



RESEARCH REPORT

Equitable Access to Quality Climate Infrastructure Jobs: A Framework for Collaborative Action

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Executive Summary

Recent federal laws, including the 2021 Infrastructure Investment and Jobs Act (IIJA; H.R. 3684) and the 2022 Inflation Reduction Act (IRA; H.R. 5376), focus on updating and improving the nation's infrastructure, while also taking steps to mitigate and adapt to the effects of climate change. These federal infrastructure investments include goals around creating quality jobs and ensuring that benefits accrue to populations that have been historically marginalized. Largely missing from enacted legislation was specific funding or requirements for developing the workforce for emerging jobs. This report provides a framework for nonprofit, public, and private-sector organizations at the local and regional levels to connect workforce development and climate infrastructure efforts to realize the goals of climate resilience, equity, and job quality.

The Opportunity

Emerging from the COVID-19 pandemic, lawmakers were galvanized to promote job creation and economic recovery through investments in infrastructure and climate resilience, with increased attention on how to make these investments benefit communities that have been historically marginalized, including people of color and women. Estimates of the number of green infrastructure jobs being created because of these investments vary widely from the hundreds of thousands to nearly 19 million. Many existing infrastructure jobs and those anticipated to be created appear to offer good pay, benefits, and career growth potential, but more information is needed to understand the number of jobs available, the quality of these jobs, and who can access them.

Currently, key industries like construction, manufacturing, and maintenance are dominated by white men. As a result of demographic trends and predicted retirements, as well as new jobs created, there are opportunities to expand access to quality jobs to a more diverse workforce. But to do so requires a collective effort to develop and support the workforce, especially for those who have been historically marginalized.

Framework for Collaborative Action

This project aimed to understand local efforts to connect workforce development and climate infrastructure in pursuit of equitable access to good jobs and careers and elevate examples and evidence from the field to inform implementation of current federal and future climate infrastructure investments. We reviewed the literature to identify promising and effective practices and interviewed 26 national, regional, and local experts from nonprofits, cross-sector networks, and government and industry associations. We then engaged 31 practitioners from those organizations in two roundtables to inform our analysis and findings.

Key Principles

We identified the following key principles as a foundation for realizing the goals of equitable green jobs and careers:

- **Prioritizing equity:** Equity—that is, the consistent and systematic fair, just, and impartial treatment of all individuals, including those who belong to historically marginalized communities—is at the center of federal climate infrastructure investments and other recent policymaking. It is also a core principle guiding the strategies and examples elevated in this framework.
- **Targeting quality jobs and pathways:** This principle requires equitable access to opportunity for underserved communities; workforce development programming developed with job quality in mind; connections to trusted education and training providers with on-ramps to career pathways; skills trainings that prepare individuals for new roles in climate infrastructure jobs; and paid on-the-job training, including apprenticeship programs.
- **Fostering cross-sector collaboration:** The challenges of climate change and economic inequality require coordination and cooperation by multiple organizations that traditionally have not worked together. Cross-sector collaborations are at the center of local efforts to address climate, equity, and job quality goals, often involving facilitation and the support of intermediaries.

Core Actors

At the local level, a diverse array of nonprofit, public, and private-sector organizations play different roles to support the development of climate-resilient infrastructure projects, including the following:

- **policymakers and public-sector agencies** that oversee climate infrastructure and workforce development funding at the federal, state, and local levels
- **nonprofits and community-based organizations**, including those that work at the intersection of climate resilience, job quality and equity; operate workforce development programs; and provide key supportive services
- **education and workforce training institutions**, including the public workforce development system, community colleges, and four-year colleges
- **public and private employers in the climate infrastructure sector**, including public and private utilities; public works departments; and construction, transportation, and energy companies
- **labor unions** that represent workers in collective bargaining agreements and labor-management partnerships where employers and unions work together on workplace issues
- **intermediaries** that facilitate cross-sector networks and initiatives at the national, state, and regional/local levels
- **philanthropies** that support direct services, programs, and cross-sector networks

Strategies and Capacities

Through interviews with many of the types of organizations described above, we uncovered examples of how regions and communities are working to ensure equitable access to the quality jobs anticipated through federal infrastructure investments. The interviews surfaced five areas of strategies and capacities needed to achieve these goals:

- **Using data to guide strategy and ensure accountability**, which includes determining what the job opportunities are; whether they are of high quality; areas of underinvestment; and where to target resources, goals, and metrics to measure impact and success
- **Involving community in the design and implementation of solutions**, including efforts to gather data and understand the problem; building community organization partnerships to promote equitable access to training and jobs; and designing community benefit agreements (CBAs) and project labor agreements (PLAs) that aim to ensure infrastructure and development projects yield positive outcomes for community members

- **Aligning workforce development with equity, job quality, and local demand** through industry partnerships; employer and union engagement; implementation of paid, long-term training; and the provision of supports to ensure persistence along a career pathway
- **Providing comprehensive technical assistance and expanding implementation capacity** including supporting small and local contractors, cultivating the capacity of intermediaries, and supporting community-based organizations
- **Engaging in advocacy and policy change** by leveraging partnerships to affect change at multiple levels; influencing legislation; policy and practice; and establishing systems of accountability

How Can Actors Use This Framework?

The framework offers cross-sector networks of policymakers, practitioners, nonprofits, businesses, and labor leaders a holistic approach for advancing equitable career pathways within climate infrastructure investments through the implementation of key strategies and expansion of implementation capacity. Key actors can apply and adopt the framework as part of strategy development and policy and program design, in the implementation of those policies and programs, as part of coalition building and collective impact work, and in efforts to effect policy change through advocacy.

Insights and Ideas for Policy and Program Action

As climate infrastructure funding is dispersed throughout the country, there are many opportunities to improve implementation through the recalibration of climate infrastructure policies, programs, and grants and by building collaborative capacity.

Recalibrating Climate Infrastructure Policies, Programs, and Grants

Core actors can continue to elevate equity and job quality goals through federal, state, and local policies, philanthropic priorities, and the work of employers and unions to create more inclusive and equitable workplaces and good jobs. To maximize the benefits and scale of climate infrastructure investments requires the strategic coordination of resources. Federal, state, and local governments can target funding to support workforce development and promote regional coordination, while leveraging philanthropies for flexible funding of collaborative activities and to fill other gaps. Together, actors at all

levels can develop shared systems of accountability, including intentional efforts to measure outcomes and impacts over the long term and increase transparency.

Building Collaborative Capacity

There is a need for enhanced technical assistance, capacity-building, and opportunities for peer learning. Both federal agencies and philanthropy can fulfill these needs. Collaborative efforts—such as industry partnerships and communities of practice—offer opportunities for peer learning and development of collective capacity. With public engagement a requirement in federal legislation and a strategy for advancing equity, funders including philanthropy and government can support community engagement. Given the need for cross-sector collaboration and networks, funders should also expand intermediary capacity, to bridge the divide between workforce development and climate infrastructure and support implementation of strategies to prepare workers for emerging jobs and pathways.

Federal climate infrastructure investments, with their focus on climate resilience, job creation, and equity, provide an exciting opportunity to test and scale new tools and strategies for improving access to quality climate infrastructure jobs for historically marginalized populations.

Equitable Access to Quality Climate Infrastructure Jobs: A Framework for Collaborative Action

Introduction

Over the past few years, the federal government has made unprecedented investments to not only repair and refurbish aging infrastructure, but to achieve multiple goals for climate resilience, job creation, and equity. Although the 2021 Infrastructure Investment and Jobs Act (IIJA)¹ and the 2022 Inflation Reduction Act (IRA; H.R. 5376) include funding to address these three interdependent priorities, they include limited provisions and specific guidance on workforce development. To realize these triple goals for climate resilience, job creation, and equity requires connecting the climate infrastructure and workforce development ecosystems through a multisector and multilevel effort. The purpose of this report is to provide a framework for understanding what is needed locally and regionally to advance effective implementation of workforce development in conjunction with current and future climate and infrastructure investments.

The Opportunity

Investments in infrastructure have been on the decline since the 1970s, with the percentage of federal, state, and local funding relative to the gross domestic product (GDP) decreasing steadily over time.² Recent disasters such as the Flint water crisis,³ train derailments,⁴ and collapsing bridges and roads⁵ put a spotlight on the need to provide federal support. At the same time, global action through the Paris Agreement⁶ in 2015 and research assessed by the Intergovernmental Panel on Climate Change⁷ elevated the need for steps to mitigate the effects of climate change and to promote environmentally sustainable development. In the US, lawmakers proposed climate legislation through the “Green New Deal,” a congressional resolution put forward in 2019 to reduce greenhouse gas emissions while addressing racial inequality.⁸ Starting in 2020, the COVID-19 pandemic precipitated a steep recession and put a spotlight on racial disparities in outcomes for Blacks, Latinx, and Indigenous populations in nearly all areas of life from health, to education to employment and earnings.⁹ Emerging from the pandemic, there was a renewed focus on how to ameliorate racial inequities through access to quality

jobs. Infrastructure jobs offer one area of opportunity, with many jobs that pay well and offer benefits, and anticipated retirements creating job openings. Investments in infrastructure can open up new areas of opportunity for workers of color and women to access quality jobs in a sector that has long been dominated by white men.

In this context, Congress passed the IIJA and IRA, providing new funding to support economic recovery and infrastructure development with priorities related to climate resilience, job creation, and equity. According to an analysis by the Congressional Budget Office, IRA contains eight titles, which each focus on addressing climate change through prevention strategies like lowering greenhouse gas emissions or adaptations that respond to climate change impacts (Ramseur 2023). The IIJA invests \$1.2 trillion in the nation's aging infrastructure, including expanding access to high-speed internet, improving public transportation, and rebuilding roads, bridges, and waterways. Although not exclusively focused on sustainability, the act includes provisions that focus on reduction of carbon and greenhouse gas emissions (Mallett 2022).

Estimates of the number of green infrastructure jobs being created because of these investments vary. Kane (2022) illustrates a range of estimates from 420,000 jobs created annually over the next 10 years up to 1.5 million jobs created annually during that time. More recent analysis by researchers at the Political Economy Research Institute estimates spending for the IRA and IIJA, as well as CHIPS (not discussed in this report) will result in approximately 2.9 million new jobs a year and approximately 19 million new jobs with gaps between supply and demand in key occupations (Wicks-Lim and Pollin 2024). In addition, Kane (2022) shows projected annual retirements of 1.7 million in infrastructure-related occupations from 2021 to 2031.

Given the projected retirements and anticipated jobs created, there is a need for a workforce development strategy that trains workers to meet new job demand and develops new skills related to climate resilience.

Yet the laws focus primarily on the infrastructure investments themselves without dedicated allocations or explicit programming to develop the workforce. As noted by Martha Ross in a 2024 article published by Brookings Institution, "Broadly speaking, the IIJA and IRA recognize the need for workforce development. But they are vague about what it will take to recruit and prepare talent. Notably, the laws direct no explicit funds to the Department of Labor, nor do they invest in strengthening the public workforce development system, such as state and local workforce development boards, state and federal apprenticeship offices, career and technical education programs, or community colleges."¹⁰ Although targeted funding for workforce development through the public

workforce system is limited, the IIJA and the IRA allow or encourage workforce development activities across multiple programs, including through programs overseen by the US Department of Transportation and US Department of Energy (NGA 2023; White House 2022a). Furthermore, some programs have required workforce and equity plans, but with little guidance on what should be included in those plans (Scott and D’Elia 2023).

Despite some of these limitations in the IIJA and the IRA, there is the opportunity to leverage and expand the local connections with the Good Jobs Initiative, which in many ways set the stage for inclusion of workforce training as a component of climate infrastructure dollars. The Good Jobs Initiative is a cross-agency federal effort led by the US Department of Labor that focuses on providing strategic direction, information, and resources to support federal and state efforts to improve access to “good jobs free from discrimination and harassment for all working people.”¹¹ Best practices in community benefit agreements, plans, and policies are being incorporated into scoring criteria for federal competitive grants, with each agency taking a unique approach to this directive to use these resources in a way that creates pathways out of poverty into good union jobs for disadvantaged and low-income communities. Federal policy guidance further encourages state and local governments to take similar approaches in their disbursement approach to federal pass-through funding.

Grant Funding under the IIJA and the IRA

There are two types of grants—**formula** and **competitive**—that involve different processes for applying and receiving the funds. Formula grants often flow from federal to state government based on criteria such as population/demographics and then down to local governments for specific programs or projects; in some cases, the grants fund planning processes to help with the design and development of the program and project. Competitive or discretionary grants are awarded through a competitive selection “process based on program and applicant eligibility, evaluation criteria, and Departmental or program priorities, therefore making it ‘discretionary.’”¹²

The Infrastructure Investment and Jobs Act predominately dispenses formula grants allocated to and managed by state agencies, who have their own rules and processes related to procurement, workforce, and labor. Funding then passes down to regional and local governments, which lead or are involved with actual projects. Some provisions do support workforce and labor, but only a few have explicit workforce development training and capacity-building elements and it is unclear whether those support green jobs and/or equitable green careers.

The Inflation Reduction Act, passed into law in August 2022, is the **largest investment** in combating climate change in US history. With most funding provided through tax credits, but also other forms of funding including loan guarantees and grants, the goal is to increase clean energy adoption by driving down costs. According to a study published in the journal *Science*, modeling the effect of the IRA on carbon emissions, the annual decrease in carbon emissions by US would be at 4 percent compared with the 2 percent before the passing of the IRA (but still falling short of the 6 percent annual rate needed to meet 2030 climate goals of limiting emissions to 50 percent of peak levels).

Under the IRA and the IIJA, nonprofits and community-based organizations are for the first time eligible for several competitive grants under these two federal programs. Among the funding provided through IRA grants, most are competitive with few formula funding options. Similar to the IIJA, there are some provisions for workforce and labor (for instance, electric vehicle incentives through the Environmental Protection Agency direct grants and rebates toward workforce development and training) but with a more direct focus on clean energy jobs). According to data compiled through tracking public announcements of projects, *ClimatePower*,¹³ an environmental advocacy group, found that since the passage of IRA and as of July 2023, 272 new clean energy projects have been launched, which have created more than 170,000 clean energy jobs in occupations such as electricians, mechanics, and construction workers—although, as noted above, projections for future job creation vary.

Much work needs to be done to build knowledge, capacity, and partnerships to effectively meet job demand and to ensure equitable access to these opportunities. This report aims to provide regional and local actors with a strategic framework they can adapt and apply as they implement climate infrastructure programs.

About This Project

The goal of this project was to identify examples of how communities around the country have worked to develop and ensure equitable access to green jobs and career pathways. We define equitable career pathways as workforce development efforts that are aimed at providing historically marginalized populations—including Black, Latinx, Indigenous, and other workers of color as well as women—access to and preparation for high-quality jobs, whether through a first job or advancement. For a glossary of key terms used in this report, see box 1. We focused on recent federal resources and grants to advance climate-resilient infrastructure that can be connected to workforce development initiatives with equitable career pathways at their center. We also wanted to learn how communities were engaged in

planning to advance equitable career pathways in response to federal infrastructure investments, particularly in the areas of water and energy.¹⁴ In this report, we put those efforts in the context of existing research on promising and effective practice in workforce development.

BOX 1

Glossary

Capacity-building: “The process of developing and strengthening the skills, instincts, abilities, processes, and resources that organizations and communities need to survive, adapt, and thrive in a fast-changing world.”^a This can include recruiting and training personnel, the provision of technical assistance, overhauling technology or management systems, remodeling physical infrastructure, and optimizing existing resources.^b

Career pathways: Career pathways operate at two levels: systems and individual programs. At the systems level, career pathways development is a broad approach for serving populations that may experience significant barriers to employment and can substantively alter the way the workforce system delivers its services and its relationship with partner organizations and stakeholders. Career pathway programs offer a clear sequence, or pathway, of education coursework and/or training credentials aligned with employer-validated work readiness standards and competencies.^c

Climate infrastructure: Long-term adjustment of existing or planned infrastructure assets that anticipates, prepares for, and adapts to changing climate conditions while advancing sustainability’s economic, environmental, and social equity policy goals. It can also withstand, respond to, and recover rapidly from disruptions caused by these climate conditions by ensuring climate resilience is a continual process throughout the life of the asset. Climate-resilient infrastructure includes both projects to adapt traditional infrastructure systems and assets to a changing climate and projects specifically conceived to address climate change risks, such as coastal defense systems, in order to protect people, investments, and economic activity.^d

Climate resilience: Ability of a social, ecological, or socio-ecological system and its components to anticipate, reduce, accommodate, or recover from the effects of a hazardous event or trend in a timely and efficient manner.^e

Equity: “Equity” refers to fairness and justice and is distinguished from equality: Whereas equality means providing the same to all, equity means recognizing that we do not all start from the same place and must acknowledge and make adjustments to imbalances. The process is ongoing, requiring us to identify and overcome intentional and unintentional barriers arising from bias or systemic structures.^f

Green jobs: The Bureau of Labor Statistics defines green jobs as jobs that produce goods or provide services that benefit the environment or conserve natural resources or jobs in which workers’ duties involve making their establishment’s production processes more environmentally friendly or use fewer natural resources.^g

Historically marginalized population: Groups or communities that have faced discrimination and/or exclusion from social, economic, and political opportunities. The communities continue to bear the effects of marginalization through economic/social barriers and reduced access to opportunities. For this report, we focus on Black, Indigenous, and other people of color (BIPOC), women, and low-income groups.

Sources:

^a “Capacity-Building,” United Nations, accessed April 28, 2024, <https://www.un.org/en/academic-impact/capacity-building>.

^b J. D., Lammert, L. Johnson, and T. A. Fiore, “*Conceptualizing Capacity Building*,” (Rockville, MD: Westat, 2015).

^c US Department of Labor, “Career Pathways Toolkit: A Guide for System Development” (Washington, DC: US Department of Labor, 2015), https://www.dol.gov/sites/dolgov/files/ETA/advisories/TEN/2015/TEN_17-15_Attachment_Acc.pdf.

^d “Key Concepts,” Infrastructure Pathways, accessed April 22, 2024, <https://infrastructure-pathways.org/key-concepts/>.

^e Fatima Denton, T. J. Wilbanks, A. C. Abeysinghe, I. Burton, Q. Gao, M. C. Lemos, T. Masui, K. L. O’Brien, and K. Warner, “Climate-Resilient Pathways: Adaptation, Mitigation, and Sustainable Development” in *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects, Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (New York: Cambridge University Press, 2014), https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-Chap20_FINAL.pdf.

^f “Equity,” National Association of Colleges and Employers, accessed April 22, 2024, <https://www.naceweb.org/about-us/equity-definition>.

^g “Green Jobs,” US Bureau of Labor Statistics, accessed April 22, 2024, <https://www.bls.gov/green/overview.htm>.

To do this work, we began with a set of scoping calls with national, regional, and local organizations involved in the climate and workforce space to identify key issues and challenges, as well as promising examples from around the country. We also conducted research on effective, promising, and emerging practices, and on recent legislation and initiatives. Next, we conducted interviews with 26 people from 13 organizations countrywide, based in Seattle, Milwaukee, Philadelphia, and Pittsburgh, and regional organizations working in Appalachia, central New York, and the Midwest. Interviewees included sustainability and workforce officers in municipal governments, an industry association, nonprofits, and cross sector networks (table 1). We synthesized and analyzed this information to design a framework that identifies the critical elements needed to connect sustainability efforts and workforce development to design equitable career pathways. At the end of data collection, we invited organizations we engaged with to participate in two virtual roundtables where we received feedback from 31 individuals on the framework and ideas for how it could be used to support the goal of supporting equitable access to climate infrastructure jobs in relationship to the IRA and IIJA but also in the future.¹⁵

TABLE 1

Organizations Interviewed for This Study

Organization or institution name	Area served	Type	Focal industry or occupation
American Council for an Energy-Efficient Economy (ACEEE)	National	Nonprofit research and advocacy organization	Energy efficiency
BlueGreen Alliance	National	Nonprofit research and advocacy organization	Clean energy and energy efficiency
CenterState Corporation for Economic Opportunity (CEO)	Central New York (Syracuse)	Nonprofit business, economic development membership organization	None
City of Philadelphia Office of Sustainability	Philadelphia, PA	City government	Energy efficiency
City of Seattle Office of Sustainability and Environment	Seattle, WA	City government	Green stormwater infrastructure, urban forestry, etc.
Clean Tech Alliance	National	Nonprofit industry association	Clean energy
Elevate	National	Nonprofit research, policy and program development organization	Solar/clean energy and energy efficiency
Groundwork USA	National and local ^a	Nonprofit that supports network of local green CDCs through advocacy, technical assistance, and capacity building	Urban greening, Brownfields revitalization, environmental justice
Landforce Pittsburgh	Pittsburgh, PA	Nonprofit workforce development and land stewardship organization	Urban forestry
Milwaukee Water Commons	Milwaukee, WI	Cross-sector network	Water stewardship
Philadelphia Energy Authority	Philadelphia, PA	Quasi-governmental organization	Energy efficiency
PowerCorpsPHL	Philadelphia, PA	Nonprofit workforce development program	Green stormwater infrastructure and urban forestry
RelImagine Appalachia	Ohio River Valley	Cross-sector network	Climate infrastructure
Seattle Jobs Initiative	Seattle, WA	Nonprofit workforce development organization	None

Note: ^a The research team did not conduct an interview with staff members from Groundwork USA, but five staffers participated in the two roundtables at the end of the project to provide feedback on the framework.

The Framework

Informed by our interviews, feedback sessions and research, the following framework rests on three essential principles, a set of core local actors and five key strategies that workforce and sustainability organizations and leaders can use to advance green equitable career pathways. Communities of all sizes can use the framework to leverage recent federal and state investments in equitable, climate-resilient infrastructure now and into the future. The framework also serves as a guide for designing and developing policies, programs, and plans that can align regional and local policy goals related to climate resilience, equity, economic mobility, and the promise of green jobs.

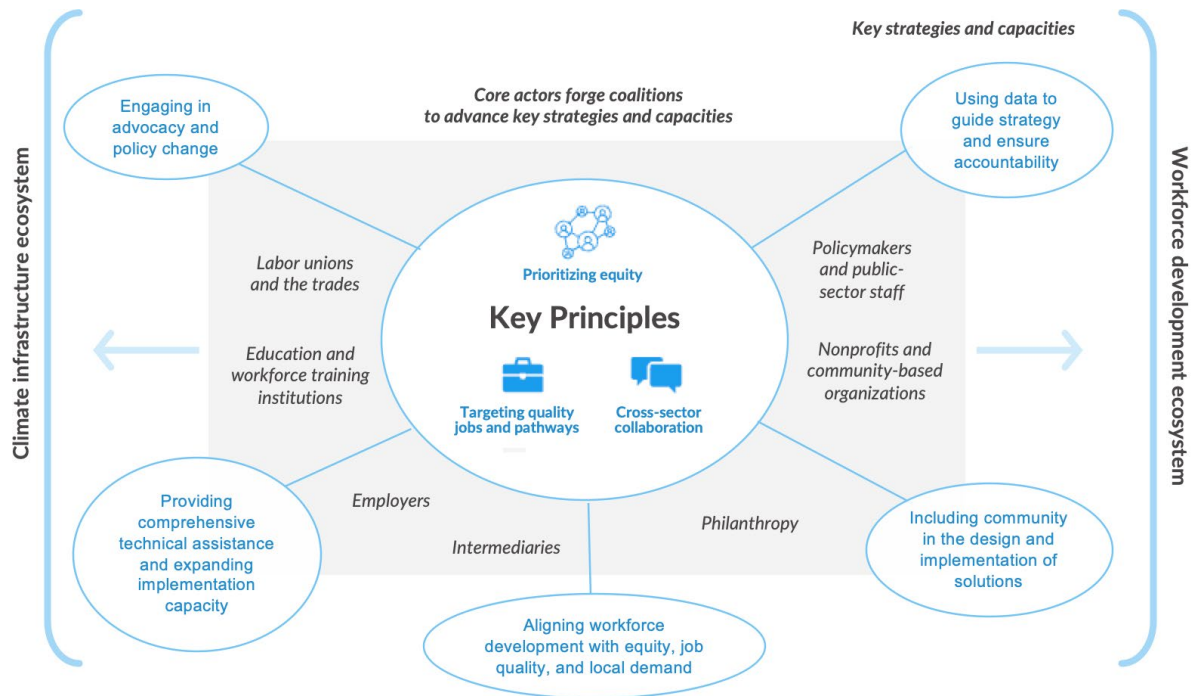
The framework connects two primary ecosystems: (1) climate infrastructure and (2) workforce development. Each ecosystem contains its own set of policies, agencies, programs, and projects with somewhat distinct goals and actions. Generally, the actors and agencies within these domains work independently from each other. Thus, our research identified a pressing need for approaches that can strengthen coordination and collaboration across ecosystems to advance equitable green careers. In this report, we highlight emerging programs, coalitions, networks, and partnerships that are bridging these ecosystems.

As outlined in figure 1 below, the framework's key principles set the foundation for advancing equitable green jobs and careers. These principles include prioritizing equity, targeting quality jobs and pathways, and fostering cross-sector collaboration. Core actors include a range of public, nonprofit and private-sector organizations and entities playing distinct roles to infuse equitable green careers within climate resilient infrastructure programs and projects. These core actors can then forge strategic coalitions organized around the key principles and adopt one or more key strategies and capacities to implement more holistic projects and policies. The key strategies and capacities include

- using data to guide strategy and ensure accountability;
- including community and workers in the design and implementation of solutions;
- aligning workforce development with equity, job quality, and demand;
- providing technical assistance and expanding implementation capacity; and
- engaging in advocacy and policy change.

We explore each dimension of the framework, including the key principles, core actors, and essential strategies, later in the report.

FIGURE 1
Framework for Equitable Climate-Forward Career Pathways



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Source: Framework based on authors' analysis of interviews, roundtables, and other research conducted in 2023 and 2024.

Key Principles

The key principles in our framework serve as the foundational strategies for actors undertaking efforts to advance equitable career pathways to climate infrastructure jobs; they represent many of the values and initiatives that we discovered during our interviews and research. Keeping these key principles at the center can help guide the design, development, and implementation of equitable workforce development and career pathways as part of existing and future climate infrastructure initiatives.

Prioritizing Equity

The first key principle in our framework is prioritizing equity. Equity should be at the core of the design and implementation of career pathway initiatives and in the distribution of climate infrastructure dollars, resources, job opportunities, and other benefits in communities. During the Great Recession, efforts to grow green jobs and green workforce development strategies as part of the American Recovery and Reinvestment Act (ARRA) did not benefit communities equitably (Hughes 2018). For

example, African American communities experienced disparities in access to resources from ARRA investments, and low numbers of women participated in ARRA green job training programs (Harper-Anderson 2012; Mundaca and Richter 2015).

Job creation gains from green stimulus funds also accrued to wealthier areas where the workforce already possessed higher levels of applicable skills, while blue-collar workers who made employment gains in the green economy were left with suppressed wages (Popp et al. 2021). Important lessons can be learned from these and other recent shortcomings regarding how to equitably implement climate infrastructure investments.

Recent federal government actions such as Executive Order 13985¹⁶ require the prioritization of equity, tasking federal agencies with embedding goals to advance equity and developing plans for meeting those goals. Although this mandate and other federal actions such as the Justice40 Initiative¹⁷ focused on environmental justice are important for localities to leverage, local efforts to advance equity in place are necessary given much of the work to implement workforce development initiatives that leverage climate infrastructure dollars happens at the local level. As communities develop climate resilience plans and compete for federal and state investments in climate infrastructure, there are multiple dimensions of equity to consider when developing strategies and initiatives that seek to advance both climate equity¹⁸ and workforce equity (Langston, Scoggins, and Walsh 2020). These dimensions include procedural equity (developing inclusive processes for implementing programs and policy), distributional equity (the fair distribution of resources and burdens), structural or systemic equity (addressing the underlying or root causes of past harms), and reparative equity—designing interventions to explicitly improve the conditions of a specific group within a population (Balu et al. 2023; Dsouza et al. 2023; Palmer, McShane, and Sandler 2014).

In practice, examples of prioritizing equity include embedding fairness and inclusion as core values in the development and implementation of worker recruitment, retention, and advancement strategies; conducting harm mitigation planning to avoid misaligning intent and impact; considering benefits to communities at large as well as specific groups within that community; codesigning strategies with affected communities; and identifying opportunities for community voice (Fu, Williams, and Ship 2022).

Prioritizing equity is a key theme throughout the discussion of the other key principles and practices described in this report; it should be at the center of efforts to identify and target quality jobs and pathways, in the use of data, and in efforts to implement cross-sector collaboration as organizations are responding to federal funding opportunities in the workforce and the climate resilience space.

Targeting Quality Jobs and Pathways

The second key principle in our framework involves targeting quality jobs, and training pathways that provide workforce preparation and access to good jobs and career advancement (box 2). Not all jobs stemming from climate infrastructure investments are expected to be good jobs, and job quality varies by sector. A 2024 analysis by Scott and D’Elia exploring job quality in clean energy occupations found that more good jobs are expected in the energy efficiency and renewable energy sector and less good jobs are expected in green construction occupations. Furthermore, their analysis found that women and Black people are heavily underrepresented in clean energy occupations, with less access to high-quality jobs, speaking to the need for pathways to good jobs for these groups, not just entry-level positions.¹⁹ Previous research reflects the challenges of transitioning green workforce training into long-term employment opportunities for disadvantaged workers in high-quality jobs (Martinson et al. 2016).

BOX 2

Defining Good Jobs

Good jobs provide livable wages and predictable pay, benefits, opportunities for on-the-job skill development, fair working conditions, autonomy, and advancement opportunities.^a The Departments of Labor and Commerce have partnered to identify what comprises a good job as part of their Good Jobs Initiative and have identified eight dimensions to leverage through the IIJA and IRA procurement process. These dimensions include recruitment and hiring, benefits, DEIA, empowerment and representation, job security and working conditions, organizational culture, pay, and skill and career advancement.^b

Sources:

^a William Congdon, Molly Scott, Batia Katz, Pamela Loprest, Demetra Smith Nightingale, and Jessica Shakesprere, *Understanding Good Jobs: A Review of Definitions and Evidence* (Washington, DC: Urban Institute, 2020).

^b US Department of Labor, “The Good Jobs Initiative: Department of Commerce and Department of Labor Good Jobs Principles” (Washington, DC: US Department of Labor, 2024), available at <https://www.dol.gov/general/good-jobs/principles>.

Targeting pathways that lead to good jobs requires intentional strategies to connect workers to training opportunities and careers with potential for economic mobility. We discuss strategies for targeting quality jobs throughout the report, but it is especially important that workforce programming be developed with job quality in mind, including fair wages, earning potential that grows with increasing job responsibilities, access to benefits, worker protections, and fair labor standards (Congdon et al. 2020). This includes programming with direct links to registered apprenticeship programs and other paid on the job training models that target and recruit low-income workers from disadvantaged

communities while providing access to work support services designed to break down barriers to employment including childcare and transit vouchers (Woodrum et al. 2021).

Identifying quality jobs and pathways also requires acknowledging the different motivations for work among new generations who will be working in climate infrastructure. This includes identifying where training opportunities do or do not exist in occupations with future projected growth, exploring the motivation and demands of the working environment and flexible work styles desired by Gen Z and future generations, new models of work and ownership, such as worker cooperatives that allow for worker power. It also involves considering how employers and employees—including partnerships between industry, labor groups, and community members—can engage in ongoing dialogue to ensure work roles adapt to the changing market and needs of workers.

Fostering Cross-Sector Collaboration

The final principle in our framework is fostering cross-sector collaboration. The overlapping challenges of climate change and economic inequality demand collective actions by multiple organizations that traditionally have not worked together. Due to the way existing laws and government programs (such as those supporting water infrastructure) are structured, there are policy and funding silos that impede progress toward climate resilience and expanding access to green jobs. Our research and interviews found emerging collaborations are often driven by organizations and networks that are bridging the climate infrastructure and workforce divide, by providing forums for discussion, policy advocacy, community engagement and empowerment, and collective action. For example, a cross-sector network might come together to incorporate goals for equitable development and climate resilience into a citywide sustainability plan.

Cross-sector collaboration is frequently facilitated by intermediaries, who act as the “backbone” or convener of many different stakeholder groups, such as community members, policy advocates, community-based organizations, and government representatives. The term “green intermediaries” refers to convener organizations who have a track record of helping to build and expand the sustainability capacities of local governments and their partners (Schilling, Tumber, and Velasco 2023). These intermediaries and their affiliated networks also frequently include employers and industry partnerships, or groups of employers within a particular industry sector that work together to advocate for change. This type of collaboration requires key actors willing to play a role in policy and program coordination.

Core Actors and Roles in Policy and Program Collaboration

As shown in table 1, a diverse array of public, nonprofit, and private-sector organizations and entities play different roles to fund, administer, and build climate-resilient infrastructure programs and projects. These core actors and agencies can apply the framework and insights from our report to forge new alliances and cross-sector coalitions to support the development of programs and initiatives that provide equitable access to green career pathways. The following seven categories capture the core actors and their roles in policy and program coordination.

1. Policymakers and Public-Sector Agencies

Federal and state officials control and oversee the majority of infrastructure, climate resilience, and workforce investments and programs. Regional and local governments typically receive or apply for these federal and state resources and then implement related programs, processes, and regulations from procurement and apprenticeships through project construction and maintenance. They also tend to have the policy authority that reviews and legally approves infrastructure projects. Local governments can play pivotal roles braiding together funding and coordinating a range of departments and agencies (e.g., departments and offices of sustainability, public works, and transportation). Local governments can also transform their infrastructure procurement processes in support of green jobs and equitable career pathways by expanding access to contractors from historically marginalized groups and promoting apprenticeships and training opportunities for emerging green jobs.

2. Nonprofits and Community-Based Organizations (CBOs)

Many of the organizations we researched operate on the ground at the intersection of climate resilience, sustainability, and equitable green jobs. Their community-based programs and projects for improving climate resilience and energy equity often involve and support neighborhoods of color. Some of these urban greening and climate infrastructure organizations have extensive experience operating training programs for basic green jobs that could evolve and expand into pathways for green careers. Other regional and local nonprofits focus on workforce training and support services that provide opportunities in the emerging energy equity/energy efficiency sector. Given their roots in the community and their experiences with greening and workforce, NGOs and CBOs are in an ideal position to engage in cross-sector collaborations that foster and facilitate equitable green careers.

3. Education and Workforce Institutions

Community colleges along with regional and local workforce development organizations help connect people to jobs and conduct a wide range of training programs and upskilling initiatives. Four-year colleges also play an important role in helping workers earn the higher-level credentials required for some quality jobs. As the demand for green jobs increases, education and workforce institutions can leverage those jobs into training tracks for equitable green careers.

4. Employers

Public- and private-sector employers—whether they are traditional employers incorporating climate resilience into existing jobs or employers with sustainability at their core—are critical partners in driving the transition toward green jobs and equitable career pathways. They help inform market projections of the supply and demand for green jobs and skills, partner with education and workforce training institutions and with unions to provide training, offer training directly, and hire or promote workers for emerging jobs. Employers within climate infrastructure sectors include public and private utilities, and public works departments, along with construction, transportation, and energy companies. With sufficient resources, training and capacity-building, small businesses play critical roles incubating equitable pathways for green jobs and careers given their role in the US economy and as employers.²⁰

5. Labor Unions and Labor Management Partnerships

A larger share of projected jobs from the federal infrastructure investments are anticipated to be union jobs (Pollin et al. 2023). Union representation is often used as a proxy for job quality in that unions use collective bargaining to achieve higher wages, secure or maintain benefits, and improve working conditions. Union jobs also offer opportunities for paid training through apprenticeships. Although unions have historically been predominately white and male, projected retirements in climate infrastructure jobs mean that unions are important partners in efforts to improve access to high quality jobs for historically marginalized populations. In addition, through labor-management partnerships, employers work with the unions that represent their employees to tackle important workplace issues that are often outside of traditional collective bargaining, such as retention challenges and how to train workers for new skills.

6. Intermediaries

Many different types of organizations can play the role of intermediaries, but within the scope of our research their main function is facilitating cross-sector networks and initiatives that bridge the policy and program silos surrounding climate infrastructure and workforce development programs and policies. These intermediaries operate at different scales (national, state/regional, local) and can act as conveners, policy advocates, capacity builders, technical assistance (TA) providers, etc.

7. Philanthropies

Some foundations fund the work of cross-sector networks, as well as support the work of nonprofit, community-based social enterprises involved with urban greening, climate infrastructure, energy equity and green jobs along with wrap around social service supports for workforce development and training.

Key Strategies and Capacities

In this section, we outline the key strategies and capacities identified as important for supporting workforce initiatives aligned with emerging climate infrastructure jobs and consistent with the core principles of job quality, equity, and collaboration.

Using Data to Guide Strategy and Ensure Accountability

The IJJA and IRA both have goals around the creation of quality jobs with estimates ranging from the thousands to the millions, though they lack specific information on the types of jobs, compensation levels, and where jobs would emerge. Data and research are needed to identify existing and emerging jobs in the labor market and to ensure accountability for the goals of local efforts and use of funding at all levels.

DETERMINE WHAT THE JOB OPPORTUNITIES ARE

A critical first step is to identify emerging job opportunities. This was top of mind in our interviews with national and regional organizations, as well as with local leaders. In the words of a representative from the BlueGreen Alliance, a coalition of labor unions and environmental organizations, “There’s an analytic requirement here. What we don’t have yet is, I want to be able to show workforce development folks in states exactly or a reasonable estimate of which sectors this federal investment is going to flow into in their state. So that they can plan appropriately.” BlueGreen Alliance supported a study to answer

a part of this question, examining the gap between supply and demand in key sectors at the national level (Wicks-Lim and Pollin 2024).

CenterState Corporation for Economic Opportunity (CEO), an economic development organization in central New York, has engaged in its own research to ensure that they deeply understand how the federal legislation translates into potential demand for workforce training. The staff person we spoke with described, “if new homes have to have heat pumps, well what industries does that effect? What’s the growth trajectory look like? Do we need a heat pump training program? Or is this just expanding HVAC training that’s already going on? Is there really enough volume to merit anything new?”

Research is starting to emerge, as outlined in the background section of this report, but more analysis is needed at the local and regional level, and by sector. Because it is challenging to develop local estimates, practitioners often combine national data with imperfect local data and insights gathered through conversations with employers. For information on what data and partnerships can be leveraged to create estimates of jobs created by occupation or sector and how they can be used, see box 3.

BOX 3

Data Sources and Strategies

Local actors can see what national projections say about anticipated jobs created and supply using federal datasets such as the following:

- Bureau of Labor Statistics occupational projections;^a and
- American Community Survey regional estimates.^b

The following analyses of national data can also prove helpful:

- “Labor Supply, Labor Demand, and Potential Labor Shortages through New US Clean Energy, Manufacturing, and Infrastructure Laws” from the Political Economy Research Institute at the University of Massachusetts Amherst^c, and
- “Seizing the US Infrastructure Opportunity: Investing in Current and Future Workers” from the Brookings Institution.^d

Local actors can derive estimates by leveraging

- information available from state or local labor agencies;
- job openings data like those produced by Lightcast labor analytics²¹ to determine job openings, education and experience requirements, skills and competencies, etc.;
- partnerships with local colleges, universities, research institutions or the workforce system to get estimates of employment demand; and

- engagement with employers, industry associations and local or state government, including recipients of competitive grants or formula funding under the IIJA and IRA.

Local actors can use this information to

- identify what jobs are projected to grow and by how much;
- understand the characteristics of jobs, desired qualifications, and dimensions of job quality;
- assess who currently holds these jobs or similar jobs in the community and whether there is an existing equity gap that needs to be addressed;
- help employers promote equity by eliminating unnecessary degree requirements in job listings;
- identify occupations with similar competencies that may be the focus of recruitment efforts; and
- design training programs for emerging job or skill needs in partnership with employers.

Sources:

^a “Employment Projections,” US Bureau of Labor Statistics, accessed April 18, 2024, <https://www.bls.gov/emp/>.

^b “American Community Survey,” US Census Bureau, accessed April 18, 2024, <https://www.census.gov/programs-surveys/acs>.

^c Jeannette Wicks-Lim and Robert Pollin, *Labor Supply, Labor Demand, and Potential Labor Shortages Through New U.S Clean Energy, Manufacturing and Infrastructure Laws* (Amherst, MA: Political Economy Research Institute, 2024).

^d Joseph Kane, *Seizing the US Infrastructure Opportunity: Investing in Current and Future Workers* (Washington, DC: Brookings Institution, 2022).

UNDERSTAND ISSUES OF JOB QUALITY AND EQUITY IN EMERGING JOBS

A data gap is understanding the quality of jobs, the demographic characteristics of who traditionally holds these jobs, and—for jobs that are of lower quality—what career pathways exist to better jobs. As a representative from the BlueGreen Alliance put it, “Sometimes people talk about these jobs like they are a separate category, but they are not.” They often exist in sectors with exclusionary hiring practices where women and communities of color have historically been underrepresented. Another respondent from the American Council for an Energy-Efficient Economy, a national organization focused on promoting energy efficiency, noted the need for “more research on what a high road job (or quality job) is,” noting that this “looks different across states and cities.”

Because residents may lack the skills needed for emerging jobs, some may start at the entry level. Analyses of career pathways can be useful for showing workers the steps they might need to take to get to a high-quality job, but according to a representative from the American Council for an Energy-Efficient Economy, sometimes national career pathway maps do not translate to the local level. Engagement with employers and industry was described as important for understanding job opportunities, skill requisites, and career pathways in a particular region or community.

Research by Scott, Axelrod, and D’Elia²² provides a start to the kind of local level of analysis that is needed. They identify a set of jobs in energy efficiency, assess the quality of these jobs and then examine the characteristics of the workforce that currently hold these jobs. Their analysis starts at the national level, but then drills down to the local level in a set of communities. With this type of information, community groups and local governments can engage with industry actors, and employers can help to build out knowledge about the skills and pathways connected to federal infrastructure investments.

IDENTIFY AREAS OF UNDERINVESTMENT AND WHERE TO TARGET RESOURCES

Interviewees discussed the importance of conducting research to understand the local area and issues related to the sector or occupation targeted. The organization ReImagine Appalachia is a coalition of individuals and organizations working to develop and push for a shared vision of improved conditions for the residents of Appalachia and a shared policy agenda. It harnessed research to understand how shifting to clean energy sources impact health, jobs, and local economies. In a recent report that examined the opportunity to implement a subsidized employment program in the region to address structural unemployment, the authors used data to understand the local economy and workforce in relationship to potential federal climate investments (Kovach et al. 2023).

The authors of this report first used American Community Survey data to compare the Appalachian workforce to US averages, including the levels of underemployment and labor force participation, characteristics of the workforce, including the percentage of the workforce experiencing poor health or disability. They used this information to make the case for the creation of a subsidized employment program that would help move the region toward full employment. This example shows how data can bring attention to a critical issue and help advocate for resources to support areas of underinvestment.

Similarly, the Milwaukee Water Commons, a cross-sector network that focuses on community engagement, water stewardship, and equity in Milwaukee, uses research to understand the “enabling environment” in making decisions about what goals and strategies to prioritize; for example, whether available funding is aligned or whether a particular agency has a focus on diversifying the workforce. As one staff member shared, “Our team right now is really trying to make more of an effort, especially with all the money that’s coming into Milwaukee around capital investments to make sure that our task force is being intentional about how we’re intersecting with those investments.”

From the city perspective, research helps to identify high-need communities, workforce gaps, and job growth projections. Seattle, for example, uses labor market data at the national, state, and city level to predict what jobs will be available and what funding will funnel down. These data also illustrate the

city's inequities, from historic redlining to today's tech-driven housing crisis, that feeds into their decision making. In practice, this tool identifies "priority zip codes," areas in—or just outside of—the city that suffer from underinvestment for funding opportunities.

ESTABLISH GOALS AND METRICS

The Milwaukee Water Commons uses data on industry sectors and local initiatives to prioritize goals and strategies the collaboration of organizations has developed through a working group structure. Every strategy the group considers adopting is measured against SMARTIE goals—building on a business management framework for goal setting that is Specific, Measurable, Achievable, Relevant, and Timebound, as well as Inclusive and Equitable.²³ As the person we interviewed noted, this "creates a really tangible time bound action that we can kind of be holding ourselves accountable to and measuring, that every time we're doing that, that we're also really making sure that we're having an open conversation about equity, inclusion and justice."

For individual workforce training providers, standard metrics of success include data on the number of people who enroll in a program, complete a program or obtain certification, and get a job. Some organizations go further to collect data on the entry wage or retention in a job. Despite funder requirements for collecting and reporting on these data, we learned about gaps when it comes to the data collected being aligned with the goals of job quality and equity. As one interviewee from the American Council for an Energy-Efficient Economy put it, "We noticed a lot of workforce programs don't have robust evaluation processes. How are they measuring and evaluating their impact and measuring success? We want to emphasize, when it comes to diversity and racial equity—to maximize your impact you need to have comprehensive metrics both quantitatively and qualitatively. How many people are they training? How many partnerships are created?"

Local governments can use community-level data related to climate and sustainability goals. For example, Seattle has a data portal called the One Seattle Climate Portal,²⁴ which is designed to track collective progress toward the city's climate goals, such as monitoring the city's climate investments.

When we convened the interviewees at the end of the project for two roundtables to get feedback on the framework, they noted the need for systems of accountability at all levels. This includes accountability for equity and job quality goals when funding comes to the state or local government. Strategies for accountability can include community benefit agreements and new procurement processes discussed later in this report.

Involving Community in the Design and Implementation of Solutions

One way to ensure that strategies are designed to meet community needs is by engaging community members and organizations. Engagement can occur over time through the implementation of workforce strategies and efforts. Both the IIJA and IRA have requirements around public and community engagement. For example, potential applicants for environmental remediation grants provided by the Department of the Interior, Environmental Protection Agency, and Department of Energy are encouraged to “begin to inventory sites and launch community-led stakeholder engagement sessions to determine eligibility for funding remediation work, as well as assess the needs of the local workforce from a training standpoint, so jobs created by these projects can employ members of affected communities” (White House 2022b). In our interviews, we learned about efforts to engage community members in the design of programs and initiatives, to provide access to training opportunities through relationships with community-based organizations, and to engage communities in accountability strategies.

ENGAGE COMMUNITY AS PART OF DATA GATHERING AND UNDERSTANDING THE PROBLEM

ReImagine Appalachia developed a blueprint for investments in the Ohio River Valley region by convening virtually for two days of listening sessions with community racial justice advocates, union leaders, environmental groups, researchers, and others. This blueprint strategy has already garnered the endorsements from over 50 organizations that represent the voices of residents in the region and various sectors, including Black Women Rising, Concerned Ohio River Residents, and the Evangelical Environmental Network.

We’re promoting and empowering stakeholders at the local level to come together to engage in bottom-up visioning for their community, making sure that people that are often left out of the economic development conversation have a say in what the future of their communities look like.

—ReImagine Appalachia staff member

ReImagine Appalachia also runs the ReImagine Your Community Visioning Session Project, an initiative that brings together community leaders from across the Ohio River Valley for a series of monthly meetings to support each other in creating a grassroots vision for a sustainable and equitable economy in each community. Each participant receives a small stipend to support their efforts as part of the cohort and to implement their learnings. Through the project, these community leaders gain tools

for identifying stakeholders, building coalitions, educating the public, and applying for competitive federal climate infrastructure grants.

When the Milwaukee Water Equity Taskforce was convened in 2018 to build a more equitable water workforce, they knew they had to take time to better identify and understand the barriers to entry for people living in underserved communities. They partnered with the University of Wisconsin–Milwaukee Center for Economic Development to develop a Needs Assessment for the local water sector, which included extensive research and community focus groups (Williams 2020). Based on the findings of the report, they were able to identify opportunities for the taskforce to leverage in raising awareness of water-related jobs, increasing diversity, and providing clear pathways.

ENSURE EQUITABLE ACCESS THROUGH COMMUNITY ORGANIZATION PARTNERSHIPS

A key focus of community engagement efforts for the organizations we interviewed was on recruitment to ensure that workers of color and workers from other historically marginalized groups can equitably access training opportunities.

Recruitment and outreach is another barrier for people of color entering into the skilled trades. Certain programs not having the capacity to do door knocking and flyering or even being able to have adequate referrals made from community partners is a huge issue. What are certain bottlenecks keeping women and people of color out of the skilled trades?

Recruitment and outreach is a big one.

–BlueGreen Alliance staff member

Community organization partnerships can be combined with other strategies for attracting participants, such as those outlined by the US Department of Labor in a resource developed to support recruitment of diverse populations into apprenticeships. The US Department of Labor has identified the following strategies (Souvanna 2023) to reach underserved groups and set them up for success:

- use inclusive and accessible recruitment materials that show a diverse range of training participants and successful graduates.
- clearly communicate all application requirements and the supports available.

- partner with other community organizations to create referral networks and build trust with community members.

Landforce, a nonprofit workforce development and land stewardship organization in Pittsburgh, casts a wide net in its recruitment efforts, including reaching out to probation officers and church groups, leaving flyers at bus stops and libraries, and going straight to the neighborhoods that need the most support. Staff reported over 200 recruitment and referral partners, as well as social media campaigns. The organization also brings back alumni to meet and share resources and their experiences with current cohorts. The staff members interviewed shared their belief that this intentional cultivation of community is especially valuable for those who do not have strong support groups of their own or do not see themselves represented in certain fields or sectors.

The Philadelphia Office of Sustainability leverages conversations with residents about how to reduce their home energy costs to educate recruit people on the opportunities to train for energy audit jobs. The idea is to connect people with entry-level jobs as energy auditors so that they can progress into careers in retrofitting, solar, and weatherization.

DESIGN COMMUNITY BENEFIT AGREEMENTS (CBAS) AND PROJECT LABOR AGREEMENT (PLAS) FOR ACCOUNTABILITY

Strong CBAs and PLAs can empower communities to demand more from developers.^{25 26} These contracts have the power to set local hiring targets, livable wage levels, paid on-the-job training opportunities, and financial commitments to community-based organizations. Best practices, such as convening large and diverse planning coalitions, may unfortunately be beyond the capacity of many communities. This is a chance for regional intermediary organizations to develop guiding principles and example language that smaller community groups can draw from.

At the federal level, the Department of Energy requires CBA submission for recipients of IIJA and IRA funding. The agency describes plans as reflecting the following four priorities: engaging communities and labor unions, creating quality jobs, advancing equity through recruitment and training; and implementing Justice 40 principles directing 40 percent of benefits to disadvantaged communities.^{27 28} Federal guidance further encourages state and local governments to take similar approaches in their disbursement approach to federal pass-through funding.

RelImagine Appalachia brought together labor organizations, racial justice groups, environmental activists, faith communities, government agencies, and others from across the region to design better CBAs. RelImagine Appalachia places strong emphasis on the role of CBAs in securing systemic funding,

ensuring the jobs created are high paying and achieving, or at least make a good faith attempt to achieve, targeted hire rates from high poverty districts.

See appendix for tools and resources that can support the development of CBAs.

Aligning Workforce Development with Equity, Job Quality, and Local Demand

At the core of efforts to prepare the workforce for emerging climate-forward infrastructure jobs are the education and training programs that give people the skills needed for those jobs. The IIJA does not include an explicit role for the public workforce system, although states are encouraged to create “Human Capital Plans” which address how infrastructure investments will meet immediate and longer-term workforce needs (NGA 2023).

Organizations implementing education and training programs can build on promising, evidence-based practices to design local or regional strategies, including the development of industry partnerships, engagement of employers and unions, and adopting training models like pre-apprenticeship or registered apprenticeship, where participants are paid employees receiving training and mentorship as they build competencies to advance on the job, and receive supportive services to support progress along career pathways.

ESTABLISH INDUSTRY PARTNERSHIPS LED BY INTERMEDIARIES

Regional industry partnerships are an important approach to strategically organizing human capital needs across a sector, as opposed to one employer at a time. The National Fund for Workforce Solutions defines an [industry partnership](#) as a “dynamic collaboration of a regional group of employers that convene regularly with the assistance of a workforce intermediary” (Lynch 2004). Workforce intermediaries are in a unique position to bring the necessary—and sometimes, historically overlooked—stakeholders to the table to develop and implement green workforce plans. Whether they take the form of community-based organizations, labor-management partnerships, or some other model, these entities facilitate partnerships that help connect the needs of employers and job seekers. These partnerships are key to taking full advantage of the federal resources at our disposal because they bridge information gaps, aggregate employer demand, and train the local workforce to compensate for skills gaps (Lynch 2004).

We heard from many different institutions, including city governments, that it is useful to have intermediaries function as conveners for labor, CBOs, academic systems, government, and businesses to discuss how to move forward on difficult issues such as the implications for employers and workers

related to mitigating, adapting to, and reversing climate change. Since this is a shared challenge, there is also a shared motivation to work together to address it.

One challenge raised by interviewees and roundtable participants is that not everyone has the capacity to join meetings outside their prescribed role. A toolkit from the Urban Institute on community engaged research methods recommends providing meaningful compensation for organizations and people to minimize this barrier to participation (Langness et al. 2023).

Outside of our interviews, there are other examples of industry partnerships being a vehicle to implement climate workforce initiatives. For example, the governor of Maine recognized the opportunity that an expanded clean energy workforce poses for the state. To reach the goal of doubling Maine's clean energy and energy efficiency jobs by 2030, the Governor's Energy Office established a Clean Energy Partnership to convene employers, educational institutions, industry associations, and nonprofit organizations. This partnership is guided by an advisory group of members from different stakeholders that meet to discuss and plan workforce development efforts in the clean energy and energy efficiency sectors.

ENGAGE EMPLOYERS AND UNIONS IN DEVELOPING PROGRAMS

Research has documented the importance of employer engagement and partnership in the development and implementation of effective workforce and career pathway models (Barnow and Spaulding 2015; Patterson and Carson 2021). A meta-analysis of 46 career pathway program evaluations found that engaging employers to provide input on curricula or in the design of programs was associated with larger education progress impacts. Employer involvement can include oversight of programs, assisting with projecting future job openings, identifying in-demand skills, co-creating training curriculums, providing paid on-the-job learning opportunities, conducting mock interviews, hiring program graduates, and contributing equipment for training (Spaulding and Martin-Caughey 2015).

PowerCorpsPHL, an AmeriCorps initiative in Philadelphia that supports unemployed and underemployed young people in paid training that prepares them for green jobs and careers, emphasized the importance of strong employer relationships for the success of their programs. For example, they reported enlisting employers or industry groups to codevelop curriculum, which gives them a real-time understanding of what makes a good candidate. They indicated that this engagement is ongoing. They revisit the curricula periodically, adjusting based on employers' current and future demands.

Similarly, CleanTech Alliance, an industry trade association with over 1,100 members across the country which helps members adapt to clean energy technology, engages employers at the recruitment stage through worksite visits, copresented webinars, and high school internship programs. The idea is to provide employers the opportunity to attract youth, women, and others who would likely not have joined the pathway without direct outreach, and to provide potential workers with information and training opportunities within the company.

At Seattle Jobs Initiative, a nonprofit workforce development organization in Seattle, staff also talked about the importance of employer partnerships. Because the organization works with vulnerable populations—from people with criminal records to those with limited English language skills—staff shared that they take care to ensure that their employer partners are bought in to the organization’s mission. In practice, this means examining employee handbooks, company policies, and mission statements, and making visits to where people have been placed at a worksite for training or a job. The opportunity for assistance in sourcing talent is what often brings employers to the table; Seattle Jobs Initiative tries to work with them to build commitment beyond just hiring.

IMPLEMENT PAID, LONG-TERM TRAINING AND SUPPORT CAREER PATHWAYS

One component of a quality job is the potential for advancement because workers may not immediately have the skills or credentials required for higher-paying jobs. As green jobs and the clean energy economy continue to grow and evolve, respondents talked about the importance of connecting workers with opportunities to expand their skills with paid, short-term or on-the-job training.

Pre-apprenticeship provides an important on-ramp into many trades, especially for people who have been historically excluded, such as women and people of color. CenterState CEO works on creating pre-apprenticeship programs with about half a dozen union leaders who share their commitment to diversifying the trades. They have found, after six cohorts, that allowing participants to apply to apprenticeship outside of the normal cycle is crucial, so as to not to lose momentum with a long waiting period. Additionally, the unions agree to put women and people of color at the front of the line for apprenticeship opportunities, which offer structured training on the job while apprentices earn pay and receive mentorship to advance into higher-paid positions. A goal of Seattle Jobs Initiative programming is to build in multiple steps along a career path that allow the trainee to keep advancing until they are earning a livable wage in the city. Based on data about credential requirements, some jobs, such as those in the energy efficiency sector, may require a college degree, pointing to the need to connect participants with opportunities to earn these credentials.²⁹

[It's about] long term support and working with people over a number of years. Supporting folks once they're in a job and how they advance once they get there. Especially in industries that are predominantly white. Support with helping folks advance within companies.

—Seattle Jobs Initiative staff member

PROVIDE SUPPORTS TO ENSURE PERSISTENCE AND ADVANCEMENT

Several respondents noted the importance of supportive services as a strategy to support program retention. Transportation, childcare, and mental health counseling are just a few examples of common services mentioned as critical.

PowerCorpsPHL works with justice-involved youth for whom they provide legal advocacy in addition to their standard service navigators. In fact, about 60 percent of incoming participants have adult criminal records and 10 percent came through the foster system. PowerCorpsPHL has staff in place to address this population's unique challenges, including expunging juvenile records, navigating social security and childcare benefits, and accessing mental health care. Staff point to the relationship between this kind of holistic support, including lifelong access for all alumni, as the reason for the organization's 8 percent recidivism rate compared to 45 percent citywide.³⁰

Seattle Jobs Initiative invested in a unique supportive service for their state maritime program, offering a \$52 daily stipend for food. Staff shared their belief that this support has been critical for retention of participants, along with the rent, child care, and transportation assistance the organization provides. Staff from Landforce Pittsburgh also commented on the importance of transportation supports. The organization leverages the US Department of Agriculture's Supplemental Nutrition Assistance Program Employment and Training³¹ funding, along with other grants, to support transportation needs, including money for public transportation, gas, and vans used to transport participants from the office to work sites all over the county.

Providing Comprehensive Technical Assistance and Expanding Implementation Capacity

The success of the IIJA and IRA requires that recipients (e.g., state, regional, local, and Tribal governments and their nonprofit and community partners) have the capacities to access these grants and tax credits and then equitably and effectively deploy these investments so they achieve the

legislations' ambitious economic, infrastructure, and climate goals. Given that many communities have lacked the capacity to even apply for these funding opportunities, the Biden–Harris Administration organized more than 100 federal technical assistance programs to help communities win these federal funds.³² Administered by a joint federal interagency working group coordinated by the Department of Transportation through the Thriving Communities Network, most of the technical assistance programs so far focus on helping eligible communities apply.³³ Only a handful of these federal technical assistance programs touch upon workforce development strategies under the IRA and IIJA. Networks of nonprofits, professional associations, and nonprofit organizations with support from philanthropy also manage a series of training programs and capacity building communities of practice to help local governments and their partners apply for and obtain IRA and IIJA funds.³⁴

In our interviews, we learned about a few important areas for capacity building to support the implementation of climate-forward workforce initiatives locally, aligned with the principles of job quality, equity, and collaboration.

SUPPORT SMALL AND LOCAL CONTRACTORS

Several organizations we spoke with emphasized the need for building the capacity of small, minority- and women-owned contracting businesses as a strategy for promoting upward economic mobility. One organization that runs a contractor accelerator program noted that the companies they work with are deeply committed to their mission. So much so, in fact, that they have become training providers, or volunteer at local high schools to inform youth about clean energy careers.

We need a more aggressive and robust small business development center so contractors who are smaller and wish to grow have the TA need to successfully bid on a project, have the equipment, and relationships with unions and apprenticeship programs to provide them with skilled workers.

—BlueGreen Alliance staff member

Investing in small contractors led by representatives from historically marginalized communities can help expand access for workers from those communities and contribute to economic development. Elevate, a national nonprofit that focuses on ensuring that the benefits of clean energy accrue equitably,

operates “contractor accelerators” which support a select group of contractors in a particular location. The program helps contractors looking to diversify, scale their businesses, and transition into the clean energy economy by providing access to capital, financial health trainings, and small business development supports. Elevate also convenes a contractors roundtable that involves the local departments of public works, environment and sustainability to help align local government procurement, workforce, and climate-forward project investments.

Other organizations that do similar work have found that smaller businesses, especially those owned by women and people of color, often face multiple barriers to government contracting, such as learning about requests for proposals, connecting with prime contractors, positioning themselves as prime contractors, and navigating the administrative burdens of applying for and managing the contract, including long delays in payment. A staff member from Elevate, described how, in some cases, local governments “don’t have the partnerships in place to make sure that diverse companies and diverse workforce can bid on projects.” They often lack the capacity to efficiently comply with the federal procurement requirements. The staff member went on to say, “Many diverse businesses are not prepared to be able to bid, nor would they maybe even want to bid because the payment timelines are so long that you have to be a pretty well financed entity to be able to weather that time. That’s a structural problem.” Given these issues, our interviewees emphasized readiness as a key strategy.

CULTIVATE THE CAPACITIES OF INTERMEDIARIES

In many places throughout this report, we highlight the success of emerging collective, cross-sector collaborations that seek to infuse green jobs and green career pathways with climate infrastructure programs and projects. At the heart of these collaborations, we found intermediaries playing pivotal roles as the backbone organizations bringing together core actors from the workforce development field with climate resilience/sustainability entities and groups. National and regional organizations such as ReImagine Appalachia and Elevate operate across states and localities, while other intermediaries such as Center State CEO focus their programs within a region.

Intermediaries have the insights and know how to build trust to forge partnerships among state and local government agencies, elected officials, local nonprofits, employers, unions, workforce education, and training organizations. They have extensive networks often within each of the relevant policy domains—workforce and climate resilience. Some intermediaries focus on workforce and bring experience providing job training and collaborating with employers and unions.

Through the Syracuse Build Initiative,³⁵ CenterState CEO, in partnership with the Syracuse Mayor’s Office, support a network of community-based organizations, employers and trade groups and

state/regional and local workforce training programs with a commitment to equity by engaging and recruiting residents from low-income neighborhoods to participate in a range of workforce development training programs. These CBOs have long-standing relationships with local residents. They know their communities and what is needed to ensure successful training that leads to equitable career pathways within the construction and infrastructure trades.

SUPPORT COMMUNITY-BASED ORGANIZATIONS

Nonprofit workforce development and climate resilience organizations exist at this strategic intersection of policy and program. Many of the local organizations that we interviewed have extensive experience with urban greening, urban forestry, green infrastructure, and energy efficiency retrofitting. Only in the past few years have they begun to leverage their urban sustainability expertise to advance a range of workforce training programs around emerging green jobs. Despite their initial successes, many of the community-based organizations we spoke with acknowledged how difficult it is to scale and expand these community-level initiatives. They shared several ideas on where their organizations need additional support and resources:

- Continuity of CBO leadership and staff—“the nonprofit sector needs some readiness support” in order to sustain this bridge building work.
- Engagement in national and local collaborations and networks. “Not everyone has that capacity—a staff person—to join meetings outside of their role ... it’s not part of their workload.” “CBOs are overtaxed.”
- Continuous development of the necessary partnerships with employers and unions. “Jobs are about relationships and trust.”
- Holistic support services (e.g., transportation, child care, housing, food, etc.) for the local residents that participate in their green workforce training programs.
- Community engagement across their diverse communities so they can maintain and strengthen relationships with the members and leaders in their respective communities.

Engaging in Advocacy and Policy Change

Advocacy is an integral part of bringing about social changes to advance both labor and environmental policy. The goal of advocacy is to effectively communicate the individual’s or group’s perspectives and ideas to relevant stakeholders including policymakers and industry leaders, develop consensus, and

effect change.³⁶ Many of the organizations we interviewed indicated their involvement in advocacy efforts that shaped the development of the IIJA and IRA, and efforts to roll out funding across the country.

LEVERAGE PARTNERSHIPS TO AFFECT CHANGE AT MULTIPLE LEVELS

Interviewees described the importance of partnerships at the center of advocacy efforts, with local coalitions of organizations working together to effect change within their communities and at the regional, state, and local levels. For example, ReImagine Appalachia developed their blueprint,³⁷ which outlines strategies that local and regional partners across the region can advocate for, organized around the goals of expanding opportunity through public investments, building a 21st-century sustainable Appalachia, and rebuilding the middle class.

Another example is from CleanTech Alliance, which supports companies in the clean energy sector and provides services tailored to meeting the needs of individual members ranging from advocacy work to grant writing, research, and educational programs. They also act in the role of an intermediary by helping build partnerships across their member organizations to leverage each other's expertise in addressing needs or challenges.

ADVOCATE FOR FUNDING TO FURTHER SUSTAINABILITY AND WORKFORCE GOALS

Leveraging partnerships within a region can also be an effective advocacy strategy for securing funding to further sustainability and workforce goals. For example, Landforce Pittsburgh is a part of the Pittsburgh Canopy Alliance, a county-level group of nonprofits and government agencies in Allegheny County championed by the organization Tree Pittsburgh. The purpose of the alliance is to facilitate dialogue on tree conservation and related best practices. The alliance was awarded an \$8 million USDA Urban and Community Forestry Grant³⁸ to support more resilient forests and increase tree canopy in communities, with Landforce Pittsburgh contracted as a partner organization. According to a staff person at Landforce, advocating for this grant with other organizations in the region was part of "a conversation about how we could work together," and the effort to pursue funding was "successful because of a long history of collaboration in Pittsburgh among environmental organizations."

Staff from ReImagine Appalachia also noted how a collaborative approach allows for better resource coordination to achieve common goals. "The places that most need the resources are the least well equipped to write grant grants," described a ReImagine Appalachia staff person, "... we try to make sure that somebody or that the region collectively steps up to that capacity challenge." They went on to

add, “we really want to catalyze, for example, the use of collective procurement ... to both get more federal money and to make sure it’s used right [in line with community benefit agreements].”

Elevate hosts the Justice40 Accelerator in association with three other organizations with the goal of providing frontline environmental justice organizations with resources to access federal funding. At the time of the interview, the Justice40 Accelerator helped facilitate \$33 million from the IJJA and other sources (but not IRA). Elevate also works with government partners to find them federal funding for climate-related initiatives.

INFLUENCE LEGISLATION, POLICY, AND PRACTICE

Advocacy for policy change involves engaging directly with policymakers to influence legislation, policy, and practice. Local organizations can do this directly, but can also partner with regional or national organizations that share similar values and goals.

For example, staff members from BlueGreen Alliance described how they have worked toward broader policy goals by advocating for statutory changes. Staff members reported on efforts to shape the clean energy tax credit part of the IRA, including advocating for attaching labor standards to the credits. The organization also worked with the Department of Energy (DOE) to incorporate industrial decarbonization provisions within the IRA, and on design decisions for that program.

Another example is from ReImagine Appalachia, which has been active in conversations about the Farm Bill and engaged with members of Congress and the Biden administration to influence the IJJA. A staff member shared, “almost everything that we advocated for showed up in some form into the federal climate infrastructure package ... Now that we’ve mostly turned to implementation, we continue to work with Biden administration folks and advocates to...draw down these funds, and we’re helping to inform grant applications. So, there’s sort of a feedback loop to working at the congressional level.”

Milwaukee Water Commons staff shared about the advocacy work they do on a variety of infrastructure issues, such as waterway restoration, lead pipe replacement, upgrades to the sewer system, and green infrastructure being installed around the city. As part of that work, they engage in advocacy with the local government and with utilities. Advocacy around workforce development and quality jobs has been informed by the leadership of the Milwaukee Water Task Force, a cross-sector group of utility companies, government workforce, education, nonprofits, and community organizations focused on how to create living-wage employment in the water sector. A staff member shared that learning from this effort helped shape efforts in Milwaukee to create a more diverse workforce.

ESTABLISH SYSTEMS OF ACCOUNTABILITY

Advocacy efforts can also focus on shaping the implementation of policy, including systems of accountability through community benefit agreements and procurement policies. The Good Jobs Initiative includes resources related to ensuring job quality and equity, and an “Impact Dashboard” for measuring the adoption of job quality elements in federal procurement. However, we heard little about these resources and accountability mechanisms carrying down to the local level.

Above, we highlight CBAs as an important way to ensure that federal investments are aligned with community needs. Although there is debate on the enforceability of CBAs and the need to develop better evidence of effectiveness, some research has pointed to how to use these agreements to promote accountability. The Sabin Center for Climate Change Law recommends including provisions for monitoring compliance with agreements, and enforcement for noncompliance (Eisenson and Webb 2023). Challenges with enforceability can stem from lack of specificity around the time frame of implementation, dollar amounts, and who is party to the agreement (Stephan 2022; Fraser 2023; Been 2010). Review and approval by local officials can be important for enforceability, as well as the state context and laws governing CBAs (Been 2010; Eisenson and Webb 2023). Community groups can thus advocate for involvement of local officials in the development of community benefit agreements, as well as state laws that support enforceability.

Revamping existing government procurement processes offers another mechanism for improving equity in green jobs and ensuring accountability. Government agencies can advance important equitable workforce goals by adopting changes at different points in the procurement process. Scott and D’Elia (2023) describe opportunities to influence procurement at the prequalification and proposal stage, or through post-award compliance and performance payment mechanisms. The city of Seattle and the State of Washington have taken steps to revamp contracting so it is more equitable. Executive orders from the mayor and governor in 2022 were aimed at this goal. In interviews, we heard about several ways procurement was being used as a strategy to advance equity. In Seattle, one interviewee shared that if a contract specified a program focus on expanding access for Black men, subcontractors need to report on metrics related to that goal. Milwaukee Water Commons has a committee on procurement that is looking at ways to better build equity into procurement processes, including pushing for greater transparency in whether contractors are meeting intended outcomes. Scott and D’Elia (2023) document the ways that the San Diego Workforce Partnership has designed procurements processes to align with job quality goals.

Collective procurement is another useful strategy for drawing federal money to small communities that might not otherwise have the access or capacity. In the case of ReImagine Appalachia, they build

local capacity by convening a community of practice that helps connect the dots between experts and local communities seeking funding. Seattle now has in place an open request for proposal process that involves two city staff and three community members from a CBO, labor union, academic institution, or oversight committee. As such, the city's decision to award the contracts requires consensus-building among these diverse perspectives. "They [city staff] are a partner, not the ultimate voice, remarked a representative from the City of Seattle." Pushing for changes to procurement is one of several ways local actors can advocate for state and local policies and processes that align with the goals of equity and job quality in the implementation of climate infrastructure laws.

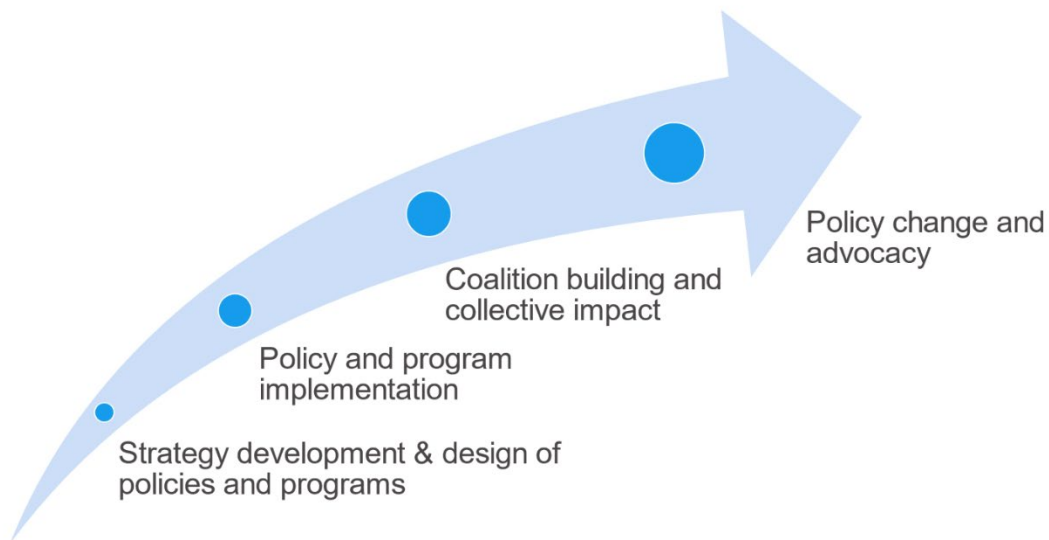
How Can Key Actors Use This Framework?

The above framework offers policymakers, practitioners, nonprofits, business, and labor leaders a holistic approach for advancing equitable career pathways within climate infrastructure investments. Although individual organizations can adopt and implement the framework's principles and strategies, collective cross-sector action by multiple actors remains critical given the complexity of the climate infrastructure and workforce development ecosystems. Our report can further help key actors and agencies within those ecosystems improve their capacities to identify, design, and implement regional and local-level policies and programs that leverage climate infrastructure investments into emerging green careers.

Below we share a few suggestions on how key actors can apply and adopt our framework (see figure 2).

FIGURE 2

How to Use and Apply this Framework



URBAN INSTITUTE

Source: Framework based on authors' analysis of interviews, roundtables, and other research conducted in 2023 and 2024.

- **Strategy development and design of policies and programs**—collectively, the framework and information from our interviews offer insights, emerging examples, and practical models that nonprofits, intermediaries, business, and labor organizations can promote with policymakers so they can design more comprehensive and collaborative initiatives that elevate the opportunities for green workforce development within climate infrastructure, grants, projects, and resources. The framework's principles can also serve to strengthen the policy and programmatic connections around equity, climate infrastructure, and workforce development.
- **Policy and program implementation**—the framework's strategies can help improve the equitable deployment and effective management of these new climate infrastructure resources. Local governments, as the prime recipients and focal points for climate infrastructure, can assess and inform changes to their program and project development processes so they align with the framework's key principles and strategies. The framework could also help shape policies at the state level as funds flow down through formula allocations from the federal to the state and then local levels. Philanthropy can use it to identify opportunities to provide flexible funding to fill gaps and provide supports needed to ensure equitable access.
- **Coalition building and collective impact**—given the myriad agencies and actors involved in these efforts, our research suggests that communities should adopt a collective impact process that

expands existing coalitions and fosters the necessary cross-sector collaborations to infuse green workforce programming within sustainable and climate resilient infrastructure projects. Nonprofits and other types of intermediaries can leverage this report and its framework by sharing it with philanthropies as they are one of the primary financial supporters of efforts that adopt a collective impact process or model.

- **Policy change and advocacy**—effective and equitable policy change will demand strong advocacy and research that supports longer term, institutional change. Nonprofit and climate resiliency advocates who share common interests and goals can leverage this report in supporting new policies and programs that elevate the importance of equitable green career pathways. Resources identified in this report and lessons from this work can be used as levers to affect changes in job quality beyond emerging “green jobs” to a broader set of occupations that make up a large share of jobs.

Insights and Ideas for Policy and Program Action

As we reflect on our research and interviews with climate infrastructure and workforce development practitioners, several insights and ideas arise that can help communities achieve the goals of federal climate infrastructure investments and ensure equitable access to emerging green careers. The first set of policy and program actions focuses on how to help communities take full advantage of the IIJA and IRA resources by improving implementation within and across all levels—federal, state, regional, and local. The second set of actions outlines how government, private sector, and philanthropy can collectively leverage their resources and expertise to support collaborative capacity at the regional and local scale where workforce development and climate infrastructure projects actually happen. Investments made in collaborative capacity can support effective implementation of federal infrastructure laws now, but can also support desired outcomes for communities over the long term.

Recalibrating Climate Infrastructure Policies, Programs, and Grants

As climate infrastructure funding continues to flow from the federal level to the states and local governments, and nonprofits apply for and receive competitive grants and tax credits, there are many opportunities to improve implementation. Below are a few starting points for key actors in the workforce and climate ecosystems.

ELEVATE JOB QUALITY AND EQUITY

- Federal agencies should build on the framework established through the Good Jobs Initiative to continue to integrate, support and elevate the goals of job quality and equity, including by providing information on how government agencies can use procurement as a tool to advance job quality and guidance on the development of CBAs and PLAs. With an expansion in PLAs and CBAs, there will be opportunities to better understand how to design these mechanisms to drive job quality and equity through federally funded research.
- State agencies and local governments should put in place procurement practices that act as levers for equitable access to quality jobs, including collaborative procurement and systems for accountability. Funding should be used to provide supportive services and paid training to ensure equitable access for historically marginalized populations.
- Philanthropies should support advocacy efforts that help policymakers and practitioners leverage climate infrastructure investments—with their focus on job quality and equity—to affect changes in other occupations and workplaces. Philanthropies can also provide access to critical supports for job seekers enrolled in programs, thus making them more accessible and responsive to participant needs.
- Employers should take steps to improve the quality of jobs to ensure a pipeline of workers for current and emerging jobs, especially in view of projected job openings due to anticipated retirements. They can attract and retain diverse talent by partnering with workforce development and education and training organizations, reducing barriers to entry such as unnecessary degree requirements, eliminating barriers to advancement, creating internal career pathways, supporting training through offering apprenticeships and other strategies, and fostering an inclusive work environment for workers of all backgrounds.
- Unions can promote equitable access to quality jobs by examining practices that may contribute to the exclusion of women and workers of color and engaging in community-wide efforts to promote access to emerging jobs that are covered by project labor agreements or have union representation. They can help expand access and promote opportunity for underrepresented groups by partnering with community-based organizations to recruit participants of diverse backgrounds, and by providing support to workers, including mentoring, supportive services, and training opportunities.

STRATEGICALLY COORDINATE RESOURCES TO MAXIMIZE BENEFITS AND SCALE

- Federal agencies should revise current guidance to require or incentivize existing IIJA and IRA grantees to use federal and state infrastructure and climate grants for related workforce development purposes, including the provision of training and necessary supports, and coordination activities.
- State infrastructure, energy, and sustainability agencies could also follow suit by developing their own guidance that requires regional and local governments to spend existing climate infrastructure dollars on expanding career pathways for green jobs. Furthermore, state agencies that are the recipients of federal dollars need to work to coordinate resources across funding streams and in collaboration with workforce development actors to ensure efficiency, scale, and alignment with best practices in developing equitable career pathways. Currently, funding flows in a few ways—through tax credits, competitive grants, and formula funding to states. For state funding, coordination of resources across agencies and in collaboration with workforce development is needed to ensure efficient and effective use of resources.
- Local governments (with the support of state governments) should strategically scale the opportunities for aligning climate infrastructure projects with green career pathways by adopting policies and programs that facilitate city- and regional-level project coordination and interwoven climate resilient investments. At the local and regional level there is a need to aggregate the demand and supply of emerging green jobs across regions to be able to operate at scale.
- Philanthropy can provide flexible resources to support collaborative activities and fill other gaps, especially for high-quality workforce training and the related supportive services needed by participants.

DEVELOP SHARED SYSTEMS OF ACCOUNTABILITY

- Government, practitioners, and philanthropy should work together to develop shared measures of accountability throughout the lifecycle of federal and state climate infrastructure investments grounded in this report's core principles. Despite the promise of recent federal and state climate resources, deliberate policies and sufficient staffing and safeguards must be in place to ensure historically marginalized populations benefit directly from climate infrastructure investments. This can include making sure that disadvantaged and vulnerable communities can access green workforce development and job opportunities, and that they are included in decisions about how these resources are deployed.

- Federal, state, and local governments should make information publicly available on how funding is being allocated, and the outcomes of efforts aligned with the principles of equity, job quality, and coordination. Increased transparency would allow actors to answer key questions about the types and numbers of jobs being created, who is accessing jobs or related training, and climate benefits to communities. Although trackers have been set up to document where funding is flowing—for example, by the National League of Cities³⁹—information is needed about the outcomes of these efforts to ensure accountability.

Building Collaborative Capacity

Nonprofit workforce development and climate organizations must further expand their capacities so they can continue to connect climate infrastructure programs and projects with green jobs and career pathways. Below are a few ideas on how government, philanthropy, and businesses can leverage their resources and assets to help expand the collaborative capacity of local communities.

ENHANCE TECHNICAL ASSISTANCE, CAPACITY BUILDING, AND OPPORTUNITIES FOR PEER LEARNING

- Federal agencies should expand technical assistance to include dedicated training and TA on green workforce development, equitable green career pathways, for existing IJJA and IRA grantees. Since implementation will continue over the next decade, it is important to provide support through the full period of implementation from procurement and grant management to project implementation, maintenance and program administration, evaluation, and impact.
- Philanthropy should provide flexible resources to develop tools, add to organizational capacity, and support the time intensive work of collaboration and ensure that inclusion and equity remain front and center.
- Businesses and unions can engage in industry partnerships to implement sustainable talent strategies that contribute to the bottom line while also promoting the well-being of the communities in which they operate.
- Federal and state governments in partnership with national and regional foundations should provide resources for nonprofit intermediaries to create and convene “communities of practice” where communities learn from each other so that people are not starting from scratch every time. During our two focus groups, several members shared their excitement to hear

from their peers from other cities as they rarely have the opportunity to learn from one another.

SUPPORT COMMUNITY ENGAGEMENT

- Funders, including philanthropy and government, should provide dedicated resources to support community engagement activities. Community engagement is pivotal in connecting residents and emerging small businesses from historically marginalized communities to the state and local systems that manage IRA and IIJA resources relative to climate infrastructure, and will continue to be critical for achieving equity goals beyond these current investments. However, outreach and engagement are time- and resource-intensive. Nonprofit intermediaries and local governments need supplemental resources to support community engagement and to ensure the equitable distribution of benefits to those eligible communities.
- Funders can also support the development of resources and tools and promote opportunities for training and technical assistance on effective strategies for authentic community engagement.

EXPAND INTERMEDIARY CAPACITY

- State and local governments in collaboration with philanthropy should assess the capacity of intermediaries within the climate infrastructure and workforce development ecosystems. Despite the promising work of intermediaries, as discussed in this report, many communities do not have intermediaries with the capacities, relationships, and networks to catalyze the necessary collaborations.
- At the national level, philanthropy (with support from government) should focus their resources in support of expanding the capacity of intermediaries to convene, coordinate, and facilitate cross-sector collaborations among workforce, industry, labor and climate infrastructure organizations, leaders, etc.
- National and regional philanthropies should design strategies and provide resources that could help sustain and expand the capacities of existing intermediaries and provide guidance and seed funding for incubating the launch of regional and local intermediaries that can advance this work.

Federal climate infrastructure investments, with their focus on climate resilience, job creation, and equity, provide an exciting opportunity to test and scale new tools and strategies for improving access to quality climate infrastructure jobs for historically marginalized populations. Although this framework

is specific to green jobs, its implementation offers lessons for other sectors to inform strategies for improving access to quality jobs and careers.

Appendix

Community Benefit Agreement and engagement resources:

- [Community Benefit Agreement Toolkit](#), US Department of Energy's Office of Energy Justice and Equity
- [Reimagine Your Community Toolkit](#) and bank of [community benefits materials](#), ReImagine Appalachia

Climate infrastructure technical assistance resources:

- [Thriving Communities Initiative](#), US Department of Transportation
- [The Communities First Infrastructure Alliance](#), hosted by Policy Link
- [The Infrastructure Hub](#), coordinated by the US Conference of Mayors and National League of Cities
- [Justice40 Accelerator](#), supported by Elevate, Partnership for Southern Equity, and The Solutions Project.

Job quality resources:

- [Good Companies/Good Jobs](#), the Aspen Institute's Economic Opportunities Program
- [Talent Rewire](#), a community of practice of employers run by FSG
- [Good Jobs Initiative](#), US Department of Labor

Notes

- ¹ H.R. 3684, also referred to as the Bipartisan Infrastructure Law.
- ² Fatima Yousofi and Susan Banta, “State and Local Governments Face Persistent Infrastructure Investment Challenges,” Pew Charitable Trusts, February 3, 2023, <https://www.pewtrusts.org/en/research-and-analysis/articles/2023/02/03/state-and-local-governments-face-persistent-infrastructure-investment-challenges>.
- ³ Joseph W. Kane and Robert Puentes, “Flint’s Water Crisis Highlights Need for Infrastructure Investment and Innovation,” Brookings Institution, January 13, 2016, <https://www.brookings.edu/articles/flints-water-crisis-highlights-need-for-infrastructure-investment-and-innovation/>.
- ⁴ Zuhayr Ahmed, “Interactive Rail Safety Map: See Derailments in Communities Across the U.S.,” National League of Cities, June 1, 2023, <https://www.nlc.org/resource/interactive-rail-safety-map-see-derailments-in-communities-across-the-u-s/>.
- ⁵ Campbell Robertson and Sophie Kasakove, “Pittsburgh Bridge Collapses Hours Before Biden Infrastructure Visit,” New York Times, January 27, 2022, <https://www.nytimes.com/2022/01/28/us/pittsburgh-bridge-collapse-biden.html>.
- ⁶ “The Paris Agreement,” UNFCCC, accessed April 15, 2024, <https://unfccc.int/process-and-meetings/the-paris-agreement>.
- ⁷ “About the IPCC,” Intergovernmental Panel on Climate Change (IPCC), accessed April 15, 2024, <https://www.ipcc.ch/about/>.
- ⁸ Lisa Friedman, “What Is the Green New Deal? A Climate Proposal, Explained,” New York Times, February 21, 2019, <https://www.nytimes.com/2019/02/21/climate/green-new-deal-questions-answers.html>.
- ⁹ Margery Austin Turner and Monique King-Viehland, “Economic Hardships from COVID-19 Are Hitting Black and Latinx People Hardest. Here Are Five Actions Local Leaders Can Take,” Urban Wire (blog), Urban Institute, August 12, 2020, <https://www.urban.org/urban-wire/economic-hardships-covid-19-are-hitting-black-and-latinx-people-hardest-here-are-five-actions-local-leaders-can-take>.
- ¹⁰ Martha Ross, “Why Workforce Development Is Crucial to New Infrastructure and Clean Energy Investments,” Brookings Institution, January 18, 2024, <https://www.brookings.edu/articles/why-workforce-development-is-crucial-to-new-infrastructure-and-clean-energy-investments/>.
- ¹¹ “The Good Jobs Initiative,” US Department of Labor, accessed April 18, 2024, <https://www.dol.gov/general/good-jobs>.
- ¹² “Federal Funding and Financing: Grants,” US Department of Transportation, accessed April 18, 2024, <https://www.transportation.gov/rural/grant-toolkit/funding-and-financing/grants-overview>.
- ¹³ “One Year of Our Clean Energy Boom: The 170,606 (and Counting) New Clean Energy Jobs Across the United States,” Climate Power, updated July 25, 2023.
- ¹⁴ IJJA and IRA are wide in scope, covering multiple sectors and industries. We decided to focus on two areas:
 1. Water—Sometime called “Blue/Green Infrastructure,” this includes a range of urban greening strategies and projects that feature nature-based systems such as green stormwater infrastructure, urban forestry, urban agriculture, etc. It also includes water infrastructure projects aimed at making communities more equitable and resilient, such as lead water pipe replacements, water quality and conservation measures, and making existing stormwater, wastewater, and drinking water systems more energy efficient and resilient.

2. Energy—This encompasses both energy efficiency and renewable energy efforts. Energy efficiency projects include the production and installation of energy-saving products and the provision of services that reduce energy consumption. Renewable energy includes the deployment of renewable technologies that reduce or eliminate carbon emissions. This includes solar, wind, and geothermal energy, hydropower, and renewable fuel (McGinn and Sneer 2019).
- ¹⁵ We invited organizations we interviewed to participate in the roundtables with participants including both people we interviewed and other staff from these organizations. In addition, we invited GroundworkUSA to representatives from local sites to attend the meeting because we were unable to schedule an interview during data collection and because Groundwork’s mission and programming aligned with this effort.
- ¹⁶ “Executive Order on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government,” the White House, January 20, 2021, <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/executive-order-advancing-racial-equity-and-support-for-underserved-communities-through-the-federal-government/>. This was followed in February 2023 with the release of the Biden–Harris administration’s executive order, “Further Advancing Racial Equity and Support for Underserved Communities through the Federal government.”
- ¹⁷ “Justice40: A Whole-of-Government Initiative,” The White House, accessed April 15, 2024, <https://www.whitehouse.gov/environmentaljustice/justice40/>.
- ¹⁸ “Climate Equity,” UCLA Luskin Center for Innovation, accessed February 22, 2024, <https://innovation.luskin.ucla.edu/environmental-equity/climate-equity/#:~:text=Home%20%2F%20Environmental%20Equity%20%2F%20Climate%20Equity,%2C%20race%2C%20and%20other%20characteristics>.
- ¹⁹ Molly M. Scott, Judah Axelrod, and Hailey D’Elia, “Who Has Access to Clean Energy Jobs?,” Urban Institute, last updated May 1, 2024, <https://www.urban.org/projects/clean-energy-job-access-race-gender>.
- ²⁰ Natalie Jimenez, “Small Firms Have a Big Role Fighting Climate Change,” BBC News, November 15, 2022, <https://www.bbc.com/news/business-63460919>.
- ²¹ To learn more, go to <https://lightcast.io/>.
- ²² Scott, Axelrod, and D’Elia, “Who Has Access to Clean Energy Jobs?”
- ²³ “From SMART to SMARTIE: How to Embed Inclusion and Equity in Your Goals,” The Management Center, May 3, 2021, <https://www.managementcenter.org/resources/smart-to-smartie-embed-inclusion-equity-goals/>.
- ²⁴ For more information on the One Seattle Climate Portal, see https://experience.arcgis.com/experience/d109ec235c8a44b08675452e64b5e4fe/?block_id=layout_733_block_36, accessed April 5, 2024.
- ²⁵ “Community Benefit Agreements,” in Pursuing Housing Justice: Interventions for Impact, accessed April 17, 2024, <https://www.urban.org/apps/pursuing-housing-justice-interventions-impact/community-benefit-agreements#:~:text=CBAs%20are%20legally%20binding%20contracts,of%20life%20of%20nearby%20residents>.
- ²⁶ “Project Labor, Community Workforce, And Community Benefits Agreements Resource Guide,” Good Jobs Initiative, Department of Labor, accessed April 26, 2024, https://www.dol.gov/sites/dolgov/files/OPA/GoodJobs/Docs/Project_Labor_Community_Workforce.pdf.
- ²⁷ “Clean Energy Infrastructure: About Community Benefits Plans,” US Department of Energy, accessed April 15, 2024, <https://www.energy.gov/infrastructure/about-community-benefits-plans>.
- ²⁸ The Department of Energy refers to Community Benefits Agreements as Community Benefits Plans.

- ²⁹ Scott, Axelrod, and D’Elia, “Who Has Access to Clean Energy Jobs?”
- ³⁰ Jessica Blatt Press, “Nurturing Tomorrow’s Workforce: Workforce Development Programs Don’t Always Live Up to Their Mission. PowerCorpsPHL Exceeds Theirs,” The Philadelphia Citizen, February 11, 2020, <https://thephiladelphiacitizen.org/powercorpsphl-philadelphia/>.
- ³¹ Landforce Pittsburgh reported leveraging the “SNAP 50-50 Program,” which allows recipients to leverage additional funding through a matched reimbursement model. For more information, see the US Department of Agriculture Food and Nutrition service fact sheet, accessed April 21, 2024, <https://snaptoskills.fns.usda.gov/about-snap-skills/what-is-snap-et>.
- ³² The White House TA guide does include several state programs that focus on helping communities obtain IIJA and IRA funding. To learn more, see the 2023 “Investing in America Technical Assistance Guide” at <https://www.whitehouse.gov/build/technical-assistance-guide/>.
- ³³ Note that many of the IRA programs are competitive grants, while most of the IIJA funds flow through state formula grant allocations. The tradeoff with competitive grants is they demand more time and effort upfront in drafting the application and pulling together diverse, collaborative teams, but can spawn innovative programs and projects that further the underlying climate resilience and sustainability goals.
- ³⁴ For example, The Communities First Infrastructure Alliance (see <https://communitiesfirst.us/>) hosted and coordinated by Policy Link, The Infrastructure Hub (see <https://localinfrastructure.org/>) hosted and coordinated by the US Conference of Mayors and National League of Cities. and the Justice40 Accelerator (see <https://justice40accelerator.org/>). Websites accessed April 22, 2024.
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