy insecurity at the highest rates.

In June of 2020, Energy News Network reported that African Americans pay a disproportionately greater share of their income, on average, for energy needs, and that compared to white households, they have higher frequencies of disconnections, disconnection notices and foregoing other necessities to pay for energy. The article noted that utilities say they enforce policies against racial and ethnic discrimination, yet few collect data that could reveal whether those policies are unintentionally creating or widening disparities for communities of color and leading to "willful blindness."[17] Nationally, African Americans earning less than 150% of the poverty level were about twice as likely to have their electricity shut off as white households with comparable incomes.[18]

African American and Hispanic households are also less likely to have rooftop solar panels than white counterparts with comparable incomes, disenfranchising them from emerging clean energy markets. After normalizing for income and home ownership, Black and Hispanic-majority census tracts have 69% and 30%, respectively, less solar than white-majority census tracts.[19]

In many states and regions, solar and wind electricity is the cheapest source of power in the wholesale market. That price advantage, however, rarely trickles down directly to customers. Most customers pay the same electricity rate regardless of where their utility acquires their electricity on a given day. Likewise, "green choice" utility programs sold to customers normally include a price premium to lock in a rate for a prolonged period. As a result, BIPOC customers who arguably would benefit the most from the lower cost of renewable energy either have no cost incentive to encourage their utility to acquire more renewable energy or have to pay more to participate in the clean energy market. For renewable energy to reduce customer energy burden, new rate structures, incentives, financing and broad-benefit projects like community solar will have to be developed and deployed at scale.

Power Generation and Other Siting

The long-lasting and intransigent impacts of geographic racial segregation policies on income and economic opportunities, education, health and financial security are well documented.[20] [21] In the power sector, historical geographic segregation policies continue to disproportionately burden BIPOC communities in two ways:

- The legacy of redlining has resulted in relatively higher energy bills due to energy inefficient housing, lack of tree cover, and low public investment in communities of color.

- Disproportionate adverse health impacts from the location of communities of color near industrial sites, including power plants, petrochemical plants and oil refineries.

A national study found that Black households are the most likely to be exposed to and suffer from fine particulate air pollution from electricity generation. Exposures are higher for lower-income than for higher-income categories, but disparities are larger by race than by income.[22]

Fossil fuel-fired power plants emit millions of tons of air pollutants each year.[23] [24] In addition to carbon dioxide, these power plants release a range of pollutants that are harmful to human health, such as sulfur dioxide (SO_2), nitrogen oxides (NO_x), particulate matter (PM), and polycyclic aromatic hydrocarbons (PAHs) and may also release volatile organic compounds.[25] Air pollutant exposures are associated with increased risks of respiratory[26] and cardiovascular diseases[27] [28], heart disease, and possibly central nervous system diseases[29] and pregnancy complications.[30]

A study by Food and Water Watch found that in Pennsylvania, people of color, people living in poverty, and recipients of the Supplemental Nutrition Assistance Program (SNAP) disproportionately lived within three miles of

existing and proposed power plants. Even though people of color make up about one-fifth of Pennsylvania's total population, they make up close to half of the population living within three miles of existing and proposed power plants. Communities of color were more common near existing power plants at every income level, and upper-income communities of color were twice as likely to be near an existing power plant than the whitest, lower-income areas. In comparison, communities that were overwhelmingly white but with lower incomes were about half as likely to live within three miles of a plant.[31]

After adjusting for age, sex, race, median household income, and rural/urban residence, there were significant increases in estimated rates of hospitalization for asthma (11%), acute respiratory infection (15%), and COPD (17%) among individuals over 10 years of age living in a ZIP code containing a fossil-fired power plant compared with one that had no power plant.[32]

Adverse health and the location of BIPOC communities near petrochemical complexes and oil refineries present another troubling aspect to the intersection of race and energy. There are myriad studies that demonstrate the negative health impacts on households that live near these facilities, including increased prevalence of leukemia and other hematological cancers and increased cancer mortality rate.[33] One study found evidence of higher adverse birth outcomes among infants born to pregnant women living closer to power plants.[34] Another study[35] investigated rates of asthmatic episodes in children in relation to short-term variations in SO_2 levels from petroleum refineries and found significant elevations in emergency department visits and hospitalizations.[36] Half of the refineries with the highest levels of benzene emissions – a powerful carcinogen – are located along the Texas Gulf Coast near Houston.[37]

Port Arthur, in Jefferson County, Texas, is the capital of American oil refining and petrochemical processing. The community is largely Black and was ranked by the EPA among the worst places in the country for toxic chemical emissions. Black residents of Jefferson County have cancer rates 15% higher than Texas as a whole and a cancer mortality rate nearly 40% higher than the state average.[38]

Renewable energy generation and manufacturing require many of the same features as fossil fuel facilities: large amounts of low-cost space, proximity to transmission lines or transportation infrastructure, for example. As distributed energy projects move closer to population centers, such facilities would likely locate close to or within BIPOC communities. Wind turbines and solar panels are cleaner than coal power plants; but they are still industrial facilities that are more likely to be co-located with BIPOC communities as a result of the legacy of redlining.

A Path Forward for Energy Equity

Just as equity is a fundamental tenet of the American dream, equal access to energy (and its many benefits) is a fundamental tenet of equity in a modern economy. After a tumultuous and racially-charged year, it is hopeful to see signs that federal policy may begin to prioritize long-standing inequities in many areas of American life, including energy and climate justice.

Just as we should not expect the energy industry to unilaterally mitigate the energy-related inequity that impacts millions of Americans, we should not rely solely on ambitious policies, including the Biden administration's pledge to inject equity goals into its economic, energy or climate policies. America's energy inequity was centuries in the making and has many causes. It's incumbent on all of us to identify the root causes of inequity and commit to lasting solutions that rectify it.

End Notes

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