Leading with Equity and Justice in the Clean Energy Transition:

Getting to the Starting Line for Residential Building Electrification

Green & Healthy Homes Initiative®

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EXECUTIVE SUMMARY AND KEY TAKEAWAYS

The current model of climate interventions is broken. By relying on market force – and treating equity as an afterthought – climate policies and programs have been unable to achieve a just transition.

Instead, climate technology rollouts like residential solar and energy-efficient appliances have ignored starting-line disparities and therefore exacerbated health and wealth gaps between the haves and have-nots. Time and again, these rollouts have failed to meet environmental and social justice (ESJ) communities where they are or address their most pressing needs. We cannot afford to make these same mistakes within the residential building electrification movement.

In this paper, we review historical injustices within housing and community development in the United States, highlight current manifestations of these injustices – which include enduring negative impacts on health, wealth, and community – and examine the old, business-as-usual approach to technology adoption and program implementation and analyze its unjust outcomes. Then, we ground our discussion of equity with a case study from the COVID-19 vaccine rollout. The rest of the paper argues for a new approach to center equity within residential building electrification by prioritizing the needs of ESJ communities and by treating starting-line disparities not as an afterthought but as the first thought. Finally, we offer policy and programmatic implementation recommendations that will enable the equitable delivery of residential building electrification in ESJ communities.

If residential building electrification policy starts with equity and follows through on President Biden's Justice40 Initiative,[1] the subsequent technology rollout can be an invaluable opportunity to right historical wrongs and provide restorative justice to many ESJ communities in the United States.

KEY TAKEAWAYS

- Climate technology policies and programs have failed ESJ communities by ignoring starting-line disparities and the needs of ESJ communities. Without concerted action, the residential building electrification movement risks repeating and compounding these mistakes.
- The most crucial starting-line disparities in the residential building electrification movement involve deferred maintenance in old buildings, which are more likely to be occupied by Black, Brown, and limited-income individuals. These maintenance issues—including lead, mold, asbestos, and structural deficiencies—represent extreme and inequitable health risks and must be addressed before any move toward electrification.
- Prioritizing equity within residential building electrification will require significant, targeted investments in pre-weatherization and weatherization in ESJ communities. As such, Congress should provide:
    - **$423 billion** in funding for the Department of Energy's Weatherization Assistance Program and the Department of Energy's Weatherization Readiness Fund.
    - **$45 billion** in funding for the Department of Housing and Urban Development's Lead Hazard Control and Healthy Homes Program.
    - **$20 billion** in funding for the Department of Health and Human Services' Low-Income Heating and Energy Assistance Program.
    - **$100 billion** in funding for a newly-created National Clean Energy and Sustainability Accelerator.
- Any policy or program must respond to ESJ communities' needs and values. To accomplish these goals, policies must engage community stakeholders, identify customer values (such as health, affordability, and community development), lower costs, democratize jobs, and deliver results.

INTRODUCTION

The United States is at a critical juncture. A majority of Americans understand that racism and racial inequities are built deep into the American economy, government, and educational system.[2]

At the same time, most Americans understand that climate change is an existential threat and should be a political priority.[3] After generations of denialism, both issues are now front and center on the national stage and are seen by many as critical to building a just and equitable future. In response to this growing call for racial, environmental, and climate justice, President Biden entered the presidency with racial equity and climate change as two of his seven priorities.[4]

The opportunity to advance policies that address these issues is coming to a head in discussions over the American Jobs Plan and related infrastructure bills. These plans—which vary in size and scope—aim to address generations of racial and environmental injustices while also placing the United States on a path toward a clean, renewable energy future.[5] For example, the American Jobs Plan calls for the replacement of all lead service lines in the United States and a significant investment in addressing public housing capital needs, both of which have been symbols of racial injustice for decades. At the same time, the plan calls for a carbon-pollution-free power sector by 2035 and a net-zero-carbon U.S. economy by 2050. President Biden also issued executive order 14008, committing to a series of actions to center environmental justice within U.S. climate policy. One of those commitments is the Justice40 Initiative, in which at least 40% of the benefits of federal investments must accrue in disadvantaged communities.[6]

The scope of this challenge—to mitigate the worst impacts of climate change while promoting racial equity—is massive, requiring both significant overall investment and targeted investment in communities that have been disproportionately impacted by climate change. While these investments will span all sectors of the economy, the building sector is critical, responsible for 40% of total U.S. energy consumption.[7]

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The most impactful strategy to reduce carbon and other greenhouse gas (GHG) emissions is to stop using fossil fuels to power our economy, a process known as decarbonization. Our buildings and homes can be powered by electricity, and the necessary technology already exists. As explained in a recent report by the Center for American Progress and Rewiring America, small building electrification requires the adoption of four main technologies: heat pump heating/cooling systems, heat pump water heaters, electric cooktops/ranges, and upgraded breaker boxes.[8]

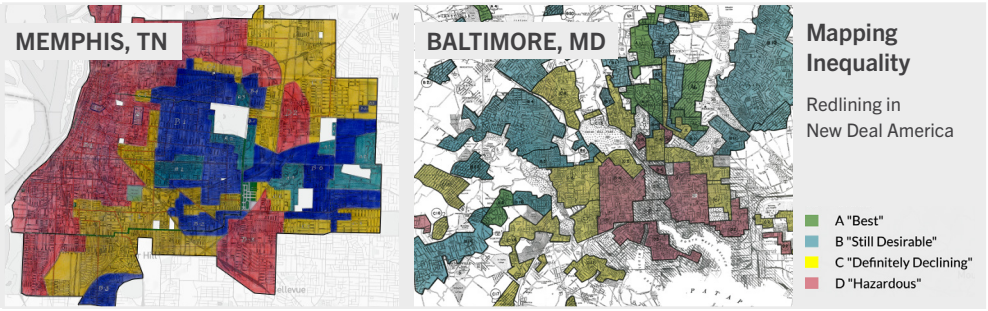
While widespread deployment of these technologies across the country is critical to achieving our climate goals, we cannot leave this transformation to market forces. Market forces alone cannot and will not center equity or respond to calls for racial justice. Instead, policymakers and program implementers must endorse new rollout and adoption strategies to ensure residential building electrification is used as a catalyst to further racial and environmental justice by prioritizing underserved and under-resourced communities.

REFRAMING THE ELECTRIFICATION STARTING LINE

As the United States looks to scale up residential building electrification, we must acknowledge that there is no universal starting line in the race to electrify.

Today, residential building electrification is most accessible to wealthy households that can afford to invest in these technologies and live in homes that are readily electrifiable. Such communities are already at the electrification starting line. In contrast, under-resourced and underserved communities—including many Black, Brown, Hispanic, Latinx, Asian-American, and Indigenous communities, and low- and moderate-income (LMI) communities—are often not at the electrification starting line. While recognizing that their histories and traumas are unique, these communities are often intersectional and face common barriers to reach the starting line. As such, we will refer to these populations broadly as environmental and social justice (ESJ) communities in this paper.

ESJ communities are most likely to live in older housing with structural deficiencies, a result of the United States' long history of racist and discriminatory policies that contributed to residential segregation and disinvestment, particularly in Black and Brown communities. These policies include redlining, in which the Federal Housing Administration (FHA) furthered segregation efforts by refusing to insure mortgages in and near Black and Brown neighborhoods. At the same time, the FHA was subsidizing the construction of entire new subdivisions for White people—with the requirement that none of the homes be sold to Black and Brown families.[9] In addition to the FHA's policies, laws and ordinances across the United States explicitly forbade homeowners from selling to Black and Brown Americans.



Robert K. Nelson, LaDale Winling, Richard Marciano, Nathan Connolly, et al., "Mapping Inequality," American Panorama, ed. Robert K. Nelson and Edward L. Ayers, accessed July 26, 2021, https://dsl.richmond.edu/panorama/redlining/#loc=11/39.293/-76.862&city=baltimore-md; https://dsl.richmond.edu/panorama/redlining/#loc=12/35.135/-90.118&city=memphis-tn

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State-sanctioned violence and intimidation tactics, such as the Tulsa Massacre, also normalized and reinforced discrimination and segregation. Black Americans, attempting to move to better neighborhoods occupied by mostly White families, were denied both police protection against these attacks and legal justice to hold attackers accountable.

Black and Brown Americans were repeatedly promised and then denied wealth-building opportunities, from '40 acres and a mule' to the New Deal and the 1944 G.I. bill.[10] Each time White Americans were offered new opportunities to climb the socio-economic ladder, Black and Brown Americans were systemically and intentionally excluded. Even today, in a damaging reversal of the equally-damaging 'White Flight' movement, White families are returning to revitalized cities, gentrifying and pricing out Black and Brown Americans from neighborhoods they have occupied for generations.

The United States' long history of racism, segregation, and disinvestment led to high demand among Black and Brown Americans for an artificially limited supply of housing, which both increased housing prices and decreased housing quality in historically Black, Brown, and other ESJ communities.

The slow but steady decline in housing quality within ESJ communities has directly contributed to current, persistent disparities in energy and health outcomes. It has also exacerbated the effects of climate change on ESJ communities. Because ESJ communities were denied government investments in green spaces and tree cover, they are more likely to suffer from extreme heat and its dangerous consequences. In some cities, the difference in summer surface temperatures between redlined and non-redlined neighborhoods can reach as much as 20 degrees Fahrenheit: a modern-day 'heat apartheid.'[11] This increased exposure to extreme temperatures results in an

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increased energy burden—the percentage of gross household income spent on energy costs—for ESJ communities. Across the United States, the median energy burden for Black households is 43% higher than for non-Hispanic White households.[12]

Extreme temperatures are not the only cause of disproportionately high ESJ energy burdens. Black and Brown Americans are also significantly more likely to live in older, energy-inefficient homes with structural deficiencies, outdated appliances, and faulty energy systems.[13] Limited-income households in ESJ communities are, on average, 27% less efficient than high-income households.[14] As a result, energy and electricity are more expensive for the poor than for the rich.

ESJ residents are also more likely to live in unhealthy and polluted homes. Studies show that Black and Brown Americans are 61% more likely than White people to live in a county with heavy pollution, including particulates, soot, benzene, and ozone.[15] In addition, old oil- and gas-burning boilers and unventilated gas stoves, found most commonly within ESJ communities, release sulfur dioxides, nitrogen oxides, and harmful particulate matter, which can cause severe health impacts after prolonged exposure.[16] Buildings within ESJ communities often also contain serious health hazards like lead, mold, and asbestos. Nationally, Black children are nearly three times more likely than White children to have elevated blood-lead levels.[17]

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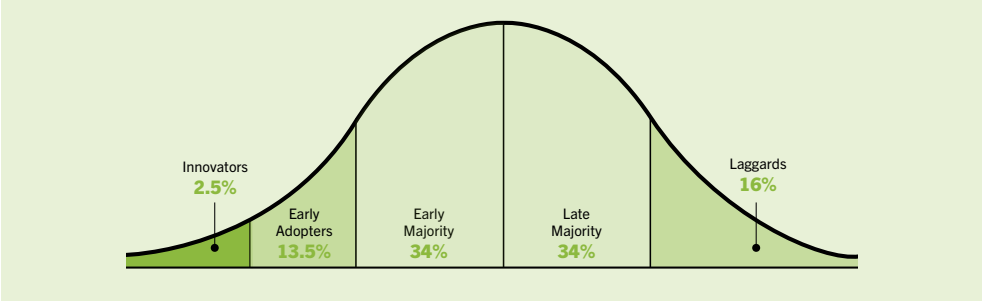
The Biden Administration has pledged to lead and aid a market-wide electrification transformation in the United States. However, it is still unclear whether policymakers will act to create policy that uses this opportunity to fight the nation's racist and classist housing legacies that impact a household's ability to access electrification as well as other climate-friendly technologies. If new policies and programs lead with equity and meet communities where they are, residential building electrification can be an opportunity to provide restorative justice to many ESJ communities in the United States. But if market forces are allowed to continue to drive the industry, residential building electrification will follow residential solar and the energy efficiency movement as yet another example of technological advancements that leave ESJ communities behind.

THE OLD ADOPTION APPROACH

Most new technologies, including residential solar, electric vehicles, and energy-efficient appliances, follow old patterns of adoption. They rely on wealthy early adopters to bring down cost, which decreases slowly as more consumers adopt the technology. This pattern of adoption mirrors Everett Rogers' 1962 product adoption bell curve.[18]



Rogers' (1962) bell curve of product adoption, outlining percentange of the market who adopt a product.

The adoption model begins with a small segment of wealthy and knowledgeable early adopters and then moves to mass-consumer market adoption (early and late majorities). The tail end of the adoption curve, called 'laggards,' includes late adopters both by choice and necessity. Most individuals living in ESJ communities fall into the last or second-to-last category. These individuals often miss out on early adoption because they cannot afford the new technology, the technology does not fit their unique and most pressing needs, or the technology was not built with their market in mind.

This approach almost always leaves underserved and under-resourced individuals late to the starting line as benefits accrue to wealthy communities with significant head starts. The cycle gets even worse when late-to-the-game governmental and nonprofit programs commit themselves to technologies at the tail end of their adoption curves, which are then at further risk of becoming inefficient or obsolete. In this way, ESJ communities become locked into the late adoption stage, despite standing to benefit the most from early adoption of these new technologies. Within the residential solar rollout, for example, Black-majority census tracts have installed less rooftop photovoltaics (after adjusting for median household income) compared with no-majority tracts by 69%, while white-majority census tracts have installed 21% more.[19] These racial disparities in solar installation worsen when homeownership is accounted for.

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Rogers' widely accepted product growth plan is one example of how traditional approaches to market transformation have failed ESJ communities and will continue to do so without intentional change. The failed approach is especially dangerous when it comes to residential building electrification, for two reasons. First, as stated above, residents of ESJ communities live in the hottest neighborhoods and the most unhealthy buildings. Already, air pollution and extreme heat kill inner-city residents at a higher rate than almost all other causes,[20] and the death rates will only increase over time as the impacts of climate change become more severe.

Second, late adoption of residential building electrification puts ESJ communities at risk of being stranded on expensive and aging infrastructure, as certain regions see gas and oil become more costly and less reliable over time. As wealthy Americans electrify their homes and leave fossil fuel systems, those Americans who still rely on gas and oil will be left to pay higher bills for system and infrastructure repairs and upgrades. And as fossil fuel demand decreases, per-user system maintenance will become more costly for operators, which will likely jeopardize service availability, delivery, and quality. If ESJ communities continue to bear the burden of fossil fuels, residential building electrification might turn into a worst-case scenario: the people and communities who had the most to gain from these upgrades will actually be punished for their place in an adoption curve they do not control.

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While many organizations and elected officials have maintained good intentions to improve the quality of life in ESJ communities, they have rarely engaged in a real effort to understand the root causes of systemic injustices, the downsides of late technology adoption, and distrust of interventions. They have also rarely acted seriously to change the standard patterns of top-down technology adoption or offer a new approach that prioritizes equity.

Fortunately, there are models within the green affordable housing movement that we can look to and improve upon. Currently, 27 states and Washington, D.C. require that affordable housing developments that utilize public funds comply with the Enterprise Green Communities Criteria, which is the only national green building standard designed explicitly for green affordable housing construction.[21] These requirements have enabled the deployment of new, efficient technologies in affordable housing – a broad term that refers to housing that is developed with the intention of being affordable for low- and moderate-income households – thereby enabling many low- and -moderate income households to benefit from these new technologies earlier than they otherwise would have. Models like this are what is needed to ensure that residents of ESJ communities are able to adopt electrification technologies earlier on the curve.

VACCINE ROLLOUT CASE STUDY

The outdated approach to market transformation—and its inadequate outcomes for ESJ communities—is not the only way forward.

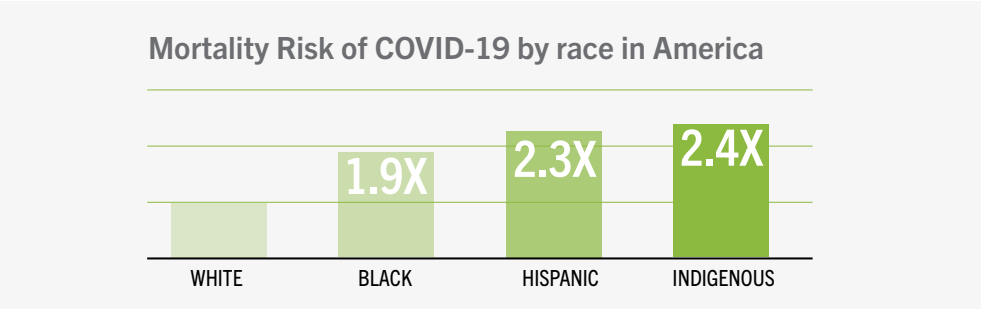
To address today's needs, public- and private-sector leaders cannot simply rely on hasty marketing, listening tours, or clean-and-fast interventions to move ESJ communities from the tail-end of the adoption curve to somewhere in the late middle. Instead, effective implementation programs must prioritize equity and racial justice and act accordingly, flipping the entire adoption curve on its head.

It is perhaps instructive to analyze the relationship between technology rollouts and equity within a different issue: the COVID-19 vaccination rollout. For the most part, the U.S. vaccine rollout was guided by two main principles: speed and equity. The first principle, speed, was relatively straightforward: how do we vaccinate people as quickly as possible? To accomplish that goal, the design of the rollout relied on the existing healthcare system and infrastructure, which allowed for rapid deployment of vaccines to hospitals, clinics, and other healthcare entities.

The second principle, equity, was layered and guided by risk. Healthcare workers who faced the highest risk of contracting COVID-19 were among the first people to receive the vaccine. Older Americans, who were most vulnerable to the virus, were the second group to receive the vaccine. In some cities, like Washington D.C., childcare workers or other 'essential' workers were prioritized as a third group. It is crucial to note that, unlike most technology rollouts, these decisions were not based on market forces. Instead, the decisions were based on an analysis of who could benefit the most from being an early recipient of the vaccine. But while the intent was good (and its result certainly better than leaving the vaccine rollout to market forces), the rollout ignored some stark realities.

COVID-19 did affect healthcare workers, older Americans, and other essential workers, but it also disproportionately impacted ESJ communities. Black Americans were 1.9X as likely to die from COVID-19 than were White, Non-Hispanic Americans. Hispanic Americans were 2.3X as likely to die, and Indigenous Americans were 2.4X as

likely to die.[22] These disparities were caused by several risk-increasing factors within ESJ communities, including increased likelihoods of working essential jobs or jobs that do not provide adequate healthcare, suffering from pre-existing conditions that exacerbate the effects of COVID-19, and not having safe, healthy homes to shelter-in-place. Another of these factors was indoor air quality: old, oil- and gas-burning buildings already cause diseases like asthma and decreased lung function, but they also exacerbate the effects of respiratory viruses like COVID-19.[23]



As the vaccine rollout began, not enough attention was paid to these realities, and ESJ communities were not prioritized within the vaccine rollout. And it showed: by March 1, 2021, White Americans had been vaccinated at more than twice the rate of Black and Brown Americans.[24] From March to June, this gap shrunk somewhat, as states began to reconsider the role of equity in their vaccination processes. Some states incorporated geographic targeting, increasing the vaccine supply in hard-hit ESJ neighborhoods. Despite increased supply, the gap between White vaccination rates and Black and Brown vaccination rates remained at 13% as of June 14.

During the months it took to correct the initial, inequitable vaccine rollout, more Americans living in ESJ communities died, and racial and economic injustices were further exacerbated. Within this cautionary tale, though, a few communities decided to approach the vaccine rollout differently and truly prioritize equity and racial justice.

One example is the city of Loma Linda, California, which increased investments in communities experiencing high levels of vaccine hesitancy. By engaging with and listening to its community, Loma Linda identified multiple barriers to vaccine uptake within ESJ communities, including well-justified distrust of healthcare institutions, lack of access to internet connectivity to secure an appointment, and an inability to take time off from work or other responsibilities to get vaccinated.

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To overcome these barriers, Loma Linda targeted resources within its ESJ communities and adopted an equity-centric approach that consisted of three tiers: engagement of Black faith leaders, delivery of education about COVID-19 vaccinations by Black healthcare professionals, and development of a multidisciplinary mobile vaccination effort. These tiers built trust by tapping into pre-existing community relationships and delivering tangible results, and each tier was designed to address the community's needs. Faith leaders and other community leaders worked to decrease vaccine hesitancy through on-the-ground conversations; the mobile clinics mitigated time and geographic barriers; and the entire system was paper-based, which democratized access to appointments. After adopting its new approach and devoting significant resources to ESJ communities, Loma Linda's proportion of Black residents served by the mass vaccination clinics increased by 20%.[25]

The overall COVID-19 vaccine rollout shows what can happen when starting lines and on-the-ground realities are ignored, but Loma Linda shows what can happen when starting lines and on-the-ground realities are understood and respected. By moving the starting line to meet ESJ communities where they were, Loma Linda achieved real, equitable progress in its vaccine rollout. The parallels between COVID-19 and residential building electrification are clear: in both cases, the United States cannot afford to relegate ESJ communities to the end of the adoption curve, and ESJ communities cannot afford to stay there. And in both cases, technology rollouts must lead with equity.

BLUEPRINT FOR EQUITABLE GOVERNANCE

Rebates, tax credits, and standards can be part of the electrification solution, but they cannot be the whole solution.

Unfortunately, many of the currently proposed residential building electrification policy solutions do not lead with equity. Instead, they lead with market-based interventions including rebates, tax credits, loan products, energy efficiency standards, and emissions limits. Rebates and tax credits, especially, require upfront investments that can be prohibitively expensive to low- and moderate-income individuals. Households may be eligible to receive a tax credit or rebate for every electric appliance bought or efficiency upgrade completed, but they must have the resources to make the initial investment required to buy the products or services. Loan programs can help households afford initial investments in electric appliances, but they can also result in harmful debt, especially in ESJ households that have other compounding debts.

Energy efficiency and emissions standards are other tools that can drive the market towards electricity. However, without concurrent financial support for ESJ and LMI communities, a minimum efficiency standard greater than the efficiency of fossil fuel appliances will incentivize wealthy homeowners to invest in electric appliances and penalize other homeowners who cannot. Establishing on-site emissions limits (i.e. emissions generated within buildings) will steer wealthy homeowners to electric appliances in much the same way.[26] These proposed policy solutions can be effective in shifting the market towards electric appliances, but they do not address the underlying issues that continue to make these technologies inaccessible for many households in ESJ communities. Rebates, tax credits, and standards can be part of the electrification solution, but they cannot be the whole solution.

Instead, and similar to the COVID-19 vaccine rollout, equitable residential building electrification requires targeted investments and on-the-ground engagement in ESJ communities. Investments must include efforts to improve building stock and maximize energy efficiency; thereby enabling electrification. As written earlier, residential building electrification requires replacing appliances like boilers and gas stoves with electric heat pumps and electric cooktops. While these are often one-to-one exchanges, the condition and capacity of a building's energy infrastructure determine whether electrification is possible. An unstable, dangerous, or poorly maintained building—or a building that simply does not have the requisite electrical

capacity—cannot be fitted with the equipment and wiring necessary to connect electric appliances to the building's energy system.

Weatherization can alleviate these issues and prepare buildings for electrification. Weatherization increases a building's energy efficiency, safety, and comfort by upgrading electrical panels, weather-stripping or repairing broken exterior doors and windows, patching small holes in walls and roofs, performing minor furnace maintenance and repair, and insulating attics, walls, floors, water heater pipes, and furnace ducts.[27] Weatherization is often most necessary in older buildings occupied by ESJ communities that have long been denied these upgrades by discriminatory policies and other cost barriers.

Weatherization goes a long way towards enabling electrification, but other obstacles still stand in the way for ESJ neighborhoods. Before building weatherization and electrification, policymakers and program implementers must meet ESJ communities where they are and address basic health and safety issues, such as lead, mold, asbestos, roofing deficiencies, and dangerous wiring, which are often called pre-weatherization measures. These deferred upgrades, which have long been inaccessible to Black and Brown Americans due to implicit and explicit programmatic exclusion, are some of the clearest manifestations of historical and current racial injustice. More critically, the deferred upgrades and their dangerous health impacts are some of ESJ communities' most pressing needs. An equitable approach demands that these needs are met first.

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Another obstacle to electrification in many ESJ communities is a lack of broadband access. The lack of broadband in many ESJ communities represents both a general trend of disinvestment and a specific obstacle to electrification efforts, because efficient and electric appliances rely on micro-WiFi networks and internet-of-things (IoT) technology. Since less than half of households with annual family incomes less than $20,000 have home-internet access,[28] the digital divide is yet another starting-line inequity in the march towards electrification.

What follows below are specific recommendations to prioritize equity within weatherization and electrification policies and programs:

WEATHERIZATION ASSISTANCE PROGRAM (WAP)

- Congress should provide **$423 billion** in funding for the Department of Energy's Weatherization Assistance Program and the Department of Energy's Weatherization Readiness Fund.

The Department of Energy's (DOE) Weatherization Assistance Program (WAP) provides resources to help income-eligible households lower energy usage, reduce energy burden, and improve housing quality. Through WAP, households can receive weatherization upgrades that include insulation and air sealing, weather-stripping doors and windows, and more efficient appliances.[29] The program primarily supports cost-saving measures, with a limited budget of 15% of project cost available to address necessary health and safety issues. For the average project, the maximum budget for health and safety is just over $700 and is often not enough to address the many health and safety issues present in homes within ESJ communities.[30] Since it can be harmful to perform weatherization on a house with health and safety issues, a project typically gets deferred indefinitely if the necessary health and safety repairs exceed the budget available to address them.[31] This limitation prevents households that can most benefit from WAP from participating in the program. While there are some state programs that utilize other funding sources to perform pre-weatherization measures, there is no universal pre-weatherization program.[32]

Fortunately, these tides may be turning. In the December 2020 omnibus bill, Congress authorized DOE to establish its own grant program dedicated to increasing access to WAP by providing funding to perform pre-weatherization measures. Utilizing this new authority, DOE requested $21 million in its FY 2022 Congressional

Budget Justification to establish a Weatherization Readiness Fund that will help households perform structural or health and safety repairs necessary to complete weatherization.[33] While this program would increase access to WAP among households with the greatest needs, its funding level is not nearly enough to meet the tremendous need nationwide. To repair and weatherize all 39.5 million WAP-eligible households in the United States,[34] WAP and the Weatherization Readiness Fund should be funded at a level of $423 billion. This includes flexibility to spend upward of $50,000 on a retrofit that includes pre-weatherization measures, weatherization, and full decarbonization.

It is also important that WAP be funded in a way that provides the flexibility and stability necessary for Community Action Agencies (CAAs) and other nonprofit organizations that implement WAP locally to sustainably scale their work to meet the significant need present in ESJ communities. In practice, this means providing long-term funding for WAP of at least five years with dedicated resources for expanded administrative capacity, and increasing that funding annually. These are lessons learned from the American Recovery and Reinvestment Act of 2009 that funneled $5 billion in stimulus dollars into WAP to be spent over a 3-year period. To ensure that those resources could be deployed, CAAs had to scale their work quickly, ultimately hiring new energy auditors and contractors. After the 3-year period when the ARRA stimulus dollars were spent down, many of those newly hired workers were laid off given the lack of resources to sustain payroll. This flawed history still haunts many weatherization contractors to this day, resulting in a reluctance to participate in WAP programs.

WAP has been a tremendous resource for limited-income households, helping to weatherize over 35,000 homes a year, and has the potential to reach even more families in ESJ communities with additional funding.[35] Still, this funding must be deployed in a manner that can sustain the many jobs that will inevitably be created and supplemented with government policies and standards that can help maintain the demand for weatherization contractors over time.

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LEAD HAZARD CONTROL AND HEALTHY HOMES PROGRAM

- Congress should provide **$45 billion** in funding for the Department of Housing and Urban Development's Lead Hazard Control and Healthy Homes Program to address residential lead-based paint hazards.
- Congress should expand the Department of Housing and Urban Development's Healthy Homes and Weatherization Cooperation Demonstration Grant and should fund other cooperation grants between federal assistance programs.

The Department of Housing and Urban Development's (HUD) Lead Hazard Control and Healthy Homes Program exists to eliminate lead-based paint hazards that can cause lead poisoning.[36] As opposed to DOE's WAP program, which provides funding to every state, HUD's Lead Hazard Control program is a competitive program that is available to all states and localities that wish to apply. Funded at $360 million in 2021, the program is a tremendous resource for families living in homes at risk of containing lead hazards. While this program is designed primarily for lead remediation, it also includes funds to address other home health hazards. While jurisdictions can make a specific funding request during the application process, a typical funding award amount for a jurisdiction is $3.6 million, with $3 million for lead remediation and $600,000 for healthy homes. Given its scope, this program can help address common hazards that can prevent weatherization and electrification. However, similar to DOE's WAP program, the funding level for the healthy-homes portion of the program is completely insufficient in meeting the scale of need.

Recognizing the potential for HUD's Lead Hazard Control and Healthy Homes Program to help address common reasons for WAP deferral, HUD established the first-ever Healthy Homes and Weatherization Cooperation Demonstration Grant (HHWCD)

to support coordination in jurisdictions that have access to both federal programs.[37] While this coordination grant was established to help increase access to weatherization among income-eligible households, it also acknowledges that ESJ communities often experience overlapping issues. The federal government should scale up this program and fund other cooperation grants between federal assistance programs.

LOW-INCOME HEATING AND ENERGY ASSISTANCE PROGRAM (LIHEAP)

- Congress should provide **$20 billion** in funding for the Department of Health and Human Services' Low-Income Heating and Energy Assistance Program and target a portion of that funding for bill payment assistance that mitigates any increase in electric bills for limited-income households that electrify their homes.

After homes are brought to the starting line and ready for electrification, policies and programs must ensure that any transition to electric appliances does not result in higher utility bills. This is a clear risk because, in some parts of the country, operating an efficient electric appliance may still cost more than operating a harmful gas alternative. While the United States works to drive down electricity costs—by fostering more clean energy generation and increasing transmission capacity—we must mitigate temporary electricity burdens as much as possible.

The Department of Health and Human Services' Low-Income Heating and Energy Assistance Program (LIHEAP), which provides bill payment assistance to income-eligible households that are struggling to pay utility bills, can be a helpful resource in overcoming this issue. Targeting LIHEAP assistance at households that electrify—in coordination with WAP and DOE—would help ensure utility bill affordability among energy-burdened households. Although Congress approved $4.5 billion in LIHEAP funding in the 2021 American Rescue Plan, the program continually runs out of funding due to significant need.[38] So, any additional targeting of LIHEAP funding would have to come with an increase in the overall LIHEAP budget.

NATIONAL CLEAN ENERGY AND SUSTAINABILITY ACCELERATOR

- Congress should create a National Clean Energy and Sustainability Accelerator and provide **$100 billion** in funding for the Accelerator.

One proposed policy solution that can help scale up targeted investments and resource coordination is the National Clean Energy and Sustainability Accelerator. The Accelerator would be funded initially by the federal government and would direct capital to state and local green banks, whose goals are to mobilize investments in clean energy solutions.[39] The benefit of this model is the opportunity for state and local green banks to tailor investments to the needs of their communities and act as a coordinating agency to align federal, state, and local resources such as WAP, LIHEAP, and other HUD programs. The Accelerator, as proposed, would also have a mandate to direct at least 40% of investments to underserved and under-resourced communities in line with President Biden's Justice40 Initiative. There is immense potential to scale clean energy solutions in ESJ communities through this model: if the Accelerator is capitalized with $100 billion in federal funds, it could mobilize up to $884 billion in total public and private investment.[40] However, any funding or financing deployed through the Accelerator must alleviate the energy burden experienced by struggling households, rely more on grants than on rebates or tax credits, be flexible enough to address substandard building conditions, and support the type of community engagement needed to build trust and encourage uptake of green technologies.

STATE AND LOCAL PROGRAMMATIC ALIGNMENT

While resource availability is essential, it is often not sufficient to encourage wide-scale, equitable uptake. To achieve that goal, we must target resources in a way that reduces the undue burden on struggling households and optimizes programs for ease of access. In Louisiana, the state lead remediation program was transferred from the Department of Health to the Louisiana Housing Corporation—the agency that administers WAP—to encourage more coordination between the two programs. In New Jersey, the Board of Public Utilities is piloting a 'whole house' approach that would align lead poisoning prevention programs with energy efficiency programs to maximize the benefits available to income-eligible households. And in Virginia, the Housing Innovations in Energy Efficiency Program and the Percentage of Income Payment Program represent a two-pronged effort to increase access to weatherization services while also decreasing energy burdens. Similarly, DTE Energy, a utility based out of Detroit, is piloting a program that would target energy bill assistance and weatherization services at households who are behind on their bills and at-risk for utility shut-offs.[41] Improving the efficiency and efficacy of program coordination can also help to more effectively leverage investments from private-sector partners, community organizations, foundations, green banks, and healthcare entities like hospitals and health systems.

DTE Energy, a utility based out of Detroit, is piloting a program that would target energy bill assistance and weatherization services at households who are behind on their bill and at-risk for utility shut-offs.

EQUITY IN ACTION

As the federal government designs and implements programs to advance racial justice and mitigate climate change, policy solutions must also provide adequate support for localized efforts to rebuild trust in ESJ communities. After all, residential building electrification can only happen block by block and community by community. And as evidenced in the Loma Linda model, overcoming generations of disinvestment, marginalization, and exploitation requires persistent and concentrated community engagement. What can this engagement look like in the context of residential building electrification?

Outlined below are four principles that can be used to center equity within residential building electrification and prioritize the needs of ESJ communities.

1. Community members and community-based organizations know their communities best and any programmatic interventions must start with their engagement and at their direction. Engaging with partners at every level, including residents, manufacturers, contractors, utilities, local and state governments, and nonprofit and corporate organizations can help build successful public-private partnerships and remove barriers to residential building electrification, including lack of funding, regulatory roadblocks, and building owner education.

2. Customer values should anchor policies and programs, ensuring that products meet customer needs. These values often include health, affordability, and community investment.

   'Health' is often the highest priority for residents of ESJ communities. These residents are often acutely aware of the devastating, daily effects of unhealthy buildings, which result in asthma and lead poisoning, other respiratory illnesses, emergency room and doctor visits, and missed school and work. Pre-weatherization upgrades clean up buildings by removing lead, mold, and asbestos; weatherization upgrades improve indoor air quality and reduce the effects of extreme heat and cold; and electrification itself further improves indoor air quality by reducing fossil-fuel combustion and contamination within buildings. For example, replacing a gas stove with an electric stove reduces nitrogen dioxide levels by 50-400% and reduces child asthma by 24-42%.[42]

These residents are often acutely aware of the devastating, daily effects of unhealthy buildings, which result in asthma and lead poisoning, other respiratory illnesses, emergency room and doctor visits, and missed school and work.

'Affordability' is two-fold. First, customers must be able to afford electrification and the pre-weatherization and weatherization upgrades that enable electrification. Customers must also be able to afford the front-of-the-meter electrical panel upgrades that are often necessary in larger projects. Limited-income customers cannot leverage point-of-sale subsidies or tax credits (a year later) if such subsidies and tax credits also require thousands or tens of thousands of dollars in up-front costs. Second, limited-income customers cannot move forward with projects if they result in greater energy bill burdens after upgrades and electrification. Electric load-increasing upgrades must be offset by lowered fossil fuel (natural gas) usage, increased energy efficiencies, and financing that reduces operating costs/monthly bills. Ideally, customer bills should fall—but at the very least remain steady—and cannot increase in order for projects to succeed.

'Community investment' speaks to ESJ communities' broad, holistic needs beyond individual building upgrades and electrification. Individual residential building electrification upgrades can respond to customers' affordability and health values, but large-scale, community-wide retrofit projects can offer additional opportunities for significant concurrent investments. These investments support ESJ communities more broadly: workforce development programs create local, green-economy jobs; community WiFi installations provide digital access for school and work, and provide connectivity for smart sensors and other modernization technology; and clean air in retrofitted community spaces supports healthy residents. Community-wide electrification can begin with 'lighthouse projects'—highly visible projects like schools,

community spaces, and houses of worship—that build trust in communities and demonstrate programmatic capacity to complete weatherization and electrification projects without raising costs. Lighthouse projects act as beacons to attract attention and interest, build community-wide buy-in, and light the way for larger electrification initiatives.

3. Project financing models should be flexible, accessible, and holistic. Because high project cost and financing are two of the biggest obstacles to building weatherization and electrification in ESJ communities, policies and programs should address both issues in residential building electrification projects. A no-money-down, utility-bill-neutral financing model both enables projects and keeps bills steady (or lowered) after electrification. Policies and programs should also drive down net costs by stacking all available incentives across jurisdictions (local, state, federal) and parties (manufacturers, contractors and installers, landlords and homeowners).

4. Policies and programs should strengthen ESJ communities by keeping both jobs and expertise local, empowering companies that have committed to training ESJ community residents to manufacture, install, and maintain cutting-edge electrification equipment. Programs should prioritize workforce development within communities historically excluded from wealth-building opportunities, especially women, people of color, and formerly incarcerated individuals.

To truly center equity in residential building electrification, community members must be engaged in the design and implementation of electrification programs in their communities—a process that can and should be time and resource-intensive, and any policy or program put forth by the federal government must provide adequate resources to ensure that community members are empowered to drive decisions that will meet the needs of their communities.

CONCLUSION

Climate change and racial injustice are two of the most pressing issues of our time and, as evidenced above, we can and must address both at the same time. Residential building electrification and weatherization can usher in an equitable future, where all Americans—no matter where their starting line is—have access to safe, healthy, energy-efficient homes. To accomplish this, we must design residential building electrification policies intentionally and we must ensure that the communities hit hardest by climate change are able to transition justly.

President Biden's Justice40 Initiative represents the most significant opportunity to provide long-awaited justice for ESJ communities and chart a path forward to an equitable energy future. Under this initiative, at least 40% of the benefits of federal investments must accrue in disadvantaged communities, and progress towards this goal must be tracked over time. As the administration designs and implements this initiative, attention must be paid to the legacy of racist and discriminatory housing policies that continue to impact Black and Brown communities across the United States. By investing in housing, not only can we provide restorative justice, but we can also enable ESJ communities to receive the full benefits of a clean energy transition.

Still, commitments—like the Justice40 Initiative—are only as good as what they deliver. Therefore, the United States' progress towards equity and justice must be tracked and measured along the way. The University of Michigan's Urban Energy Justice Lab's Energy Equity Project and the American Council for an Energy Efficient Economy's Leading with Equity Initiative are two examples of efforts to develop and utilize metrics that help us understand how well energy programs are advancing and achieving equitable outcomes for those households most impacted. Since community members ultimately understand what's best for their community, perhaps the most impactful metric of success is feedback from community members. Any policy or program must be designed to maximize positive feedback from community members, responding first and foremost to the on-the-ground realities of ESJ communities and fostering engagement at every step of the way.

To promote racial justice and address climate change, we must prioritize Black and Brown communities—as well as other underserved and under-resourced communities—and we must let our actions be guided by the needs of these communities.

The University of Michigan's Urban Energy Justice Lab's Energy Equity Project and the American Council for an Energy Efficient Economy's Leading with Equity Initiative are two examples of efforts to develop and utilize metrics that help us understand how well energy programs are advancing and achieving equitable outcomes for those households most impacted.

GLOSSARY

BUILDING ELECTRIFICATION: Building electrification eliminates the use of fossil fuels for functions like heating (space heating, water heating, clothes drying) and cooking and replaces gas appliances with alternatives that use electricity. Building electrification can be accomplished with the adoption of technologies like heat pump heating/cooling systems, heat pump water heaters, electric cooktops/ranges, and upgraded breaker boxes.

ENVIRONMENTAL AND SOCIAL JUSTICE (ESJ) COMMUNITIES: ESJ communities are communities where residents are predominantly people of color (Black and Brown, Hispanic, Latinx, Asian American, Indigenous) or living on low or moderate incomes; residents are underrepresented in policy-setting or decision-making processes; or residents are subject to disproportionate impacts from climate change or other environmental hazards.[43]

ENVIRONMENTAL JUSTICE: Environmental justice is the systemic fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.[44]

EQUITY: Equity is the just, impartial, and fair treatment of peoples within social systems. Equity involves trying to understand and give people what they need to enjoy full, healthy lives.[45]

PRE-WEATHERIZATION: Pre-weatherization addresses severe conditions in a building that would cause that building to be deferred from the Department of Energy's (DOE) Weatherization Assistance Program (WAP) because the conditions would render the weatherization measures unsafe or ineffective. Examples of such conditions include moisture/standing water, electrical/wiring issues, environmental contaminants like mold, lead, and asbestos, and structural/roofing deficiencies.[46] Pre-weatherization is a prerequisite for weatherization.

RACIAL JUSTICE: Racial justice is the systematic fair treatment and meaningful involvement of people of all races that results in equitable opportunities and outcomes for everyone.[47]

WEATHERIZATION: Weatherization increases a building's energy efficiency, safety, and comfort by eliminating drafts. Weatherization can include electrical panel upgrades, weather-stripping or repairing broken exterior doors and windows, patching small holes in walls and roofs, performing minor furnace maintenance and repair, and insulating attics, walls, floors, water heater pipes, and furnace ducts.[48] Weatherization is a prerequisite for residential building electrification.

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ABOUT GREEN & HEALTHY HOMES INITIATIVE

The Green & Healthy Homes Initiative (GHHI) is a national organization with the mission dedicated to addressing the social determinants of health and the advancement of racial and health equity through the creation of healthy, safe and energy efficient homes. By delivering a standard of excellence in its work, GHHI aims to eradicate the negative health impacts of unhealthy housing and unjust policies for children, seniors and families to ensure better health, economic and social outcomes for low-income communities of color. The vision of our work is to advance health and racial equity through healthy housing, with a focus in limited-income communities of color.

GHHI is the largest healthy homes organization in the country, operating in over sixty-five communities and states, focused on improving housing quality and establishing public-private partnerships that allow local governments to efficiently and effectively utilize resources related to housing. GHHI has worked to design and implement policies and programs at the federal, state, and local level that promote healthy, energy efficient, and climate friendly housing. This includes serving on the New York State Housing and Energy Efficiency Advisory Panel as a part of implementation of the Climate Leadership and Community Protection Act, and recently being awarded a contract with the New Jersey Board of Public Utilities to develop the concept for a Whole House Pilot, which aligns and coordinates the state's energy efficiency and healthy housing resources to help achieve complementary goals of reaching 100% clean energy and eliminating exposure to residential lead-based paint.

GHHI is leading the charge for transformative, sustainable healthcare investment in occupied housing as a social determinant of health. Partnerships with Promedica and Amerigroup are allowing us to build frameworks for alignment of housing, heath and energy programs and investment of flexible funds in housing quality improvement across dozens of cities. A partnership with the state of Michigan has enabled us to build a revolving Lead Fund with cross-sector investment from public, private and philanthropic sources, which will create a sustainable source of support for meeting the lead poisoning problem at scale statewide, and our work with Pennsylvania's largest healthcare system is advancing a $50 million investment of community benefit dollars in a comprehensive lead poisoning prevention program, to launch in 2021.

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