

Crafting Climate Solutions in Coal Country: Lessons from the Work of the Energy Communities Interagency Working Group (IWG) in Wyoming

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Executive Summary:

Current federal efforts to support coal dependent “energy communities” will be insufficient to ensure their well-being through clean energy transition. Energy Community incentives and frameworks that treat coal communities as a monolith fail to account for distinct local needs between coal communities in different regions. The story of the coal producing state of Wyoming’s engagement with federal funding opportunities designed to support coal communities in transition demonstrates the shortcomings of current federal policy frameworks to support coal communities. While there has been alignment between Wyoming and federal policy goals around clean energy transition with support for carbon capture, utilization, and storage demonstration projects (CCUS), the state has largely failed to receive funding from competitive grant programs aimed at supporting diversified economic development within coal communities, even though Wyoming is the highest producing coal area in the country.

All that said, the work of the Energy Communities Interagency Working Group and their pilot Rapid Response Team (RRT) in Wyoming offers lessons that could be applied to federal programs aiming to support a just transition for coal communities in the US. The successes of the RRT demonstrate how a focus on place-based community engagement, emphasis on relationship building and building on the ground capacity to engage with federal programs, and flexibility in program design can create the conditions that lead to policy progress on climate even in unlikely places like Wyoming communities whose economies, culture, and politics have been dominated by fossil fuels for decades.

Introduction:

The imperative to rapidly reduce greenhouse gas emissions from fossil fuels, particularly coal, raises questions about how to achieve this phase out without economically devastating communities with local economies dependent on the coal industry. The Inflation Reduction Act ties many incentives to labor requirements, domestic manufacturing, and project location, including offering additional incentives for projects to locate within “energy communities.” However, the definition of energy communities is vulnerable to wide interpretations, and there are

persistent questions as to whether the provisions, as currently constructed, will effectively steer investments toward communities most affected by a transition away from fossil energy. Communities such as those located in Campbell County, WY exemplify the kinds of challenges that coal dependent energy communities face. Through engagement with both federal resource providers and local Wyoming stakeholders, this paper will evaluate the effectiveness of the federal government's efforts to support energy communities through the Interagency Working Group on Coal & Power Plant communities & Economic Revitalization (Energy Communities IWG).

The paper is structured in five parts. The first section provides background information on the implications for coal use and the climate crisis, as well as context about the importance of coal to Wyoming's tax structure and labor markets. The second section outlines federal policy approaches that respond to the decline of coal communities, including the formation of the Energy Communities IWG and the energy communities tax credit "add-on" within the Inflation Reduction Act (IRA). The third section documents the state of Wyoming's CCUS efforts to separate the continued use of coal from harmful greenhouse gas emission given increased scrutiny and regulation of GHG emissions. The fourth section describes the origins and work of the IWG Rapid Response Team (RRT) in Wyoming. Finally, the final section explores lessons learned from the IWG experience in Wyoming that could be applied to future federal efforts to support energy communities. Ultimately, this paper will combine aggregate policy analysis with case-based analyses from Wyoming's Powder River Basin to offer recommendations to enhance the effectiveness of federal programs and incentives aimed at supporting energy communities undergoing economic transformation.

Section 1: The Rise and Fall of Coal

1.1) The Climate Imperative to Stop Burning Unabated Coal

To limit global average temperature increases to 1.5 degrees Celsius by the end of the century, countries need to reduce greenhouse gas emissions by 43% by 2030.¹ Failure to hold warming to these levels will lead to more extreme weather events, sea level rise, and disruptions to global food supplies, among other harms.

One of the primary pathways available to mitigate greenhouse gas emissions is transitioning from fossil fuels such as coal to zero-carbon energy sources, such as wind and solar power. Within the United States, a 40 percent decline in U.S. coal-fired power generation between 2009 and 2019 accounted for fully 75 percent of the total reduction in U.S. energy-related carbon dioxide (CO₂) emissions between 2005 and 2017.²

Rapidly phasing out the use of coal fired power plants to generate electricity is a central component of decarbonizations strategies. In its latest report assessing mitigation pathways to limit the average warming of global temperatures to below 2 degrees Celsius (C), the Intergovernmental Panel on Climate Change (IPCC) states that “substantial reductions in fossil fuel consumption and a near elimination of the use of coal without carbon capture and storage (CCS)” will be necessary.³ To meet more aggressive goals to limit warming to less than 1.5 C, the IPCC says coal use for electricity should fall 88% between 2020 and 2030.⁴

A key component of achieving a just clean energy transition in the United States is ensuring that energy communities are not abandoned even as the country moves away from fossil resources. Given that coal production was an economic engine for the development of the United States for decades, the needs of coal communities today and into the future deserve attention and resources. Creating equitable sharing of the benefits and burdens associated with energy production and

consumption is a central tenant in definitions of environmental justice. Taking environmental justice seriously means taking seriously the needs of the communities who stand to lose the most from the energy transition.

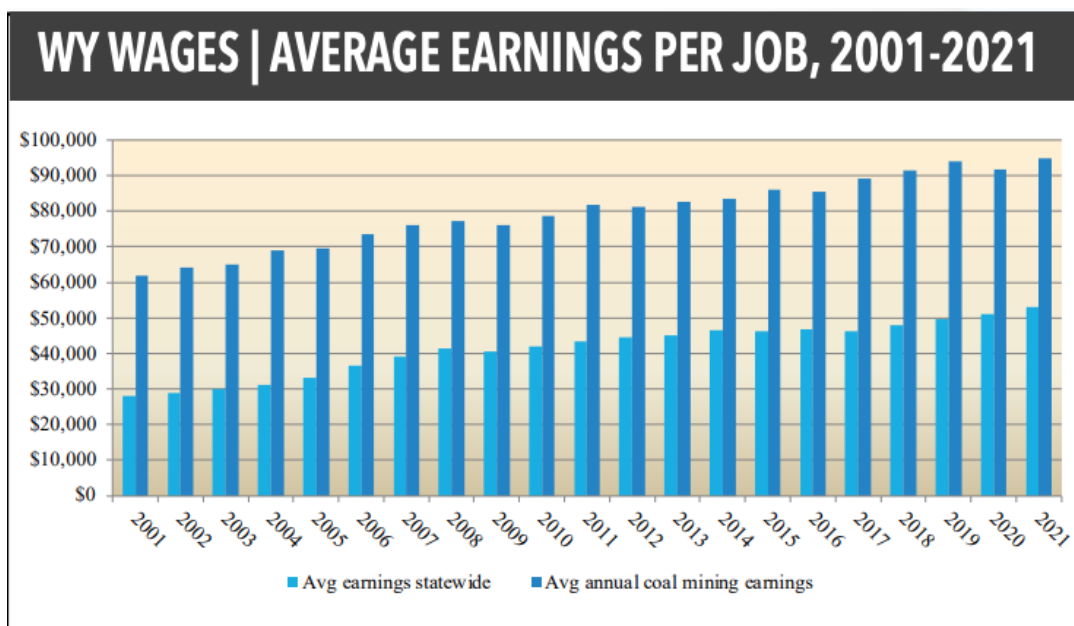
1.2) The Economic Uplift from Coal in Wyoming

For communities such as Gillette, Wyoming where coal production anchors their economy, a precipitous and rapid transition could cause dire consequences. Without intentional planning and major investments in efforts such as economic diversification and workforce retraining, coal communities could be economically devastated by the loss of a foundational industry. The decline of the coal industry poses serious challenges for communities like those in Wyoming that have come to heavily rely on the revenue generated from coal extraction and use to fund basic public services like schools and roads.⁵

As a state, Wyoming has experienced major benefits from the exploitation of its coal resources. Funding from coal revenues has provided most of the funding for school construction and maintenance in the state over the course of the last few decades, though the amount of school funding is declining. Coal leasing payments for school construction have declined from a high of \$400 million in 2005-06 to around \$100 million in 2017-18.⁶ Additionally, employment in extractive industries such as coal has helped keep young people in the state by providing economic opportunities and high salaries for younger workers. Furthermore, there is a strong sense of identity and pride associated with the mining culture within the state. Coal is deeply interwoven into the socioeconomic structure and cultural heritage of the state of Wyoming, entrenching support for this industry in ways that federal incentive programs alone will be insufficient to dislodge.

1.3) Job Losses and Falling Tax Revue Are the Twin Threats Facing Wyoming Coal Communities

For Wyoming, the decline of coal communities poses two major threats. The first is the loss of jobs directly associated with the coal industry. Cumulatively, the direct, indirect, and induced employment from the coal industry in Wyoming is estimated at 12,000 people, including about 4,750 miners and another 1,100 employed by coal fired electricity generation.⁷ For a state with a total population of roughly 600,000 people, this is a significant impact. Coal jobs are highly accessible to young workers, and high school graduates can find themselves making nearly \$100,000 after only a few years of mine work. Coal jobs are incredibly high paying jobs for the region. The average wage for around coal miners of \$89,000 is nearly three time the average median wage in the state, as demonstrated in the chart below.⁸

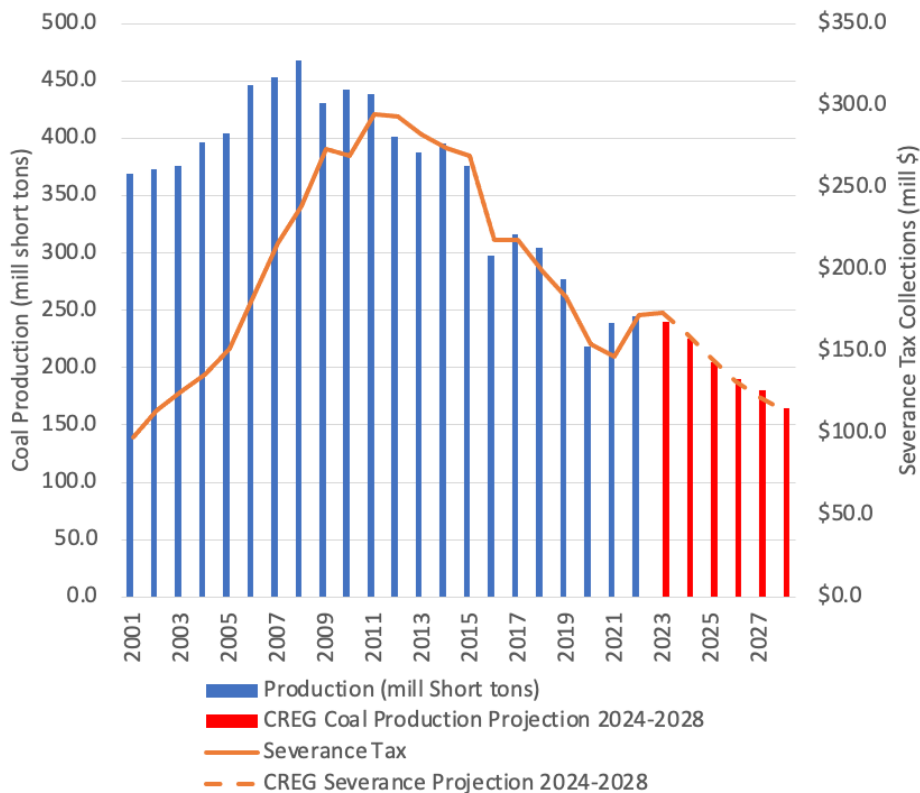


A graph from the Wyoming Mining Association that demonstrates the extent to which average annual coal mining earnings outpace average earnings statewide.⁹

Even more concerning is the extent to which the state of Wyoming relies on royalties from mineral revenues, including coal, to fund state and local government functions. Analysis by Professor Rob Godby of the University of Wyoming has found that the coal economy accounted

for 13% of yearly economic value produced by the state in 2021. A full 11% of state general fund revenues were directly attributable to coal related revenues.¹⁰ The graph below illustrates the amount of severance tax income from coal plants, plotted against tons coal production in the state.

Wyoming Coal Production/Severance Taxes 2001-2028



Source: EIA and State of Wyoming Consensus Revenue Estimation Group (CREG)

The mineral industry has brought billions of dollars into the state and provided significant economic benefits to Wyoming citizens. The economic development strategy of the state of Wyoming has been to reduce taxes for its citizens as much as possible and subsidize the provision of services with revenues from extractive industries. The state’s sovereign wealth fund, the Permeant Wyoming Mineral Trust Fund, was founded in 1975, and has almost \$10 billion in assets as of March 2022.¹¹ As a result, citizens of Wyoming have become accustomed to very low tax

rates, and the prospect of raising taxes in the state is politically fraught. A report prepared by the Wyoming Economic Analysis Division and the Wyoming Taxpayers association estimated that a family of three in a modest home in Wyoming utilizes \$28,280 in public services while paying a mere \$3,770 in personal taxes.¹² This gulf between the cost of providing public services and tax revenues received by the state is filled largely with royalties from mineral extraction, which are threatened by a broader economic transition away from fossil fuels. While there has have been multiple attempts to create a tax base less dependent upon mineral wealth over the past four decades, none have been successful.¹³

In his book “Wyoming – The Paradox of Plenty: The Allure and Risk of a Mineral Economy,” former Governor David Freudenthal describes how the region has focused almost exclusively on supporting extractive industries and made very little significant investment in alternative economic sectors. As an economy fueled by exporting a commodity, he writes, “producers within the region are ‘price takers’ not ‘price makers.’ Commodity prices, particularly for energy commodities, can shift quickly and dramatically.”¹⁴ This overdependence on extractive industries has left Wyoming’s economy one of the least economically diversified in the country. As illustrated in the figures below, even compared to other “resource colony” states, Wyoming’s fiscal dependence on mineral revenues is extremely high.¹⁵

Table 1: State and Local Fossil Fuel Revenues, 2015-2019 (Averages; 2019 US\$)

State	Total government fossil revenue in US\$ million (1)	State	Per capita government fossil revenue (2)	State	Government fossil revenue as a share of state and local own-source revenue (3)
Texas	14,591	Wyoming	7,339	Wyoming	59%
California	7,823	North Dakota	3,854	North Dakota	31%
Pennsylvania	4,422	Alaska	2,713	Alaska	21%
Wyoming	4,264	New Mexico	1,303	New Mexico	15%
North Dakota	2,917	West Virginia	698	West Virginia	9%

Source: [Raimi et al \(2022\)](#)

Section 2: Federal Policy Responses to Coal Decline

2.1) Biden Administration Forms Energy Communities Interagency Working Group to Support Coal Communities

In response to the current and anticipated decline of the coal industry, federal agencies have undertaken work to collaborate with state and local governments, most notably through the work of the Energy Communities IWG. The primary purpose of the Energy Communities IWG is to direct federal resources to help coal, oil, gas, and power plant communities create good paying jobs, spur economic revitalization, remediate environmental degradation, and support energy workers.¹⁶ During the first week of his presidency, President Biden issued an Executive Order creating the Interagency Working Group on Coal and Power Plant Communities and Economic Revitalization (Energy Communities IWG).¹⁷ The Energy Communities IWG is comprised of 11 federal agencies, including the Department of Energy (DOE), the Environmental Protection Agency (EPA), the Department of Commerce (DOC), and others listed in the graphic below.

Agencies represented on the Interagency Working Group are:



Office of Management and Budget/Domestic Policy Council



U.S. Department of Energy



U.S. Department of the Treasury



U.S. Department of the Interior



U.S. Department of Agriculture



U.S. Department of Commerce



U.S. Department of Labor



U.S. Department of Health and Human Services



U.S. Department of Transportation



U.S. Department of Education



U.S. Environmental Protection Agency



Appalachian Regional Commission

This image shows the 11 federal agencies who are represented on the Energy Communities IWG.¹⁸

2.2) The Inflation Reduction Act (IRA) and Implications of the Energy Communities Tax Adder

The efforts of the Energy Community IWG have been accelerated due to the unprecedented availability of federal funding aimed at spurring investment in sustainable technologies within the Inflation Reduction Act (IRA) and Bipartisan Infrastructure Bill (BIL). Passed by the U.S. Congress and signed by President Biden in 2022, the IRA represents the single largest investment in measures to address climate change in the country's history. Among the key policy objectives of IRA are investing in the production and deployment of renewable energy in the United States, with special emphasis placed on encouraging economic development in "energy communities." Energy communities are areas that have historically been economically dependent upon fossil fuels and are given special recognition within IRA in recognition of the fact that displacing fossil fuels with renewable energy could have severe negative economic consequences for those communities.¹⁹ With the decline of economic anchors like coal fired power plants, there is a need for federal programs to support diversified economic development and alternative industries for energy communities.

There are outstanding questions about how effective the energy community tax credits be in spurring economic development in fossil fuel dependent regions. Sometimes referred to as "bonus credits," projects that are claiming tax credits such as the Investment Tax Credit (ITC) or the Production Tax Credit (PTC) can claim an "adder" of an additional 2% of the credit amount if they are in an energy community. The energy community tax credit bonus can be increased to 10% if a project meets prevailing wage and workforce training requirements.²⁰

In the text of the IRA, there was ambiguity around what exactly constituted an "energy community." Guidance released by the Department of the Treasury (Treasury) and the Internal Revenue Service (IRS) on April 4th, 2023, answered some questions about the criteria that

determine an “energy community” for the purposes of determining applicability for the associated bonus tax credit. The three criteria for identifying energy communities are 1) brownfields, 2) coal communities, and 3) metropolitan or non-metropolitan statistical areas where at least 25% of local tax revenues are related to activities of the coal, oil, or natural gas industry and unemployment is at or above the national average of the previous year.²¹ Communities need to meet certain thresholds in one of the three areas above to be categorized as an energy community for purposes of claiming energy community tax credits.

Within the context of the IRA, coal communities have a distinct definition that is utilized to determine eligibility for the “bonus” energy community tax credits. U.S. census tracts where a coal fired power plant has closed since 2010 or a coal mine has closed since 2000 are considered “coal communities.”²² This definition notably neglects to include areas with high levels of current coal employment or workforce if they haven’t faced a plant closure.

It is significant that eligibility for one of the criteria to receive energy community tax credits is delineated by the employment characteristics and the composition of the tax base of an area. Specifically, metropolitan, or non-metropolitan statistical areas where at least 25% of local tax revenues are related to activities of the coal, oil, or natural gas industry and unemployment is at or above the national average of the previous year are considered “energy communities.”²³ One major difficulty with interpreting this provision is that county tax authorities do not regularly denote particular payments as coming from the fossil fuel industry, meaning there could be significant administrative burden on local tax officials attempting to gauge their eligibility for this program.

2.3) Ambiguity Poses Challenges for Determining Eligibility for Energy Communities Tax Credit

There are major questions around how these eligibility criteria for energy communities will be interpreted by Treasury officials. Differing interpretations of employment characteristics or what constitutes fossil fuel activities all have major implications for what geographic areas attract increased clean energy development. Depending on how broadly or narrowly these definitions of “energy communities” are interpreted, they could have widely variable geographic dispersion across the country.²⁴ As described in a report by Daniel Raimi of Resources for the Future (RFF), ultimately, “the law’s definition of energy communities could vary widely depending on interpretation of key phrases. In addition, we find that the law... is unlikely to steer investment specifically toward those communities that will be most heavily affected by a transition away from fossil energy.²⁵”

More foundationally, the tax credit provisions for energy communities within IRA seem designed to react to areas already in economic decline, rather than to proactively provide resources and support to areas before they experience major losses in employment in tax revenue. This poses challenges for supporting coal communities where job losses have not yet reached the thresholds identified in within the IRA criteria. Not all coal communities are the same position as economically devastated communities in Appalachia for instance, yet the federal incentive structure as expressed in the energy communities adder seem more focused on diverting resources to areas that are already devastated, with less emphasis on proactively preventing the conditions that lead to economic devastation in places like Wyoming.

2.4) IRA Incentives Promoting Clean Energy Development in Energy Communities Insufficient to Secure Well Being of Energy Communities

At the heart of the IRA tax provisions is a policy objective of creating new renewable energy jobs in areas that traditionally had a significant percentage of their workforce in coal. While

the job creating benefits of the clean energy economy on aggregate are high, the job intensity for individual renewable energy projects is comparatively low. Because solar and wind projects require less ongoing labor to operate than coal plants, individual clean energy projects create far fewer permanent employees to operate and manage than existing fossil fuel plants.²⁶

Nationally, hundreds of coal-fired power plants have closed over the last 20 years, and dozens of coal mining companies have gone into bankruptcy.²⁷ Direct jobs in coal mining fell from over 125,000 workers in 1990 to less than 50,000 in 2022.²⁸ While roughly 50,000 workers are a relatively small number compared to other industries in the United States, the dense concentration of coal jobs within geographic areas magnifies the impact of those job losses on local economies.

While retraining coal workers to work in renewable energy is often touted as a potential solution to coal job losses, unfortunately this career transition rarely occurs. Surveys of labor force patterns in the energy sector have found that among workers who were leaving fossil fuel jobs, fewer than 2% ended up in finding new employment in renewable energy.²⁹ Additionally, areas where coal mines were built are not necessarily the locations with the best access to renewable resources such as wind and sun. Additionally, tax credits alone fail to address the structural and cultural barriers to clean energy adoption within fossil fuel dependent communities.

Additionally, lost tax revenues from the declining coal industry are unlikely to be offset by revenue from renewable electricity generation. In their report “Energy Transition and Local Government Finance,” researchers from Resources for the Future (RFF) describe the inadequacy of replacing lost tax revenues from fossil sources with income from renewables:

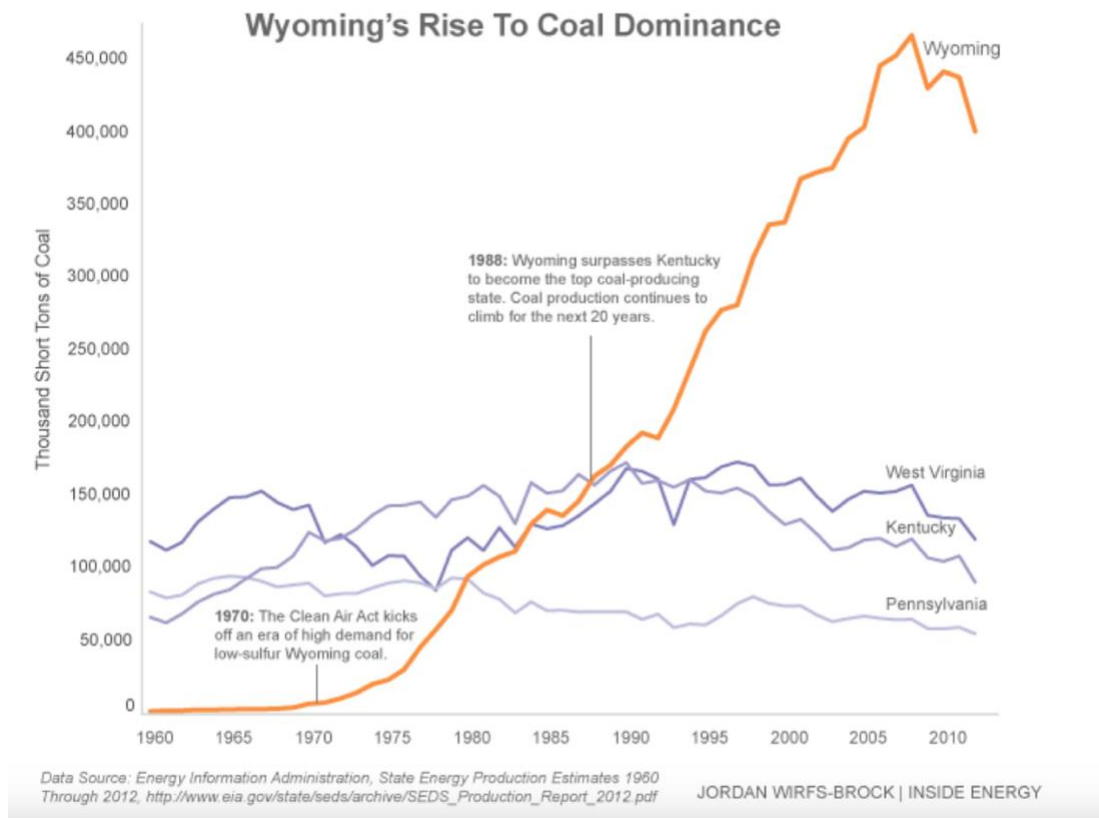
In most counties that depend heavily on fossil fuels for local revenues, solar—but not wind—has the technical potential to replace existing fossil fuel revenues, but this would require dedicating implausibly large portions of developable land (in some cases, more than half) to solar... This finding suggests that while renewable energy will provide new revenue streams for communities, fossil fuel-dependent

regions will need to build new tax bases well beyond wind and solar, develop other sources of revenue, or risk a decline in public service provision.³⁰

2.5) “*Lucky Rocks*” – *Wyoming’s Coal Boom as a Product of Federal Environmental Policy*

Ironically, despite widespread narratives among Wyoming political leaders that the federal government and the Biden Administration is engaged on a “war on coal” and federal regulations are killing the industry and the local economy, Wyoming’s coal boom was largely a product of federal environmental policy.³¹ Federal environmental policy has played a defining role in shaping the utilization of Wyoming coal resources. When the Clean Air Act was passed by Congress in 1970, policymakers were deeply concerned with the problem of acid rain that was exacerbated by sulfur dioxide emissions from power plants. The law required that new coal fired power plants reduce their sulfur dioxide emissions and created a new market demand for low sulfur Wyoming coal.

Fortunately for Wyoming, the sub-bituminous coal that is mined in the state had a comparatively low sulfur and ash content compared to coal extracted elsewhere in the country. Burning lower sulfur coal from Wyoming enabled new power plant operators to comply with new sulfur dioxide regulations by switching their fuel source rather than installing expensive scrubber equipment.³² This comparative market advantage helped overcome some of the other factors that had caused lower adoption of Wyoming coal up to that point, including the relatively lower heat rate of Wyoming coal as well as the high cost of transporting coal from Wyoming to power plants. In 1988, Wyoming surpassed Kentucky as the top coal producing state in the country. The graph below, produced as part of the public radio collaboration *Inside Energy*, demonstrates the positive impact that the passage of the Clean Air Act had on the Wyoming coal industry.³³

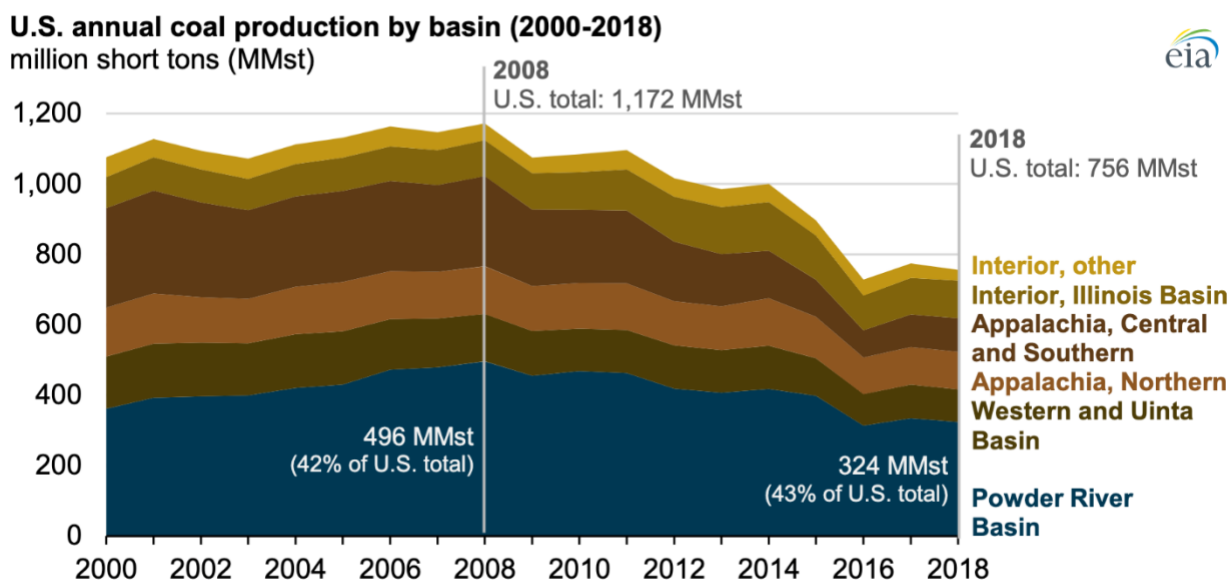


Before the Clean Air Act was passed, coal mines in the PRB produced only 4.6 million tons of coal and employed 448 people. By 1990, after the Clean Air Act Amendments were enacted to expand sulfur dioxide regulations to existing plants as well, production in the PRB had swelled to 184 million tons.³⁴ Coal production in the PRB peaked in 2008, with the region generating 466 million tons of coal and directly employing around 6,760 workers.³⁵

In 2023, the PRB region produced less than half that amount of coal, with only 230.4 million tons of total production.³⁶ The decline in the market for coal has been largely driven by market forces, particularly the shale gas boom of the mid-2000's.³⁷ The technique of hydraulic fracturing, or fracking, made previously inaccessible deposits of shale natural gas economically viable to exploit, leading to a sudden increase of natural gas onto the market.. Consequently, natural gas prices fell and production soared. Shale gas production in the United States rose rapidly

from 2 trillion cubic feet (TCF) in 2007 to 17 TCF in 2016.³⁸ Between 2011 and 2019, more than 100 coal fired power plants in the US were either retired or repurposed to burn natural gas.³⁹ This led to direct competition with coal as a fuel for power plants. Burning natural gas for energy results in fewer emissions of air pollutants and carbon dioxide (CO₂) than burning coal, which also helped give natural gas power plants an advantage as governments at all levels began seeking means to reduce their GHG emissions.⁴⁰ Even as the coal industry declined, Wyoming’s relative share of coal production has remained fairly constant, as demonstrated by this chart from the Energy Information Administration.

Sixteen mines in the Powder River Basin produce 43% of U.S. coal



Source: U.S. Energy Information Administration and U.S. Mine Safety Health Administration (MSHA)

Even as coal production declined in aggregate across all major coal producing basins in the United States, the Powder River Basin’s relative share of total production held steady.⁴¹

With the anticipated retirement of coal fired power across the country, market demand for coal imports is expected to rapidly contract. Recently proposed regulations by the EPA would accelerate this trend by mandating that all new and existing coal and natural gas plants capture 90% of their GHG emissions by 2040.⁴² Coal plants that schedule closure in the next decade would

not be subject to these standards, which leads analysts to suggest that some coal plants may retire rather than comply with these tightened emissions standards. Federal policies mandating carbon capture for coal plants to continue operations have led the state of Wyoming to double down on efforts to commercialize carbon capture, utilization, and storage within the state.

Section 3: Wyoming’s Big Bet on CCUS to Extend Use of PRB Coal

3.1) CCUS Offers Rare Area of Alignment Between Federal Climate Goals and Local Interests in Preserving Coal Economy

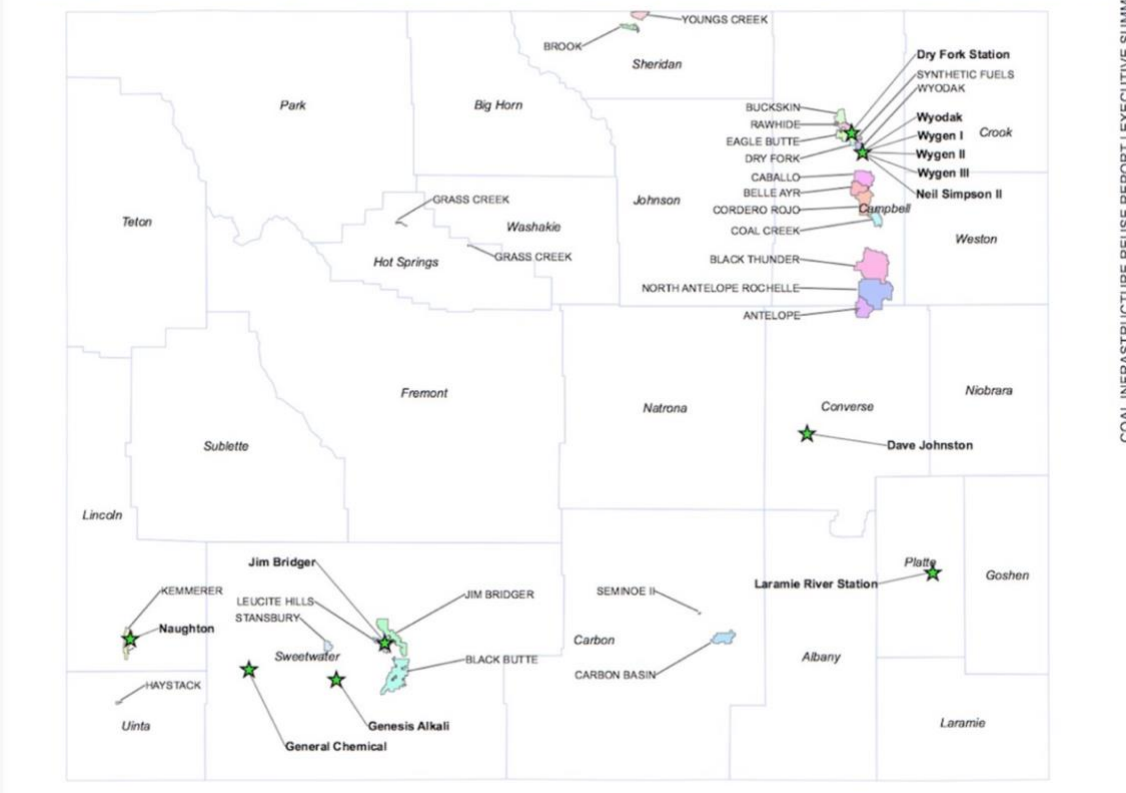
Given the benefits that the coal economy has had for the state, Wyoming is committed to extending the amount of time that coal is utilized. To that end, the state has doubled down on efforts to extend the amount of time that they can maintain their use of coal resources. Wyoming has devoted considerable energy and resources to exploring what it would take for coal to continue to be viable given the current and future demand for GHG emissions reductions. Wyoming officials have repeated that the state is pursuing an “all of the above” energy strategy, and said that it is the harmful emissions from coal, not the use of coal itself, that is the problem.⁴³ To that end, many of the policies and programs funded the state have the explicit goal of finding ways to continue to exploit coal resources while capturing and sequestering the carbon dioxide emissions, or by generating value added products using coal as a material input rather than an industrial fuel source. Stakeholders in Wyoming interviewed for this project repeatedly emphasized their efforts to enable the continued use of coal through their investment in technologies such as carbon capture, utilization, and storage and sequestration (CCUS) of carbon emissions.

3.2) WY’s Powder River Basin – Energy Capital of the United States

To extend the region’s ability to benefit from exploitation of its coal resources, the Powder River Basin (PRB) in northeastern Wyoming has become a hub of testing sites for carbon capture, utilization, and storage (CCUS). At the heart of the PRB is the city of Gillette, WY, which proudly proclaims itself to be the “Energy Capital of the United States.” The author traveled to Gillette Wyoming to talk with local stakeholders about their interaction with federal programs, and their vision for the future of Wyoming’s economy.

Coal produced within the PRB accounts for approximately 40% of all coal production within the United States, making it the largest coal producing area in the country.⁴⁴ The map below shows the significant concentration of coal mines within the PRB.

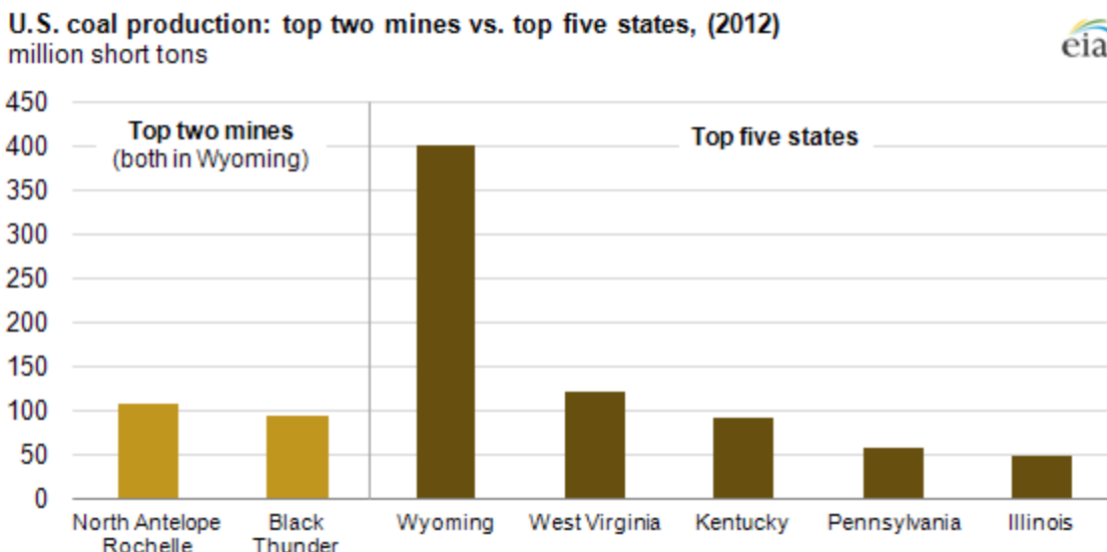
FIGURE 1.A WYOMING STATEWIDE COAL FIRED POWER PLANTS WITH MINE PERMITS



COAL INFRASTRUCTURE REUSE REPORT | EXECUTIVE SUMMARY

This map from the Nature Conservancy’s “Coal Infrastructure Report” shows the high concentration of coal mines within the Powder River Basin of in Northwestern Wyoming as of 2022 (upper right corner of map).⁴⁵

As of 2021, coal from the PRB is exported to 25 states, down from a high of 38 states who received coal for use in coal fired power plants in 2008.⁴⁶ The chart below displays the extent to which Wyoming has dominated the American coal industry. In that year, two Wyoming mines alone accounted for 20% of all U.S. coal produced.⁴⁷



This graphic by the Energy Information Administration from 2012 demonstrates that at that time, the two largest coal producing mines were in Wyoming, and the state itself vastly eclipsed comparable states in annual coal production.⁴⁸

3.3) Wyoming Focuses on CCUS for Economic Development While Federal Policies Promote it for Emissions Reductions

A shared interest in CCUS represents the largest area of overlap between the objectives of the State of Wyoming and the Biden Administration’s climate policies. According to the International Energy Administration (IEA), rapidly expanding the rate of CO2 capture and storage will be essential for meeting net zero emissions goals.⁴⁹ In its April 2022 report, the IPCC echoed this sentiment, stating that “the deployment of carbon dioxide removals to counterbalance hard-to-abate residual emissions is unavoidable if net zero...emissions are to be achieved.⁵⁰” Nevertheless, the current high costs of carbon capture processes, concerns about the safety and permanence of sequestration, and uncertainty about the ability to rapidly scale up CCS technologies

are major challenges for the industry. To address these concerns, the IRA updated the 45Q tax credit, expanding the tax credit for CO₂ capture and storage to \$85/ton and making the credit more accessible to a wider swath of industries.⁵¹ Given its history with mining and industrial processes and a geologic landscape favorable to permanent sequestration, Wyoming is well positioned to contribute to efforts to commercialize and scale up CCUS.

One local Wyoming official encapsulated the distinctions between the federal energy policies motivated by a desire to address climate concerns and state policies aimed at perpetuating Wyoming's ability to reap economic benefits from the exploitation of coal:

I don't spend one minute in my day thinking about climate crisis... I don't think about the global push in developed countries, away from higher CO₂ emissions versus lower. I don't even think about the war on coal because if it gives me a gut ache and it makes my head want to explode. All I have to say is my town was selling almost half a billion tons of coal. It was really good for my friends, my neighbors, and my family. Now we're not selling that much. That's it. That's all I need to pay attention to.⁵²

Recognizing the commercialization of CCUS technologies as a means of extending the usable life of their coal resources, Wyoming officials have invested tremendous resources on efforts to separate the production of climate warming CO₂ from the utilization of coal. To this end, three projects with the PRB are illustrative of Wyoming's efforts to find new uses for coal that do not produce greenhouse gases. Several projects located near each other exemplify different approaches that the state is taking to attempt to secure the future of its coal, 1) Reutilizing existing mine infrastructure, 2) accelerating the nonthermal use of coal by creating value-add "coal to products," and 3) investing in demonstration projects to employ post combustion carbon capture on coal fired power plants.

3.3) Reutilizing Coal Mine Infrastructure – Fort Union Industrial Park

The Fort Union Industrial Park is the first industrial park in the PRB to be created on the site of a former coal mine. The park is the site of the Wyoming Innovation Center, a technology innovation center designed to aid in the development of advanced carbon products. The facility is intended to support and accelerate the commercialization of coal products to demonstrate the scalability of these products, and to demonstrate the commercial potential of processes that utilize coal.

The Wyoming Innovation Center is owned and operated by the local nonprofit Energy Capital Economic Development. One of the key attributes the facility advertises to potential tenants is that it has achieved a Termination of Jurisdiction (TOJ), a first of its kind air emissions permit by the Wyoming DEQ that utilized the supremacy that WY has under the Clean Air Act to provide a fixed pool of air emissions permits that are directly controlled by the operator.⁵³ This means that tenants of the industrial park will not have to apply for their own individual air permits for research projects on the site. While this unique regulatory setup offers the potential to reduce regulatory delays in product commercialization, there are risks for the operators who will need to closely monitor the air emissions of the facilities on the site to avoid exceeding their emissions allowance.

The language that the Wyoming Innovation Center uses to describe its role in the future of the energy economy is illustrative of how the state is attempting to respond to pressures to reduce carbon dioxide emissions while continuing to find ways to utilize coal:

Dedicated to the reduction of carbon intensity and thoughtful development of re-purposed mine lands... At Fort Union Industrial Park, we're ushering in a new carbon age. We believe that CO2 capture and sequestration as a service is the future, and we're proud to be leading the charge in this emerging field. By providing innovative solutions for carbon reduction and management, we're helping to create a more sustainable future for our planet.⁵⁴

As of March 2024, the industrial park is the host site for Atlas Carbon, an activated carbon manufacturer that is utilizing a proprietary process to manufacture activated carbon for use in filtration systems. Atlas Carbon is utilizing the abandoned coal mine infrastructure as part of its operations. This was the first company to commercialize a non-thermal use for coal from the Powder River Basin and was also among the first to receive direct financial support from the state of Wyoming. In 2016, the Wyoming Legislature passed a revision of its economic development programs, creating the Economic Development Large Project Loan Program.⁵⁵ Atlas Carbon was awarded a \$15 million loan from the that program that same year. Unfortunately, the company has experienced financial difficulties, and was declared in default on the state loan in early 2024.⁵⁶ Both state officials and Atlas Carbon representatives have expressed a desire to continue the project, as maintaining the first commercial operation to reuse old mine infrastructure and produce significant quantities of a carbon product from coal.



Atlas Carbon has modified old mine infrastructure for use in its manufacturing process to generate activated carbon for use in filtration systems. It is the first commercial demonstration of turning PRB coal into value-add products, though the company is facing financial difficulties. Photo by author.

Additional tenants have signed agreements to utilize the facilities at the Innovation Center. These include the University of Wyoming’s School of Energy Resources (UW SER) Advanced Carbon Projects program, which will be testing processes to utilize coal in the production of asphalt. The other confirmed project is a partnership with the National Engineering Technology Laboratory (NETL) Rare Earth Element project. Utilizing funding from the US Department of Energy (DOE), this project will test methods of chemically extracting these critical minerals from coal ash.⁵⁷ The photo below displays an overhead view of the innovation center and the repurposed mine equipment utilized by Atlas Carbon.



A rendering of the Fort Union Industrial Park on display at the headquarters of Energy Capital Economic Development. The Industrial Park hosts the Wyoming Innovation Center (the two square buildings in center), while Atlas Carbon utilizes old mine equipment in the background. This site is the first successful repurposing of abandoned mine infrastructure within the PRB. Photo by author.

3.4) Carbon Utilization – The Carbon XPRIZE at the Wyoming Integrated Test Center (ITC)

Accelerating efforts to commercialize CCUS technologies is the primary goal of the Wyoming Integrated Test Center, a facility that enables researchers to test carbon capture and

utilization approaches. The Test Center provides coal-based flue (exhaust) gas from the Dry Fork Power Station to various test bays that can access large quantities of flue gas due to their proximity to an active coal fired power plant. The first tenant of this facility was the NRG COSIA Carbon XPRIZE, in which companies competed for a \$20 million prize for the creation of products that sequestered carbon at low costs and with high market potential.⁵⁸ While pandemic related restrictions meant that some finalists were unable to demonstrate their projects at the ITC as had been originally planned, the prize was finally awarded in 2021 to two companies.

Both winning teams demonstrated technologies aimed at reducing GHG emissions from traditional concrete manufacturing. The two teams demonstrated technologies in which CO₂ injection into concrete mix enabled the production of concrete with a reduced water and carbon footprint while maintaining structural reliability. One of the two teams, CarbonCure, spent months demonstrating its technology at the Wyoming ITC.⁵⁹ The variety of products from carbon that were manufactured during this process was quite diverse, including cinder blocks, yoga mats, and slippers, as demonstrated in the photo below. While the ability to generate consumer products from coal has been proven to be technically possible, it is unclear whether these kinds of products could commercially compete with substitutable goods manufactured from petroleum.



Products manufactured as part of the Carbon XPRIZE challenge are displayed within the Wyoming ITC. These included vodka, pens, and exercise weights. Photo by author.

3.5) Testing CCUS at Dry Fork Station – CarbonSAFE and MTR FEED Study

The Dry Fork Generating Station near Gillette is one of the newest coal fired power plants in the country, and was intentionally designed to serve as a testbed for carbon capture.⁶⁰ Exhaust systems installed to direct flue gas from the power plant to bays that are utilized to test different carbon capture technologies, as displayed in the images below.



The Dry Fork Power Station is one of the cleanest burning coal plants in the United States, as well as one of the newest, having come online in 2011. Its proximity to the Dry Fork mine enables it to have comparatively low fuel prices. Photo by author.

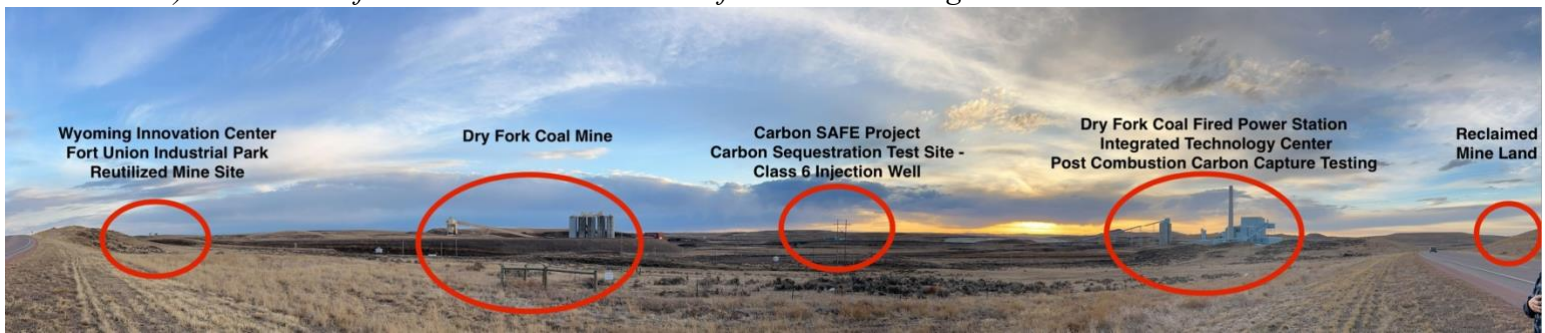
With rising concerns about how the carbon capture requirements in the proposed Obama era “Clean Power Plan” might force the retirement of coal power plants, Wyoming stakeholders set up a testing center at Dry Fork designed to accelerate the commercialization of carbon capture technologies.⁶¹ The Integrated Technology Center (ITC) came online in 2016 as a public-private partnership. The center was funded by \$15 million from the State of Wyoming, \$5 million from the Tri-State Generation and Transmission Association, and an additional \$1 million from the National Rural Electric Cooperatives Association.⁶² Basin Electric Power, which operates the Dry Fork Station, provides technical services to the center. The ITC is one of the few facilities in the world that enables researchers to test their technologies at an operating power plant. The ITC features seven test bays designed to accommodate distinct demonstration projects that have access to 20 MW of flue gas between them. Like the Wyoming Innovation Center, the ITC is designed to help carbon technologies move from laboratory demonstration to commercialization.

The Carbon Storage Assurance Facility Enterprise (CarbonSAFE) project operated by the University of Wyoming at the Dry Fork Station, is one of thirteen CCUS projects in the U.S. to

receive direct funding from DOE.⁶³ The \$19.1 million project is examining the feasibility of different geologic rock layers for permanent sequestration of injected carbon dioxide.

Another major project at the Dry Fork Power Station is the Membrane Technology and Research (MTR) Carbon Capture is constructing a large pilot program utilizing a membrane-based approach to post combustion carbon capture that is expected to go online in 2024. The proprietary Polaris membrane is anticipated to capture more than 150 tons of CO₂ per day.⁶⁴ Because the process utilizes no extra chemicals and requires little water compared to solvent based carbon capture methods, it is considered a more environmentally friendly method of carbon capture.

3.6) *The Sunset of PRB Coal or a New Dawn for Carbon Management?*



A panorama showcasing the plethora of paths the state of Wyoming has taken to try to extend the utility of coal amidst efforts to reduce greenhouse gas emissions. These include repurposed mine infrastructure, technological commercialization accelerator facilities, and post combustion CO₂ capture and storage. Photo by author.

The Powder River Basin may be unique in the extent to which all aspects of the efforts to find new uses for coal are in close geographic proximity. As noted in the photo above, within the span of a few miles, the author visited 1) repurposed mine infrastructure utilized as an industrial park, 2) an active coal mine, feeding power to a “mine mouth” mine, 3) the Dry Fork Power Station, one of the most advanced and cleanest burning coal plants in the world, which was testing 4) multiple techniques for post-combustion CCUS, including the on-site sequestration of carbon in Class six disposal wells, and, 5) uses of carbon for products.

While Wyoming stakeholders are upfront about the fact that the goals of their efforts are to extend the lifespan of their coal power plants and the demand for coal as a fuel, it is uncertain whether they will succeed. Within the United States, many major utilities are moving away from coal, and many federal programs and philanthropic efforts are reluctant to fund projects that explicitly mention coal. The Biden Administration has set a goal of a carbon free power sector in the United States by 2035, a goal which can only include the continued use of coal if the carbon emissions from coal can be captured and sequestered at a much lower cost than is possible today.⁶⁵

Cost concerns are a major barrier to continued coal use. A report from the firm Energy Innovation released in early 2023 found that “99 percent of all coal-fired power plants the U.S. are more expensive to operate on a forward-looking basis than the all-in cost of replacement renewable energy projects.⁶⁶” Interestingly, the only US coal plant that remains cost competitive to operate compared to renewables is the Dry Fork Power Station in Wyoming’s Powder River Basin. More foundationally, research by the Institute for Energy Economics and Financial Analysis released in 2023 indicates that the levelized cost of electricity (LCOE) for power generation with CCS is at least 1.5-2 times above current alternatives, including renewable energy plus storage.⁶⁷

While coal’s future in the power sector of the US is uncertain, coal will continue to be an important source of electricity globally for the foreseeable future.⁶⁸ If Wyoming can contribute to bringing down the cost of CCUS technologies that can then be utilized globally, it could make an important contribution to the effort to bring down greenhouse gas emissions. The participation of some international companies in the ITC such the Japan based Kawasaki Heavy Industries offers a model for the benefits of technological innovation in the state to benefit international efforts to mitigate climate change.



Japan based company Kawasaki Heavy Industries is testing a solid sorbent capture technology at Dry Fork Power Plant. Photo by author.

Section 4: The Work of the Wyoming Rapid Response Team (RRT) of the Energy Community IWG

4.1) Initial IWG Report Leaves Wyoming Stakeholders Feeling Overlooked

The work of the Energy Communities IWG to support the energy producing state of Wyoming offers valuable insights into how the federal government can best help coal communities navigate the clean energy transition. In particular, the experiences of the fossil fuel rich Campbell County in northeastern Wyoming are illustrative of the challenges and opportunities associated with federal efforts to support economic development, diversification, and resilience for communities historically dependent on coal.

In their first publication in April 2021, the “Initial Report to the President on Empowering Workers Through Revitalizing Energy Communities,” the Energy Communities IWG noted that Wyoming is the top coal producer of the country, and hosts more than 6,300 miles of hydrocarbon pipeline infrastructure.⁶⁹ Despite this, the top five priority areas listed for action in the report were all located in the Appalachia region, with the “Eastern Wyoming non-metropolitan area” listed as the 8th of the top 25 coal dependent communities.⁷⁰ This ranking was based on the number of direct coal-related jobs as a percentage of the total number of jobs in each area. As the report itself acknowledges, this quantification understates the impact of the industry on local economies dependent on the coal industry for tax revenue. As discussed earlier, Wyoming is particularly dependent on revenue from extractive industries, including coal, a level of economic dependence that is not captured in a jobs focused metric. Policies that focus on job losses alone to prioritize federal investment in coal communities without incorporating broader economic implications in their ranking could unintentionally deprioritize Wyoming for federal assistance.

The initial report acknowledged the distinction between investing in communities already impacted by coal decline and proactively supporting communities likely to be impacted by declines when it said that “the Working Group will promote job-creating investments in these communities already impacted by losses in coal mine and power plant employment. The Working Group is also looking to the future to plan proactively and support communities likely to be impacted by near term declines in coal production and generation.”⁷¹ While this report accurately notes that these are separate policy goals, subsequent federal support aimed at revitalizing coal communities disproportionately emphasize efforts to invest in already impacted communities.

Wyoming stakeholders interviewed for this project noted that they were upset to see a map in this initial report (below) that drew a circle around Wyoming and parts of Montana and the

Dakotas as part of a “Northern Rocky Mountain” priority region.⁷² The map and Wyoming’s lower than expected ranking in the metrics used in this report reinforced preexisting narratives from Wyoming stakeholders interviewed from this project that federal officials did not fully understand the needs of the state.⁷³

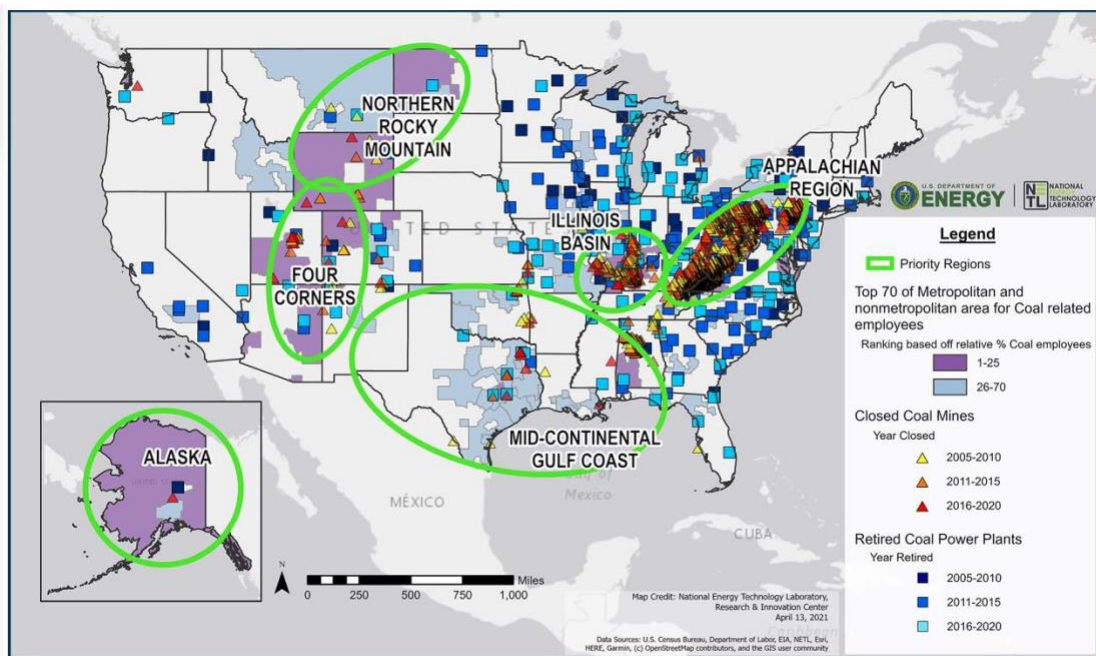
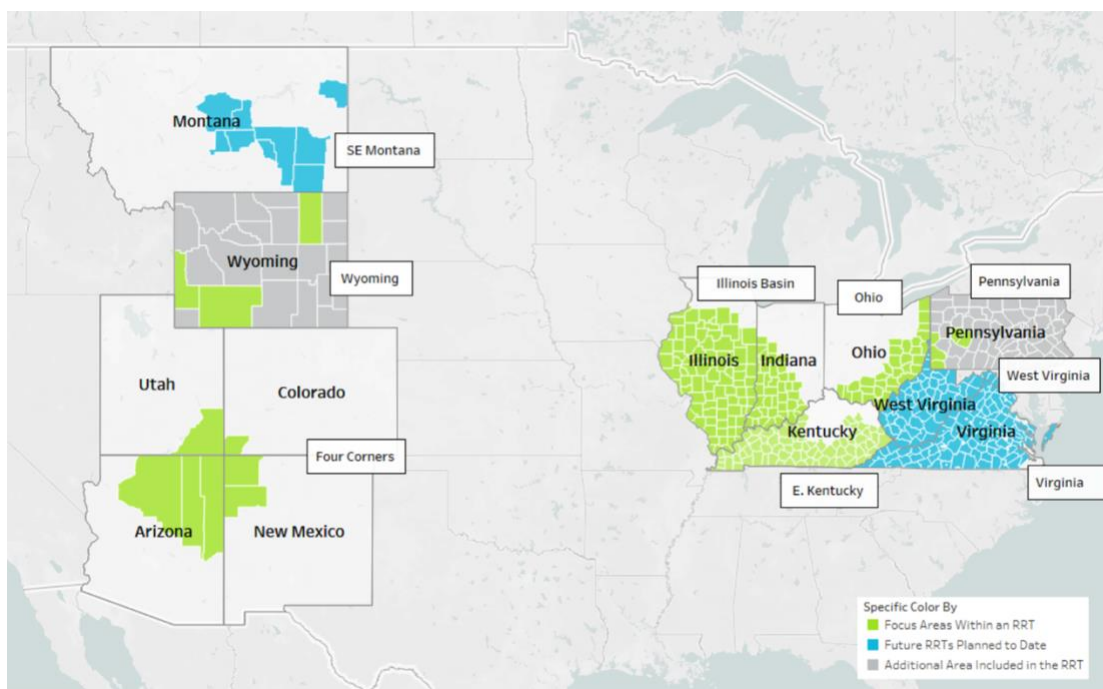


Figure 3. Map indicates coal mine and power plant closures from 2005–2020.

The origins of the work of the Energy Communities IWG in Wyoming emerged from this background of local distrust of federal officials and programs. During a meeting with the EPA Deputy Administrator Janet McCabe in the summer of 2021, Wyoming Governor Mark Gordon (R) expressed his frustration with what he viewed as inconsistent application of EPA regional haze rules across administrations. When the Deputy Administrator noted that the Energy Communities IWG could be able to help the state better position itself to respond to federal regulations, the Governor noted that while he had heard of the IWG, he had not heard anything from them. As a result of this exchange, the Deputy Administrator encouraged other EPA leaders to give some direct attention to Wyoming through the IWG process. Ultimately, EPA Senior Advisor for

Sustainable Communities Matt Dalby was tasked with establishing what would become the first “rapid response” team of the Energy Communities IWG.⁷⁴

While the Wyoming effort remains in a pilot status as of 2024 (largely due to political concerns of local officials not wanting to be too closely associated with federal agencies largely distrusted by their constituents), the Wyoming RRT paved the way for the creation of three other RRTs. As seen in the map below, as of 2024, with programs focused on supporting energy communities in Four Corners, the Illinois Basin, and Eastern Kentucky.⁷⁵



A map of Energy Community IWG RRTs as of March 2024. Campbell County Wyoming, home to the Powder River Basin, is the rectangular green county in Northeastern Wyoming.

RRT’s provide regionally tailored support from federal agencies to connect communities to federal resources that could help address their unique needs. As articulated on the Energy Communities website, RRTs:

are intended to work with energy communities who have experienced a recent or approaching fossil fuel facility closure to address worker and community needs using existing federal resources. RRT members work with community members to

identify economic transformation and revitalization goals, figure out ways to pursue those goals, and make the connections between programs across the federal family and up and down levels of government. RRTs aim to understand the needs of communities and work to make sure barriers to meeting those needs are smoothed over.⁷⁶

The RRT in Wyoming began its work by hosting several meetings in 2022 with leaders of the counties in the state most dependent on coal, including Campbell, Lincoln, and Sweetwater County. Rather than starting these meetings by presenting information about their programs or priorities, federal officials asked local leaders to identify the major challenges facing their communities. Over time, those conversations broadened to include meetings with the Wyoming Department of Environmental Quality (DEQ), officials from the Governor's office, and economic development organizations such as the Wyoming Energy Authority.⁷⁷

Even as federal officials were working to establish trust and connections with local officials, Wyoming officials became very frustrated at the state's lack of success in applications for competitive federal grant programs. A particular area of contention was the state's failure to be listed among the finalists for the Economic Development Authority (EDA) Build Back Better Regional Challenge established by the American Rescue Plan.⁷⁸ EDA had allocated \$300 million of funding toward their Coal Communities Commitment, but ultimately none of Wyoming's applications were funded. As one local official described the sentiment at the time, "How does it work that we don't get any of the funding for coal communities when we produce nearly 50% of the coal?"⁷⁹

Wyoming also failed to field successful applications for other competitive federal grant programs, including applications to the Department of Energy's (DOE) Clean Energy Demonstration Program on Current and Former Mine Land (CEML).⁸⁰ Wyoming officials were also dismayed when the state was not selected as Regional Hydrogen Hubs established by the BIL

and announced in October 2023.⁸¹ As one federal official involved with the Rapid Response Team described:

The state of Wyoming was extremely upset with the federal government. They felt like there were a bunch of opportunities in Wyoming just wasn't being picked. They felt like there was no attention paid to Wyoming. They felt like they never knew who to reach out to... it was my job to make sure that they have someone they can reach out to as a connector.⁸²

4.2) Federal Support for a Homegrown Idea – Gillette Office of Economic Transformation

That connector role would pay dividends, and the relationships that were established with local leaders like then County Commissioner Rusty Bell were essential to helping the IWG be responsive to community concerns. Articulating a sentiment that the RRT would hear repeatedly, Bell stressed that Wyoming proudly viewed itself as an energy producing state and was most interested in initiatives that aligned with continuing that role. While Bell and other officials were initially leery of engaging with the federal officials, he has since built positive working relationships and become known as something of an ambassador for the PRB and the state of Wyoming at national and regional conferences.

In 2022, Bell was selected as the first Director of the newly established Office of Economic Transformation (OET), a position which received federal funding from the Economic Development Authority (EDA) and is housed within the Gillette College Foundation. The idea for the OET originated with Wyoming stakeholders who were engaged in conversations with federal officials about what creative ideas could help support economic diversification in the PRB. Even though they had rejected a broader application by the state of WY for EDA funds, the agency identified this piece within the broader application as something that they could support. By utilizing the comparative flexibility of EDA funds to create this position, the IWG demonstrated

an ability to be responsive to community requests, even if it could not grant every request made by Wyoming communities.

The existence of the OET created new local capacity to implement proactive planning for community transition within Gillette. As a key part of his responsibilities, Bell is encouraging local leaders to be proactive in planning for an economic future that looks different from the past. The office is currently developing a “Campbell County Transformation and Implementation Plan,” which will aim to identify opportunities to support economic recovery, diversity, and resilience in Northeastern Wyoming.⁸³

4.3) Dedicated Federal Staff Key to IWG and RRT Success

A large contributor to the creation of a positive working relationship between was the provision of dedicated staff to support the RRTs efforts. Unlike many IWG efforts within the federal government, the Energy Communities IWG was able to access funding and support staff to support its efforts. This funding was made possible because of the selection of National Energy Technology Laboratory (NETL) Director Brian Anderson as the Executive Director of the IWG initiative. The Wyoming RRT benefited from programmatic funding with the selection of Carolyn Bryan from EPA Region 10 serves as the regional lead. Initially, Wyoming officials were hesitant to interact with an official from an agency that they had negative connotations with. Over time however, Bryan built strong working relationship with Wyoming leaders including Dru Palmer of the Governor’s office and Kathy Lenz, a congressional staffer focused on economic development for Wyoming Senator Cynthia Lummis.

4.4) The Federal Funding Summits – Meeting Communities Where They Are

One of the key successes of the IWG effort was the Wyoming Funding Summit. This idea originated in Senator Lummis' office during conversation about how a lack of connections between federal agencies with resources to offer and local leaders was causing Wyoming to miss out on federal funding opportunities. Building on the relationships that she had established with staffers from the IWG, Lenz suggested hosting a summit to bring federal officials to Wyoming to speak about their program offerings. This resulted in the first, five day Wyoming Federal Funding Summit in June 2023. A second summit is planned for April 2024.

Once the idea was proposed to the RRT, the RRT used its relationships within the IWG to invite federal funding partners to participate in the summit. Officials involved in organizing the summit described how the event emerged organically as a product of relationships between state and federal officials made through the IWG work. As described by one official involved in organizing the event, this approach was new to the federal agencies,

Most of the federal funding agencies that came said 'we've never been asked to do this before'... So we brought all of them that had funding that pertained to Wyoming and we put them on panels in front of front of communities, business owners, and nonprofits, and they explained their programs. People were able to ask questions, make those connections... They bonded with them.⁸⁴

Another summit attendee described how the event broke down barriers between communities who could benefit from funding and the federal funding agencies with an example illustrative of the trust that was established by interactions at this summit.

My favorite thing about the whole summit last year there was this old mayor in the room. He was in his 80s. And he stood up and it was a whole panel of the federal funding partners...And so he stepped in, he pointed his finger at the federal staffers and said, 'I don't know you. I didn't like you. But I like you now.'⁸⁵

As a result of the summit, cohorts of local grant seekers from towns across the state began holding regular meetings across town to collaborate. This "Wyoming Grants Coalition" has helped

communities apply for grants, but found some struggles given that local officials often have little capacity to seek new grant programs on top of their existing responsibilities.

4.5) RRT in WY – Progress Made in Fits and Starts

A common sentiment expressed by individuals interviewed for this project was that IWG work in Wyoming often progressed fitfully, taking “two steps forward, one step back.” This is exemplified by Wyoming’s engagement with the EPA’s Climate Pollution Reduction Grants Program (CPRG). Worried that the state would refuse to participate due to negative political and cultural connotations within Wyoming around “climate policy,” federal officials privately urged their state counterparts not to reject this funding out of hand. Subsequently, the state of WY initially agreed to participate in the program, which would make it eligible to receive non-competitive grant funding to reduce climate pollution. However, political pressure and concerns that the program could impinge on his stated “all of the above” energy strategy caused the Governor to ultimately withdraw the state from the CPRG.

Ultimately, one local official who was interviewed for this project summed up both the successes of the RRT in building trust and relationships between federal officials and state partners, as well as the continuing frustrations with the rigid structure of federal funding programs:

The rank-and-file people in the interagency working group from the federal government and the rapid response teams, they are solid. They're really good. They are really trying hard to help local communities and states in their regions that they're supporting. But I think that their hands are tied by the policies on how money can be spent. They can't move money across agencies, especially when it's a competitive process. A lot of the money seems to be directed towards... places that are not proactive, that are already in despair.⁸⁶

5.1) WY Looks to the Future While Trying to Preserve the Local Benefits of the Extractive Economy

As the initiatives discussed above demonstrate, Wyoming is taking some steps to acknowledge the reality that coal use will look different in the future than it has in the past. One local official used the analogy of a grocery store to describe how Wyoming's use of coal will have to change to reflect market demands and government imperatives for low-emissions products.

Let's say you own a grocery store, and you had one particular product line that was your staple forever. Then people were just weren't buying it anymore. You got to change. Are you just gonna sit back, cross your arms and be pissed and say they're stupid, they're wrong? Or are you going to change what's on your shelf?⁸⁷

Another local official echoed the sentiment that this moment represents an unparalleled opportunity for the state, but expressed concerns that the fractured nature of political debates around energy could cause Wyoming to miss the moment. Noting that Governor Gordon had come under fierce criticism from the conservative Freedom Caucus for supporting a goal for Wyoming to become carbon neutral, they noted the need to persevere through such opposition stating,

My bigger fear is that we're gonna miss the boat. Because we have a boat right now. With a lot of opportunity. People want to move here. They want to bring their business here. They want to develop new industry. But I'm afraid we'll miss this window if we can't get enough of us moving in that right direction.⁸⁸

Section 5: Findings and Recommendations

5.1) WY RRT Demonstrates the Importance of Intentional Stakeholder Engagement in Building Trust and Momentum

The successes that the WY RRT has achieved demonstrate the importance of intentional community engagement for the effectiveness of federal programs designed to support marginalized communities. By identifying initial stakeholders and identifying areas for early and relatively easy successes, the RRT laid the foundation for the subsequent momentum and sustained engagement it received from officials from a state that remains deeply skeptical of the intentions of federal programs under a Democratic administration. This approach is exemplified by a non-energy

housing project that the RRT helped to support in Gillette. By beginning the conversations by listening to community concerns instead of immediately sharing information about existing programs, the RRT was able to quickly identify a housing shortage as a key concern for Wyoming communities. Unfortunately, few of the federal agencies with the Energy Communities IWG could offer direct financial assistance for that issue, especially because the county's median income was too high to qualify for Federal Housing Administration (HUD) grants or assistance from the US Department of Agriculture (USDA). Even in the absence of direct funding opportunities, the interpersonal relationships that were created through the IWG created opportunities for further engagement.

One example of the power of these relationships to support economic development beyond the direct energy sector came from conversations around housing in Gillette. Within the city of Gillette, local leaders such as County Commissioner Rusty Bell helped to convene a working group to address housing issues in the city, bringing together the mayor, city council, and housing developers with federal officials to identify possible funding streams. This exercise of having federal officials be directly responsive to community concerns and using the power of convening to create opportunities even when they couldn't offer support directly, proved pivotal for establishing trust.

Initially, the IWG was very intentional about identifying trusted intermediaries within certain geographies, and then empowering those intermediaries to be more a direct interface between federal officials and local communities. As one federal official described of the importance of cultivating relationships with trusted intermediaries:

They'll be trusted so conversations can happen faster... you can at least get started with understanding what is on the minds of communities. Then, we can show them that we can add value through delivering resources without them having to actually

trust us. By delivering resources, or at least doing the work of listening and understanding what their needs are, we are building trust.⁸⁹

As illustrated by the success of the Wyoming Federal Funding Fair discussed earlier, respectful interactions between state and federal officials on issues of economic diversification and community resilience can create unexpected opportunities for progress. Sustained attention and engagement caused state and local leaders to trust that the federal government is attempting to be responsive to their needs. Ultimately, they recognize the opportunity to secure resources for their community. In practice, this has manifested in Wyoming with state leaders taking strides toward increasing the capacity of their communities to successfully receive federal grants. Success creates momentum, and a willingness to seek out federal resources from communities who may not have seen the value in engaging with them in the past. Encouraging local engagement with federal agencies can create synergies to find alignment between federal policy objectives and local concerns that may not be obvious on the surface.

These relationships also enable federal officials to learn more about the communities they are trying to serve. Bridging the cultural divide between rural and urban areas through impactful relationships and finding flexibility within existing programs to adapt to current and future needs as they learn of them can help federal funding agencies see a greater impact from their investments and more utilization of their services. By engaging in dialogue, persisting even in the face of initial distrust and suspicion, and finding ways to be responsive to requests, federal officials can make progress. As one official noted during an interview, “I just care about delivering for the communities and workers that are being hit hard by the transition. For that, we need constructive dialogues. They don't have to be perfect dialogues.”⁹⁰

5.2) Provide Funds to Hire of Local Grant Writers in Marginalized Communities

One of the key challenges facing marginalized community is a fundamental lack of capacity to engage with complicated federal grant programs. This was a gap readily identified by both Wyoming stakeholders and federal officials interviewed for this project. In many ways, the work of the RRT is a targeted effort to expand local capacity by sharing information that can increase the effectiveness of potential grant recipients to understand how best to pursue federal programs. The place-based focus of the RRTs allow federal agencies to provided tailored support to meet the local needs of energy communities, which vary greatly across and even within states and counties.

Capacity building was an explicit goal expressed by IWG staffers interviewed, who stated “[Capacity building] is what we are doing in rural communities. We recognize that role as a guiding principle, and that energy communities lack the capacity to access federal resources. Therefore, we need to be cognizant about how to lower barriers on the federal side... to help communities come to the table.”

This federal official continued to describe that a key barrier to the effectiveness of the IWG is the lack of direct resources that the federal government can provide for capacity building. They expressed hope that other sectors of civil society such as philanthropy and non-government organizations (NGO’s) could help to address that gap. As its stands today, this official stated:

Unfortunately, the federal government doesn’t have a lot of resources for capacity building. We’ve gone through the funding looking for it and it basically doesn’t exist. That’s not to say we’re not doing anything, but we have to be creative. There’s not much out there for the most foundational capacity building like adding community staff or data gathering infrastructures necessary be more competitive. They’re foundational capacity issues that are not being addressed.⁹¹

5.3) Reduce Complexity and Redundancy in Process of Applied for Federal Funding

Both federal officials and Wyoming stakeholders interviewed for this project described the complexity of applying for multiple federal grant programs as a barrier to program uptake. As described by one federal official interviewed for this project:

We hear all the time is that it's too hard to apply for federal funding, and that once you get the federal funding, it's way too hard to implement. [Energy communities] don't have the grant writers, they don't have the staff to implement it, and they don't have the staff longevity to sustainability keep a project going. This is a catch 22, because if they get the federal funding and then they mess it up, they're never gonna get funded again.⁹²

A state level stakeholder bemoaned the repetitive nature of applying for federal funding, with communities having to enter the same information for each application. She suggested that a more efficient approach could be to standardize the process of applying for multiple federal funding opportunities.

Let's create something like a 1040 EZ tax form for federal grants to standardize the process. So many of these grants are asking for the same information, just in different ways. This should be the same across all the federal agencies. Let's make them all have one grant application with all of their basic information and then just write the pieces that pertain to the grant they are applying for.

5.4) Eliminate Competitive Grant Programs That Pit Deserving Communities Against Each Other

Another area of frustration identified from this research stems from the prevalence of competitive federal grant programs that cause communities to invest inordinate resources in putting together competitive applications, where some of those efforts will go unrewarded. Multiple individuals interviewed for this project on both the state and local level expressed frustration with the wasted time and effort that these competitions create for communities that already face capacity challenges. To the extent practical, multiple stakeholders suggested that federal support for energy communities would be enhanced if the element of competitive grants were removed. As one official said,

Let's take away competition. Let's just do a formula. If the money is already at a given agency, and the intent is for it to go to energy community, why do we make them compete for it? Just identify the energy communities, prioritize them, because you won't have enough money to go around right. That's better than having them spend all of their time chasing this money that some of them will never see.⁹³

For federal programs to have a greater impact for marginalized communities, policymakers should consider utilizing the discretion afforded to them in program design to replace competitive grant programs with formula funding that is targeted to address the unique needs of a community at a given point in time. In the context of the IWG, recognizing that not all coal communities have the same kinds of needs and giving discretion and flexibility to staffers with direct relationships to the community to recommend funding priorities would be helpful.

An alternative approach to competitive grants model could be a tiered funding system, where identified energy communities are placed in different tiers based on an assessment of the strength of local stakeholder engagement and the infrastructure to support it. For communities with a demonstrated lack of capacity to navigate federal grant programs, the federal government could fund temporary grant writers to help disadvantaged communities better access federal funding opportunities. This approach would go beyond mere technical assistance and call centers, and involve providing direct, on the ground, staffing support to help communities avail themselves of programs that ostensibly exist for their benefit. For communities that already have this infrastructure in place, grant funding could be awarded to support projects that align with the policy objectives of the federal programs.

Other criteria for federal funding opportunities could be focused on leveraging local competitive advantage, with an understanding of place-based competencies and practices given consideration. This could better align federal programs to best fit local contexts. The overlapping

interest and support of innovative carbon capture technology in WY is one example of how programs that align with local interests and capacities are more likely to see durable success.

5.5) Reform Surface Mining Reclamation Laws To Make Repurposing Mine Infrastructure Easier

As coal mines and their associated infrastructure become abandoned, there are opportunities for those already disturbed sites to be utilized for economic development. This is illustrated by the success of the Fort Union Industrial Park discussed earlier. However, existing provisions within the federal The Surface Mining Control and Reclamation Act of 1978 (SMCRA) can make it difficult to repurpose abandoned coal mines. While some aspects of all mines should be remediated as close as possible to natural conditions, making it easier to carve out mine infrastructure that could be repurposed could make economic development efforts in these areas much easier.

There is great potential for existing mine sites to be repurposed as industrial parks, as discussed in the example of the Wyoming Innovation Center above. The Wyoming Nature Conservancy commissioned a report to inventory existing coal assets in the state of Wyoming in the “Coal Infrastructure Reuse Report Study.” This report found that implementation of reuse strategies for already disturbed coal industry sites could provide displaced workers with new jobs and facilitate economic diversification.⁹⁴ Given existing transmission infrastructure, these could be prime sites for industrial deployment, including for clean energy technologies, within energy communities.

5.6) Adjust Vocabulary Used in Federal Grant Announcements to be Compatible with Culture of Communities Targeted for Support

A common sentiment expressed by individuals interviewed for this report was that the language utilized by federal grant programs felt incompatible with local narratives of the economy. Figuring out how to communicate about federal programs in culturally competent ways for rural, largely politically conservative communities, can help prevent low-capacity communities from being turned off by language that they are uncomfortable with. To improve the effectiveness and uptake of their support for Energy Communities, Federal agencies should use their discretion in program design to utilize language in a way that enables the communities they are attempting to serve to see themselves as the intended audience.

Rightly or wrongly, the term “environmental justice” was widely perceived to be a description of communities of color living near industrial infrastructure and bearing disproportionate pollution burdens. When attempting to describe their own experiences, many stakeholders in Wyoming were uncomfortable utilizing the term “environmental justice” to refer to their predominantly white communities. Broadening language to ensure that environmental justice also encapsulates notions of supporting those who stand to be economically harmed in the clean energy transition could help communities see themselves as having a place within these frameworks.

Another barrier of vocabulary came from federal grants that asked communities to describe themselves as “disadvantaged” to receive funding. While it is entirely appropriate for the federal government to identify disadvantaged areas and prioritize funds to those locations, forcing rural people with a great deal of pride in their heritage as energy workers could be counterproductive to the goal of getting money to these communities.

Finally, language around labor provisions within federal grant programs were also challenging for Wyoming communities to comply with given the state’s history as a “right to work

state.” While the labor provisions of federal funding are important, finding ways that low-capacity communities with little union presence can adequately fulfill these requirements while still accurately characterizing their communities’ merits further consideration from federal funding agencies.

Conclusion:

Programs like the Energy Communities IWG can be transformational in ways that extend well beyond financial impact or economic development. Beyond the obvious economic implications of this work, the cultural impacts of the clean energy transition on coal communities should not be dismissed. From a political standpoint, communities are likely to resist any efforts to transition away from areas that they have built their livelihoods, economic security, and sense of cultural identity around. Given the outsized political influence exercised by rural areas given their disproportionate influence in the Senate, building durable climate progress requires identifying climate solutions that are politically palatable for those communities. The creation of sustained economic opportunities in communities skeptical of climate action could help to shift the political economy to create a more durable foundation for future climate policies.

Given the need to rapidly decarbonize the energy system as a foundational step toward mitigating the impacts of climate change, there is a high degree of risk that coal communities could be left behind as the country accelerates the adoption of renewable energy technologies. This is just as true for coal communities anticipating future job losses and losses of tax revenue as it is for communities already struggling with economic decline from a collapsed coal industry. However, there is a dearth of proactive federal policy responses for communities like those in the PRB in Wyoming to provide durable economic diversification to prevent economic devastation like that faced by Appalachia communities. In crafting programs to proactively promote diversified

economic development within coal communities, the successes of the community engagement strategies deployed by the Wyoming RRT should be incorporated into future policy design. The experience of federal officials working to support Wyoming through this period of transformation offers lessons that increase the effectiveness of place based federal policy efforts.

Appendix A: List of Interview Participants

Aaron Pratt	US Economic Development Authority (USDA)	Deputy Economic Development Representative
Anja Richmond	Wyoming Energy Authority	Program Director
Brandi Harlow	Wyoming Business Council	Northeast Region Director
Briggs White	Energy Community IWG Deputy Executive Director	Advisor, National Energy Technology Laboratory (NETL)
Carolyn Bryan	EPA Region 10 (Denver)	IWG Rapid Response Team - WY
Daniel Raimi	Resources for the Future (RFF)	Director, Equity in the Energy Transition Initiative
Dru Palmer	Office of Governor Mark Gordan - Consultant	Consultant
Glenn Pauley	United States Department of Agriculture	Wyoming State Director
Holly Krutka	University of Wyoming School of Energy Resources	Executive Director
Jason Begger	Integrated Technical Center	Managing Director
Jim Ford	Energy and Industry Advisor, Board of Campbell County Commissioners	Campbell County Commissioner
Kathy Lenz	Office of Senator Cynthia Lummis	Business and Economic Development Manager
Marc Brown	HBW	Senior Director, State and Government Affairs
Mary Throne	Wyoming Public Service Commission	Chair
Matt Dalbey	Environmental Protection Agency (EPA)	Senior Advisor for Sustainable Communities
Phil Christopherson	Energy Capital Economic Development	Director

Rob Godby	University of Wyoming Ruckelshaus Institute	Professor of Economics
Rusty Bell	Office of Economic Transformation, City of Gillette	Director of Diversification, Former County Commissioner
Shannon Anderson	Powder River Basin Resource Council (PRBRC)	Organizing Director
Sharon Fain	Rocky Mountain Power	VP of Community Engagement
Shawn Waldron	HBW	Director, Legal and Government Affairs
Simon Pang	Lawrence Livermore National Laboratory	Associate Group Leader

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