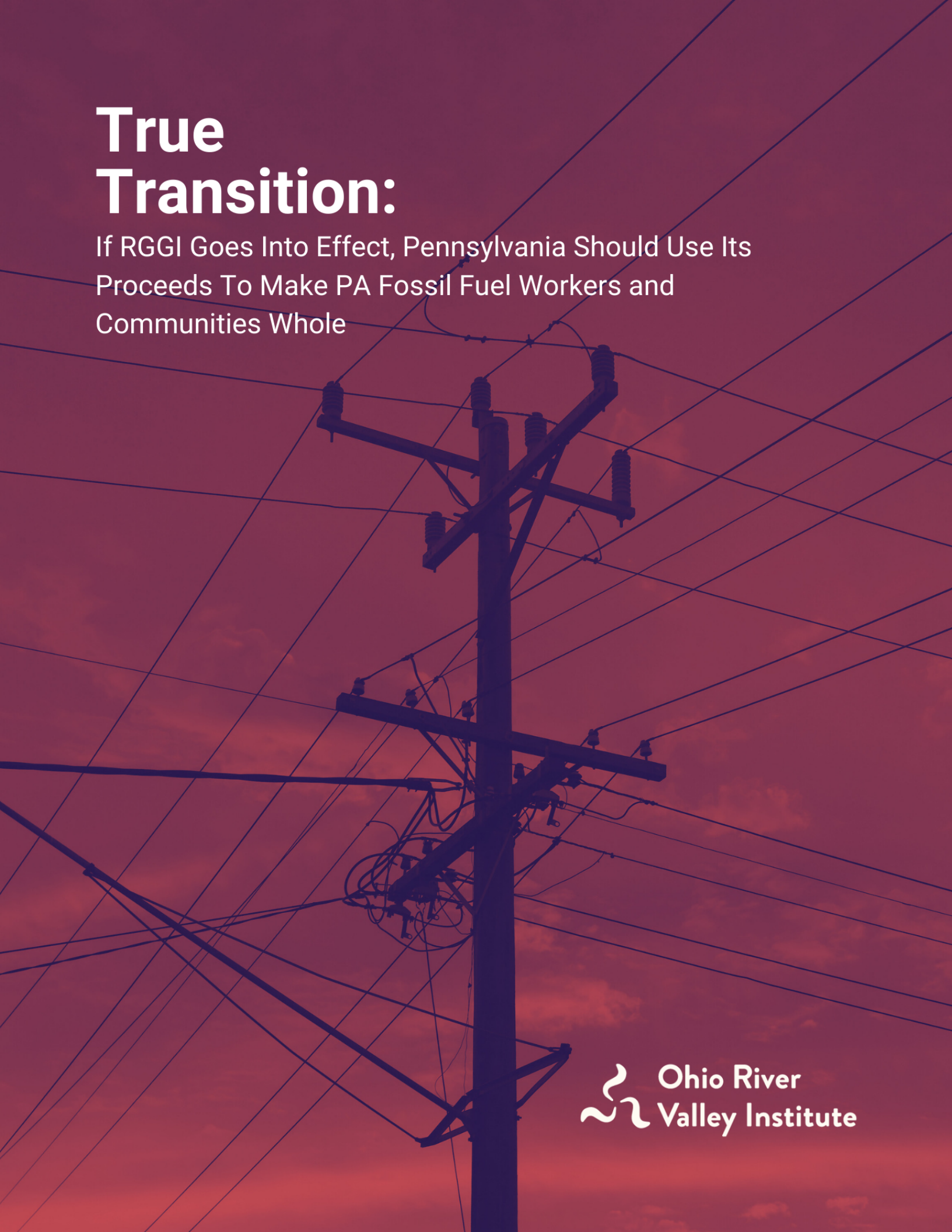
True Transition:

If RGGI Goes Into Effect, Pennsylvania Should Use Its Proceeds To Make PA Fossil Fuel Workers and Communities Whole



Ohio River Valley Institute

Table of Contents

Executive Summary

As of this writing, whether Pennsylvania remains the 12th state in the Regional Greenhouse Gas Initiative (RGGI) will be resolved by the Pennsylvania courts.[1] If Pennsylvania remains in RGGI following appellate court decisions in the coming months, it will begin to participate in quarterly auctions of carbon dioxide "allowances"—i.e., rights to generate emissions—and Pennsylvania will receive more than $663 million in the first year alone.[2] Once these revenues begin to flow, this report argues that a top priority in allocating RGGI proceeds in Pennsylvania should be workers and communities losing jobs.

Pennsylvania communities have been losing coal power plant jobs for decades, with recent losses due to highly efficient gas-fired power plants outcompeting older coal-fired plants. The loss of these jobs—often in places that have also lost high-paid manufacturing jobs—can be traumatic for workers, families, and communities. In the past, dedicated resources have not been made available to mitigate or eliminate the negative economic impacts. RGGI could provide such resources—*if* auction proceeds directly help dislocated workers and coal communities land equivalent jobs and tax base. (Another priority for Pennsylvania's RGGI proceeds should be "environmental justice communities" most impacted by pollution and climate change, as recognized in Senate Bill 15 and its companion, House Bill 1565. Since 21 environmental justice, faith, environmental and other non-profit groups issued recommendations on investments in environmental justice communities in mid-2021, however, the present report contains recommendations on a topic not yet the subject of detailed analysis: how RGGI proceeds could benefit workers and communities).[3]

We recommend investing a portion of RGGI proceeds in four priorities:

1. **Implementing strong labor standards** (prevailing wage and benefit standards, project labor agreements with first source hiring/community workforce requirements, responsible contractor and apprenticeship utilization provisions) in conjunction with the distribution of RGGI proceeds and other climate policies, **improving the quality of clean economy jobs,** some of which could go to dislocated fossil fuel workers.

2. **Funding building trades and labor-management partnerships to help dislocated workers land good clean energy and other sustainable industry jobs.** These should go beyond traditional training-only—aka "train and pray"—approaches by combining training with placement support. Best case, this new "train and place" approach would get workers a new job as good as their old one without workers having to relocate.

3. **Investing capital in energy efficient and sustainable manufacturing that utilizes trades formerly employed in fossil fuel power plants,** such as boilermakers and electricians, targeting communities that have lost power plants. Since manufacturing projects can have high capital costs, RGGI proceeds may only be sufficient to provide a portion of public subsidies required. To fill the remaining gap, the state could use a portion of RGGI funds as a match for, and to compete for, larger amounts of federal dollars from the Infrastructure Investment and Jobs Act, Inflation Reduction Act, CHIPS+, or future

---

[1] On April 23, with the publication of a new regulation in the Pennsylvania Bulletin, the Wolf Administration sought to enter RGGI using its executive authority. See "RULES AND REGULATIONS: Title 25—ENVIRONMENTAL PROTECTION; ENVIRONMENTAL QUALITY BOARD [25 PA. CODE CH. 145] CO2 Budget Trading Program [52 Pa.B. 2471] [Saturday, April 23, 2022]," https://www.pacodeandbulletin.gov/Display/pabull?file=/secure/pabulletin/data/vol52/52-17/625.html. A Commonwealth Court judge Michael H. Wojcik issued July 8, and on July 25 reinstituted, a preliminary injunction that stops the state from implementing the new regulation; see Stephen Lee, "Judge Reinstates Order Blocking Pa. From Climate Group," Bloomberg Law, https://news.bloomberglaw.com/environment-and-energy/judge-reinstates-order-blocking-pennsylvania-from-climate-group.

[2] John L. Micek, "Environmentalists, advocates urge Shapiro to stay the course on carbon compact," Pennsylvania Capital-Star, March 30, 2023, https://www.penncapital-star.com/government-politics/environmentalists-advocates-urge-shapiro-to-stay-the-course-on-carbon-compact/

[3] See Black Church Center for Justice and Equality et al., "Re: Recommendations on Draft Investment Framework," June 1, 2021; online at https://docs.google.com/document/d/1Sd5j0eGduoD5j_-XqnntxSlkOJ_jXdfy/edit.

clean energy or climate infrastructure legislation.

4. **Providing direct assistance to dislocated fossil fuel workers and to communities** losing tax base from fossil fuel businesses.

Research for ReImagine Appalachia by the Political Economy Research Institute suggests that the massive investments (public and private) needed to achieve net zero carbon emissions by 2050 would generate nearly a quarter million jobs in Pennsylvania—disproportionately trades and manufacturing jobs.[4] With the right policies and public investments, more of these jobs can be good union jobs and provide new opportunities for workers and communities losing fossil fuel jobs. Ultimately, the issue for the future is not RGGI, but whether policymakers can achieve the climate and environmental progress we need *and* create enough good jobs. This report argues that they can and explains how it can be done, if RGGI is implemented, through the creative use of RGGI proceeds. But the use of RGGI proceeds is just one of many contexts in which policymakers need to demonstrate their commitment to policies that create more middle-class jobs—because those jobs won't automatically create themselves through the magic of the market.

The Regional Greenhouse Gas Initiative: The Basics

RGGI is a market-based approach that reduces CO_2 emissions in the electricity generation sector from fossil-fuel-fired electric generators with a capacity of 25 megawatts or greater. At quarterly regional auctions, each state sells allowances for its currently permitted level of emissions (the current "cap") at regional auctions; these allowances may then be traded on the RGGI market. These two steps explain why RGGI is called a "cap and trade" approach to reducing carbon emissions. The auctions require power plants to pay a (modest) sum for the carbon pollution they emit and enable participating states to generate proceeds that can be invested in clean energy and other socially beneficial programs.

Pennsylvania's Unique Context and Entrance Into RGGI

State law governs whether states enter RGGI. Pennsylvania entered RGGI through a regulatory rulemaking by the DEP under the authority of an existing statute, the state Air Pollution Control Act.

State law also governs, along with the RGGI multi-state framework, allowed uses of RGGI auction proceeds. For Pennsylvania, two scenarios exist with respect to state law that governs use of RGGI proceeds. Currently the Air Pollution Control Act (APCA) and its regulations would govern. In the second scenario, the state would pass new legislation modifying how the state may use RGGI auction proceeds.

In the first scenario, without new legislation, RGGI auction proceeds will get deposited in the state's Clean Air Fund and allocated by DEP for "use in the elimination of air pollution." The next section explains in more detail how the APCA and its regulations constrain use of RGGI funds, though it notes that considerable flexibility exists in the interpretation of what eliminates air pollution.

[4] ReImagine Appalachia, "ReImagine Appalachia Blueprint Creates 243,000 jobs for Pennsylvania: Summary of results from PERI economic recovery analysis," January 2021; online at https://reimagineappalachia.org/wp-content/uploads/2021/03/ReImagine-Appalachia_PeriBrief_PA_Jan2021.pdf.

In the second scenario, the Pennsylvania General Assembly would enact legislation that modifies allowed uses of RGGI proceeds. For example, the RGGI Investment Act, introduced last legislative session in both the Pennsylvania Senate (SB15) and House (HB1565), would provide explicit statutory authority for using RGGI proceeds to assist fossil-fuel workers, communities, and environmental justice communities. We review the proposed legislation below *after* we discuss how proceeds may currently be used *without* new legislation.

How RGGI Proceeds Could Be Used in Pennsylvania Under Current Law

The Pennsylvania Department of Environmental Protection (DEP) promulgated the rules under which Pennsylvania entered RGGI after Governor Wolf issued Executive Order No. 2019-07—*Commonwealth Leadership in Addressing Climate Change through Electric Sector Emissions Reductions*. This regulation relies on DEP's existing authority to regulate air pollution under the Air Pollution Control Act (APCA). Pennsylvania's use of RGGI proceeds is therefore governed currently by the RGGI rules *and* the APCA. The APCA requires fines, civil penalties, and fees levied by DEP in implementing the air pollution control program to be deposited into the "Clean Air Fund" for use by DEP in the "elimination of air pollution." Thus, without new legislation, there must be a strong-enough connection (or "nexus") between the uses of the fee proceeds generated by RGGI and the elimination of air pollution.

With some potential investments in the training of dislocated coal workers and their placement in renewable energy industries in construction, operator, or maintenance jobs, the connection with reducing air pollution would be relatively direct.[5]

Both the APCA statute and its implementing regulations have additional language that strengthens the basis for courts to rule new uses of RGGI proceeds permissible as long as they have a common-sense connection with reducing air pollution. First, the APCA grants DEP broad authority to "[d]o any and all other acts and things not inconsistent with any provision of this act, which it may deem necessary or proper for the effective enforcement of this act and the rules or regulations promulgated under this act."[6] Second, Environmental Quality Board ("Board") regulations that govern the use of Clean Air Fund monies also grant DEP broad authority. The regulations (25 Pa. Code § 143.1) contain a *non*-exhaustive list of purposes for which Clean Air Fund monies may be used and state explicitly that all DEP activities—"the full and normal range of activities of the Department [of Environmental Protection]"—"…shall be considered to contribute to the elimination of air pollution."

In sum, the APCA tasks DEP with implementing a comprehensive approach to air pollution control that extends beyond monitoring emissions and enforcing standards at individual fossil fuel electricity generation facilities. This latitude expands the range of uses of RGGI auction proceeds that Pennsylvania courts might deem to reduce air pollution and thus not require new legislation.

Legislation to Broaden Statutory Authority Governing Use of RGGI Proceeds

[5] For an example of such investment, see New York State Research and Development Authority, *Green Jobs - Green New York, 2021 Annual Report Final Report* (Oct. 2021) *available at* https://www.nyserda.ny.gov/About/Publications/GJGNY-Advisory-Council-Reports (the New York "Green Jobs Green New York" program allocated over $7 million in fiscal year 2020 to support clean energy workforce training).
[6] See 35 P.S. § 4004 (27).

Senate Bill 15 (and its companion House bill, HB1565), introduced last legislative session, would amend the Clean Air Act to explicitly broaden by statute the permitted use of RGGI auction proceeds in four main ways:

- The bill would deposit 37.5% of proceeds into a new "Energy Communities Trust Fund," one third of which (12.5%) would be dedicated to projects in "environmental justice communities."

- Another 12.5% of RGGI proceeds would be deposited in a separate Environmental Justice Communities Trust Fund, meaning that a total of 25% of all proceeds would target such communities (i.e., the sum of the 12.5% from the Energy Communities Trust Fund and the 12.5% in the EJC Trust Fund).

- Forty-six percent of the funds would be deposited into two new accounts within the Clean Air Fund:
    - the Greenhouse Gas Abatement, Energy Efficiency, Clean and Renewable Energy Investment Account would receive just over half (56%) of this 46%; and
    - the Commercial and Industrial Energy Efficiency Account would receive a bit less than half of this 46% (i.e., 44% of it).

The final 4% of RGGI auction proceeds would be deposited into the Clean Air Fund for administration of the funds. Box 1 provides more detail on these four proposed uses of RGGI proceeds.

Box 1: The RGGI Investment Plan Bills in More Detail

The text highlights the four main ways that SB15 and the companion House bill would expand the potential uses of RGGI proceeds authorized by statute. This box fleshes out those four uses.

The Energy Communities Trust Fund would provide grants for energy community projects, including projects that support workers and communities affected by the closure of fossil-fuel-fired power plants and other energy facilities, including, but not limited to, the following:

1. programs for workforce development and worker training;
2. supplemental unemployment compensation for displaced energy workers;
3. funding to school districts or municipalities due to the economic impact or loss in tax revenue from the closure of an energy facility after the effective date of this section;
4. economic development projects; and
5. environmental cleanup projects, including projects to benefit water quality and air quality.

In addition, the Board of the Energy Communities Trust Fund would consist of 13 members, including four members of the administration (three department secretaries and the governor or the governor's representative), two members appointed by each of the highest-ranking members of each party in the PA Senate and PA House, and five additional representatives nominated by the governor, four of which must come from a list provided by the President of the PA AFL-CIO, with one of those four chairing the board.

The Environmental Justice Communities Trust Fund would be used for projects within environmental justice communities, including, but not limited to, any of the following:

1. environmental cleanup projects, including projects to benefit water quality and air quality;
2. recreation;
3. economic development projects;
4. transportation projects; and
5. environmental education.

The Board of the Environmental Justice Communities Trust Fund would mirror that of the Energy Communities Trust Fund except that instead of four members from a list provided by labor, six members would come from a list of candidates nominated by the board of the Environmental Justice Advisory Board (one for each of the DEP-designated environmental justice regions), one of whom would chair this board.

The Greenhouse Gas Abatement, Energy Efficiency, Clean and Renewable Energy Investment Account would provide grants "that eliminate air pollution, including, but not limited to…" projects for:

1. cost-effective carbon capture utilization and storage;
2. abandoned oil and gas well plugging;
3. energy efficiency;
4. mass transit and electric vehicle transportation;
5. agricultural conservation;
6. forest stewardship;
7. clean and renewable energy investments, including, but not limited to, biomass, geothermal, hydropower, energy storage, and solar and wind technologies; and
8. other projects that contribute to the reduction or elimination of greenhouse gas pollution.

The "Commercial and Industrial Energy Efficiency Account" would provide grants for projects that eliminate air pollution, including, but not limited to, projects for:

1. process electrification;
2. fuel switching;
3. combined heat and power;
4. demand response and reduction;
5. energy efficiency;
6. cost-effective carbon capture utilization and storage; and
7. other projects that contribute to the reduction or elimination of greenhouse gas pollution.

In addition to the specific uses of funds allowed in this proposed legislation, the repeated use of the phrase "...that eliminate air pollution, including, but not limited to…" underscores that all enumerated uses of funds are considered by the legislature (if it passes this bill) to reduce air pollution, consistent with the original purpose of the APCA.

Summing up, the last two sections establish that using RGGI proceeds to assist fossil fuel workers and communities requires either (a) making a legal argument that the proposed uses have a strong enough connection to reducing air pollution and/or (b) enacting legislation that makes explicit the legislature's intent

that RGGI proceeds be used for the purposes proposed. The rest of this paper fleshes out in more detail policies that could benefit fossil fuel workers and communities. Our general line of argument is that the uses of RGGI proceeds we propose can be pursued without, or with, new legislation. Without new legislation, the state could defend these uses in court by pointing to their direct and/or indirect support for the growth of renewable energy, energy efficiency, and other sustainable industries. Enacting legislation, however, would eliminate any legal ambiguity about these proposed uses and should be pursued if the opportunity exists.

How Other States Allocate RGGI Proceeds

Before we make recommendations regarding how Pennsylvania should use RGGI revenue, we briefly review how other states in the multi-state agreement have allocated their funds. Under the RGGI framework, RGGI proceeds may be transferred to states' general funds, set aside for future funding ("future committed funds"), or invested in any of four energy-related categories. Every year a report on the investment of proceeds is released, the most recent of which profiles the distribution of 2019 proceeds.[7] To date, most RGGI proceeds go to the four energy-related categories (83%), with 6% transferred to general funds and 11% used for "future committed" funds.

Among the four categories, **energy efficiency** accounts for over half (54%) of cumulative investment of RGGI proceeds (Figure 1), although it accounts for a bit less (40%) in the most recent year (Figure 2). This includes improvements in homes and businesses: upgrading appliances and lighting, weatherizing and insulating buildings, upgrading heating, ventilating, and air conditioning systems at offices, and improving industrial processes. Suggestive of RGGI's impact, six RGGI states ranked among the top ten states for energy efficiency in 2018, according to the American Council for an Energy Efficient Economy.

Clean and renewable energy account for the second-largest share of investment of RGGI proceeds—14% on a cumulative basis and 18% in 2019. Since 2005, RGGI states have increased non-hydro renewable energy generation by 95%.

Direct bill assistance comes third, accounting for one-seventh of investment (15%) on a cumulative basis and nearly one-fifth (19%) in 2019. This assistance provides rate relief to consumers on their energy bills, targeting low-income families and/or families impacted by specific revenue losses in communities.

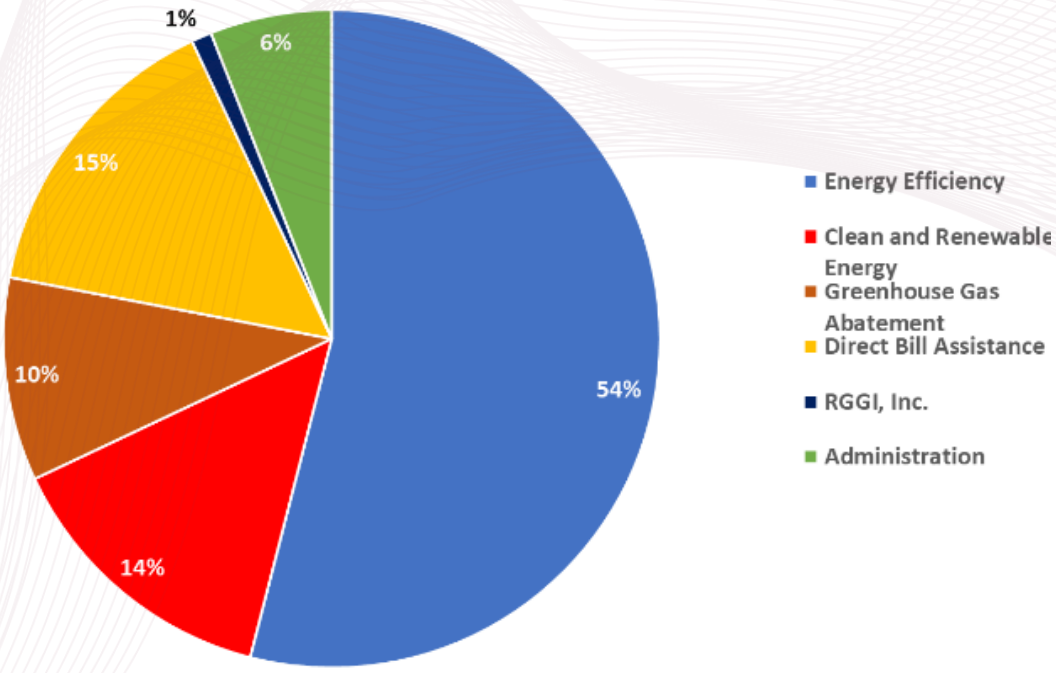
Greenhouse gas abatement comes fourth, accounting for 10% of RGGI investment on a cumulative basis and 15% in 2019. This category currently includes four categories tracked separately by RGGI: clean transportation programs, electric vehicle programs, technology research, and climate change policy research. It could potentially include other categories in the future, such as helping farmers adopt carbon-absorbing regenerative agriculture, or a state civilian conservation corps program that increases carbon capture by planting trees, restoring wetlands, or assisting regenerative farmers.[8]

---

[7] "Regional Greenhouse Gas Initiative Investment of Proceeds 2019," June 2021, Chart 2 and Chart 4; online at https://www.rggi.org/sites/default/files/Uploads/Proceeds/RGGI_Proceeds_Report_2019.pdf.

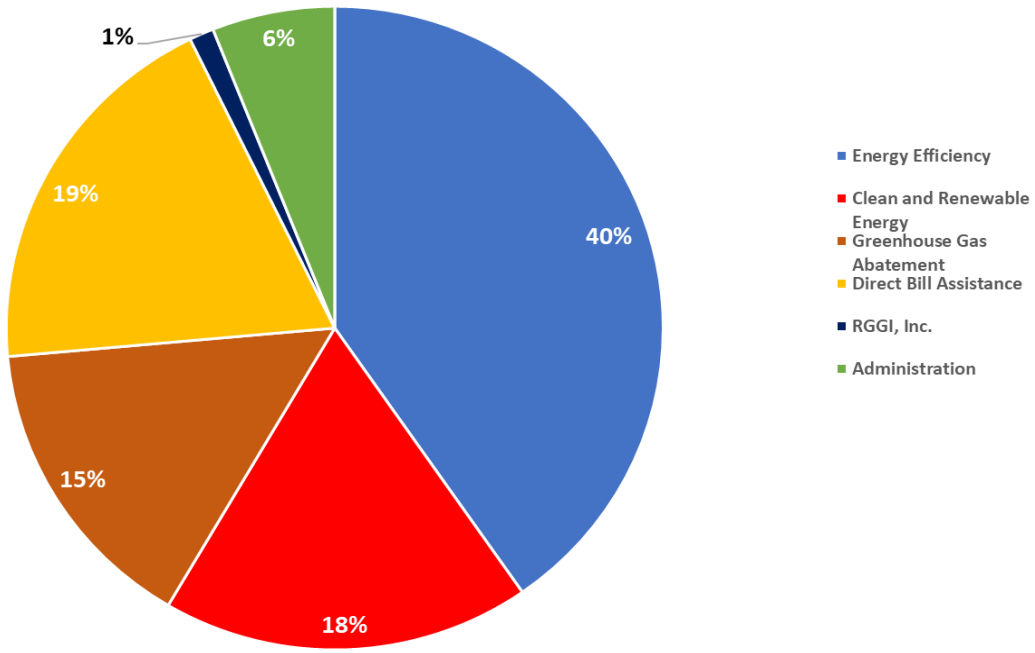
[8] For details on seven US Congressional CCC proposals and on the arguments for a CCC that creates substantial employment, see Ted Boettner and Stephen Herzenberg, "A Big Climate Corps Is Vital for the Economy and Appalachia," Ohio River Valley Institute, Keystone Research Center, and ReImagine Appalachia, September 2021. For discussion of how a revitalized CCC could provide labor to help farmers adopt carbon-absorbing regenerative practices, see Patricia DeMarco, Sara Nicholas, and Stephen Herzenberg, "Heal Our Land and Our People: Create a Modern Civilian Conservation Corps and Promote Regenerative Agriculture and Agroforestry," ReImagine Appalachia, October 2020; online at https://reimagineappalachia.org/wp-content/uploads/2020/10/Reimagine-Appalachia-Regenerative-Ag-CCC-Whitepaper-10-28-2020.pdf.

Figure 1: RGGI Investment of Proceeds, Cumulative Investments



Source: Data accessed from the RGGI 2019 Investments of Proceeds:
https://www.rggi.org/sites/default/files/Uploads/Proceeds/RGGI_Proceeds_Report_2019.pdf

Figure 2: RGGI Investment of Proceeds, 2019 (Most Recent Data)



Source: Data accessed from the RGGI 2019 Investments of Proceeds:
https://www.rggi.org/sites/default/files/Uploads/Proceeds/RGGI_Proceeds_Report_2019.pdf

Box 2. Why Achieving "True Transition" Is Difficult in Pennsylvania

The economic and political importance, and difficulty, of providing a "true transition" that does not result in sharp downward mobility for dislocated Pennsylvania fossil fuel workers stems partly from the high-wage blue-collar job losses, the de-unionization, and the increase in economic inequality in Pennsylvania and the United States that accelerated in the late 1970s. That job loss has been a searing experience for Pennsylvania's working people and communities. Dislocated men (mostly)—Black and white—found they could not find equivalent jobs. Displaced Pennsylvania manufacturing workers in the 1980s saw average declines in annual earnings of 20% even 15 to 20 years later, with some workers experiencing bigger declines.[9] Today, utilities and mining still pay far more than typical jobs for workers without a four-year degree (while relative pay in manufacturing has fallen substantially), so workers and their unions fear a repeat of the downward mobility experienced by 1980s manufacturing workers.[10] The expectation that a new job would pay much less makes workers reluctant to accept that their old job won't come back and that they should retrain.[11]

The fact that the loss of fossil fuel jobs plays a small role in eroding the middle class in all but a few places—and that most of the decline in fossil fuel jobs that is going to happen has already happened—is cold comfort.[12] Warmer comfort would be enabling dislocated fossil fuel workers to get good union jobs in the clean economy. That is why the focus of this report is on improving the quality of clean economy jobs and assisting dislocated coal workers to access these good new jobs.

[9] Till von Wachter et al. "Long-term Earnings Losses due to Mass-Layoffs During the 1982 Recession: An Analysis Using Longitudinal Administrative Data from 1974 to 2004." Mimeo, Columbia University. 2009; Louis Jacobson et al., "Earnings Losses of Displaced Workers." *American Economic Review*, 83(4). 1993, p. 697.

[10] Manufacturing workers earn 9% more than non-manufacturing, controlling for education, experience, and demographics. See Andrew Stettner et. al., "Why Manufacturing Jobs Are Worth Saving," The Century Foundation High-Wage America Project, Washington D.C., June 13, 2017; https://tcf.org/content/report/manufacturing-jobs-worth-saving/. Blue-collar utility jobs (in production, construction and extraction, and installation, maintenance, and repair occupations) pay a stunning 56.7% more than blue-collar manufacturing jobs and blue-collar mining and extraction occupations pay 12.5% more. (Authors' calculations based on Bureau of Labor Statistics data downloaded from https://www.bls.gov/oes/current/naics4_212100.htm on November 6, 2017.)

[11] Valerie Volcovici, "Awaiting Trump's coal comeback, miners reject retraining," Reuters, November 1, 2017, https://www.reuters.com/article/us-trump-effect-coal-retraining-insight/awaiting-trumps-coal-comeback-miners-reject-retraining-idUSKBN1D14G0?il=0

[12] Joseph Cullen, "Options and Opportunities for Coal Plant Communities," Ohio River Valley Institute, June 2021; online at https://ohiorivervalleyinstitute.org/options-and-opportunities-for-coal-plant-communities-pennsylvania-and-the-regional-greenhouse-gas-initiative-rggi/. The rest of this paragraph is based on the Cullen report.

How Pennsylvania Should Use Its RGGI Proceeds

This section outlines four ways Pennsylvania could use RGGI auction proceeds to reduce air pollution while benefiting workers and communities impacted by the loss of fossil fuel jobs.

1. **Establish strong labor standards with first source/local hiring provisions** on clean energy and other job-creating sustainable economy projects subsidized by investment of RGGI proceeds or otherwise subject to influence by the state (e.g., subsidized by other funds controlled by the state—like federal Infrastructure Investment and Jobs Act funds or state economic development funds—or otherwise regulated by the state). This would help these industries attract and retain great workers while also creating good new union jobs. Many industries and businesses in the United States currently face difficulties attracting and retaining great workers, especially skilled workers without four-year college degrees (including trades, precision machining, and industrial maintenance workers). First source and local hiring provisions, explained further below, can enable targeted hiring of former coal workers and of diverse, low-income local workers.

2. **Workforce training *and* placement.** In other states, RGGI proceeds help dislocated workers emphasize retraining. Such training, however, is not ordinarily coupled with meaningful assistance to help dislocated workers obtain a new job as good as their old job, and so it rarely achieves that goal, earning the label "train and pray." Pennsylvania can achieve a "true transition" for coal workers too young to retire by coupling training with investments in placing former fossil-fuel workers in new, clean economy jobs.

3. **Capital investment in clean energy and sustainable manufacturing** to create good new jobs in trades and other occupations in which workers lose jobs, as well in the places workers lose jobs.

4. **Direct assistance to coal communities and coal workers.**

Policies and investment in the first three categories would each support the growth of clean industries and thus contribute directly to the elimination of air pollution—and should be permissible without new legislation. Category 4, direct assistance to coal communities and coal workers, would reduce air pollution by increasing support for, or reducing opposition to, aggressive action to lower carbon emissions. That provides a legal basis for the courts to decide that category 4 also fits within the allowed uses of RGGI proceeds without new legislation. That said, it would be preferable to enact legislation that eliminates any legal uncertainty.

Synergies exist among these four recommended categories. For example, categories 1 and 3 (strong labor standards and capital investment in clean economy projects) would help create new, unionized non-fossil fuel jobs. This, in turn, would make it easier for investment in categories 2 and 4 to lead to the placement of dislocated coal workers in such jobs. Box 3 profiles a Washington State case study that illustrates how the synergies among these four categories can create a vibrant future for a community.

Box 3: The Centralia Model of Economic Renewal[13]

For Pennsylvania coal communities, one model for economic renewal comes from Washington State, in Centralia, a small city (population 17,000) between Seattle and Portland, Oregon. For decades, Centralia's largest employer was a strip mine employing 600 workers, with a coal-fired power plant employing another 300. But the mine closed in 2006 and, a few years later, the power plant announced a planned retirement. These twin blows seemed like a possible "death sentence" in a place where then-Mayor Harlan Thompson called the power plant "our Boeing and Microsoft put together."

In the decade since, the community has flourished even as power plant employment has fallen below 200. A major reason: with encouragement from Washington Governor Christine Gregoire, the mine and power plant owner, TransAlta Corporation, struck a deal with the state and environmental groups to help Centralia adapt to a clean energy economy. The company was given until 2025 to operate two generating units, giving Centralia time as well as resources to prepare, and enabling 40% of workers to reach retirement age.

The company provided $55 million in funding over 10 years—a scale of resources that could be available to Pennsylvania coal plant communities because of RGGI proceeds.

The $55 million covered:

- $25 million for job-creating energy technology projects, including clean energy generation, energy efficiency, storage, and transportation electrification.
- $8 million for dislocated workers and $1 million for education and training. Given that the number of workers dislocated may end up around 100 or less, this amounts to more than $80,000 per worker and $10,000 per worker for training.
- $10 million for weatherization to improve energy efficiency in low- and moderate-income households. One advantage of investment in this industry: it is labor-intensive and relies on small, local materials suppliers. Thus weatherization investment keeps income circulating in the local economy rather than leaking out to absentee owners and shareholders.
- $11 million for businesses and economic development.

In the first four years of disbursement of these funds, from 2016-19, the region's economy outperformed the nation for the first time since the mine closed in 2006.[14] Regional job growth doubled the national average, adding 2,800 jobs to a base of 24,000. GDP also grew at twice the national rate; and wage growth and population growth exceeded the US average.

The deal replaced a contentious shutdown plan and has since received praise across the board. It also helped forge a political consensus that Centralia could thrive beyond coal.

---

[13] This box draws primarily from Cullen, "Options and Opportunities for Coal Plant Communities," Ohio River Valley Institute, June 2021; and from Sean O'Leary and Ben Hunkler, "The Centralia Model for Economic Transition in Distressed Communities, " Ohio River Valley Institute, July 2021, online at https://ohiorivervalleyinstitute.org/the-centralia-model/.

[14] Joe Cullen, "Options and Opportunities for Coal Plant Communities: Pennsylvania and the Regional Greenhouse Gas Initiative (RGGI)," Ohio River Valley Institute, June 30, 2021, p. 28, https://ohiorivervalleyinstitute.org/options-and-opportunities-for-coal-plant-communities-pennsylvania-and-the-regional-greenhouse-gas-initiative-rggi/

Labor Standards with First Source and Local Hire Provisions

A widespread perception exists that clean energy jobs—and clean economy jobs more broadly—pay poorly and will necessarily continue to pay poorly as the clean economy grows.[15] Data indicate that clean energy is, in fact, predominantly non-union—but then again, so is most of the private sector in the United States (94% non-union) and Pennsylvania (92% non-union).[16] A 2020 study of the jobs impact of aggressive climate action for the ReImagine Appalachia campaign found that union membership in clean energy occupations varies between 5% and 22%—higher, in most cases, than the Pennsylvania private sector.[17]

In the end, the union density of clean economy jobs is not set in stone—not any more than union density was initially in US mass production manufacturing, which went from non-union in the 1920s to mostly union by the 1940s. As with manufacturing in that period, the union share of future clean energy and economy jobs hinges critically on policy. A Center for American Progress (CAP) report, "The Clean Economy Revolution Will Be Unionized," makes the basic point: policy can transform clean energy into a more unionized sector.[18]

The CAP report and a white paper released by ReImagine Appalachia, a campaign that encompasses Pennsylvania, Ohio, West Virginia, and Kentucky, outline policies summarized below that could improve the job quality and union share of clean energy and clean economy jobs.[19] These same policies would simultaneously enable these industries to attract and retain experienced, well-trained workers, many of whom would have been through four- or five-year apprenticeships.

Such labor standards should be directly connected to investment of RGGI proceeds—e.g., in clean energy, sustainable manufacturing, and energy efficiency. This would follow the model used with the bipartisan Infrastructure Investment and Jobs Act (IIJA): the federal statute applies federal Davis-Bacon prevailing wage standards to IIJA-funded construction in Pennsylvania and Biden Administration guidance, still being finalized in some cases, often contains stronger labor standards. In Pennsylvania, such labor standards need not be limited to RGGI investments. Pennsylvania already imposes state prevailing wage standards to any construction projects supported by state subsidies and tax breaks. It could attach all the provisions below to any state financial support for job creation and to non-RGGI statutes and regulations (e.g., a new Advanced Energy Portfolio Standard or community solar law) that accelerate the growth of clean energy and other sustainable jobs.

The main labor standards consist of prevailing wage and benefit standards, project labor agreements, responsible contractor and apprenticeship utilization provisions, and, when RGGI proceeds or other state action create permanent (i.e., non-construction) clean energy jobs, "labor peace" agreements that prohibit employer opposition to unionization.

Prevailing wage and benefit laws require that construction crafts on publicly subsidized projects receive at least local prevailing wages and benefits on similar (non-residential) construction projects in the area. In Pennsylvania, state prevailing wage and benefit standards tend to be set at the collectively bargained rates for

---

[15] A 2021 *New York Times* story noted that most clean energy jobs are non-union and quoted Jim Harrison, the director of renewable energy for the Utility Workers Union of America, who said that "clean tech industry is incredibly anti-union" and that the work done in these jobs is currently "marginal, precarious and difficult to organize." See Noam Scheiber, "Building Solar Farms May Not Build the Middle Class," July 16, 2021; online at https://www.nytimes.com/2021/07/16/business/economy/green-energy-jobs-economy.html. See also Lauren Kaori Gurley, "LABOR Shifting America to Solar Power Is a Grueling, Low-Paid Job," *PORTSIDE*, July 17, 2022; https://portside.org/2022-07-17/shifting-america-solar-power-grueling-low-paid-job?utm_source=portside-labor&utm_medium=email.

[16] For the latest U.S. and Pennsylvania union density figures, see "Union Coverage, Membership, and Earnings from the CPS," http://unionstats.com/.

[17] Robert Pollin et al., "Impacts of the ReImagine Appalachia & Clean Energy Transition Programs for Pennsylvania," Political Economy Research Institute, January 2021, Table 2.17, p. 53; https://reimagineappalachia.org/wp-content/uploads/2021/01/Pollin-et-al-PA-Final-Report-1-22-21.pdf.

[18] Rita Clifton at al., "The Clean Economy Revolution Will Be Unionized," Center for American Progress, July 7, 2021; online at https://www.americanprogress.org/article/clean-economy-revolution-will-unionized/#:~:text.

[19] Amanda Woodrum et al., "Maximizing Value: Ensuring Community Benefits," ReImagine Appalachia, May 2021; online at https://reimagineappalachia.org/wp-content/uploads/2021/05/Community-Benefits_Whitepaper_05-28-2021.pdf.

each craft in each craft and area.[20] Pennsylvania's state prevailing wages in 2022 typically range from $25 to $40 per hour, depending on the craft and geographical area, and benefits range from $15 to $25 per hour—compensation competitive with the fossil fuel industry. Prevailing wages and benefits help ensure that statutory requirements that public entities accept as the "low bid" do not fuel cutthroat competition based on worker compensation.

A large body of research shows that state prevailing wage laws do not raise construction costs but do increase training, workforce experience, safety, and union market share.[21] Research also shows, however, that many contractors violate prevailing wage benefit standards and commit prevailing wage benefits fraud.[22] To take one example, a major Pennsylvania contractor that received an estimated $1.7 billion in contracts from the Commonwealth of Pennsylvania between 2003 and 2018, Glenn O. Hawbaker, Inc., reached a plea agreement in 2021 for theft relating to violations of the Pennsylvania Prevailing Wage Act and the federal Davis-Bacon Act.[23] The company agreed to pay more than $20 million in stolen wages to over a thousand Pennsylvania workers, the largest prevailing wage criminal case in U.S. history. Endemic violations of prevailing wage and benefit standards underscore the need for additional labor standards on publicly subsidized projects aiming to reduce air pollution including carbon emissions.

Project labor agreements (PLAs) are project-specific agreements signed by all the contractors, unions, and the owner on major projects. They ordinarily prohibit work stoppages, standardize work rules including holidays and shift times, require that all contractors pay the applicable union wage and benefit rates in the project region, and allow and require contractors, including non-union ones, to access most of their trades labor from union referral services. Many large private companies, such as large manufacturers and the Pittsburgh-based health care giant UPMC, choose to deploy PLAs on large projects because of the prohibitions on work stoppages, standardization of work rules and, critically, guaranteed access to skilled labor through union hiring halls. Since trades labor consists almost entirely of employees accessed from unions, prevailing wage benefit fraud and worker misclassification as independent contractors (another widespread problem among non-union contractors) are highly unlikely on PLA projects. Research also shows that PLAs do not reduce cost competition (defined as the number of bidders) on public projects.[24]

Responsible bidder provisions restrict eligibility for construction work in a geographical area (e.g., a county) or on a particular project to contractors that meet basic criteria, such as maintaining valid licenses and certificates, complying with all federal, state, and local laws, having no history of business or labor violations, meeting bonding and general liability requirements, and participating in an active registered apprenticeship program.[25] RBOs have been adopted by a number of Pennsylvania localities in recent years, including Bucks

---

[20] In Pennsylvania, prevailing rates are set based on information provided to the Department of Labor and Industry by contractors and unions. In most crafts and most counties, the union rates are the most frequent wage and benefit levels (i.e., the "mode" of the distribution) and hence those rates become the prevailing rate.

[21] Prevailing wage laws exist at the federal level, in many states, and in some localities. Each of the claims in the text about the impact of these laws is supported by one or more of the chapters in Peter Philips and Hamid Azari-Rad, *The Economics of Prevailing Wage Laws*, Routledge, November 10, 2016; accessible from https://www.routledge.com/The-Economics-of-Prevailing-Wage-Laws/Philips-Azari-Rad/p/book/9781138258495. On the federal Davis-Bacon Act, for more information, see https://www.dol.gov/agencies/whd/government-contracts/construction.

[22] For more detail on prevailing wage benefit fraud, see Russell Ormiston et al., "Am Empirical Methodology to Estimate the Incidence and Costs of Payroll Fraud in the Construction Industry," ICERES, January 2020; online at https://www.dol.gov/agencies/whd/government-contracts/construction. For a recent review of the national research literature on irresponsible contractors and of available Pennsylvania-specific data, See Stephen Herzenberg and Russell Ormiston, "Illegal Labor Practices in the Philadelphia Regional Construction Industry," Keystone Research Center, January 2019.

[23] Office of Attorney General "Hawbaker Sentenced, Will Pay Workers More than $20 Million in Stolen Wages," August 3, 2021; online at https://www.attorneygeneral.gov/taking-action/hawbaker-sentenced-will-pay-workers-more-than-20-million-in-stolen-wages/

[24] Peter Philips and Emma Waitzman, "Do Project Labor Agreements Reduce the Number of Bidders on Public Projects: The Case of Community Colleges in California," *Public Works Management & Policy*, 2021, Vol. 26(4), 337–358; online at https://journals.sagepub.com/doi/abs/10.1177/1087724X20956662?journalCode=pwma&.

[25] For details on responsible contractor policies and specific examples, see "Policy and Tools: Responsible Contracting," online at https://www.forworkingfamilies.org/page/policy-tools-responsible-contracting. The Illinois Economic Policy Institute explains the benefits of responsible bidder laws in "A Responsible Bidder Ordinance Is a Protection Plan for Taxpayers," online at https://illinoisupdate.com/2017/05/10/a-responsible-bidder-ordinance-is-a-protection-plan-for-taxpayers/. See also a peer-refereed journal article that finds that RBOs do not increase bid costs: C. Jeffrey Waddoups and David C. May, "Do Responsible Bidder Policies

County and Bristol Township within Bucks County.[26] Box 4 provides a summary of standard responsible bidder ordinance language.

Box 4: Summary of Standard Responsible Bidder Language

(a) For all aspects of construction, reconstruction, demolition, alteration, repair, or maintenance work on the project, [LOCALITY or PROJECT] shall promote successful project performance, safety, law compliance, level competition, and business integrity, and ensure future workforce development, by utilizing only contractors and subcontractors that:

(1) Maintain all valid licenses, registrations, or certificates required by a federal, state, or local government that may be required to do business or perform work at the location of the facility.

(2) Are in compliance with the Workers' Compensation Act and Unemployment Compensation Law, and meet bonding and general liability insurance requirements set forth by the contract for work.

(3) Within the last three years, have not been found by a final decision of a court or government agency to be in violation of any law or regulation applicable to its business, including tax, prompt payment, wage and hour, prevailing wage, environmental, or safety laws or regulations, and have not been debarred or suspended on any project by a federal, state, or local government entity.

(4) Within the last three years, have not defaulted on a project or declared bankruptcy.

(5) Within the last 10 years, have not been convicted of any crime relating to the contractor's or subcontractor's business.

(6) Ensure that all individuals employed for work at the facility have completed, at minimum, the 10-hour safety training course established by the Occupational Safety & Health Administration of the United States Department of Labor.

(7) Participate in an approved apprenticeship training program that is registered with and certified by the United States Department of Labor or the Department of Labor and Industry of the Commonwealth that provides for on-the-job training, classroom training, and the graduation of apprentice trainees to the status of journeyperson similar to and pursuant to the training and graduation requirements as outlined under the registered apprentice

Increase Construction Bid Costs?" *Industrial Relations*, 53(2), April 2014; online at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2409364.

[26] For the Bucks County ordinance, go to https://www.buckscounty.gov/DocumentCenter/View/7570/Proposed-Ordinance-Number-167-final-revised is the proposed March 16, 2022; for the Bristol Township ordinance, see https://ecode360.com/31657721. Another labor standards approach that includes a responsible contractor provision, recommended recently to the Gainey Administration in Pittsburgh by ReImagine Appalachia, is a "Partnership for Community Wealth," https://communitywealth.builders/our-plan/.

training programs that are certified by the Department of Labor and Industry, for each specific trade or classification employed for work at the facility; and has graduated apprentices to journeyperson status for at least three of the past five years. This may be an apprenticeship program subject to the Employee Retirement Income Security Act of 1974, 29 USC sec. 1001 et seq. ("ERISA"), or a non-ERISA program.

(b) Each [CONTRACTOR] shall submit an attestation along with its [bid] affirming compliance with this provision.

A recent report by the Illinois Economic Policy Institute (ILEPI) and Midwest Economic Policy Institute (MEPI), found that in Illinois and Indiana, "…union contractors are more likely than non-union contractors to be responsible businesses…[and]…responsible bidder ordinances increase the market share of union contractors by between 9% and 13%."[27] Another found that pay is 8% higher among heavy/highway construction workers in Indiana counties with RB ordinances than in Indiana counties without them, and worker turnover is lower.[28] ILEPI and MEPI found that RB ordinances in Indiana and Illinois "promote apprenticeship programs that produce skilled craftworkers for local businesses, and increase work for contractors who pay family-supporting wages and benefits."[29] Further, RB ordinances in Indiana and Illinois had no impact on construction costs. A 2003 study by the Fiscal Policy Institute found that a contractor with labor law violations is more than five times as likely as a contractor with no labor law violations to prove costly to a municipality.[30] Based on its research, ILEPI argues that "by weeding out cut-rate contractors, RB ordinances encourage successful project delivery and ensure that taxpayers get the quality they pay for."

First source/local hire agreements—also called community workforce agreements—allocate a portion of hiring on a project to targeted groups. The targeted groups in the case of clean energy and clean economy construction can be defined by geography (e.g., zip code or environmental justice communities) or by status (e.g., dislocated fossil fuel workers). First source hiring often brings targeted groups into pre-apprenticeships—also known as "apprenticeship readiness" programs—which give successful participants a higher probability of landing a unionized construction job and/or entering joint labor-management apprenticeships and then enjoying a career in construction.

Box 5 profiles a utility scale solar project in Cincinnati that included several provisions listed above: a project labor agreement and apprenticeship utilization and geographical hiring requirement (80% of employees hired had to be Ohio residents).

---

[27] Andrew Wilson and Frank Manzo IV, "The Impact of Responsible Bidder Ordinances on Union Contractors in Illinois and Indiana Evidence from a Natural Experiment of New Ordinances and a Local Case Study," Illinois Economic Policy Institute and Midwest Economic Policy Institute, January 5, 2022; https://illinoisepi.files.wordpress.com/2022/01/ilepi-impact-of-new-rbos-in-illinois-and-indiana-final.pdf

[28] Frank Manzo IV and Jill Manzo, "Responsible Bidder Ordinances Promote Local Construction Standards Evidence from Indiana," Midwest Economic Policy Institute; online at https://midwestepi.files.wordpress.com/2018/05/mepi-responsible-bidder-ordinances-executive-summary.pdf

[29] Andrew Wilson and Frank Manzo IV, "The Impact of Responsible Bidder Ordinances on Union Contractors in Illinois and Indiana Evidence from a Natural Experiment of New Ordinances and a Local Case Study," Illinois Economic Policy Institute and Midwest Economic Policy Institute, January 5, 2022; https://illinoisepi.files.wordpress.com/2022/01/ilepi-impact-of-new-rbos-in-illinois-and-indiana-final.pdf

[30] Moshe Adler, "Prequalification of Contractors: The Importance of Responsible Contracting on Public Works Projects," May 5, 2003; online at https://illinoisepi.files.wordpress.com/2016/10/prequalification.pdf

Box 5: The Cincinnati Solar Procurement Project (2017)

Using the local purchasing power enabled by the State of Ohio's Community Choice Aggregation policy, the City of Cincinnati issued a Request for Proposals (RFP) for a 25-megawatt solar project to help meet the electricity demands of the City of Cincinnati, its small businesses, and its residents, while moving closer to the City's goal of becoming 100% renewable by 2035 and avoiding energy cost increases for the city.[31] The City provided a guarantee of energy purchase, and the RFP gave bidders the option to use city property or private property to meet its goal, making the project low-risk for investors. Creekwood Energy Partners in partnership with Hecate Energy and Generate Capital bid successfully on the project.

The Request for Proposals required:

1. Bidders to enter into a Project Labor Agreement with the City that would set wages, healthcare and retirement benefits, and apprenticeship utilization requirements. The final project included an 80% Ohio resident requirement for employment.

2. Businesses were required to submit an "MBE/WBE Inclusion Packet," or a notarized statement committing to inclusion goals, and ensure that at least 4% of the contract would be performed by minority business enterprises (MBE), women business enterprises (WBE), or small business enterprises (SBE), whether through the contractor, subcontractors or in partnership with them.

The RFP resulted in a contract with the Creekwood Energy Team for the development of 100MW of solar.

[31] Woodrum, "Maximizing Value" and John Juech, "Cincinnati's Path to a 100 MW Solar Deal," American Cities Challenge, Rocky Mountain Institute, no date; online at https://cityrenewables.org/wp-content/uploads/2020/08/CRA_Cincinnati_Case-Study.pdf.

Box 6: Project Labor Agreements Create Good Jobs in the West Virginia Wind Industry

Over the past decade, several major wind power construction projects have been undertaken in West Virginia.[32] As a result, electricity generated from wind power doubled in West Virginia, from under 1 million megawatt-hours in 2010 to 1.9 million in 2020. [33] New projects going online since 2020 promise further increases. [34] All the state's major wind projects recently have been governed by project labor agreements and built by unionized workers.

On each project, the process starts with a "Memorandum of Agreement" in which the developer agrees to require the (engineering, procurement, and construction) firms with which the developer contracts on the construction phase to use a PLA. As with other private sector PLAs, the skills of workers available through union referral services make a PLA attractive. Steve White of the West Virginia Affiliated Construction Trades observes that wind projects "…are high skill. They involve crane operators working, by definition, in some of the windiest parts of the state. It's very tricky work. You also need millwrights, iron workers, and electricians with high skills." Another benefit of the PLA is the assistance building trades unions can bring during a variety of administrative permits needed by the developers. For example, in West Virginia, all electric generation projects require a state siting approval from the Public Service Commission. Some also require changes in local zoning. Before state or local regulatory bodies, developers who are sometimes from out of state value support from local West Virginia trades workers who can vouch for the jobs payoff from the project for local economies.

In states where wind power construction takes place without labor standards, jobs typically pay about a third less in wages than jobs in unionized fossil fuel power plants. The benefits gap is even greater. But in West Virginia and a handful of other states in which unions, sometimes with the help of strong labor standards, siting permit procedures, or local hire requirements (which exist on electric generation projects in Ohio), clean energy solar and wind construction jobs pay wage rates above $30 per hour and good benefits, close to the compensation on fossil fuel jobs. This is especially important because the quality of jobs and compensation of workers are often the most important determinant of whether renewable energy projects benefit the local community. In many cases, according to industry experts, such projects pay little or no local property and income taxes.

Labor standards on "permanent" (non-construction) jobs: The discussion so far focused on labor standards on construction projects. Labor standards can also strengthen workers' rights on permanent (non-construction) jobs—e.g., in factories that receive RGGI proceeds (or other public subsidies) to increase their energy efficiency and reduce their carbon emissions. For example, "labor peace agreements" require permanent employers not to oppose an attempt by workers to form a union or establish a "card check"

[32] This box is based in part on an interview with Steve White, executive director, Affiliated Construction Trades of West Virginia; and wage and compensation data provided by Ed Hill Jr., of the IBEW and Erin Hutson of LIUNA.
[33] Data extracted from https://www.eia.gov/electricity/data/state/.
[34] For a brief description of a recently completed 115 megawatt project that spans Grant and Mineral Counties, see "Clearway Group announces its West Virginia Black Rock wind farm has reached commercial operations," https://www.eia.gov/electricity/data/state/. See also Chris Lawrence, "Black Rock Wind Farm goes online in West Virginia," February 10, 2022; online at https://wvmetronews.com/2022/02/10/black-rock-wind-farm-goes-on-line-in-west-virginia/

provision under which a union may be established when a simple majority of workers sign a card indicating that they support union representation.[35]

A growing number of states and local governments are enacting strong labor standards to clean energy legislation. For example, Maryland's Clean Energy Jobs Act of 2019 provides grants for workforce training conditioned on implementation of Project Labor Agreements that ensure compliance with wage and benefit provisions of collective bargaining agreements and prevailing wage laws.

Train and Place: Giving Former Coal Workers Priority for Good New Clean Energy Jobs

Perhaps the most frequently mentioned approach to helping dislocated fossil fuel workers is workforce training. To workers with high-paid, unionized coal-fired utility plant jobs, however, training by itself comes across as a lead balloon—the kind of "just transition" policy seen as "an invitation to a funeral." Research supports Pennsylvania workers' and unions' perceptions that training alone is an ineffective policy. Evaluation studies show that even "Trade Adjustment Assistance," the most generous US workforce training policy for dislocated workers—which provides up to two years of training plus income maintenance (extended unemployment benefits), a health coverage tax credit, and relocation allowances—has little impact on the earnings losses and length of unemployment of workers displaced from high-wage manufacturing jobs. The critical missing complement to workforce training is placement in the next new job. In its use of RGGI proceeds, Pennsylvania has an opportunity to break new ground by going beyond traditional "train and pray" policies to "train and place"—coupling training with priority access for dislocated workers to their next good, often-union job.

The ability to implement train and place hinges on access to good new jobs. The labor and first source hiring standards described above can provide that access. The more such standards translate into unionized clean energy, sustainable manufacturing, and other clean economy jobs, the more opportunities Pennsylvania will have to give dislocated workers access to those jobs in conjunction with supplemental training when necessary. In the past, in the United States, priority access to good new, usually-construction, jobs has mostly focused on local hiring from low-income communities and/or of people of color. This means there are not off-the-shelf examples of successful train and place policies with dislocated fossil fuel workers. In the transition from fossil fuel electricity to clean energy and other sustainable jobs, however, some concrete hypothetical examples may help the reader see how the transition for dislocated workers could work. The bullets below move from transitions that are simpler to mediate to ones that might be a heavier lift.

- Workers move from a fossil fuel job to a clean economy job in the same company: e.g., if a unionized coal mining company expands its abandoned mine land reclamation business or begins harvesting rare earth elements from coal ash.

- Workers move from a fossil energy job to a clean economy job in a different company but in the same union: e.g., an IBEW electrician moves from a coal-fired power plant to an electrician job building utility-scale solar. This example requires a shift from one part of the IBEW (utility section) to another (construction section) and involves a transition from inside to outside work.

[35] This suggestion draws from "Recommendation 4" in Karla Walter, "Infrastructure Investment Must Create Good Jobs for All," Center for American Progress, April 22, 2019; https://www.americanprogress.org/issues/economy/reports/2019/04/22/466754/infrastructure-investment-must-create-good-jobs/. See also the discussion of "labor peace agreements" in David Madland and Terry Meginniss, "5 Ways State and Local Governments Can Make Climate Jobs Good Jobs," October 9, 2020, https://www.americanprogress.org/issues/economy/reports/2020/10/09/491226/5-ways-state-local-governments-can-make-climate-jobs-good-jobs/.

- Workers change company and union but stay in the same sector: for example, a member of the Utility Workers union moves from a closing power plant to a construction or permanent job in another company and union but still in the electricity generation industry (e.g., onshore or offshore wind). As Box 7 suggests, the state could use legislation, regulation and/or funding to establish a multi-company, multi-union utility sector partnership to help with this type of transition. This would work as long as the partnership includes employers hiring as well as laying off.

- Workers change industry and union: For example, utility workers or mine workers (or, for that matter, internal combustion car workers) leave the Utility Workers, United Mine Workers, or United Auto Workers and enter one of the building trades. The ReImagine Appalachia community and labor standards paper has an example called the "HeadLamps to HardHats" approach which captures the idea of a UMW-to-trades transition.

To make these transitions work—and make more fossil fuel workers truly "whole" in the energy transition—RGGI proceeds could provide unions and labor-management-community partnerships with grant funds to help dislocated workers get their next union job.

Box 7: The Keystone Utility Partnership

For fossil fuel utility workers who are not ready to retire, the goal *should not* be asking them to take a job they do not want in a place they do not want to move to; the goal should be enabling workers to get a new job as good as their old one where they currently live. This is what building trades unions do already for their members. Through union "hiring halls," they routinely take workers from one project and company to the next project and company, often (not always) in the same community.

If the same union represents workers in conventional energy industry jobs as those found in more sustainable industries, this will simplify the transition, enabling the workforce to pivot from one kind of job to another similar job in the new energy industry. For example, the International Brotherhood of Electrical Workers, part of which represents utility workers, also trains members to install solar arrays, electric vehicle infrastructure, and energy-efficient commercial building technology. In other cases, conventional industry workers might enter a new trade. For example, utility plant workers not currently in a trade might become plumbers and pipefitters.

To mediate transitions within the electric generation sector, a sectoral labor-management utility partnership could bring together multiple companies and trade unions. In particular, such a partnership already exists—the statewide "Keystone Utility Partnership" which first formed in the administration of Governor Tom Ridge. While formed originally to deliver incumbent worker training within individual utilities, the partnership could now facilitate movement of workers from conventional energy companies to geothermal, hydro-electric, wind, or solar companies or their construction contractors, all while retaining union status.

Invest in Clean Manufacturing that Requires the Skills of Dislocated Electricity Workers

While nowhere near its 40%-plus peak share of Pennsylvania employment in World War II, Pennsylvania manufacturing today still accounts for about 569,400 jobs (in the 12 months ending February 2023), nearly one in 10 non-farm jobs in the state. Manufacturing also pays 13% more in compensation (wages plus benefits) than other sectors to "comparable workers" (i.e., controlling for education, experience, and other measurable variables that impact pay), a smaller gap than in the past but still a meaningful amount.[36] Maintaining a robust manufacturing sector as a source of good new jobs is especially critical to communities losing fossil fuel jobs. Investment of RGGI revenues in clean manufacturing should focus on increasing energy efficiency, on positioning Pennsylvania to win a substantial share of manufacturing sectors critical to clean energy and sustainability, and on application of green hydrogen and carbon capture and storage in the limited applications where the economics might work (e.g., the cement industry—see Box 8).

The industrial sector in Pennsylvania consumes more energy than any other sector, accounting for one-third of all energy used. Manufacturers burn fossil fuels on-site to generate heat to bend metals and process chemicals and glass, and—separately—purchase electricity from the grid to light their factories and power electric motors, welding tools, conveyor belts and the like. Both uses of energy produce emissions and contribute to the carbon footprint of manufacturing.

To increase energy efficiency in manufacturing, the state should invest in industrial assessment centers and manufacturing energy partnerships through which manufacturers can access low-cost industrial energy audits and energy-efficiency training for the workforce. In some states these assessment centers are housed in manufacturing extension partnerships, such as Pennsylvania's industrial resource centers. The state should also look for opportunities to further diffuse combined heat and power (CHP), a 100-year-old technology that harnesses both the heat and power produced during electricity production to meet the energy needs of manufacturers more efficiently while reducing emissions. Because boilers and turbines at former coal plants can be repurposed for CHP and energy efficient manufacturing—which creates jobs at exactly the location where they have been lost, and in some of the same occupations—Pennsylvania should conduct an assessment of the feasibility of such repurposing at the sites of the state's recently closed or soon-closing coal plants.

As a second priority for investment of RGGI proceeds in manufacturing, Pennsylvania should support manufacturing sectors likely to grow in tandem with clean energy and in conjunction with the overall effort to reduce carbon emissions and other pollutants. These include sectors such as battery technology, alternatives to single-use plastics (e.g., made from hemp), green building materials (e.g., "mass wood" made from Pennsylvania hardwood trees), and electric vehicles. The historic strength of Pennsylvania's manufacturing sector means that our state retains great engineering and workers' skills still today. The strength of our research universities (CMU, Penn, Penn State, Lehigh, Drexel, etc.) in science and technology are another asset, albeit one that has not always translated into manufacturing jobs in Pennsylvania. To guide the state's investment in "sustainable" manufacturing (also called "circular manufacturing" based on the idea that a company's waste should all be recycled by the same company or an input to another company), the state's economic development non-profit, Team Pennsylvania, could commission a study to identify and assess Pennsylvania's most promising sustainable manufacturing sectors.

A third priority for investment of RGGI proceeds is Carbon Capture and Underground Storage (CCUS) linked to cement production. As Box 8 explains in more detail, CCUS is not proven and is unlikely to prove economic on a wide basis. Cement production, however, releases an unusually large amount of carbon emissions—two-thirds

[36] Lawrence Mishel, "Yes, manufacturing still provides a pay advantage, but staffing firm outsourcing is eroding it," Economic Policy Institute, March 12, 2018; online at https://www.epi.org/publication/manufacturing-still-provides-a-pay-advantage-but-outsourcing-is-eroding-it/.

of them not from the energy used but from the chemical reaction involved. Moreover, cement is heavy and thus the market is inherently local—if the CCUS drives up the cost, Pennsylvania will still get most of its concrete within the state (or nearby states). Another reason to explore CCUS linked with cement production: the federal government will likely pay for most of it. Thus, the state should use a small amount of RGGI revenue to develop a plan with industry and labor to pilot CCUS in the cement industry. Since manufacturing projects often have high capital costs, the state could seek to use a portion of RGGI proceeds to leverage larger amounts of federal dollars as a general approach to subsidizing sustainable manufacturing.

Box 8: Why Carbon Capture and Underground Storage Makes Sense in the Cement Industry[37]

The fossil fuel industry and its political allies have for some time been enamored of the idea of capturing carbon emissions produced in electricity generation or industrial processes and then storing them permanently underground or otherwise isolated from the atmosphere—i.e., "carbon capture and underground storage" (CCUS). Yet as *The Economist* recently reminded us, "carbon-capture technology …. has not been done at scale anywhere in the world."[38] Put simply, carbon capture and storage is highly unlikely to happen on any very large scale (with possible exceptions for direct removal of CO_2 from Earth's already overburdened atmosphere, which is a totally different issue).

CCUS, however, may make sense in some specific, narrow applications, the most compelling one of which is cement production. Cement-making produces greenhouse gasses (GHGs) from (1) fuel burned to heat kilns in which limestone, $CaCO_3$, and other ingredients react chemically to form the binder agents in common Portland cement; and (2) the chemical reactions themselves, the major one being $CaCO_3$ to $CaO + CO_2$. Roughly one-third of GHG emissions come from fuel burning and the rest from the reactions. These require very high temperatures, impractical for electrical heating, so there is no quick and easy way to dispense with burning natural gas or coal. But the greater obstacles to decarbonization lie in the basic chemistry of making cement from limestone.

It should be possible to alter the composition of cement to reduce rates of CO_2 release, and perhaps through research to find alternative reaction pathways that will yield further reductions, but cement is so cheap, so durable, and for these and other reasons has so few practical substitutes, that this is a niche application in which capture and storage of CO_2 emissions might make sense—i.e., because there are no clear-cut alternatives in sight for making cement itself. What also makes sense is greater recycling of concrete, reduction of the cement/concrete content in structures (e.g., buildings) through better design practices (concrete is so cheap and easy to work with that no one has much cared in the past if more is used than needed), and in some cases substitutes for concrete such as processed (or mass) wood, which at least in principle promises something close to carbon neutrality. None of this promises to be quick and easy, nor to reduce GHG emissions by all that much, hence the possible recourse to carbon capture and storage.

[37] Keystone Research Center thanks John Alic for drafting this box.
[38] The Economist, "It's Not Cheap Being Green," January 15, 2022, p. 46, https://www.economist.com/britain/2022/01/15/expensive-energy-is-baked-into-britains-future

Direct Assistance to Coal Workers and Communities

Our fourth and final recommendation for RGGI proceeds is investment in direct assistance to coal workers and communities. As well as training, assistance for workers could include "wage insurance" that makes up the difference between wages on fossil fuel jobs and subsequent employment. For older workers, such wage insurance for three to five years can provide a bridge to retirement. Box 9 describes some examples of other states providing direct assistance to coal communities. As noted above, this is the category of recommended investment where the connection to reducing pollution is most indirect: compensating coal workers and communities should help reduce resistance to RGGI and other state policies that reduce air pollution.

Box 9: The Use of RGGI Proceeds to Directly Assist Coal Workers and Communities

The Ohio River Valley Institute in 2021 released a report which details policies in other RGGI states that do directly assist coal communities and workers, and which contains short case studies of communities assisted.[39] Both New York and Massachusetts have used a substantial share of RGGI proceeds to replace lost local tax revenues, provide direct services, and clean up brownfield sites in communities losing coal-fired energy plants. For example, New York launched the "Electric Generation Facility Cessation Mitigation Program" in July 2015 to provide financial support to communities with coal plant closures, including revenues to replace lost taxes that phase down over seven years. The coastal town of Somerset, Massachusetts, where the Brayton Point coal plant closed, received nearly $11 million in RGGI proceeds over a three-year period. Somerset also received assistance to turn the Brayton Point coal plant site into an industrial port for the now-booming offshore wind power industry. In New York, the town of Barker received funds to repurpose an old coal plant site for a "data hub."

[39] Joe Cullen, "Options and Opportunities for Coal Plant Communities: Pennsylvania and the Regional Greenhouse Gas Initiative (RGGI)," Ohio River Valley Institute, June 30, 2021, https://ohiorivervalleyinstitute.org/options-and-opportunities-for-coal-plant-communities-pennsylvania-and-the-regional-greenhouse-gas-initiative-rggi/

We’re In This Together—Let’s Utilize All Workers’ Talents in Our Climate Fight

Creative use of RGGI proceeds can launch Pennsylvania fossil fuel workers and communities onto new and more sustainable futures. In past transitions, such as the decline of the steel industry, Pennsylvania and the United States mostly left workers and communities on their own—with devastating consequences. RGGI proceeds make possible a less traumatic transition, one that works for workers, families, and communities. Pennsylvania should invest in such a true transition, redeploying dislocated workers, managers, and capital-intensive infrastructure on brownfield sites in the fight to reduce carbon emissions. As well as reducing the wage and income losses suffered by workers who lose good jobs—and attendant social costs, from family breakdown to declining health to addiction—a true transition could increase workers’ dignity and sense of purpose, as essential workers of climate response. Securing workers’ place in our society as well as our job market—and respecting them and the skills they bring to a cleaner economy—could help consolidate support for policies that reduce carbon emissions.