REDSTONE

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Changing the Game

Community-based strategies and climate mitigation

Analysis prepared for the MacArthur Foundation, Marin Community Foundation, and Equation Campaign

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*Report prepared by **Redstone Strategy Group,** a leading advisor to private foundations and non-profits worldwide. Redstone helps clients identify their highest-return investments, track and learn from results, and continually improve their efforts to solve urgent social problems.*

Foreword

Climate change remains one of the defining challenges of our time. While we have collectively made enormous strides, we are on track to surpass the 2030 Paris Agreement targets – which themselves are insufficient, as evidenced by massive climate disruptions and catastrophes worldwide.[1] The 2025 Los Angeles wildfires are a salient example of the increasingly catastrophic effects of climate change. These fires caused damage or destruction to over 35,000 acres of land, placed over 200,000 residents under evacuation orders, and resulted in 29 deaths.[2] The discrepancy between governments' planned fossil fuel production and global production levels consistent with limiting warming to 1.5°C or 2°C raises further alarms.[3] As democracy in the US and around the world faces increased threats, local strategies not subject to the vicissitudes of national politics and elections become even more critical. Investing in climate work from the ground up not only gives us a fighting chance of mitigating climate change but also supports thriving democracies by building the type of deep citizen engagement that often begins at the local community level.

We commissioned this report in 2024 because of the notable gap in the understanding of, and appreciation for, the power of community-based strategies to reduce emissions. While we each approach this work from different vantage points – as a national climate funder, a community foundation with a climate focus, and a climate intermediary funding frontline movements – we all recognize the vital role that community-based work plays in addressing the climate crisis.

Historically, climate philanthropy has prioritized national and international policy advocacy, which has achieved great impact. At the same time, philanthropy has underfunded local policy, legal, and media initiatives. **As this report shows, community-based climate strategies are indispensable to change at the state, national, and international levels, while also achieving measurable greenhouse gas (GHG) reductions. Community-led climate mitigation efforts depend on an engaged citizenry for their success. As such, they are deep democracy work, offering both a high return on investment (ROI) and the sustainable social and political change that we need now.**

Changing global reliance on fossil fuels requires a tremendous shift, and these kinds of societal shifts always need broad social movements. Such movements cannot happen without community-level work. Community work builds political support for climate efforts by meeting ordinary citizens where they are and tying climate efforts to the issues that matter most to them. Since these strategies often have immediate economic, health, and equity benefits, they can sustain public support regardless of national politics. In this way, support for community-based strategies trickles up to strengthen the transformative change that we need. In contrast, federal and technocratic policies can more easily be reversed by opposing administrations, especially when these policies are disconnected from the daily lives of average citizens.

This report compiles, for the first time, the direct quantifiable carbon mitigation impacts, in metric tons of CO_2e, or $MTCO_2e$, of community-based work. **The results are exciting: community-based strategies have advanced meaningful carbon mitigation at a low cost. The strong ROI of such work makes it an obvious tool to add to our collective funding portfolios.**

While this report explains how community-based work moves the needle toward a 1.5°C or 2°C world, we also want to underscore and elevate the transformational effects of such work on democracy, health, justice, and economic mobility. GHG reduction is a vital outcome of community-based strategies, but it is by no means the only beneficial outcome. If we only count GHGs, we are missing a huge piece of what local initiatives do to advance both climate health and the deep democracy work needed to protect the planet.

Local efforts are a critical part of a comprehensive climate mitigation portfolio that seeks the transformative and durable results that science requires. Funding multiple smaller community-based strategies can be complex, especially for larger national funders. Fortunately, a number of intermediaries and community foundations have established structures enabling national donors to effectively reach the community groups doing this work.

We have much yet to accomplish. We hope this report helps philanthropy make the most of what community-based climate work can achieve. We look forward to working alongside you to make this a reality.

With gratitude,

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Executive summary

This report aims to present a comprehensive account of the benefits and impacts of community-based climate strategies. It both (1) describes *how* community-based strategies can lead to broader climate impact, drawing on specific campaigns as examples, and (2) quantifies the carbon mitigation of those efforts. Further, it describes the additional benefits of community-based strategies, beyond specific mitigation numbers, to elements such as durability, strengthening national policy efforts, and innovating new ideas that can be scaled.

This report draws on a synthesis of academic research on climate efforts and interviews with more than 40 climate experts, practitioners, organizers, and funders. Funders and experts consulted identified several ways that community-based work fits into their theories of change for climate mitigation. A given effort may operate through one or several of these pathways, depending on the circumstances; actors tend to focus on making an impact through one or two (rather than all) of these pathways. Community-based climate work can:

1. **Build an engaged citizenry to create systemic change:** Community-based strategies can generate durable local support based on the direct employment, health, or equity impacts their efforts have on residents' lives. This in turn can build community engagement that supports transformational efforts. Support rooted in community impacts can avoid the lightning rod that climate specific terminology has become.
2. **Implement national mitigation strategies:** Local investments are needed to ensure that national strategies and policies translate into reality and produce their intended impact.
3. **Advance climate progress that can only happen locally:** Some progress can only happen locally, typically because it depends on local decision-making, or because certain places can advance solutions that are politically infeasible elsewhere.
4. **Develop, test, and prove scalable solutions:** States and major cities can be laboratories for developing and testing new policy approaches that can subsequently be adopted more widely.

We also analyzed 15 data points to understand the carbon mitigation impact and ROI of community-based climate strategies. These strategies included state and local legislation; renewable energy development; supply-side campaigns/strategies (e.g., shutting down a coal plant); and implementation efforts (e.g., retrofitting of buildings). **The analysis reveals that these community-based strategies can yield meaningful mitigation impacts with strong ROIs. Many of the efforts profiled will mitigate 1 to 8 million metric tons of CO_2e by 2030 (with some mitigating significantly more), at a cost of well under $1 of local philanthropic investment per metric ton of CO_2e mitigated by 2030.** The table at the end of the executive summary presents an overview of this analysis.

This report does not seek to imply that carbon mitigation is the most important element of local efforts, which often have other economic, health, and equity benefits. Rather, this report aims to fill a gap in the field through a systematic effort to understand the mitigation impacts of community-based strategies. There is an opportunity for philanthropy to become more involved in local efforts that complement federal policy, state policy, and national

interventions. This sort of diversified portfolio can support philanthropy to achieve results at the speed and scale that is required to meet the climate crisis.

The analysis below only captures the direct, quantifiable impact of each effort. The ROI estimates account for the total philanthropic cost of *local* efforts, since the activities of national NGOs and government are usually relatively well funded and taken as a given condition. For additional details on the approach, see the "Analysis methodology" section. For additional details on each data point, see Appendix A.

Overview of ROI of community-based climate strategies

Effort	Metric tons of CO_2e ($MTCO_2e$) avoided			Cost of local efforts	Cost per total $MTCO_2e$ avoided through 2030
	Per year	By 2030	By 2050		
State and local legislation					
New York's Climate Leadership and Community Protection Act	N/A	58-120 M	1.8-1.9 B	$10 M	**$0.08-0.17**
California's Advanced Clean Trucks regulation	N/A	17 M* (2040 estimate)	24 M	$4 M	**$0.24* (through 2040)**
New York City Local Law 154	N/A	2.1 M* (2040 estimate)	Not available	$1.5 M	**$0.71* (through 2040)**
San Jose electric policies (2019 reach code and ordinance, 2020 building code)	N/A	887 K	7.8 M	$1 M	**$1.13**
Renewable energy development					
Empire Wind 1	1.4 M	5.4 M	32.6 M	$2 M	**$0.37**
Sunrise Wind	1.5 M	7.7 M	38.7 M	$200 K	**$0.03**
Eagle Shadow Mountain Solar PV Park	600 K	4.2 M	16.2 M	$500 K	**$0.12**
South Fork Wind	222 K	1.3 M	6 M	$200 K	**$0.15**
California's Solar on Multifamily Affordable Housing program	N/A	600 K-1.4 M	2.2-7.2 M	$14 M	**$10.30-22.43**
Oak Run Solar Project	1 M	5.1 M	25.5 M	$110 K	**$0.02**
Supply-side strategies					
Keystone XL pipeline cancellation	6-12 M	52-105 M	168-337 M	$2.6 M	**$0.02-0.05**
Crawford and Fisk power plants shutdown	2.2 M	39 M	82 M	$1 M	**$0.03**
Enbridge Northern Gateways pipelines cancellation	4-7 M	51-103 M	124-250 M	$8.5 M	**$0.08-0.17**
Implementation efforts					
Industrial decarbonization in Pennsylvania	N/A	5.3 M	9.2 M	$500 K	**$0.09**
Maine's heat pump program**	150 K	1.2 M	4.8 M	-	**-**

* Indicates value for a different time horizon than listed in the column heading, as noted in the cell, based on available data.
** In this case, philanthropy helped launch a quasi-governmental state entity that then led the heat pump work. While philanthropy's role was critical, it is hard to quantify how much philanthropic funding should be attributed to this effort.

Background

For decades, the interplay between local, national, and global climate efforts has helped power the environmental movement. Historically, national philanthropic efforts targeting climate have focused on national and regional policy, supported by a rigorous quantitative methodology centered on greenhouse gas (GHG) mitigation. In recent years, national funders have directed increased resources to community-based climate strategies* – with a particular focus on marginalized communities, who are disproportionately harmed by the climate crisis across the globe.[4] This trend has also played out at the federal level: the landmark climate bill, the Inflation Reduction Act (IRA), implemented the Justice40 Initiative, which required directing significant resources to underserved communities.[5] Following this, the Environmental Protection Agency (EPA) launched an initiative to help local communities navigate and leverage IRA funding.[6] These actions were bolstered by national funders, who coordinated to accelerate local implementation of the IRA (e.g., via Invest in Our Future, BuildUS, the Powering Climate & Infrastructure Careers for All Initiative).[7]

Community-based climate strategies have countless societal, economic, health, and equity benefits that are well understood and tend to be highlighted in public reports – for good reason.[8] This report is not meant to imply that carbon mitigation is the primary or most important element of local efforts. Climate strategies with strong community leadership and participation, whether cancelling the Keystone XL pipeline or banning gas in new buildings, can also provide concrete carbon mitigation impacts. **Yet to date, there has been no systematic effort to compile and analyze the carbon impacts of these local and community-based climate strategies. This report aims to fill that gap** and serve as a bridge between many of the funders and practitioners involved in community-based climate work and those who focus on measuring the carbon impact of mitigation efforts.

When done well, local and national work can create a virtuous cycle to support each other (e.g., local efforts draw on federal subsidies or expertise and research from national institutions; national advocacy efforts mobilize and rely on communities who became climate supporters through local projects).

As this report shows, community-based strategies can yield meaningful mitigation impacts with strong returns on investment (ROIs). Many of the efforts profiled will mitigate 1 to 8 million metric tons of CO_2e by 2030 (with some mitigating significantly more), at a cost of well under $1 of local philanthropic investment per metric ton of CO_2e mitigated by 2030.

This report is not the first to highlight the need to fund community-based climate strategies, and it heavily draws on the insights of the many leaders and thinkers who have grappled with this previously.

* Please note that this report uses the term "community-based strategies" to encompass the wide variety of place-based strategies that involve leadership or meaningful input from local grassroots groups, and which mainly occurred at a local, county, or occasionally state level. These strategies are also sometimes referred to as grassroots, local, front-line, or community-led strategies. This encompasses, but is not limited to, support for litigation and legal advocacy; permitting, administrative, and regulatory processes; investigative journalism and media strategies; community outreach; education and organizing; rallies and protests; and arts and cultural events. This definition excludes efforts that were largely driven and shaped by elites, technocrats, or policymakers. Please also note that community-based strategies can have impact at the local, regional, and/or national levels, with the goal of achieving Paris-aligned GHG reductions.

Community-based climate mitigation: pathways to impact

This report draws on a synthesis of academic research on climate efforts and interviews with more than 40 climate experts, practitioners, organizers, and funders. Funders and experts consulted identified several ways that community-based work fits into their theories of change for climate mitigation. A given effort may operate through one or several of these pathways, depending on the circumstances; actors tend to focus on making an impact through one or two (rather than all) of these pathways. Community-based climate work can:

1. Build an engaged citizenry to create systemic change
2. Implement national mitigation strategies
3. Advance climate progress that can only happen at the local level
4. Develop, test, and prove scalable solutions

1. Build an engaged citizenry to create systemic change

As outlined below, community-based strategies can (1) generate durable local support for strong climate laws and policies, which can in turn (2) enable transformational national change, and ultimately (3) create the enabling conditions that shift the balance of power to make climate progress.

1.1. Community-based climate strategies can generate durable local support for strong climate laws and policies

Ohio's work on renewable energy portfolio standard illustrates a broader principle on the importance of community-level work in advancing and maintaining climate policies. Policy and industry insiders – including lawmakers, utility companies, and environmental NGOs – worked for years to make progress on renewable energy and energy efficiency in Ohio.[9] In 2008, lawmakers in Ohio enacted bold policy that required 12.5% of energy supply to come from renewable resources, mirroring similar efforts in other states (e.g., in California and Oregon). Despite the success of these early efforts, in 2019, opponents enacted legislation to scale back this work. There had been almost no community engagement or support for the original work and, as such, there was almost no public impetus to oppose the reversal (consumer advocates could not even garner enough signatures to create a ballot initiative on the law).[10] In response to these setbacks, local leaders decided to try another approach that would provide a more durable force for climate. They formed a statewide coalition of communities committed to climate solutions, Power a Clean Future Ohio. The effort has received commitments from over 50 communities (e.g., 100% renewable energy by 2050 in Cincinnati and Cleveland) and is tracking their collective mitigation impacts.[11]

Local climate work can have a concrete impact on citizens' lives – like their health or jobs. When people have a stake in an effort, they will stand up to protect it, and their self-interest can transcend ideological views.

As shown in Ohio, local- and state-level work has enabled climate progress to persist throughout the shifting political winds – and climate policy backlash – of the past decade. Climate work becomes meaningful to residents when, for example, renewable energy projects bring job opportunities or when a coal plant closure reduces levels of asthma or pollutants in drinking water. And since self-interest in benefits like clean air or new jobs transcends ideological views on climate change, residents will fight for their interests and the efforts will be more likely to withstand changing political climates. Mayors, county commissioners, and governors – regardless of their political views – will feel pressure to advance these efforts when their constituents support it. Power a Clean Future Ohio, for instance, has gotten conservative mayors to join its efforts because they see concrete benefits to their communities. Climate policy can then become popular policy.

Beyond that, the broader environmental movement has notched a series of victories that have strong enough grassroots support to withstand evolving state and federal policy environments. For example, the environmentally friendly Mid-Barataria Sediment Diversion, which has been in development since 2016, has maintained continued support from New Orleans and Louisiana policymakers. Its support comes from its ability to boost communities' economies, reduce storm surge risk, and ultimately maintain and build more land than simple dredging.[14]

For additional detail on how community involvement can lead to more effective outcomes, please see the box to the right.

1.2. Community-based support can enable transformational national change

Community-based strategies can help catalyze transformative national changes. Many practitioners believe that seeing the benefits and impact of local efforts firsthand – a new solar farm creating jobs, or cleaner water in nearby rivers – can help shift residents' views about what is possible nationally.

From the Civil Rights movement to #MeToo and Black Lives Matter, countless global movements have started from grassroots efforts. This was the case for the environmental

How does community involvement in climate planning affect implementation and success?

When working in communities, enabling more community involvement can produce even more impressive results. Inviting community input does, of course, require more time and resources up front. Yet some studies indicate that climate plans that are designed with community input can lead to more progress than plans designed solely by technocrats (as demonstrated in the example above of Ohio's renewable energy plans). In one study of nine cities that were creating climate plans, participatory processes led to improved climate and energy outcomes over a ten-year timeline.[12] The improved efficacy of projects with community input has also been documented in studies of climate-resilience efforts (e.g., when cities meaningfully collaborated with community groups and built neighborhood capacity to shape and implement resilience solutions, strategies were more effective) and in global development (e.g., intervention design was more effective when communities were consulted on problems).[13]

movement as well. In the late 1960s, local anti-pollution groups began forming in major cities. As they started gaining traction in communities and at the state level, a nationwide Earth Day 1970 was planned.[15] This proved to be a catalyst for the environmental movement and led to 12 major national laws over the following years, which form the basis for today's environmental regulatory framework.[16]

Many have argued that tackling climate change is fundamentally a question of power. Most of the technical and policy changes needed have been known for years, but have been blocked by the power of the fossil fuel industry and its influential financial and political supporters.

While it is hard to predict which efforts will gain national or even international momentum, if even one of them goes viral (e.g., Keystone XL, Standing Rock), the success can provide exponential returns that cover the investment in a broader portfolio. For example, in response to the rapid expansion of liquefied natural gas (LNG) terminals, groups from frontline communities (e.g., Vessel Project, Permian Gulf Coast Coalition, For a Better Bayou, Fishermen Involved in Sustaining our Heritage) started organizing against the terminals.[17] The local groups focused on community education and organization, litigation, investigative journalism, and meetings with local and national government officials. They also partnered with national groups who leveraged their connections with Biden administration officials to amplify local groups' messages.[18] In early 2024, the Department of Energy paused all approvals for new LNG export terminals until it could establish a process to evaluate projects' impacts on climate, communities, and national security.[19] In announcing this policy, the Biden administration directly credited the work of grassroots activists and communities.[20] President Trump reversed this executive action in January of 2025[21]. This rollback could not reverse the impact of the pause. Impacts include continued downward trends in renewable electricity costs[22] and continued upward trends in LNG construction costs,[23] likely to be exacerbated by any tariffs on steel. This example illustrates how local efforts can shape federal decisions, and how their effects outlast unfavorable ones.

As the LNG terminal example shows, even once national policy wins are achieved, significant work – and political power from continued grassroots support – are needed to protect them. Without popular support, these successes remain very vulnerable. From 2017 to 2020, nearly 100 federal environmental rules, including the Clean Power Plan and vehicle emissions limits, were revoked or otherwise rolled back by the Trump administration.[24] Beginning in 2021, many were reinstated through executive orders. These rules made a meaningful impact, despite their repeals, but could have accomplished more if local support was built to sufficiently withstand federal opposition.

1.3. Broad-based support will help create the enabling conditions that shift the balance of power to make climate progress

A wide array of voices – ranging from the United Nations to local climate justice advocates – argue that successfully tackling the climate challenge is fundamentally a question of power.[25] For years, experts have known most of the policy, technocratic, and technological changes needed to mitigate climate change. And yet the entrenched power of the fossil fuel industry has stymied that progress by spreading misinformation about renewable energy, obstructing governments' climate efforts, and pushing anti-climate legislation.[26] Building the capacity of community organizations to harness residents' voices and translate them into policy can help shift the balance of power, especially as fossil fuel lobbying remains

pervasive throughout the government.[27]

Political campaigns and issue-advocacy groups have spent decades trying to crack the elusive question of how to most effectively generate public support and translate it into political power. This undoubtedly requires a mix of tools – compelling communications and narratives, strong platforms and messengers, and meaningful engagement with individuals.[28]

Community-based work is a critical part of shifting this balance of power. Local organizations can build the kind of deep support that requires a long-term, thoughtful presence in the community (e.g., demonstrating commitment over multiple years, not just in the months before an election; engaging on a range of projects that matter to residents, not just ones that have the largest climate impact; using deep canvassing to do what many text blasts could never accomplish).[29] Local groups give communities structures to engage and mobilize residents.[30] In an era of diminished voluntary associations, the structures formed by local organizations – whether they are primarily climate-focused or not – are crucial for these efforts. These strong relationships can be leveraged into political power when the moment of need arises (e.g., when a federal climate bill is under consideration). In such moments, rather than acting alone, local groups can rely on regional and state coordination bodies to help align and scale efforts. The fossil fuel industry appears to believe that popular opposition can threaten its work (i.e., by eroding the industry's social license), and thus has taken increasingly strong measures to try to hold it back (e.g., targeting the public with misleading information, fighting shareholder advocacy and ESG policies, and supporting laws that restrict free speech and association).[31]

2. Implement national mitigation strategies

Local investments are crucial for ensuring that national strategies and policies are properly implemented.

The national Beyond Coal Campaign, for example, was more successful in closing coal plants in places where it had the resources to meaningfully engage the local community. After a given plant was slated to close, opponents often would try to delay the shutdown. In most locations, the communities who were involved with the campaign successfully blocked those efforts and kept the retirements on track. However, in some places where community engagement was minimal, opponents succeeded. Wisconsin's Columbia Energy Center, for example, had its retirement delayed by at least two years, and there was minimal local engagement to push back on this.[32]

Many of the large-scale renewable energy efforts that national policymakers seek to encourage also hinge on local efforts. Under the US land use planning framework, communities often have the authority to approve new renewable energy developments. And getting residents to feel comfortable with these projects and to see the benefits they can provide often requires engagement from local organizations that have the community's trust. Without the right local engagement, many of these projects will be blocked, and the national policies and incentives aimed at funding new projects will never have their desired impact. Indeed, 15% of counties have blocked the development of utility-scale solar or wind projects – the way the fossil fuel industry has organized local opposition shows the power of community-based strategies, which can also be leveraged to oppose

The Beyond Coal Campaign was more successful in closing coal plants in places where it had the resources to meaningfully engage the local community.

climate goals.[33] These dynamics are explored further in the "Renewable energy development" section later in this report.

Finally, the ongoing implementation of the IRA also illustrates this dynamic. The $27 billion Greenhouse Gas Reduction Fund depends on a network of community development financial institutions, credit unions, nonprofits, green banks, and local government agencies to help finance a range of building decarbonization, clean transportation, and renewable energy projects. This will require providing loans, rebates/incentives, and technical assistance to individuals and small businesses, with a focus on disadvantaged communities. Doing this will require partnering with local organizations that have significant staff capacity, technical expertise, and trust in these disadvantaged communities.[34]

Smart policies and well-designed incentives are usually not enough to get people to change their behavior. Validation, outreach, and hands-on support from trusted sources in one's own community can help close the adoption gap.

Getting homeowners to install heat pumps or induction stoves cannot be accomplished solely with directives from Washington. Smart policies and well-designed incentives are usually not enough to get people to change their behavior: validation, outreach, and hands-on support from trusted individuals and organizations in one's own community can help close the adoption gap.[35] Similarly, additional support can help ensure that a local school or affordable housing operator can retrofit its buildings. Getting different organizations to opt in and successfully navigate projects will require significant outreach, education, and technical assistance. And in the disadvantaged communities where this work is intended to focus, this kind of organizational capacity is likely to be less robust, thus requiring even more local implementation support (e.g., to access and blend multiple capital sources).[36]

3. Advance climate progress that can only happen at the local level

Some progress can only happen at the local level, typically for one of two reasons: (1) some climate efforts depend on local decision-making or (2) certain places can advance solutions that are politically infeasible elsewhere.

3.1. Many climate efforts depend on local decision-making

State and local governments play a large role in regulating the building, housing, and transportation sectors, which are responsible for the bulk of global emissions.[37] They also have significant power over land use decisions – which can either enable or block fossil fuel projects or enable or block renewable energy projects (as noted in the section above). Finally, public utility commissions have jurisdiction over state energy supply, and their approvals and cooperation are critical for transitioning to clean energy. As such, these decision-makers have tremendous power to either accelerate or stall efforts.

Community residents can either be directly involved in these types of decisions (e.g., via public hearings, zoning approvals), or influence the decision-makers (e.g., electing public utility commissioners, putting political pressure on the leaders that appoint commissioners). Having community groups that can organize citizens, educate them about these issues, and create pressure to support climate projects can meaningfully increase these efforts' likelihood of success.

3.2. Certain places can advance solutions that are politically infeasible elsewhere

Local efforts can also help make progress in broader geographies that are unfriendly to climate issues. Given American political dynamics, some states are likely to make only minimal progress, if any, on climate. Yet there are often opportunities to make an impact at the local level – whether in major cities (e.g., via building regulations) or in rural communities (e.g., reducing pollution from a nearby plant, or creating jobs through a new renewable project). While dispersed, these efforts can add up to significant impact, as demonstrated by Bloomberg Philanthropies' American Cities Challenge. The effort helped 25 cities reduce emissions by 74 million metric tons from 2020 through 2030, with a total investment of $70 million (discussed in more detail in the "State and local legislation" section below).[38]

4. Develop, test, and prove scalable solutions

States and major cities can be laboratories for developing and testing new policy approaches that can subsequently be adopted more widely. This approach has been effective across a range of issue areas: for example, Massachusetts's 2006 health care reform law served as a model for the Affordable Care Act in 2010.[39]

In the climate realm, California mandated the nation's first GHG emissions standards for cars in 2004,[40] and the EPA eventually followed suit years later.[41] Colorado passed a ground-breaking set of methane regulations in 2014, which provided a blueprint and lessons to pave the way for other states like Wyoming, and eventually the federal government, to pass similar methane rules.[42] More recently, in 2019, New York State enacted a climate bill that served as a model for similar climate bills in other states (e.g., Illinois, Massachusetts). The New York law's mandate for investment in underserved communities also was a model for the national Justice40 Initiative, which shapes spending for the IRA and other federal programs.[43] The New York law is explored in more detail in the "State and local legislation" section.

The pathways described above illustrate how community-based strategies can lead to broader progress on climate change. The following section turns to analyzing the directly quantifiable impacts of specific community-based mitigation efforts.

Approach for analysis

This report aims to provide a quantitative analysis of the direct emissions reductions of community-based climate strategies. As mentioned above, this is not meant to imply the GHG reductions are the most important dimension of these efforts (e.g., above health or economic equity impacts); rather, we are focusing on this dimension given funder interest and the lack of comprehensive data on it. In addition, as outlined in "The case for community-based climate mitigation work" section, this work can lead to transformative and long-lasting climate impacts at the national level, even if it is hard to directly quantify its role. As a result, our analysis below focuses on the most directly tangible and quantifiable emissions impacts this work can have – by definition, a limited view of only one dimension of impact.

Inclusion criteria

We conducted desk research and spoke to local and national experts and practitioners to source data points for our analysis (see Appendix B for a list of interviewees). Please note the data points included are only a small subset of all the community-based work nationwide, and were chosen based on available information about the criteria outlined below. Data points had to meet five parameters to be included in the analysis:

- **Represent community-based strategies.** Local grassroots organization(s) had to have meaningful involvement that contributed to the effort's success. Local groups did not necessarily need to be the primary leaders of an effort for that effort to be included (e.g., a renewable energy developer is trying to build a project, and a local group works to build community support); however, local groups needed to do more than simply signing their names on a petition.
- **Have direct, quantifiable emissions impacts.** To be conservative and consistent in the analysis, we only included efforts with direct emissions impacts (e.g., directly reducing energy consumption or creating cleaner energy sources; not second-order impacts that an effort had on public sentiment, later policy adoption, etc.). We also only included efforts where the GHG impacts could be quantified with relative certainty. For example, the LNG export pause continues to have a significant impact, with multiple projects still unable to launch and rising interest rates and construction costs exacerbating investor uncertainty and putting the viability of some projects into question.[44] However, experts cannot yet quantify the GHG impact of the delay.
- **Have a GHG impact at scale.** Demonstration projects that had a clear emissions impact at a very small scale (e.g., 100 homes in a development, a community center) were not included. These efforts are valuable for piloting what can be possible but are not designed to make an impact at scale on their own.
- **Have already happened or have largely certain impacts.** To increase certainty, the analysis focused on efforts that have already happened, or that are in progress and have relatively certain impacts (e.g., a law that has passed and includes enforcement mechanisms, a project in the construction phase whose emissions benefits can be projected with a high level of confidence). We leave it to others to model the potential impacts of other efforts (e.g., proposed laws that have not yet passed, the impact of widespread retrofitting or new clean energy technologies).

- **Are located in the US and Canada.** The dynamics and impacts of local climate efforts differ significantly by country. As a starting point, we have analyzed efforts in the US and Canada. We believe subsequent analyses in other global contexts would add valuable insights.

Analysis methodology

We approached the analysis as follows. We have attempted to be conservative in our approach; as a result, the returns on these efforts may often be larger than presented below.

Emissions reductions

Emissions reductions represent reductions compared to a "business as usual" scenario. Emissions reductions for each project were sourced from existing analyses by reputable climate experts, when available (e.g., RMI, World Resources Institute, or privately commissioned analyses on a specific project). When not available, emissions numbers were calculated using respected public tools and calculators (e.g., the EPA's AVERT calculator for renewable energy projects). In the small number of cases where neither were available or applicable to a project, estimates were calculated based on guidance from experts and input from prior studies or analyses (see Appendix A for details on the calculation approach for each data point). Calculation approaches were vetted by multiple experts to ensure their rigor. As noted above, emissions estimates only include changes that could be directly attributed to the effort with a high degree of certainty (one can always add to these estimates with expected secondary effects).

Estimates were standardized to reflect reductions in metric tons of CO_2e ($MTCO_2e$) occurring annually, cumulatively by 2030, or cumulatively by 2050, as applicable.

Estimates of impact were not discounted to try to estimate the "share" of credit that philanthropy could take for the impact (e.g., in situations where government actors or businesses could also get partial credit for the success). This kind of discounting is inherently subjective, and this report presents the unadjusted numbers so that readers can make their own decisions about whether and how to discount them.

Costs

Our analysis includes the estimated cost to philanthropy *for the local/community-based portions of each effort*. To gather this data, we spoke to funders and/or local practitioners who led the effort and had a bird's-eye view of the players and funding involved.

The cost estimates capture the total costs across all funders, not just a single funder. Given that this report is designed to inform philanthropic decision-making, the ROI does not include resources from government or private developers (and in general, philanthropy aims to leverage these resources).

Cost estimates capture the spending of all local players involved (e.g., if several partners worked together on an effort). We asked local leaders to estimate the true cost of the work to their organization, even if they did not have dedicated grants to cover all of it (e.g., include cost of staff who worked on the effort even if they were funded by general operating funds). Costs did *not* include the expenses of national groups who contributed technical assistance or expertise to the efforts, since their activities and funding are typically relatively well-funded and therefore taken as a given condition. However, national groups' re-granting of funds to

local groups was counted. The estimates aimed to capture the broad set of costs for an effort – for instance, the groundwork and capacity that was required several years before a campaign was in its peak phase.

Additional methodological notes

This analysis has several noteworthy caveats.

It endeavors to provide as clear a picture as possible about the order of magnitude of the spending and impact of community-based climate work. All estimates aim to be as accurate as possible but have obvious limitations (e.g., local groups not precisely tracking staff hours spent on each initiative, uncertainty about energy use rates). These likely do not change the broader trends.

Since the analysis only includes efforts that had carbon impacts, it necessarily excludes efforts that failed for one reason or another (e.g., a policy was not adopted, an effort to open a new solar plant was blocked). Any funding portfolio is assumed to include some wins and some losses, and these successes should be considered in that context.

The analysis only looks at the ROI in terms of directly quantifiable emissions benefits. One could show a higher ROI for these efforts by including their health, equity, or social benefits; secondary or less certain emissions benefits they might have; or their impact in shifting public opinion to enable transformative policy changes (which cannot be directly measured and attributed to a given effort).

As with all climate analyses, the longer the projected impact timeline, the more uncertainty there is about the impact (e.g., energy markets might shift in unexpected ways by 2050, which would change the numbers).

Finally, since the examples included are limited to efforts with directly quantifiable carbon impacts, they necessarily exclude other community-based strategies that might have major impacts on changing public sentiment or leading to national climate action. Therefore, these examples should not be considered a comprehensive illustration of the types of impactful community-based strategies.

Note that emissions reductions were calculated using third-party tools, without requiring specific calculations from local groups. Local groups interviewed reported limited ability to conduct these kinds of carbon calculations, and funders will typically be able to handle those externally based on the project data (e.g., output of a new solar project, capacity of pipeline shut down), without requiring additional reporting from grantees.

Quantitative impact of community-based strategies

The data points below were sourced from desk research and interviews with experts and practitioners. They are organized into four categories: (1) state and local legislation, (2) renewable energy development, (3) supply-side strategies, and (4) implementation efforts. Each is covered in its own section below. For additional details on each data point, see Appendix A.

The analysis reveals that community-based strategies can yield meaningful mitigation impacts with strong ROIs. Many of the efforts profiled will mitigate 1-8 million metric tons of CO_2e by 2030 (with some mitigating significantly more), at a cost of well under $1 of local philanthropic investment per ton of CO_2e mitigated by 2030.

Table 1: Overview of ROI of community-based climate strategies

Effort	Metric tons of CO_2e ($MTCO_2e$) avoided			Cost of local efforts	Cost per total $MTCO_2e$ avoided through 2030
	Per year	By 2030	By 2050		
State and local legislation					
New York's Climate Leadership and Community Protection Act	N/A	58-120 M	1.8-1.9 B	$10 M	**$0.08-0.17**
California's Advanced Clean Trucks regulation	N/A	17 M* (2040 estimate)	24 M	$4 M	**$0.24* (through 2040)**
New York City Local Law 154	N/A	2.1 M* (2040 estimate)	Not available	$1.5 M	**$0.71* (through 2040)**
San Jose electric policies (2019 reach code and ordinance, 2020 building code)	N/A	887 K	7.8 M	$1 M	**$1.13**
Renewable energy development					
Empire Wind 1	1.4 M	5.4 M	32.6 M	$2 M	**$0.37**
Sunrise Wind	1.5 M	7.7 M	38.7 M	$200 K	**$0.03**
Eagle Shadow Mountain Solar PV Park	600 K	4.2 M	16.2 M	$500 K	**$0.12**
South Fork Wind	222 K	1.3 M	6 M	$200 K	**$0.15**
California's Solar on Multifamily Affordable Housing program	N/A	600 K-1.4 M	2.2-7.2 M	$14 M	**$10.30-22.43**
Oak Run Solar Project	1 M	5.1 M	25.5 M	$110 K	**$0.02**
Supply-side strategies					
Keystone XL pipeline cancellation	6-12 M	52-105 M	168-337 M	$2.6 M	**$0.02-0.05**
Crawford and Fisk power plants shutdown	2.2 M	39 M	82 M	$1 M	**$0.03**
Enbridge Northern Gateways pipelines cancellation	4-7 M	51-103 M	124-250 M	$8.5 M	**$0.08-0.17**
Implementation efforts					
Industrial decarbonization in Pennsylvania	N/A	5.3 M	9.2 M	$500 K	**$0.09**
Maine's heat pump program**	150 K	1.2 M	4.8 M	-	**-**

* Indicates value for a different time horizon than listed in the column heading, as noted in the cell, based on available data.
** In this case, philanthropy helped launch a quasi-governmental state entity that then led the heat pump work. While philanthropy's role was critical, it is hard to quantify how much philanthropic funding should be attributed to this effort.

1. State and local legislation

State and local governments can play a crucial role in addressing climate change for several reasons. As discussed above, they can pilot new policy approaches that can then be replicated elsewhere, or advance efforts in geographies where broader change might not be politically feasible. States may lead mitigation efforts when the federal government is not doing so, and cities may lead mitigation efforts when their state leadership is not doing so (such as Power for a Clean Future Ohio).

And finally, state and local efforts can have a meaningful impact of their own. A large portion of the country's population and emissions are concentrated in certain states and urban areas.[45] Local governments can move the needle on climate mitigation through their ability to regulate construction, transportation, and energy sources, and their ability to provide tax credits or other incentives.

The Bloomberg Philanthropies American Cities Challenge illustrates how individual city efforts can add up to significant impact. The Challenge provided expert support (e.g., staff capacity, technical assistance, communications resources) and funded local groups (e.g., to organize and build public support, to lead research efforts) in 25 cities with ambitious carbon reduction goals. Bloomberg Philanthropies invested $70 million across the cities, which are now on track to reduce emissions by 74 million metric tons between 2020 and 2030.[46]

State and local legislation – data points

Effort	Metric tons of CO_2e ($MTCO_2e$) avoided			Cost of local efforts	Cost per total $MTCO_2e$ avoided through 2030
	Per year	By 2030	By 2050		
New York's Climate Leadership and Community Protection Act: A landmark climate bill, drafted by a broad grassroots coalition, that sets emissions caps and funds disadvantaged communities	N/A	58-120 M	1.8-1.9 B	$10 M	**$0.08-0.17**
California's Advanced Clean Trucks regulation: Requires manufacturers to sell zero-emission trucks as an increasing percentage of their annual California sales from 2024 to 2035; was passed with input and support from community groups	N/A	17 M *(2040 estimate)	24 M	$4 M	**$0.24* (through 2040)**
New York City Local Law 154: A law that bans gas for new construction, and which was passed as the result of advocacy by local grassroots groups	N/A	2.1 M* (2040 estimate)	Not available	$1.5 M	**$0.71* (through 2040)**
San Jose electric policies (2019 reach code and ordinance, 2020 building code): Prohibit natural gas infrastructure in all new construction in San Jose; the regulations were supported by youth activists, labor representatives, parents' groups, and environmental groups	N/A	887 K	7.8 M	$1 M	**$1.13**

* Indicates value for a different time horizon than listed in the column heading, as noted in the cell, based on available data.

Case study: New York's Climate Leadership and Community Protection Act

Avoids 58-120 million metric tons of CO_2e by 2030 at a cost of ~$0.08-0.17 per metric ton avoided

New York State passed its landmark climate law, the Climate Leadership and Community Protection Act (CLCPA), in 2019. The CLCPA commits to 100% clean electricity by 2040, targets an 85% reduction in economy-wide GHG emissions by 2050 (from 1990 levels), and directs 35% of state climate and energy funding to disadvantaged communities. The legislation's targets have clear enforcement mechanisms and are expected to avoid 58-120 million metric tons of CO_2e emissions by 2030.[47]

This legislation emerged after years of organizing, campaigning, and advocacy efforts by New York Renews. NY Renews assembled a statewide coalition of 300+ grassroots groups with diverse priorities – including labor unions, faith communities, and community groups – and gathered their input on what climate-related efforts mattered to them. Based on the coalition's input, NY Renews proposed initial policies in 2015 and spent the subsequent years advocating for support alongside its partners.[48]

NY Renews worked closely with non-climate-focused groups to build broad support for the bill over several years. NY Renews was able to provide some sub-grants to these groups to support their participation, though many also provided significant in-kind staff time. The coalition used a combination of insider strategies (e.g., working directly with policymakers), direct actions (e.g., protests), and publicity efforts to help pass the CLCPA.

The State Senate flipped to strong progressive control in 2018, providing the coalition with a policy window.[49] Near the end of the legislative session in 2019, the governor announced that the bill would need to be put on hold until the next session. In response, the coalition organized over 400 activists – including 200 taxi drivers who were invested in the CLCPA's employment benefits – who blockaded the door to the governor's office. A month later, near the end of the session, the governor signed the bill into law.

NY Renews and its partners have continued to shape the bill's implementation through the state legislature's Climate Action Council and Climate Justice Working Group.[50] The bill's passage has also strengthened NY Renews' and its partners' subsequent climate efforts in regulation and public education.

The CLCPA will help decarbonize New York's economy, expand large-scale renewable energy sources, and protect other climate laws that have come under attack (e.g., secure the ability to pass gas bans). It also provides a host of health equity and economic benefits, especially to marginalized communities. Further, the bill has become a model for other states' climate bills (e.g., Illinois,[51] Massachusetts[52]) and even helped shape federal legislation (e.g., the IRA's Justice40 Initiative structure for identifying and investing in disadvantaged communities).

2. Renewable energy development

Renewable energy development – including wind, solar, battery storage, and transmission lines – is crucial to meeting climate goals.[53] While renewable energy has broad public support, communities in the US and across the world have at times opposed renewable power development in their areas due to environmental, cultural, social, and economic

concerns (often magnified by deliberate campaigns from the fossil fuel industry to frame these projects negatively).[54]

In the US, 15% of counties have blocked the development of utility-scale solar or wind projects, and several states – including Vermont – have made it nearly impossible to build new projects.[55] The number of counties blocking this work is growing quickly and includes areas in the Midwest and South, which have particularly good conditions for these projects.[56] Even in areas where renewable energy projects remain legal, community opposition to a specific project can torpedo it. In a study of domestic opposition to clean power projects from 2008 to 2021, roughly half of projects that faced opposition were permanently cancelled (and another third faced significant delays).[57]

Wind and solar developments require vast amounts of land, and only limited land meets the required technical and financial specifications.[58] As a result, if renewables are to grow to the needed levels, the country cannot afford to have too many projects blocked.

While developers have incentives to engage communities and gain their support, the data cited above and experience in the field show they are not always able to effectively do so.[59] Structurally, philanthropy is better positioned to build community buy-in, which is often cultivated over the course of many years, through a range of efforts on different topics that matter to the community. Philanthropy, including place-based philanthropy, is inherently better able to build long-term relationships than a developer that is coming in to focus on a short-term need. Jane Kleeb's new Energy Builders project, for example, aims to use local engagement to secure support for renewable projects (aiming to unblock previously blocked projects that could reduce emissions by 9.3 million metric tons per year across three states).[60]

Fifteen percent of US counties have blocked the development of utility-scale solar or wind projects, and several states have made it nearly impossible to build new projects.

The emissions numbers in the table below were drawn from published reports on each project's impact (when available), and from the EPA's AVERT calculator.[†]

Renewable energy development – data points					
Effort	Metric tons of CO_2e ($MTCO_2e$) avoided			Cost of local efforts	Cost per total $MTCO_2e$ avoided through 2030
	Per year	By 2030	By 2050		
Empire Wind 1: Offshore wind farm in New York designed with significant input from communities	1.4 M	5.4 M	32.6 M	$2.0 M	**$0.37**
Sunrise Wind: Offshore wind farm in New York that has a host community agreement with affected onshore localities, which local groups advocated for	1.5 M	7.7 M	38.7 M	$200 K	**$0.03**
Eagle Shadow Mountain Solar PV Park: A solar plant in the Moapa River Indian Reservation	600 K	4.2 M	16.2 M	$500 K	**$0.12**

[†] The AVERT Web Edition was used for these estimates. Experts recommended AVERT as the most reliable public tool, though its estimates are less precise the further out the projections are stretched (due to changes in the broader grid, etc.).

that was supported by and is operated by the tribe					
South Fork Wind: Offshore wind farm in Long Island that faced opposition but was approved thanks to advocacy from local groups	222 K	1.3 M	6.0 M	$200 K	**$0.15**
California's Solar on Multifamily Affordable Housing program: Financial incentives to install solar panels on low-income rental buildings, which was advocated for and is now administered by local groups	N/A	600 K-1.4 M	2.2-7.2 M	$14 M	**$10.30-22.43**
Oak Run Solar Project: The largest agrivoltaic project in Ohio, which a coalition of community groups advocated for	1 M	5.1 M	25.5 M	$110 K	**$0.02**

Case study: Empire Wind 1

Avoids 5.4 million metric tons of CO_2e by 2030 at a cost of ~$0.37 per metric ton avoided

New York State broke ground on Empire Wind 1, an offshore wind project, in early 2024. Once the farm enters operation in 2027, it will reduce emissions by roughly 1.4 million metric tons of CO_2e annually (~5.4 million metric tons by 2030).[61] When announced, this effort was part of the largest combined solicitation for renewable energy ever issued in the US.[62]

The solicitation and subsequent approvals for the project followed years of advocacy by New Yorkers for Clean Power, the New York Offshore Wind Alliance, the Citizens Campaign for the Environment, and UPROSE (a neighborhood group based in Sunset Park, the underserved area where Empire Wind 1 will have its onshore base). The latter two groups have worked since 2015 to create an equitable offshore wind industry, with a "green re-industrialization" of the Industry City area, New York City's largest industrial waterfront.[63] The area was long dormant and originally slated for luxury apartments and retail shops, but UPROSE fought to prevent further gentrification and to instead develop the clean energy industry.[64] These groups were ultimately successful in getting former Governor Cuomo to commit to increasing offshore wind power, and to doing so in a way that prioritizes low- and moderate-income New Yorkers.[65] The organizations remained involved after the state's initial announcements, and have helped with subsequent project approvals.

These groups are continuing to shape the project's design, as developers have integrated community members in decision-making. The Empire Wind 1 developer worked with UPROSE and the New York Environmental Justice Alliance[66] for over two years,[67] enabling community residents to inform the project's supply chain, materials, waste disposal, and hiring practices.[68] The developer also worked with the Sunset Park Task Force and the New York City Economic Development Corporation to create the Offshore Wind Ecosystem Fund, a $5 million clean energy community grant program to support sustainable growth, workforce development, underserved communities, and climate justice in the city's emerging offshore wind ecosystem.[69]

3. Supply-side strategies

Burning fossil fuels accounts for almost 75% of total US GHG emissions.[70] Fossil fuel use is deeply entrenched in daily life (e.g., transportation, electric power), and renewable energy is not yet being produced at scale for the entire country. Many experts – including the International Energy Agency – argue that to effectively reduce fossil fuel use, work is needed on both the demand side (e.g., reducing energy consumption, such as via more efficient homes or cars) and the supply side (e.g., decreasing dependency on coal plants or pipelines).[71] Experts assert that to reach carbon mitigation goals, society must phase down fossil fuel production while ramping up renewable energy production,[72] since upstream efforts have higher abatement certainty than demand-side initiatives.[73] They argue that limiting fossil fuel supply can send clear market signals that help prevent the construction of new infrastructure that locks in future emissions.[74]

"No one in their right mind would try to permit a pipeline to the Eastern Seaboard [from Appalachia] right now. It's a losing proposition."

-VP of natural gas extraction company

For example, developers face heightened risk when seeking to build pipelines in Appalachia because of arduous federal regulatory processes and expensive, drawn-out legal battles initiated by community groups.[76] This has effectively locked more than 210 trillion cubic feet of untapped natural gas in the ground.[77] A vice president of a natural gas extraction company was recently quoted saying, "No one in their right mind would try to permit a pipeline to the Eastern Seaboard right now. It's a losing proposition."[78] And across the industry, disruptions and the resulting delays have had a business impact – the cost of capital for fossil fuel producers has spiked dramatically over the last ten years, making it harder to secure needed investments for growth.[79] Beyond the direct impacts these supply-side strategies have on limiting project development, they can also sometimes create new legal precedents or catalyze broader narrative and public opinion shifts (as discussed in "The case for community-based climate mitigation" section).

And finally, each individual supply-side disruption – even one that does not lead to broader change – has an impact. Two analysts have put forward the conservative assumption that global oil consumption decreases by 5-10% of a pipeline's proposed capacity. We used this assumption in

How do market dynamics shape the true impact of blocking a pipeline?

Economists have estimated that for every barrel of oil kept off the market, global oil production decreases by 40-50% of a barrel (based on analyses of market demand and price elasticity, since in response to the disruption other sources will increase production and replace 50-60% of the curtailed barrel).[75] This assumes that the curtailed supply is permanently taken off the market. In reality, some of the supply that is blocked can make it out of the ground and get used in other ways – whether via alternate pipeline routes, via freight train, or by being used more locally. However, the added costs this introduces (e.g., cost of train transport or less convenient pipeline routes) often means that it is only economically viable to carry a smaller share of the supply to market. Analysts have not been able to quantify the overall reduction in global supply that results from a blocked pipeline. Two analysts have suggested that assuming global oil consumption decreases by 5-10% of a pipeline's proposed capacity would be a conservative assumption, which we used in our calculations below.

our calculations below. Please see the box above for additional context on these dynamics.

Supply-side strategies – data points					
Effort	**Metric tons of CO_2e ($MTCO_2e$) avoided**			**Cost of local efforts**	**Cost per total $MTCO_2e$ avoided through 2030**
	Per year	**By 2030**	**By 2050**		
Keystone XL pipeline cancellation: The pipeline, which would have transported crude oil from Canada to the Gulf Coast, was opposed by Indigenous peoples, farmers, ranchers, and environmentalists; the local campaign eventually gained significant national attention	6-12 M	52-105 M	168-337 M	$2.6 M	**$0.02-0.05**
Crawford and Fisk power plants shutdown: Residents near two coal plants in Chicago who were directly impacted by the plants' pollution organized with local groups and environmentalists to get the plants closed	2.2 M	39 M	82 M	$1 M	**$0.03**
Enbridge Northern Gateways pipelines cancellation: The pipelines, which would have connected Alberta and British Columbia, were blocked by strong coalitions of Indigenous peoples, municipalities, and environmentalists	4-7 M	51-103 M	124-250 M	$8.5 M	**$0.08-0.17**

Case study: Keystone XL pipeline cancellation

Avoids 52-105 million metric tons of CO_2e by 2030 at a cost of ~$0.02-0.05 per metric ton avoided

The Keystone XL tar sands pipeline was abandoned by its developer in 2021 after more than 10 years of local resistance, legal battles, and executive orders. Its cancellation avoids 52 to 105 million metric tons of CO_2e emissions by 2030 alone.

The effort to oppose Keystone XL originated in 2006, when three Indigenous women approached the Indigenous Environmental Network about destructive tar sand mining in their areas.[80] They noticed that the new mining was contaminating local water supplies; harming hunting, trapping, and fishing; and causing forests to be razed. In the following years, environmental groups in Canada and the US explored several strategies to prevent the rapid expansion of the tar sands industry in Alberta, including stopping new and expanded pipelines such as Keystone XL. Indigenous groups, ranchers, and farmers along the proposed pipeline route began discussing the pipeline's detrimental impact on their communities. This coalition represented an unlikely alliance (later calling itself the "Cowboys and Indians Alliance"), and many of its members were primarily concerned about the pipeline's impact on their land and health rather than climate change. Their grassroots advocacy (e.g., by Bold Nebraska, Tribal Nations in Nebraska and South Dakota) – which for some years operated on a shoestring budget – eventually attracted national environmental groups (e.g., NRDC, Sierra Club, 350.org). Collectively, the partners pursued a mix of research, litigation, and advocacy strategies. Over time, the coalition's combined, consistent campaign activity (e.g., place- and culturally based

actions like barn raisings and Ponca sacred corn planting, combined with litigation, sit-ins, rallies, and letter-writing campaigns) began to garner national attention.[81]

In August 2011, Tar Sands Action organized 1,200 demonstrators to risk arrest outside of the White House, which proved to be a turning point that brought increased national attention to the effort.[82] Leading scientists, economists, unions, and world leaders began voicing opposition to the project. In November, more than 15,000 people returned to surround the White House in another demonstration, leading to the Obama administration issuing its first delay just weeks later. Grassroots activists also bird-dogged President Obama at events all over the US, while political donors were reported to have expressed their opposition to Keystone XL privately to the president. In February 2013, more than 50,000 people came to DC to a "Forward on Climate" demonstration to pressure President Obama to reject the project. In 2014, activists submitted more than 2 million comments to the State Department during a public comment period, urging it to reject the pipeline.[83]

Concurrently, in 2013 and 2014, the fossil fuel industry directed more than $721 million to allied candidates and political parties, television ads, and lobbyists for the 2014 midterm election.[84] Despite this, the combination of local and national environmental efforts – of grassroots and grasstops pressure – ultimately proved successful. In November 2015, the Obama administration denied the cross-border permit necessary to build the Keystone XL pipeline. The president's use of a climate litmus test ultimately informed the administration's 2016 guidance to federal agencies to fully consider emissions, warming implications, and other impacts (e.g., sea rise, drought) in federal permitting decisions.[85]

When President Trump assumed office in January 2017, his administration reissued the project permit, but this ultimately led to multiple false starts since each reissue attempt was blocked by legal efforts led by farmers, ranchers, tribes, and conservation groups.[86] Their collective efforts kept the project stalled from 2017 through 2020. On President Biden's first day in office in 2021, the Keystone XL pipeline permit was revoked. A few months later, the developer announced it was abandoning the project.

This project was perhaps the highest-profile effort to show how local climate efforts can garner significant national attention, and ultimately defeat a fossil fuel project. It has gone on to inspire and influence various other campaigns (e.g., Dakota Access Pipeline, Atlantic Coast Pipeline) and has proved the systemic impact that community-led opposition can have on the fossil fuel industry. For the sake of consistency, our analysis focused on the cost of the local efforts involved, though significant national resources were also critical for the effort's success.

4. Implementation efforts

Translating strong policies and incentives into reality (e.g., retrofitting homes and businesses, updating industrial equipment) often requires robust support for the "last mile" of the work, including education and technical assistance. For instance, state rebate programs (e.g., for electric vehicles) will be ineffective if people are unaware of the programs or cannot easily access them. This is where local efforts – which can provide the hands-on support and credibility that is key to adoption – can play an important role.[87]

For example, Maine has launched several implementation-focused efforts to reach its climate targets. The state committed to installing 100,000 heat pumps by 2025 and to weatherizing at least 35,000 homes and businesses by 2030.[88] This effort has been incredibly

successful: in September 2023, Maine reached the 100,000 heat pump mark two years ahead of schedule and set a new goal to install another 175,000 by 2027.[89] Much of this work is carried out by Efficiency Maine, a quasi-governmental body that, among other things, helps consumers and businesses navigate this work. Efficiency Maine provided easy-to-access rebates, a database of vendors and installers, and significant advertising and educational materials, while working directly with department stores to lower the retail price of the devices.[90] By making the purchase and installation process significantly simpler for consumers and contractors, Maine effectively increased adoption rates. Efficiency Maine's origin story traces back to efforts by non-profit leaders who advocated for creating the entity and drafted early plans for it. As such, it illustrates another way that philanthropic support for local efforts can be adopted and scaled by government.

Implementation efforts – data points

Effort	Metric tons of CO_2e ($MTCO_2e$) avoided			Cost of local efforts	Cost per total $MTCO_2e$ avoided through 2030
	Per year	By 2030	By 2050		
Industrial decarbonization in Pennsylvania: EPA grant written by a local nonprofit on behalf of the State of Pennsylvania; the grant would help industrial businesses adopt cleaner equipment and technologies ($396M received via EPA's Climate Pollution Reduction Grants program)	N/A	5 M	9 M	$500 K	**$0.09**
Maine's heat pump program:* Financial incentives and consumer information to support household heat pump installation. Efficiency Maine, which administers the program, was created in large part due to advocacy by local groups	150 K	1.2 M	4.8 M	-	**-**

* In this case, philanthropy helped launch a quasi-governmental state entity that then led the heat pump work. While philanthropy's role was critical, it is hard to quantify how much philanthropic funding should be attributed to this effort.

Case study: industrial decarbonization in Pennsylvania

Avoids 5 million metric tons of CO_2e by 2030 at a cost of ~$0.09 per metric ton avoided

The Ohio River Valley Institute (ORVI), an Appalachia nonprofit, has been working alongside its partners over the past several years to help implement Pennsylvania's Climate Action Plan 2021.[91] If successful, these efforts will help avoid 5 million metric tons of CO_2e emissions by 2030.

As part of this, ORVI supported the state's EPA application for funding to decarbonize Pennsylvania's industrial sector. The money would help reduce emissions from various industrial sectors (e.g., fossil fuel extraction and delivery, metals), which emit one-third of Pennsylvania's GHGs.[92] The program would re-grant EPA funds to small- and medium-sized businesses to support equipment and technology upgrades that improve energy efficiency (e.g., electrification, use of low-carbon fuels, onsite renewable energy).[93]

To develop the proposal, ORVI commissioned several studies and reports that identified

and quantified a pathway to industrial decarbonization (e.g., through electrification, fuel switching).[94] It also led outreach to labor groups and businesses to gain broader support for the plan. The submission included 20+ letters of support from industrial businesses, and 30+ letters of support from other local groups.[95]

The project received $396 million in federal funding through the EPA's Climate Pollution Reduction Grants program. This effort can serve as a model for industrial implementation efforts: it included a comprehensive analysis of the businesses involved and the changes each could make, a detailed plan for funding and supporting those changes, and a process to gain buy-in from the relevant stakeholders.

The road ahead

Community-based climate strategies have played a key role in mitigating climate change, through both their direct impacts and the transformative national changes they can bolster. This support is vital in the face of hostility toward climate policy. Community-based efforts have typically done all of this on a shoestring budget. In recent years, as these local efforts have effectively absorbed increased attention and funding, they have shown that there is significant additional potential to expand local work and its impact. Adequately funding local efforts can ensure a holistic response to the climate crisis. Indeed, various leading climate funders who contributed to this analysis underscored how essential local work is, both to make national work possible and in its own right. While this analysis has focused on domestic efforts, funders could also analyze the impact of community-based strategies in other parts of the world to inform global giving.

The Trump administration is working to dismantle many elements of the IRA. Some elements may withstand these attacks as communities defend their benefits beyond the climate protections themselves (e.g., job creation, affordable energy, and needed development projects).[96]In the near term, there is an opportunity for US-focused funders to support local climate efforts to ensure remaining IRA elements are implemented in a way that maximizes impact. The IRA relies on communities to execute climate projects at the local level. These efforts rely on the existence and strength of the community organizations who will lead the work. Funders have recognized that without additional capacity for local organizations, the IRA's climate impacts will not be fully realized, and have started funding efforts to support this implementation.[97] Early findings indicate that there is particular need for additional capacity – both financial and technical – for project pre-development, and a need for bridge funding to address cashflow issues while local entities await government rebates.

For the longer term, funders interested in this work could create a structure to facilitate better ongoing investment in and tracking of community-based strategies. This could provide a clearer picture of the impact of community-based strategies – both in direct mitigation and in the broader narrative and political shifts they can inspire. National funders who are interested, and who are not set up to make a large number of local grants, could take advantage of existing intermediaries/community foundations that have knowledge and connections to local leaders. This could offer funders a deeper understanding of the impact of community-based and national efforts, and the ways they support each other, to inform the most impactful set of investments to address climate change.

Appendix A. Further context on data points

This appendix provides additional context on each of the data points included in the tables in the report. It is organized around the four types of efforts: (1) state and local legislation, (2) renewable energy development, (3) supply-side strategies, and (4) implementation efforts.

For each data point, we provided a brief write-up of the effort's background, key players, and impact. We also included notes on the sources or methodologies for calculating the carbon impact of each. Note that all data on the cost to philanthropy were gathered from interviews with local leaders who led each effort (for more on methodology, see the "Approach for analysis" section).

1. State and local legislation

New York's Climate Leadership and Community Protection Act

New York State passed its landmark climate law, the CLCPA, in 2019. The CLCPA commits to 100% clean electricity by 2040, an 85% reduction in economy-wide GHG emissions by 2050 (from 1990 levels), and 35% of state climate and energy funding to disadvantaged communities. The legislation's targets have clear enforcement mechanisms.[98] This legislation emerged after years of organizing, campaigning, and advocacy efforts by NY Renews. NY Renews assembled a statewide coalition of 300+ grassroots groups with diverse priorities. Based on the coalition's input, NY Renews proposed initial policies in 2015 and spent the subsequent years advocating for support alongside its partners.[99] The coalition used a combination of insider strategies (e.g., working directly with policymakers), direct actions (e.g., protests), and publicity efforts to help pass the CLCPA. The CLCPA will help decarbonize New York's economy, expand large-scale renewable energy sources, and protect other climate laws that have come under attack (e.g., secure ability to pass gas bans). It also provides a host of health equity and economic benefits, especially to marginalized communities.[100]

Metric tons of CO_2e ($MTCO_2e$) avoided			Philanthropic cost of local efforts	Cost per total $MTCO_2e$ avoided through 2030
Per year	By 2030	By 2050		
N/A	58-120 M	1.8-1.9 B	$10M	$0.08-0.17

2030 and 2050 emissions estimates are based on the projected business as usual emissions, provided by Rhodium Group's Climate Deck through 2030, and by the RMI Energy Policy Simulator from 2030-2050. These were then compared to the projected emissions under the CLCPA's policies. The projected impact of the CLCPA is based on the law's enforceable targets, and the projected rate of their adoption for the assumed allowance budget and the statewide emissions cap (primarily based on the Cap and Invest program, as modeled in New York State's preliminary scenario analyses).

California's Advanced Clean Trucks regulation

Areas in California with low-income residents and communities of color – especially those near major trucking routes – face disproportionate impacts of unhealthy air pollution. Community-based groups (e.g., East Yard Communities for Environmental Justice, People's Collective for Environmental Justice) assembled a broad coalition across sectors (e.g., labor,

health organizations, industry partners committed to zero emissions) to push for strong regulations on emissions from new trucks. After the California Air Resources Board (CARB) issued a preliminary draft of the regulations, these groups mobilized to push for stronger regulation on certain items, and to stand up to businesses that were trying to block the rule. Coalition members traveled to Sacramento, met with elected representatives, and provided public testimony to CARB. Despite industry opposition, CARB unanimously voted to adopt the Advanced Clean Trucks regulation – the first clean trucking rule in the US. The rule calls for manufacturers to produce ~100,000 electric trucks by 2030 and ~300,000 electric trucks by 2050 to be sold within California.[101]

Metric tons of CO_2e ($MTCO_2e$) avoided			Philanthropic cost of local efforts	Cost per total $MTCO_2e$ avoided through 2030
Per year	By 2030	By 2050		
N/A	17 M* (2040)	24 M	$4 M	$0.24* (by 2040)

2040 emissions estimate provided by RMI report;[102] 2050 emissions estimate provided by Environmental Resources Management report.[103]

San Jose electric policies (2019 reach code and ordinance, 2020 building code)

In 2019, San Jose became the largest city in the nation to require that all newly built single-family homes, duplexes, and low-rise multifamily homes (three stories or less) be built all electric (with no fossil gas infrastructure). It accomplished this through two policies: a "reach code" with building energy-efficiency measures more stringent than those required by state code and an ordinance prohibiting fossil-gas infrastructure in all low-rise residential homes.

Together, these policies required all new municipal, single-family, and low-rise multifamily housing to be all-electric; mandated higher energy efficiency for new commercial buildings; implemented electric vehicle charging infrastructure requirements; and required solar readiness on nonresidential buildings. A range of community groups were instrumental in securing support for the new regulations, including youth activists (e.g., Silicon Valley Youth Climate Action), parent groups (e.g., Mothers Out Front Silicon Valley), environmental groups (e.g., Sierra Club, Menlo Spark, 350 Silicon Valley), labor representatives (e.g. IBEW Local 332), and others (e.g., SV@Home). To help pass the ordinance, community groups engaged in letter writing and social media campaigns, gave comments at City Council meetings and met with individual Councilmembers, organized speakers at press conferences, and got coverage in local papers and television outlets.

After these initial policies were adopted, community groups continued their advocacy, pushing for an expansion of the all-electric ordinance. In December of 2020, the City Council approved a comprehensive all-electric building code that included high-rise residential and most commercial buildings with limited exceptions, making San Jose the largest city in the country to prohibit fossil gas infrastructure in nearly all new buildings. The local advocates, participating in the Campaign for Fossil-Free Buildings in Silicon Valley, also helped nearby communities pass similar ordinances.[104]

Metric tons of CO_2e ($MTCO_2e$) avoided			Philanthropic cost of local efforts	Cost per total $MTCO_2e$ avoided through 2030
Per year	By 2030	By 2050		
N/A	887 K	7.8 M	$1 M	$1.13

Emissions estimates are based on the City of San Jose's analysis on the emissions impact of the rules, as shared in memos to the City Council. Those projections were for the 50-year lifetime of each new building; we assumed the reductions would occur evenly over the building's 50-year lifetime. We then multiplied the annual reductions by the number of new

buildings that might be built in the relevant timeframe (i.e., by 2030 or 2050), assuming that new construction continues at the rates currently forecasted.

2. Renewable energy development

Empire Wind 1

New York State broke ground on Empire Wind 1, an offshore wind project, in early 2024. When announced, this effort was part of the largest combined solicitation for renewable energy ever issued in the US.[105] The solicitation and subsequent approvals for the project followed years of advocacy by New Yorkers for Clean Power, the New York Offshore Wind Alliance, the Citizens Campaign for the Environment, and UPROSE (a neighborhood group based in Sunset Park, the underserved area where Empire Wind 1 will have its onshore base). These groups are continuing to shape the project's design, as developers have integrated community members into decision-making. The farm is expected to become operational in 2027.[106]

Metric tons of CO_2e ($MTCO_2e$) avoided			Philanthropic cost of local efforts	Cost per total $MTCO_2e$ avoided through 2030
Per year	By 2030	By 2050		
1.4 M	5.4 M	32.6 M	$ 2 M	$0.37

Annual and cumulative emissions were calculated using the EPA's AVERT tool based on the project's generation capacity.[107]

Sunrise Wind

The Sunrise Wind deal with Ørsted and Eversource will deliver power to 600,000+ homes across New York and provide significant community benefits (e.g., hundreds of local union jobs, significant additional economic investment in Suffolk County). This project had the support of local groups, such as Citizens Campaign for the Environment and the New York League of Conservation Voters. The project received approval and is expected to be operational by 2025.[108]

Metric tons of CO_2e ($MTCO_2e$) avoided			Philanthropic cost of local efforts	Cost per total $MTCO_2e$ avoided through 2030
Per year	By 2030	By 2050		
1.5 M	7.7 M	38.7 M	$200 K	$0.02

Annual and cumulative emissions were calculated using the EPA's AVERT tool based on the project's generation capacity.[109]

Eagle Shadow Mountain Solar PV Park

The Eagle Shadow Mountain photovoltaic power station (or "PV Park") is an industrial-scale, grid-connected solar park that started operations in 2003. It was developed by a partnership between the Moapa Band of Paiutes (a Native American tribe) and the clean energy developer Avantus. Avantus worked with the Moapa Band of Paiutes to navigate internal politics and build and operate the solar plant within the Moapa River Indian Reservation in Clark County, Nevada. Moapa tribe leaders became initially interested in this project when they were fighting to close a nearby coal plant. The tribe was then approached with this opportunity to pursue solar development, which was an enticing source of jobs for tribe members. Numerous community members were involved in developing the partnership between the Moapa tribe and Avantus and were hired to support construction and daily operations. The Moapa tribe is very supportive of this project, as the PV Park provides an ongoing revenue stream (i.e., through rent and tax collection) to the Moapa tribe as a part of

the development agreement and supplies enough clean energy to power 180,000 households.[110]

Metric tons of CO_2e ($MTCO_2e$) avoided			Philanthropic cost of local efforts	Cost per total $MTCO_2e$ avoided through 2030
Per year	By 2030	By 2050		
600 K	4.2 M	16.2 M	$500 K	$0.12

Annual emissions estimate provided by Global Data, via Power Technology[111] (and validated by EPA's AVERT tool based on the project's generation capacity).[112] Philanthropic costs were estimated by calculating the tribe's staff capacity over a ten-year period. These costs do not include any development or legal fees, which we presume were covered by the developer.

South Fork Wind

In March 2024, construction was completed on 12 offshore wind turbines that will deliver power to ~70,000 homes across New York. Over the prior years, community groups based near the offshore wind farm (e.g., Citizens Campaign for the Environment, Win with Wind, Renewable Energy Long Island, Concerned Citizens of Montauk) had advocated for more local clean energy initiatives. Once this specific project was proposed, these groups helped apply pressure to get it approved – including working to overcome opposition from some community residents and fisheries groups through public education campaigns to fight misinformation and speaking at public hearings. The town of East Hampton (where the cable would pass through) also supported the project, in part due to its commitment to fully transitioning to renewable energy. In addition to climate benefits, the project provides significant community benefits (e.g., hiring ~1,000 community members for the project, a $29 million community benefits agreement to the town to fund road repairs and other construction needs).[113]

Metric tons of CO_2e ($MTCO_2e$) avoided			Philanthropic cost of local efforts	Cost per total $MTCO_2e$ avoided through 2030
Per year	By 2030	By 2050		
222 K	1.3 M	6 M	$200 K	$0.15

2050 emissions estimate provided by New York State (and validated by EPA's AVERT tool based on the project's generation capacity);[114] annual and 2030 emissions calculated by EPA's AVERT tool based on the project's generation capacity.[115]

California's Solar on Multifamily Affordable Housing program

The California Environmental Justice Alliance and the Asian Pacific Environmental Network led a multi-year effort to advocate for improved solar programs in California, with a focus on the needs of low-income renters. Over time, as a bill took shape, these groups worked with a range of other partners (e.g., faith groups, solar industry and energy efficiency companies, housing advocates) to push for the bill's passage. When some pushed to scale down the bill's funding and make it a pilot effort, these groups organized advocacy days and phone banking to push back – ultimately keeping its full scale. The result of these efforts was the Solar on Multifamily Affordable Housing program, which provides financial incentives to install solar panels on multifamily affordable housing. The program's implementation is led by a partnership between the California Public Utilities Commission and local groups (e.g., Association for Energy Affordability, Center for Sustainable Energy and GRID Alternatives, California Housing Partnership), who lead community outreach and education for the program. The program's approach ensures long-term financial benefits for low-income households and property owners (e.g., lower utility bills, more jobs installing the new panels).[116]

Metric tons of CO_2e ($MTCO_2e$) avoided			Philanthropic cost of local efforts	Cost per total $MTCO_2e$ avoided through 2030
Per year	By 2030	By 2050		
N/A	600 K-1.4 M	2.2-7.2 M	$14 M	$10.30-22.43

Emissions calculated using the EPA AVERT[117] tool based on the generation capacity of solar panels installed. The range represents a high and low scenario for future uptake rates, as projected in the program's second triennial evaluation report (both the high and low uptake scenarios are based on uptake rates in the program's initial years).[118]

Oak Run Solar Project

The Oak Run Solar Project in Madison County, Ohio, will be the nation's largest and a first of its kind utility-scale solar energy plant for growing commercial crops. This project had the support of a coalition of local groups, such as the Ohio Environmental Council. In addition to climate benefits, the project provides community benefits (e.g., contracts with farmers and businesses in the community, hundreds of construction jobs and maintenance positions, $8.2M in annual revenue for local governments and schools). The project was approved by the Ohio Power Siting Board in 2024 and is expected to start construction in 2025.[119]

Metric tons of CO_2e ($MTCO_2e$) avoided			Philanthropic cost of local efforts	Cost per total $MTCO_2e$ avoided through 2030
Per year	By 2030	By 2050		
1 M	5.1 M	25.5 M	$110 K	$0.02

Emissions calculated using the EPA AVERT[120] tool based on the generation capacity of solar panels installed.[121] This calculation focuses only on the solar panels and does not include the battery system that is also a part of this project.

3. Supply-side strategies

Keystone XL pipeline cancellation

The effort to oppose Keystone originated in 2006, when three Indigenous women approached the Indigenous Environmental Network about destructive tar sand mining in their areas.[122] In the following years, Indigenous groups, ranchers, and farmers along the proposed pipeline route began discussing its detrimental impact on their communities. This coalition represented an unlikely alliance (at times calling itself the "cowboys and Indian alliance"), and many of its members were primarily concerned about the pipeline's impact on their land and health – not climate change. Over time, their combined, consistent campaign activity (e.g., sit-ins, protests, rallies, letter-writing campaigns) began to garner national attention.[123] On President Biden's first day in office in 2021, the Keystone XL pipeline permit was revoked. A few months later, the developer announced it was abandoning the project.[124]

Metric tons of CO_2e ($MTCO_2e$) avoided			Philanthropic cost of local efforts	Cost per total $MTCO_2e$ avoided through 2030
Per year	By 2030	By 2050		
6-12 M	52-105 M	168-337 M	$2.6 M	$0.02-0.05

Pipeline emissions calculated by taking 90% of the pipeline's nameplate capacity (barrels of oils per day it could carry),[125] using a conservative estimate based on studies of the actual operating levels of pipelines (which do not always run at full capacity).[126] This amount, representing the total amount of oil it would carry, is multiplied by the EPA's estimate of the carbon impact per barrel of oil.[127] This estimate was then multiplied by 5-10% (for low and high estimates, respectively), to account for the leakage and market dynamics, as explained in the "Supply-side strategies" section. 2030 and 2050 estimates extend these annual

estimates, assuming the pipeline would have been operating at the same capacity through those years.

Crawford and Fisk power plants shutdown

The Crawford and Fisk coal power plants were the largest source of air pollution and biggest industrial sources of CO_2 emissions in Chicago. Residents of the neighborhood around the plant joined a campaign to shut it down due to the severe health damages the pollution was causing the residents. The Little Village Environmental Justice Organization (LVEJO) formed alliances with 15+ other local groups and organized actions against the plant (e.g., door-knocking, attending hearings, organizing tours, publicity events). LVEJO, along with other groups, helped pass the Chicago Clean Power Ordinance, which required the coal plants to either convert to natural gas, cut operating hours, or shut down within four years. In 2012, both coal plants were shut down. This success helped LVEJO establish credibility in the Chicago political community to advocate for additional environmental justice issues (e.g., fighting diesel exhaust).[128]

Metric tons of CO_2e ($MTCO_2e$) avoided			Philanthropic cost of local efforts	Cost per total $MTCO_2e$ avoided through 2030
Per year	By 2030	By 2050		
2.2 M	39 M	82 M	$1 M	$0.03

Annual emissions cited by Chicago Tribune; 2030 and 2050 emissions assume the plant kept operating and polluting at the same levels through those years. Calculations assume natural gas replaces the decommissioned bituminous coal, and accounts for the varying emission intensities between coal and natural gas.[129]

Enbridge Northern Gateways pipelines cancellation

The community in British Columbia had been involved in several environmental efforts over the years, including the Great Bear rainforest conservation package, North Coast British Columbia fish farm disputes, and an effort to block Royal Dutch Shell drilling in the Sacred Headwaters. These efforts had given the community strong relationships and coalitions across groups along with several staffed organizations with meaningful capacity (e.g., Friends of Wild Salmon, local stewardship offices). This existing infrastructure helped the community mobilize quickly on the fight against the Enbridge pipelines. The diverse coalition included hunters, anglers, First Nations, and commercial fisheries. Many community residents were primarily concerned about the impact the pipelines would have on their land and water (e.g., oil spills, disrupting salmon fishing), not climate change. In 2016, Canada's Federal Court of Appeals blocked the pipelines, stating that the government had not adequately consulted with the First Nations who would be affected by the project; Prime Minister Trudeau's office, which could have appealed the ruling, decided not to and cited the opposition from communities in its reasoning.[130]

Metric tons of CO_2e ($MTCO_2e$) avoided			Philanthropic cost of local efforts	Cost per total $MTCO_2e$ avoided through 2030
Per year	By 2030	By 2050		
4-7 M	51-103 M	124-250 M	$8.5 M	$0.08-0.17

Emissions calculated in the same manner as was detailed above for Keystone XL.

4. Implementation efforts

Industrial decarbonization in Pennsylvania

An Appalachia nonprofit supported the state's EPA application for funding to decarbonize Pennsylvania's industrial sector. The money would help reduce emissions from various industrial sectors (e.g., fossil fuel extraction and delivery, metals), which emit one-third of Pennsylvania's GHGs.[131] The project received $396M in federal funding through the EPA's Climate Pollution Reduction Grants program in July 2024. The program will re-grant EPA funds to small- and medium-sized businesses to support equipment and technology upgrades that improve energy efficiency (e.g., electrification, use of low-carbon fuels, onsite renewable energy).[132] This effort can serve as a model for industrial implementation efforts: it included a comprehensive analysis of the businesses involved and the changes each could make, a detailed plan for funding and supporting those changes, and a process to gain buy-in from the relevant stakeholders.[133]

Metric tons of CO_2e ($MTCO_2e$) avoided			Philanthropic cost of local efforts	Cost per total $MTCO_2e$ avoided through 2030
Per year	By 2030	By 2050		
N/A	5.3 M	9.2 M	$500 K	$0.09

Emissions taken from the EPA grant proposal, based on the project leaders' modeling of impact based on prior analogous efforts.

Maine's heat pump program

Acadia Center, a New England nonprofit, worked to advocate for more efficient energy solutions in Maine. Its advocacy, including convening stakeholders from industry, helped push the State to establish Efficiency Maine in 2009. Efficiency Maine is a quasi-government organization that plans and implements energy efficiency programs in the state. A decade later, Maine's 2019 Climate Action Plan set a heat pump installation goal for the state. Efficiency Maine quickly ramped up its resources and support for these systems. Their program educated and supported residents in the adoption process (e.g., by offering easy access to heat pump rebate incentives, sharing resources on heat pump installers, streamlining the subsidy process). Maine has had the fastest adoption of heat pumps of any state and met its goal of installing 100,000 heat pumps two years ahead of schedule. Maine has now set a new target for heat pumps installation in homes, businesses, and public buildings.

Metric tons of CO_2e ($MTCO_2e$) avoided			Philanthropic cost of local efforts	Cost per total $MTCO_2e$ avoided through 2030
Per year	By 2030	By 2050		
150 K	1.2 M	4.8 M	-	-

Annual emissions estimates provided by Acadia Center. Projections for future years assume the state continues to meet its targets, and that owners replace their existing heat pumps at the end of their operational life.[134]

In this case, philanthropy helped launch a quasi-governmental state entity that then led the heat pump work. While philanthropy's role was critical, it is hard to quantify how much philanthropic funding should be attributed to this effort.

Appendix B. Experts and practitioners consulted

We want to acknowledge the input and expertise provided by many experts in the writing of this report, listed below in alphabetical order. Organizational affiliations note roles at the time input was gathered; they are listed for informational purposes only and do not imply any endorsement.

- Adrienne Esposito, Citizens Campaign for the Environment
- Alex DeGolia and Kate Courtin, Environmental Defense Fund
- Alvaro Sanchez, Greenlining Institute
- Amanda Woodrum, ReImagine Appalachia
- Angie Chen, Skyline Foundation
- Ben Passer, Sarah Christiansen, and Tehout Selameab, McKnight Foundation
- Brian Prest, Resources for the Future
- Carol Kauffman, Ohio Environmental Council
- Dan Sosland and Paola Tamayo, Acadia Center
- Dana Bourland, JPB Foundation
- Danielle Deane, The New School
- David Rich, GHG Protocol
- Denise Glaze and Tyler Valdes, California Environmental Justice Alliance
- Diane Bailey, Menlo Spark
- Dilafruz Khonikboyeva, Home Planet Fund
- Elizabeth Yeampierre, UPROSE
- Erin Rogers, The Hive Fund for Climate & Gender Justice
- Greg Knox, SkeenaWild Conservation Trust
- Ivan Thompson, former Moore Foundation BC grant officer
- Jane Kleeb, BOLD Alliance
- Jennifer Kitt, Climate Lead
- Joanne Kilgour, Ohio River Valley Institute
- Joe Flarida and Jon-Paul d'Aversa, Power a Clean Future Ohio
- John Mitterholzer, George Gund Foundation
- Kelly Shultz, Bloomberg Philanthropies
- Kenny Bruno, Cloud Mountain Foundation and advisor on Keystone XL

- Kim Wasserman, Little Village Environmental Justice Organization
- Kristin Tracz, Marin Community Foundation
- Linda Hutchins-Knowles and Susan Butler Graham, Mothers Out Front
- Lorne Stockman, Oil Change International
- Louise Glew, Sequoia Climate Foundation
- Marion Gee, Climate Justice Alliance
- Matt Cox, Greenlink Analytics
- Matthew Anderson, Energy Foundation
- Max Dovala, Verdant Impact Strategies
- Michelle DePass, Jillian Murphy, and Jordan Estevao, Climate and Clean Energy Equity Fund
- Mike Kane, Community Foundation for the Alleghenies
- Pilar Thomas, Quarles & Brady
- Peggy Shepard, Morgan Fritz, and Dana Johnson, We ACT for Environmental Justice
- Roland Hwang, Heising-Simons Foundation
- Stephan Edel, New York Renews
- Surabi Menon, ClimateWorks Foundation
- Trevor Houser, Rhodium Group

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