



# POWER for Transition

*Investment in Coal Communities through the Partnerships for Opportunity and Workforce and Economic Revitalization (POWER) Initiative*

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# 1. Executive Summary

This report examines implementation of the Partnerships for Opportunity and Workforce and Economic Revitalization (POWER) Initiative (2015–2020), established by the Obama administration to assist communities hurt by declines in coal mining and coal-fired electricity generation. It examines the distribution of POWER funds by state, county, project type, and career sectors. The lessons learned through this retrospective analysis can be used to guide current and future federal policymaking to revitalize the economies of US coal communities.

The POWER Initiative was a collaboration across several federal entities, with four agencies playing primary roles: the Economic Development Administration (EDA), the Employment and Training Administration (ETA), the Small Business Administration (SBA), and the Appalachian Regional Commission (ARC). Grants were awarded for projects that would benefit communities affected by employment loss in coal and associated industries.

We developed a novel data set of grant recipients, and we identified 641 coal counties across the United States, based on the presence of coal production or a coal-fired power plant in recent decades (Section 3). Those criteria, along with direct coal mining job loss and ARC's economic status classification, allow for comparison of counties with potential need and the actual distribution of funds.

Between 2015 and 2020, POWER provided \$410 million through 484 grants awarded across 200 counties in 30 states (Section 5). ARC administered around 60 percent of total funding, and EDA, just under 40 percent. More than 75 percent of the funding went to five Appalachian states: Kentucky, West Virginia, Pennsylvania, Ohio, and Virginia. Appalachia, which has faced serious challenges from the energy transition, is the focus of all ARC grants. The amounts awarded to grantees within a county varied substantially, ranging from \$30,000 to \$15.9 million over the five-year period.

The majority of coal counties did not receive POWER grants; only 200 of the 641 coal counties received POWER funds directly. Moreover, only 134 of the 200 counties that received POWER funding were coal counties, and 28 percent of funding was granted to applicants outside coal counties. However, we could not identify all the communities served by every project and therefore assigned funding according to the location of the primary grantee. Since grantees sometimes serve communities beyond the county in which they are located, it is possible that more coal counties benefited than our research indicates.

In general, we find low levels of federal funding explicitly designed to support communities impacted by the decline of coal (there are other federal programs that benefit coal communities, but not much is explicitly tailored to coal community transition). For example, if we divide total 2015 – 2020 POWER funds identified through our research by all 641 eligible coal counties, each county would have received under \$640,000 over the five-year period.

We also classified grants by six project types (Section 6): education and workforce development; business development; economic asset development; health; research, planning, and feasibility studies; and leadership and community capacity development. Education and workforce development projects received the greatest amount of POWER funds (\$165.5 million), followed by business development (\$160.7 million) and economic asset development (\$83.1 million).

More than half of all POWER funding went to projects with an infrastructure component (Section 7). The top three infrastructure funding categories were building construction or renovation (\$89.2 million), water and wastewater (\$51.9 million), broadband (\$39.4 million), and equipment and materials (\$33.7 million).

By career sector (Section 8), the top spending categories were manufacturing (\$102.6 million), health and social services, including substance abuse prevention and treatment (\$81.2 million), tourism and hospitality (\$42.9 million), information technology (\$40.0 million), and agriculture and forestry (\$33.4 million). Renewable energy; arts, design, and entertainment; and education and public service received little funding and are potential future areas of growth.

The report reveals the counties and project types that were prioritized in the POWER Initiative. It also indicates the possibility that little funding flowed to some particularly distressed coal communities. Further analysis is needed to elucidate whether this reflects a lack of capacity in local economic assistance programs, a lack of need, or (as noted above) data limitations. A deeper understanding of these gaps will allow future initiatives to holistically support communities across the country.



## 2. Introduction

President Obama observed that during his administration, between 2008 and 2015, economic growth and emissions were “decoupled” for the first time: carbon dioxide emissions from the energy sector fell by 9.5 percent while the US economy grew by more than 10 percent (Obama 2017). However, the economic benefits were not felt evenly throughout the country. Energy transitions are characterized by complex social, economic, and environmental trade-offs within and across communities. Consequences include the loss of fossil fuel industry livelihoods and the corresponding economic impact for towns, counties, or regions dependent on the industry (Carley and Konisky 2020).

The Obama administration recognized the effect of the energy transition on the economy of coal communities and established the Partnerships for Opportunity and Workforce and Economic Revitalization (POWER) Initiative to allocate millions of dollars for economic and community development. The program was designed to be a collaborative effort among federal, regional, state, and local agencies, and to implement policy tools like workforce training, regional economic cluster and business development, and funds to support both planning and implementation projects. Despite this program, individuals have continued to grapple with job loss, and communities have continued to face uncertain economic futures and sociocultural change. Rapid, profound economic and social change requires an immediate injection of capital to transition workers and stabilize public revenues, plus continued, long-term investment to support community reorganization and the development of new economic, social, cultural, and human capital (Shelton and Eakin 2021).

In response to the continuing need, six years after implementation of the POWER Initiative, President Biden created the Interagency Working Group on Coal and Power Plant Communities and Economic Revitalization to coordinate and deliver federal resources to revitalize the economies of coal and power plant communities (Exec. Order No. 14008 2021). To better ensure success in this challenging mission, it is critical to examine past policies and investment with similar goals. Retrospective analysis can identify which communities have succeeded in accessing federal funds, illuminate common uses of these funds, and help policymakers understand the most pressing needs and priorities for transition.

In this report, we briefly review the administrative structures through which POWER Initiative funds were distributed and the continuing need for investment in coal communities as coal production continues its decades-long decline (despite slightly increased production in 2021 above 2020 levels).<sup>1</sup> Our analysis characterizes the distribution of POWER funds between 2015 and 2020 in terms of geography, county economic status, project type, sector, and the use of funds for infrastructure projects. This descriptive analysis provides a foundation for further inquiry regarding agency decision-making and community capacity to access funding. A broad understanding of POWER-supported investments can inform future analyses of investment in coal communities under new and continuing federal programs.

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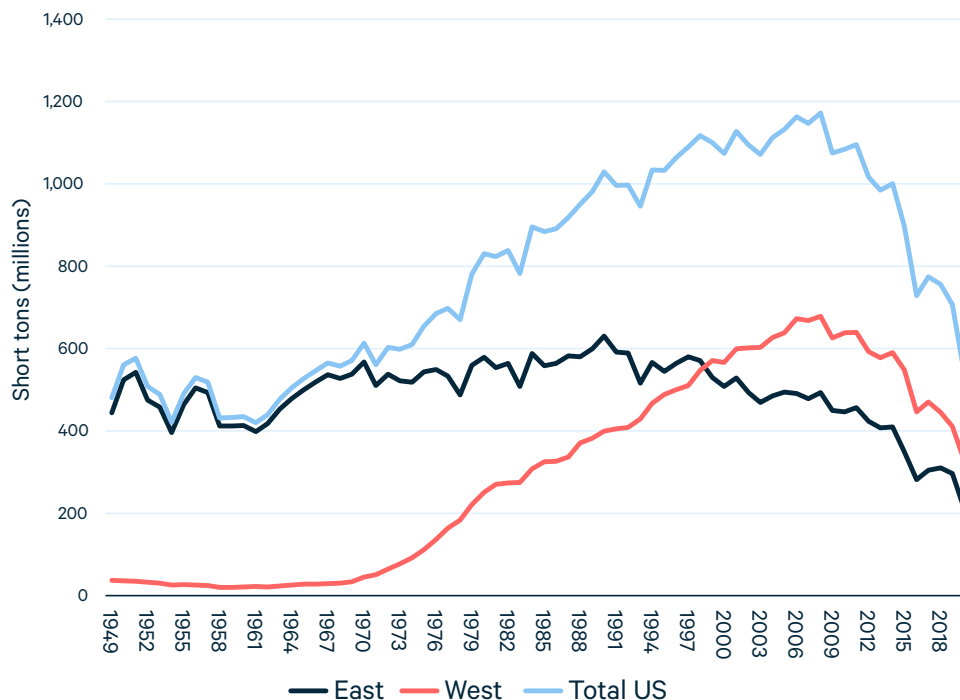
<sup>1</sup> See <https://www.eia.gov/coal/production/quarterly/>.

### 3. A Brief History of Coal in the United States

For many US communities, coal is much more than a source of energy—local economies and families have relied on the economic activity produced by coal mines and coal-fired power plants for generations. Even more, coal is a main component of the identity of many coal communities.

As shown in Figure 1, domestic coal production tripled from 1950 to 2008. Prior to the 1970s, virtually all US coal production took place east of the Mississippi. Production levels in the eastern United States were fairly consistent, ranging between 400 million and 600 million short tons annually until falling below 1950 levels in 2013. Production in the West, on the other hand, rose dramatically from the early 1970s to the mid-2000s, surpassing the East in the late 1990s and boosting total US production by approximately 200 percent over that time period. Western coal mining operations developed in large part because of the 1970s mandates to cut sulfur dioxide pollution from power plants. The least costly option for the industry to comply with this regulation was to mine low-sulfur coal, found primarily in the Powder River basin that spans Wyoming and Montana (Kolstad 2017).

**Figure 1. Annual US Coal Production, by Region, 1949–2020**



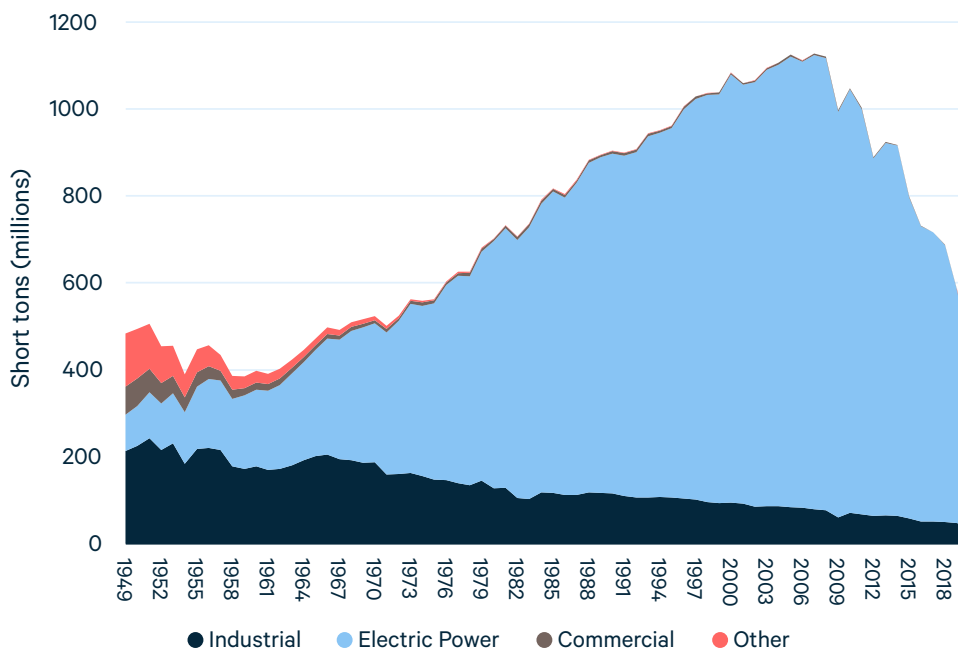
Source: Energy Information Administration (2021).



Total US coal production has declined since 2008, primarily because the shale revolution substantially lowered natural gas prices, making coal less competitive as a fuel for electricity generation. Renewable energy has also become more competitive, and advancements in energy efficiency and conservation have lowered electricity demand overall (Coglianese et al 2020; Houser et al 2017).

As shown in Figure 2, the primary uses of coal have changed drastically since the mid-1900s. Although coal is used primarily to generate electricity today, this is a relatively new phenomenon in the United States. Historically, coal was an industrial fuel: in 1950, 46 percent of coal was consumed by the industrial sector, and only 19 percent by electricity generation. In 2020, 92 percent of coal was consumed by electricity generation and only 8 percent by the industrial sector.

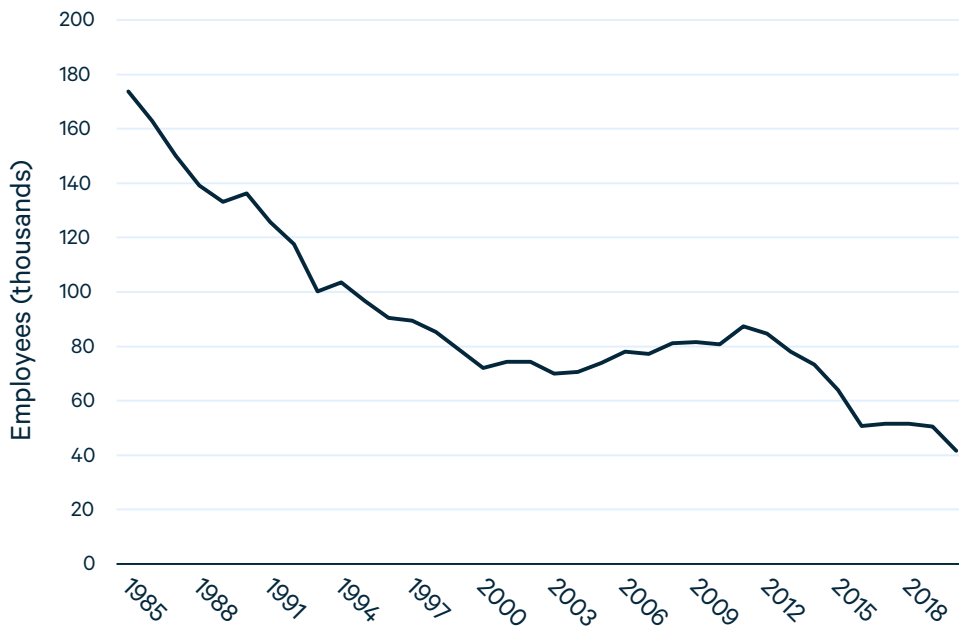
**Figure 2. Annual US Coal Consumption, by End-Use Sector, 1949–2020**



Source: Energy Information Administration (2021).

Although declining coal production is a recent occurrence, losses in coal mining employment are not. Coal mining jobs have fallen dramatically over the past four decades, even while coal production was booming. Technological advancements have led to significant productivity gains, which, coupled with the increased production from more capital-intensive surface mining in the Powder River basin, have reduced employment (Kolstad 2017).

**Figure 3. Annual US Coal Mine Employment, 1985–2020**



Source: Bureau of Labor Statistics (2021).

The Obama administration’s interagency POWER program, a response to the simultaneous decline in both coal production and employment, was intended as a lifeline to communities historically dependent on coal. POWER broadly defined such communities (for the purposes of determining eligibility for POWER funding) as “those that have been impacted, or can reasonably demonstrate that they will be impacted, by coal mining and coal power plant employment loss (or layoffs in the manufacturing or transportation logistics supply chains of either)” (US Economic Development Administration et al. 2015).

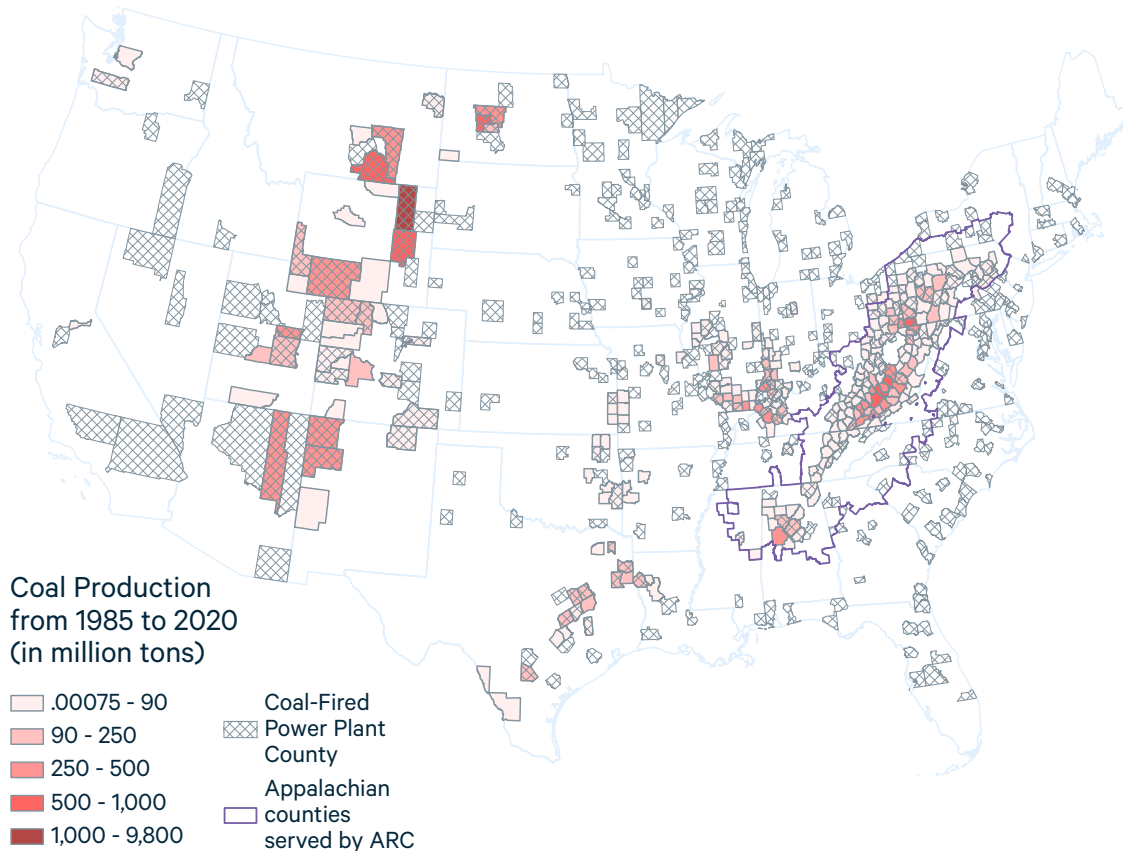
A variety of recent efforts have sought to classify communities that are vulnerable to the decline in coal production and coal-fired power plant operations (IWG-CPPCER 2021; Raimi 2021). For our study, we identify coal communities at the county level and define them as those that (1) had coal production at any point between 1985 and 2020; or (2) had a coal-fired power plant in operation as of 2020; or (3) had a coal-fired power plant closure occur between 1990 and 2020.<sup>2</sup> We considered including coal mining

2 Energy Information Administration data from EIA-7A form and US MSHA data were used to determine coal production status. We go back to 1985 for coal production data based on our observation that many communities that experienced declines in the 1980s are still struggling with transition. In some cases, these communities are economically distressed because they have been in a period of prolonged economic contraction. For Figure 4, we sum annual county-level coal production from 1985 to 2020. We used EIA-860 data to determine operable, retired, and planned closures for power plants. We used data sets from 1990 to 2020, with 1990 as the first closure year. We include operating power plants in 2020 under the assumption that even communities with operating plants may be hurt by employment loss, since the trend of coal plants across the country is closure.



employment (discussed below) as an additional metric for identifying coal counties, but we found near-perfect correlation with coal production counties (since all counties with coal mining employment also had coal production), and so for simplicity we included only coal production and coal-fired power plant status. Figure 4 shows the counties that meet our criteria.

**Figure 4. Coal Counties: Counties with Coal Production and/or Coal-Fired Power Plants**



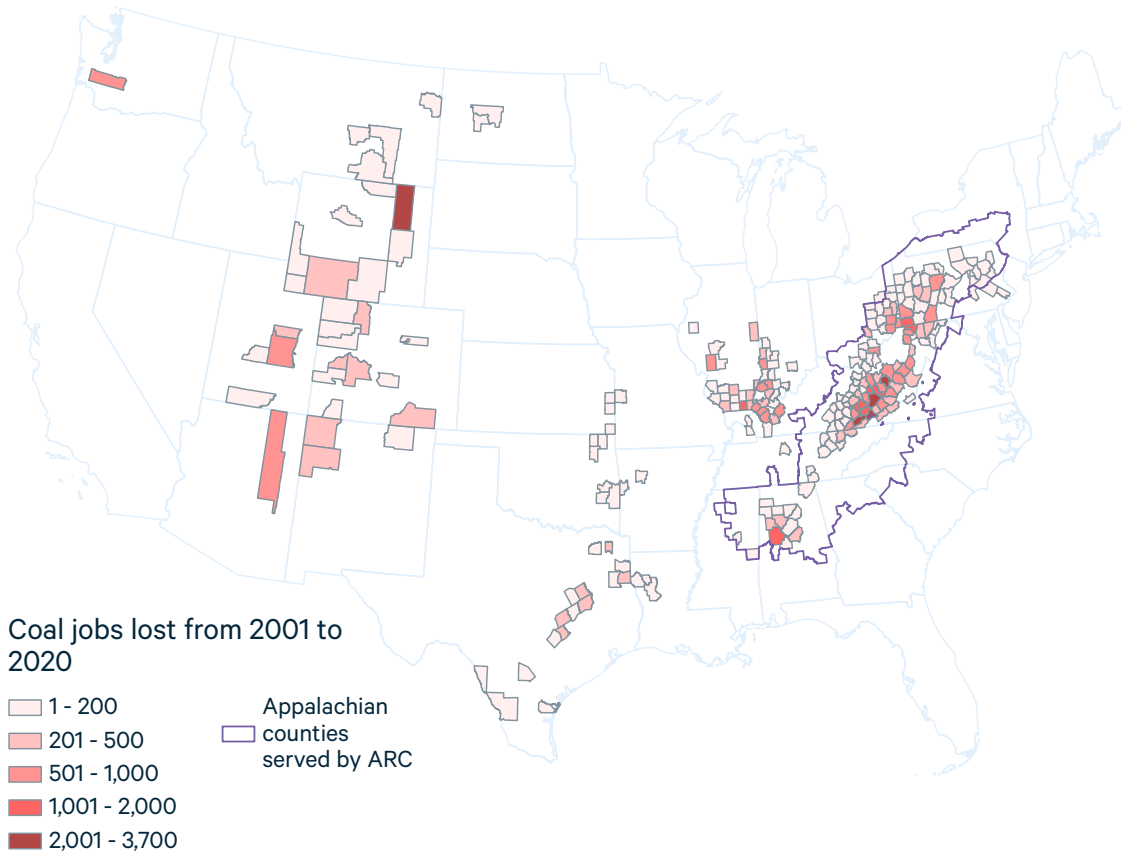
Using the above criteria, we identify a total of 641 coal counties in the United States, with the largest concentration in the region covered by the Appalachian Regional Commission (ARC). Of the 641 counties, 456 meet our two criteria regarding coal-fired power plant status, 299 meet our coal production criteria, and 114 meet both coal-fired power plant and coal production criteria.<sup>3</sup> Having identified the communities of need, we can determine the extent to which federal resources—including those deployed by POWER—have been hitting the mark.

Another indicator of need is job losses, which may reflect the immediate needs of unemployed workers as well as a larger trend of economic contraction in the coal

<sup>3</sup> Note that four of these counties are in Alaska and two are in Hawaii. In this report we map only the lower 48 states. Grants to independent cities in Virginia are added to the surrounding counties to accurately map funding distribution.

industry and therefore in local and regional economies. Figure 5 portrays jobs lost in coal mining<sup>4</sup> between 2001 and 2020. We group the data according to severity of job loss by color, with the lighter the shade reflecting more modest job losses.

**Figure 5. Coal Mining Job Losses, 2001–2020**



Again, Figure 5 shows a high concentration of job losses in central Appalachia, especially West Virginia and Kentucky. Southern Indiana and Illinois as well as the western coal states also show clusters of job losses. These clusters—across multiple counties—could indicate a broader region in distress that may be worth special attention from policies like POWER.

Finally, in addition to considering metrics of coal industry decline, we consider the underlying economic status of communities as a metric for distress and therefore

4 We examine only direct coal jobs lost in coal mining. Energy Information Administration data from the EIA-7A form was used to examine coal mining employment. To determine the magnitude of job loss for each county, we take the difference between employment in 2020 and the peak of employment as occurred for that county in any year between 2001 and 2020. There is no accessible, available data set on jobs or job losses at coal power plants. However, for an analysis of counties at risk for job losses at coal power plants, see Richardson and Anderson (2021).

need. In Figure 6, we portray ARC’s County Economic Status, an index that combines three-year average unemployment rates, per capita market income, and poverty rates to evaluate communities in the lower 48 states (Appalachian Regional Commission 2022). The index has five economic classifications: distressed, at-risk, transitional, competitive, and attainment.

**Figure 6. ARC Distressed Counties and Coal Counties**

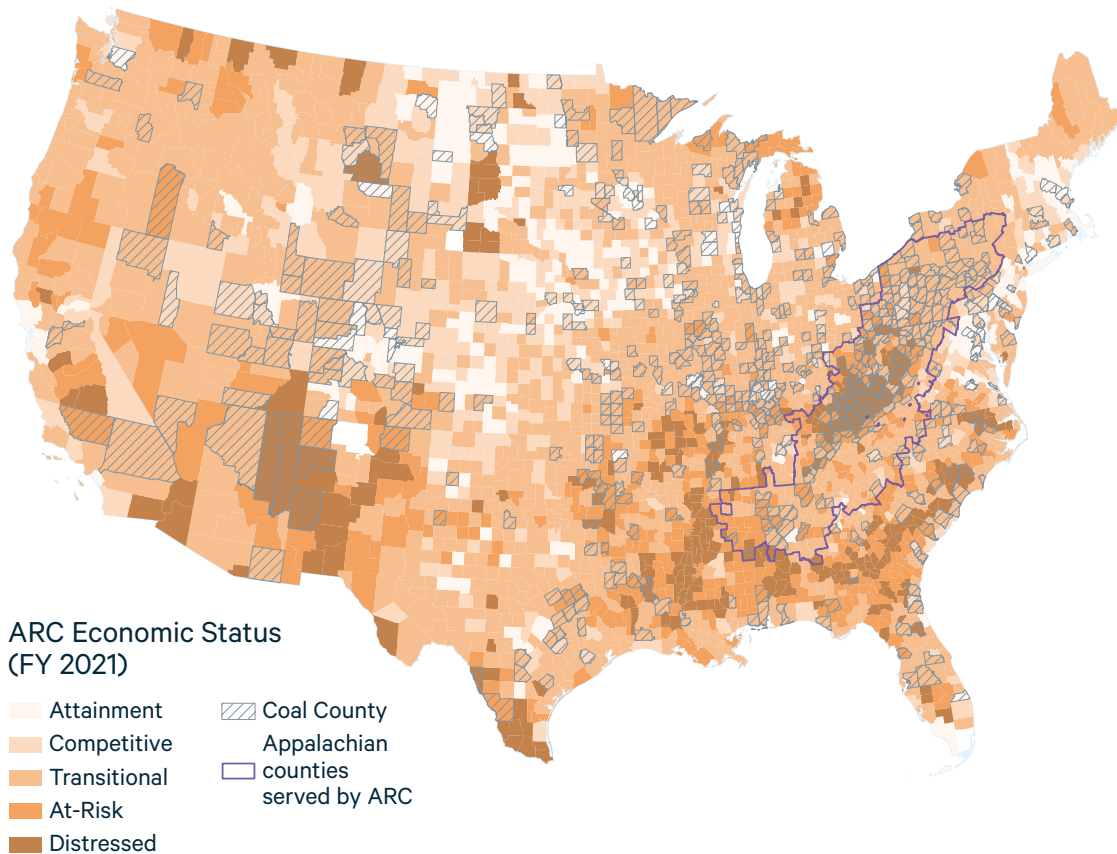


Figure 6 also includes the coal production and power plant data from Figure 4 to help reveal the extent of overlap between distressed communities and coal communities—places of the highest relevance to programs like POWER.

We again find a concentration of need in central Appalachia, where there is a large cluster of both distressed counties and coal counties. We also find a fair number of distressed and at-risk coal counties in the Four Corners area of the Intermountain West. By and large, we do not see high levels of economic strain in the Powder River basin.<sup>5</sup>

<sup>5</sup> One exception is Big Horn County, Montana, which is a distressed coal county.



## 4. Background and History of POWER

As mentioned above, the Obama administration established the POWER program to assist workers and communities hurt by declines in coal mining and coal power plant operations. In its full form, it was called the POWER+ (“POWER Plus”) Plan, which was announced in February 2015 as part of the president’s fiscal year (FY) 2016 budget. POWER+ had four main objectives (US Office of Management and Budget 2016):

- **Supporting economic diversification and job creation**—federal grant funding toward generating investment in diversification of coal economies, job creation in coal communities, and workforce training and other reemployment services.
- **Securing health care and retirement funds for mineworkers**—legislative reforms to fortify health care and pension plans for coal miners.
- **Advancing mine reclamation and redevelopment**—funding from the Abandoned Mine Reclamation Fund for cleanup of hazardous abandoned mine lands and sustainable redevelopment.
- **Deploying carbon capture, utilization, and sequestration (CCUS)**—tax incentives for incorporating CCUS technology at electric generating units.

The Obama FY2016 budget proposed POWER+ activities across nine agencies.<sup>6</sup> This included \$2 billion in tax expenditures for CCUS, \$1 billion from the unappropriated balance of the Abandoned Mine Reclamation Fund, and \$55 million for economic and workforce development programs at various federal agencies (US Office of Management and Budget 2016).

In March 2015, following the February announcement of the FY2016 budget proposal, the administration said it would make a “down payment” on the POWER+ proposal by deploying existing FY2015 funds across 11 agencies. This interagency effort, led by the Economic Development Administration (EDA), was referred to as the POWER Initiative and was intended to set in motion the economic and workforce development aspects of POWER+ (The White House, Office of the Press Secretary 2015).

The most prominent aspect of the FY2015 POWER Initiative was a coordinated federal funding opportunity of around \$40 million offered jointly by ARC, EDA, the Employment and Training Administration (ETA), and the Small Business Administration (SBA). Table 1 shows the funding and programmatic focus for each agency. The funding amounts listed in Table 1 are a combination of two tracks of grants: planning grants and implementation grants. EDA and ETA engaged in both tracks, while all four agencies engaged in implementation grants.

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6 The following agencies were involved in the POWER+ budget proposal: Departments of Labor, Commerce (Economic Development Administration), Agriculture (Rural Development), Energy, Interior, and Treasury, as well as the Environmental Protection Agency, the Appalachian Regional Commission, and the Pension Benefit Guaranty Corporation.

**Table 1. POWER Initiative Funding Amounts, by Agency, Announced March 2015 (million USD 2015)**

Agency	Program focus	Funding amount
Economic Development Administration	Economic adjustment assistance and partnership planning	\$15
Employment and Training Administration	Dislocated worker grants	\$10–20
Small Business Administration	Regional innovation clusters and growth accelerators	\$3
Appalachian Regional Commission	Technical assistance and demonstration projects	\$0.5

Source: The White House, Office of the Press Secretary (2015).

In addition to the primary four agencies, the POWER Initiative engaged other agencies and programs in supporting roles (only through FY2016; US Economic Development Administration 2016b):

- *USDA Rural Business-Cooperative Service and Rural Development.* The former was to prioritize POWER grant recipients and other coal communities when allocating its loans and grants. The latter’s Community Economic Development staff were to prioritize POWER grant recipients in their outreach efforts, with emphasis on connecting POWER grantees with resources to support regional economic development planning.
- *Environmental Protection Agency, Office of Land and Emergency Management.* The agency was to initiate a brownfield area-wide planning competition that specifically included areas affected by the declining coal economy.
- *Department of Energy.* Through its Jobs Strategy Council, the agency was to provide technical assistance (from its offices and national labs) on a variety of energy-related development issues, including mine site redevelopment and deployment of CCUS, combined heat and power, energy efficiency, and renewable energy technologies. It was also to facilitate POWER grantees’ access to the energy technology investment resources of the Loan Program Office.
- *Department of Treasury, Community Development Financial Institutions Fund.* This fund was to organize meetings targeting community development entities that were well positioned to invest in coal communities. It was also to provide training on its programs to state and regional staff and prioritize investment in POWER communities for the New Market Tax Credit program.

- *Department of Commerce, SelectUSA.* SelectUSA was to counsel POWER grant recipients on attracting foreign direct investment and accessing export markets and to help retain or attract firms involved in global location competitions.
- *Department of Commerce, NIST-Manufacturing Extension Partnerships.* This network of partnerships was to provide technical assistance to manufacturers in the coal industry located in POWER grantee communities.
- *Corporation for National and Community Service.* The corporation was meant to align its class of AmeriCorps grantees to support POWER grant recipients and connect communities with its state offices to assess potential interest and need for collaboration on antipoverty efforts with AmeriCorps VISTA.
- *Department of Interior, Office of Surface Mining Reclamation and Enforcement.* This office was to work with its Abandoned Mine Land program and POWER grantees to link coal mine reclamation projects with state and tribal economic development strategies.

## 4.1. Funding Eligibility

Each agency implementing the POWER Initiative had its own eligibility requirements. As an umbrella initiative, however, the overarching eligibility requirement for POWER funding was that the project serve communities impacted by, or likely to be impacted by, coal mining or coal power plant employment loss, and/or associated supply chain industries. Applicants did not need to be located in those communities, however, as long as the project served those communities. The POWER Initiative did not define regions of eligibility (e.g., the Appalachian region) but invited applicants to demonstrate economic impact from coal economy decline in the applicants' region of focus (US Economic Development Administration et al. 2015). See the Appendix, Section A, for eligibility requirements at EDA, ARC, and ETA.

## 4.2. Beyond the “Down Payment”

Congress ended up funding some of POWER+ in the FY2016 appropriations process (which passed in December 2015<sup>7</sup>), but not all of it. In addition, Congress began appropriating funds (\$90 million to start) for the Abandoned Mine Lands Pilot Program (now known as the Abandoned Mine Lands Economic Revitalization program), which has continued and for which appropriations have increased (Office of Surface Mining Reclamation and Enforcement 2019). The 45Q tax credit for CCUS was also in place in FY2016, but it had been established in 2008 and was largely independent of POWER (Jones and Sherlock 2021).

Table 2 shows the annual appropriations to the four agencies associated with the POWER Initiative through 2020. (Because a fiscal year spans two calendar years, FY2015 includes some appropriations for 2016, FY2016 includes some for 2017, and so forth.)

7 <https://www.appropriations.senate.gov/news/minority/summary-consolidated-appropriations-act-of-2016>

**Table 2. Appropriations for POWER Programs, by Agency after POWER Year 1 (FY16–FY20, nominal 2016–2020) (USD millions)**

Agency	Fiscal year				
	2016	2017	2018	2019	2020
Appalachian Regional Commission	\$50	\$50	\$50	\$50	\$50
Economic Development Administration	\$15	\$30	\$30	\$30	\$30
Small Business Administration	\$0.45	—	—	—	—
Employment and Training Administration	\$19	\$7.45	—	—	—

Source: Assembled from EDA, ARC, ETA, and SBA budget justifications.

Following the change of administration in 2017, the POWER initiative dissolved as a formal, cross-agency initiative. ARC was the only agency to retain a formal reference to POWER (it continued a grant program called the POWER Initiative). In FY2017, EDA created a new program, Assistance to Coal Communities, and annual appropriations doubled to \$30 million in FY2017 through FY2020. In FY2017, \$7.45 million was made available to ETA to provide grants through the Dislocated Worker National Reserve for workers dislocated from coal mines and coal-fired power plants; these replaced the POWER Dislocated Worker Grants (Mathew 2020).<sup>8</sup> After FY2017, ETA no longer set aside grants specifically for coal workers. Instead, \$30 million was directed to support workers in the Appalachian and Lower Mississippi regions. After FY2016, SBA no longer set aside coal-specific funding.

8 We use results from a FOIA request to identify that in FY2017 \$19.95 million was made available to the ETA to provide grants through the Dislocated Worker National Reserve for workers dislocated from coal mines and coal-fired power plants. However, a \$12.5 million rescission reduced the appropriation to \$7.45 million (Mathew 2020).

## 5. Distribution of Funding

Using data from Government Spending Open Data, Freedom of Information Act (FOIA) requests submitted by the research team,<sup>9</sup> and press releases, we identified POWER-affiliated grant awards issued by the primary four agencies engaged in the POWER Initiative—EDA, ARC, ETA, and SBA. From these sources, we compiled a novel and comprehensive data set that for each grant award made between 2015 and October 2020 includes the following: award amount, year of award, primary grantee of the award, location of that grantee, and various details on the type of project funded (discussed in Sections 6 through 8). We use these data to analyze how POWER funds were distributed across coal country, by project type and by county-level economic status of recipients.

We determine the location of a given POWER-funded project based on the county of the primary grantee. This approach has its limitations because many grants have multiple partners and/or are meant to serve a population outside the county where the grantee is located. However, since primary grantees are typically administrative leaders on the funded projects, this approach does provide a reasonable perspective on how capacity to access federal funding is distributed across coal communities. In many cases, project implementation and grantee are indeed located in the same county.

Table 3 shows that between 2015 and October 2020, EDA, ARC, ETA, and SBA collectively awarded roughly \$410 million in POWER-affiliated funding through 484 grants across 200 counties in 30 states. ARC provided just under 60 percent of total grantmaking (in terms of both dollar amount and number of grants), and EDA provided just under 40 percent—underscoring that these two agencies played outsized roles in the POWER Initiative.

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9 We used FOIA requests to confirm that our data set included (1) all POWER and ACC projects funded through EDA; (2) all POWER Dislocated Worker Grant awards granted through ETA in coordination with the POWER Initiative and \$7.45 million appropriated in FY17 to provide reemployment and training to workers dislocated from coal mines and coal-fired power plants; and (3) awards made through SBA in coordination with the POWER Initiative. We did not submit a FOIA request to confirm ARC projects because ARC releases comprehensive lists of projects after each award cycle. We used those lists for our database.



**Table 3. Summary of POWER Awards, by Agency**

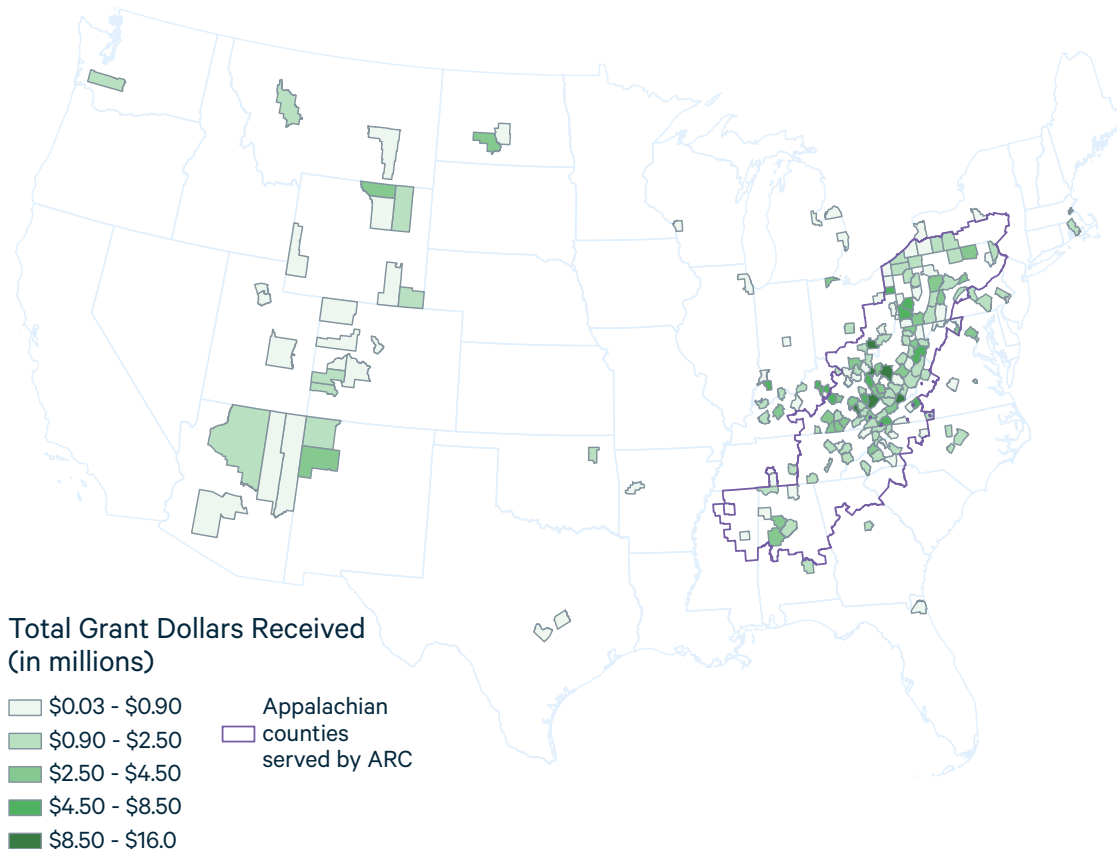
Agency	Years	Total amount	Awards	Average award	Counties	States
ARC	2015–2020	\$236,794,820	290	\$816,534	129	13
EDA	2015–2020	\$153,323,117	177	\$866,232	106	27
ETA	2015–2017	\$16,814,989	13	\$1,293,461	9	8
SBA	2015–2016	\$2,800,000	4	\$700,000	4	4
<b>Total</b>	<b>2015–2020</b>	<b>\$409,732,926</b>	<b>484</b>	<b>\$846,556</b>	<b>200</b>	<b>30</b>

Note: We include only grants in years where a given agency received POWER-affiliated appropriations; see Table 2.

### 5.1. Funding by State and County

Although funds were granted across 200 counties and 30 states, geographically, funding was still fairly concentrated, as indicated in Figure 7. Geographic distribution was likely constrained because more than half of the funds were granted by ARC, which serves only counties in Appalachia. ARC granted more than half of the total funds across just 13 states, whereas EDA, though it granted just over one-third of the total funds, made awards across 27 states (Table 3).

**Figure 7. Total Funding Awarded, by County**



More than 75 percent of the funding was granted to five states: Kentucky, West Virginia, Pennsylvania, Ohio, and Virginia. Kentucky received the most funding, at \$97.8 million, spread across 82 awards; it was followed closely by West Virginia, at \$91.1 million, spread across 117 awards (Table 4). Both states received almost \$40 million more than the third-highest state, Pennsylvania, which received \$56.6 million.

**Table 4. POWER Awards, by State**

State	Total amount	Awards	Average award
Kentucky	\$97,835,810	82	\$1,193,120
West Virginia	\$91,113,162	117	\$778,745
Pennsylvania	\$56,625,411	63	\$898,816
Ohio	\$39,440,158	44	\$896,367
Virginia	\$28,595,990	34	\$841,059
Tennessee	\$17,671,163	23	\$768,311
North Carolina	\$12,601,910	17	\$741,289
Alabama	\$12,370,904	12	\$1,030,909
Indiana	\$10,566,958	8	\$1,320,870
Wyoming	\$6,546,875	8	\$818,359
New York	\$4,860,528	8	\$607,566
New Mexico	\$4,704,400	5	\$940,880
Colorado	\$4,469,037	8	\$558,630
North Dakota	\$3,281,656	2	\$1,640,828
Maryland	\$3,198,000	7	\$456,857
Montana	\$2,550,000	7	\$364,286
Arizona	\$2,025,944	11	\$184,177
Utah	\$1,790,118	3	\$596,706
Massachusetts	\$1,527,125	3	\$509,042
Oklahoma	\$1,500,000	1	\$1,500,000
Washington, DC	\$1,335,000	5	\$267,000
Washington	\$1,175,916	5	\$235,183
Georgia	\$1,116,675	1	\$1,116,675
Texas	\$771,505	2	\$385,753
Arkansas	\$764,900	1	\$764,900
Mississippi	\$730,559	1	\$730,559
Illinois	\$200,000	1	\$200,000
Michigan	\$163,000	3	\$54,333
Florida	\$150,000	1	\$150,000
Wisconsin	\$50,222	1	\$50,222
<b>Total</b>	<b>\$409,732,926</b>	<b>484</b>	<b>\$846,556</b>

At the county level, the spread of (cumulative) awards was \$30,000 to \$15.9 million, with the most funds going to counties in central Appalachia. More than 25 percent of funds were granted to 10 counties (Table 13 in the Appendix, Section B, lists all counties and funding amounts). The county that received the most funds was Athens County, Ohio, followed closely by Pike County, Kentucky; Kanawha County and Cabell County, West Virginia; and Perry County, Kentucky. These five counties each received more than \$10 million in cumulative funding.

**Table 5. Counties That Have Received the Highest Cumulative Award Amounts**

County	State	Total amount	Awards
Athens County	Ohio	\$15,854,200	17
Pike County	Kentucky	\$14,201,484	9
Kanawha County	West Virginia	\$13,660,684	20
Cabell County	West Virginia	\$10,911,753	13
Perry County	Kentucky	\$10,196,294	10
Mercer County	West Virginia	\$8,527,000	8
Allegheny County	Pennsylvania	\$8,437,498	11
Washington County	Virginia	\$8,005,527	9
Wayne County	West Virginia	\$7,608,267	7
Mahoning County	Ohio	\$7,355,944	8

We observed some similarities among counties that were most successful in accessing grant funding. The presence of a university or college is one indicator used in the rural capacity index created by Headwaters Economics, and all five of the most-funded counties have colleges or universities (Headwaters Economics 2022). Indeed, in three of these five counties, institutions of higher education were the grantees for multiple awards: Ohio University in Athens County received eight awards, Marshall University Research Corporation in Cabell County received seven awards, and University of Pikeville in Pike County received two awards. These five counties also have relatively high populations within their regions—all have a population greater than 50,000 except for Perry County, with just 26,624 (US Census Bureau 2019). However, award size varied across these counties. Some counties had fewer but larger grants (Perry County, Pike County) whereas others received numerous small grants (Kanawha County, 20 grants). Kanawha County stands out as having the smallest proportion of repeat grantee organizations, with 16 different grantees for its 20 awards.

## 5.2. Funds for Coal and Noncoal Counties

Given the primary eligibility requirement for POWER funding—that a project serve communities impacted by, or likely to be impacted by, employment loss in coal mining or power plant operations, and/or associated supply chain industries—we examined how funds have been distributed among coal counties (see Figure 4 for a map of coal counties). We assessed the number of grantees located in coal versus noncoal counties, and we looked for any association between the number of coal jobs lost in each county and the amount of funding awarded.

The majority of the 641 coal counties we identified (Section 3) did not have primary grantees of POWER funds. Only 134 of the 200 counties that received POWER funds were coal counties, according to our analysis. That is, 28 percent of POWER funding was awarded to grantees not located in coal counties (Table 6).

**Table 6. Distribution of POWER Funds, by Coal and Noncoal Counties**

Coal county?	Total amount	ARC	EDA	ETA	SBA
Yes	\$295,120,292	\$158,470,872	\$128,917,474	\$5,131,946	\$2,600,000
No	\$114,612,634	\$78,323,948	\$24,405,643	\$11,683,043	\$200,000
<b>Total</b>	<b>\$409,732,926</b>	<b>\$236,794,820</b>	<b>\$153,323,117</b>	<b>\$16,814,989</b>	<b>\$2,800,000</b>

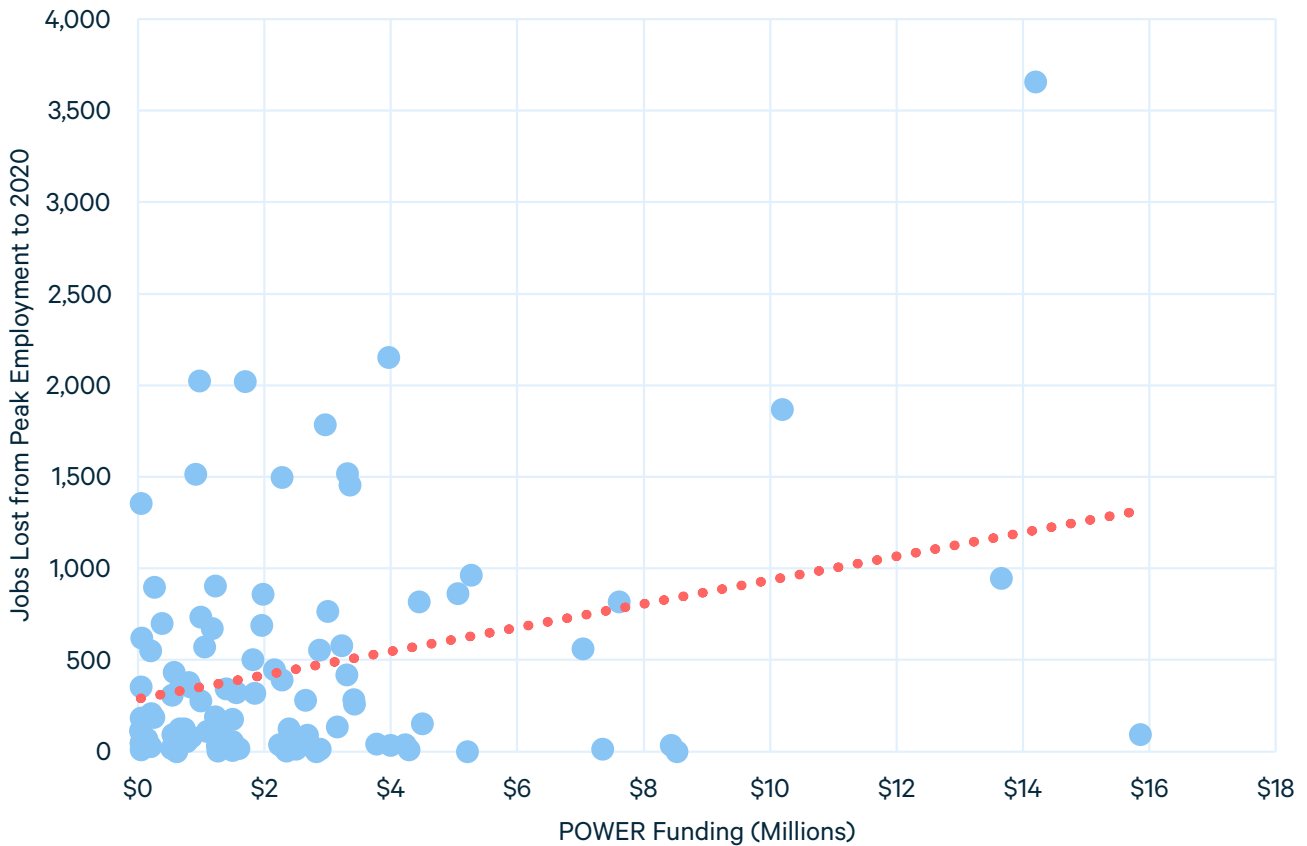
By agency, the ARC allocated the largest total amount, \$78.3 million, to noncoal counties —roughly a third of ARC’s POWER funds. As mentioned above, grantees not located in coal counties are eligible for POWER awards as long as the funds serve affected communities. Though entities outside coal counties can certainly provide services and expertise to support coal county economies, it is important to identify cases in which local capacity to apply for, lead, and execute economic development projects is lacking, since these communities may be or become dependent on external institutions, leaders, and visions of development. Future analysis should seek to understand whether entities in coal counties lack sufficient capacity to apply for funding or whether they are not receiving awards for other reasons.

The majority of ETA funding was also awarded to grantees outside coal counties. This is likely because eligible grantees for ETA awards are primarily state and Native American agencies responsible for administration of workforce development activities, as authorized under the Workforce Innovation and Opportunity Act (WIOA). These entities’ offices are not always in coal counties (e.g., state offices are in capital cities), but they often grant subawards to organizations in affected areas.

Within coal mining counties, we also looked for any relationship between declines in direct coal mine employment and the amount of funding a county received. Our analysis does not include job losses at power plant communities, nor does it include any assessment of indirect employment effects. However, the magnitude of direct employment losses partially indicates the severity of the economic impact of coal's decline (and, therefore, of the level of need for POWER funding).

Figure 8 shows POWER funding as it relates to direct coal mining employment losses, calculated as of 2020 from the year of peak employment between 2001 and 2020.

**Figure 8. POWER Funding, by Direct Coal Mining Job Losses in Recipient Coal Counties**



In general, we observed a noisy but moderate positive correlation between the amount of spending in a coal county and the magnitude of coal mining job loss. Two counties that illustrate this trend are in Kentucky: Pike County, where grantees received \$14,201,484 and 3,657 coal jobs have been lost, and Perry County, where grantees received \$10,196,294 and 1,866 coal jobs have been lost. However, this trend has many exceptions— there are multiple counties with little to no job loss where grantees have received millions, as well as several counties that experienced significant job loss but saw little to no funding. For example, although Kanawha County, West Virginia, has lost just over 944 jobs, grantees in the county have received \$13,660,684 in funding. In contrast, Boone County, West Virginia, has lost over 3,400 jobs but received no funding.



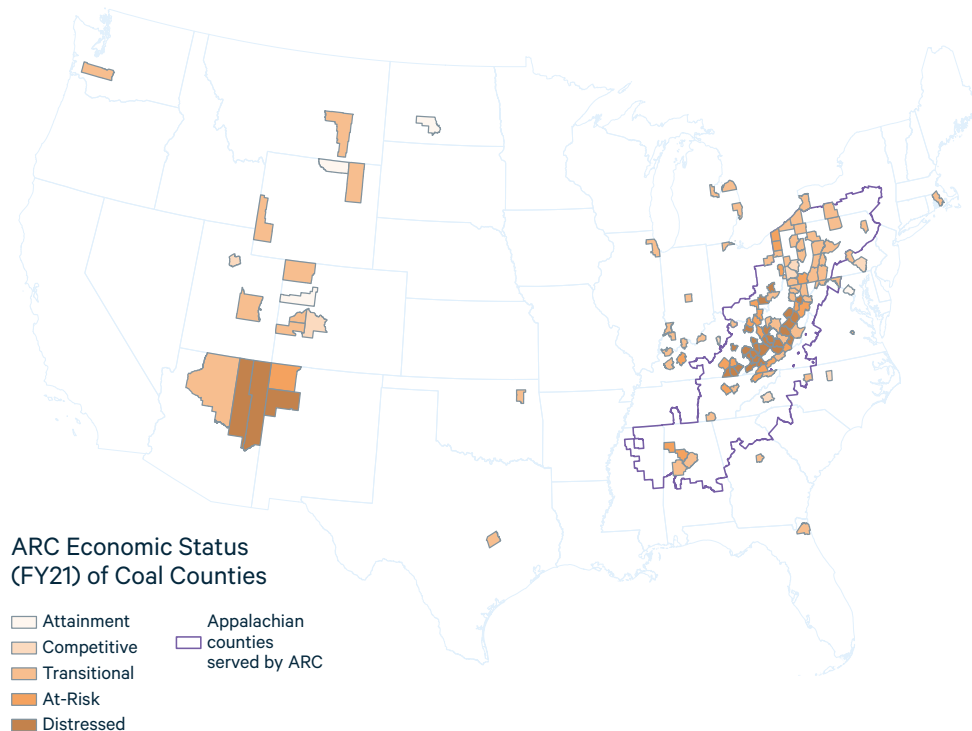
In summary, 507 coal counties, or 79 percent of all coal counties, had no grant recipients. It is not surprising that investment is not always closely correlated with the number of jobs lost over a 19-year period, since direct coal job loss is only one indicator of economic impact from a declining coal industry. For example, in communities where coal has been mined for decades (of which there are many), peak coal employment (and subsequent job losses) may have occurred many decades ago. Nonetheless, in many such cases, the community may not yet have recovered from a deep historical dependence on the coal industry.

### 5.3. Funds for Economically Vulnerable Counties

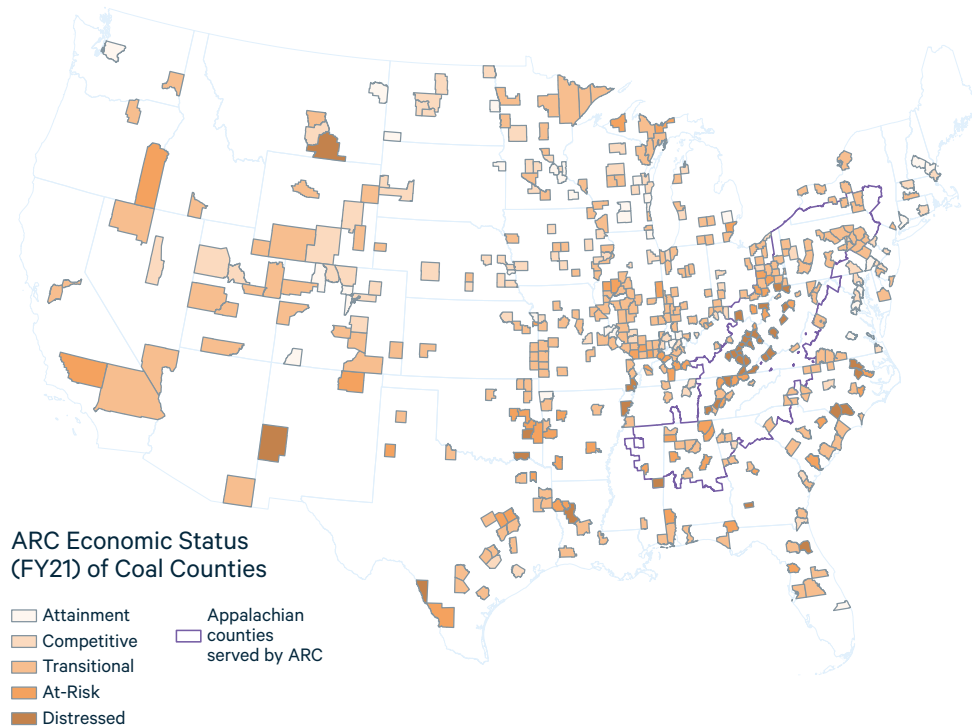
In addition to declines in the coal industry, EDA and ARC also use indicators of economic distress to prioritize investment. Such indicators may be necessary to understand the historic impact of the coal industry and its decline—and the relative need for public support like the POWER Initiative.

As described in Section 2 and shown in Figures 9a and 9b, coal counties vary in economic status, with a high concentration of distressed counties in central Appalachia, northeast Arizona, and northwestern New Mexico. Given the EDA and ARC programs’ stated priorities to invest in economically distressed regions, we hypothesized that a relatively higher proportion of funding would be invested in distressed and at-risk coal counties compared with transitional, competitive, or attainment counties.

**Figure 9a. Economic Status of Coal Counties with Grant Recipients**



**Figure 9b. Economic Status of Coal Counties without Grant Recipients**



The majority (53 percent) of coal counties across the United States are in transitional status as of FY2021. Therefore, it is not surprising that of the \$295 million awarded to grantees in coal counties, transitional counties received the greatest number of awards and the most funding (Table 7). On average, however, coal counties that are distressed or at risk received more funds than transitional, competitive, or attainment counties. Distressed counties received more than three times as much funding on a per county basis than transitional counties.

Nonetheless, as can be seen in Figure 9b, there are also distressed and at-risk coal counties that were never directly awarded POWER funds. In fact, some of the distressed counties that are most economically vulnerable to declines in the coal industry did not have primary grantees that directly received funds, whereas other distressed counties received multiple awards. The 2018 ARC report “An Economic Analysis of the Appalachian Coal Industry Ecosystem” (Jackson and Járosi 2018) identified nine counties that ranked in the top 20 Appalachian counties for (1) dependence on the coal industry; (2) changes in coal industry employment (i.e., jobs lost); and (3) susceptibility to anticipated continued coal industry decline: Mingo and Boone counties in West Virginia; Harlan, Leslie, Martin, Pike, and Perry counties in Kentucky; and Buchanan and Dickenson counties in Virginia. In addition, as of FY2021, all the above-listed counties fell into the ARC category of distressed. Five of those counties—Boone, Leslie, Martin, Buchanan, and Dickenson—did not have any primary grantees of POWER funds between 2015 and 2020.

**Table 7. Funding Distribution, by County Economic Status**

<b>Economic status</b>	<b>Coal counties in lower 48*</b>	<b>Percentage of US coal counties</b>	<b>Awards to coal counties**</b>	<b>Total funding for coal counties</b>	<b>Average funding per county</b>
Distressed	71	11.08	78	\$73,575,630	\$1,036,276
At-risk	83	12.95	67	\$65,407,138	\$788,038
Transitional	342	53.35	173	\$121,823,198	\$356,208
Competitive	93	14.51	28	\$26,189,367	\$281,606
Attainment	44	6.86	6	\$8,124,959	\$184,658
<b>Total</b>	<b>633 lower-48 coal counties (of 641)</b>		<b>352 awards to grantees in coal counties (of 484)</b>	<b>\$295,120,292</b>	

\*Based on FY2021 ARC economic status

\*\*Based on the ARC economic status index in the year that an award was granted, rather than the FY2021 ARC economic status

## 6. Types of Projects Funded

To better understand the investments made under the POWER Initiative, we used publicly available project descriptions found in press releases, project-associated websites, and news articles to categorize projects. We used an iterative inductive coding approach to develop these project categories and identified six primary project types (Table 8). Many projects fell into more than one category. For such projects, the award amount is double-counted (once per relevant category) in the analysis presented below. Using the same method, we also coded the data for project subtypes and career sectors (see Sections 7 and 8).

**Table 8. POWER Project Types**

Type	Subtype	Definition
Education and workforce development	Infrastructure investment	Infrastructure built (often, buildings constructed or renovated) or materials acquired to support training program.
	Training program	Developing curricula and programming, or providing administrative capacity or personnel to carry out training programs. Training programs may be adult education, targeted certificate programs, on-the-job training or internships, training in entrepreneurial activities, or investment in other degree or vocational programs. Training programs also include job placement services.
Business development	Infrastructure investment	Infrastructure built primarily to serve existing or future businesses, industry, or entrepreneurs.
	Entrepreneurial support	Start-up support, technical assistance, or training for entrepreneurs or new businesses.
	Technical assistance	Supporting, expanding, or serving existing business rather than developing new ones.
	Access to capital	Capital to start new businesses or aid in business expansion.
Economic asset development	Market development	Developing markets or increasing demand for local businesses.
	Natural and cultural asset development	Wildlife conservation and tourism, marketing or branding campaigns for adventure tourism or trails, associated activities to take advantage of trails, outdoor developments such as partnership building with local businesses, and outdoor tourism cluster development.
Health	Infrastructure investment	Infrastructure investments to benefit the community broadly. May be described as benefiting business and economic development but without specifying particular businesses. Includes infrastructure category of trail construction, which can serve both tourism sector and local population.
	Substance abuse program	Investment in infrastructure that will support provision of health care services and/or improve public health.
	Improve access to care	Programming to treat substance abuse disorders or help those in recovery reintegrate into workforce.
		Coordinating health care services for individuals, providing new types of care locally or regionally, or providing new ways to access care not related only to substance abuse.

**Table 8, continued. POWER Project Types**

Type	Subtype	Definition
Research, planning, and feasibility studies	Economic or business development planning	Studies that examine how to capitalize on existing assets, research emerging or analyze existing markets or opportunities to expand industry clusters, support for economic strategic planning processes, conduct demand studies, studies of best practices or pathways for economic diversification and development, research for using natural resources to promote development, studies that assess economic status of region.
	Workforce training program planning	Studies to identify workforce or skills gaps, or to assess feasibility of a proposed workforce development project.
Leadership and community capacity development	Investment in leadership or community resources	Developing community leaders' or decisionmakers' capacity to carry out economic development and community revitalization efforts, provide educational or professional development opportunities, or help coordinate and direct resources to flow into communities.

Of the six project types we identified, education and workforce development received the most funding (\$165.5 million), followed closely by business development (\$160.7 million), as shown in Table 8. Both categories had roughly twice as much funding as the category with the third-highest investment, economic asset development (\$83.1 million). Kentucky received the most for education and workforce development projects—\$58.6 million, or almost twice that of the next highest state, West Virginia (\$31.7 million).

Table 9 summarizes the main findings for funding by project type; below, we discuss the highlights for each category.

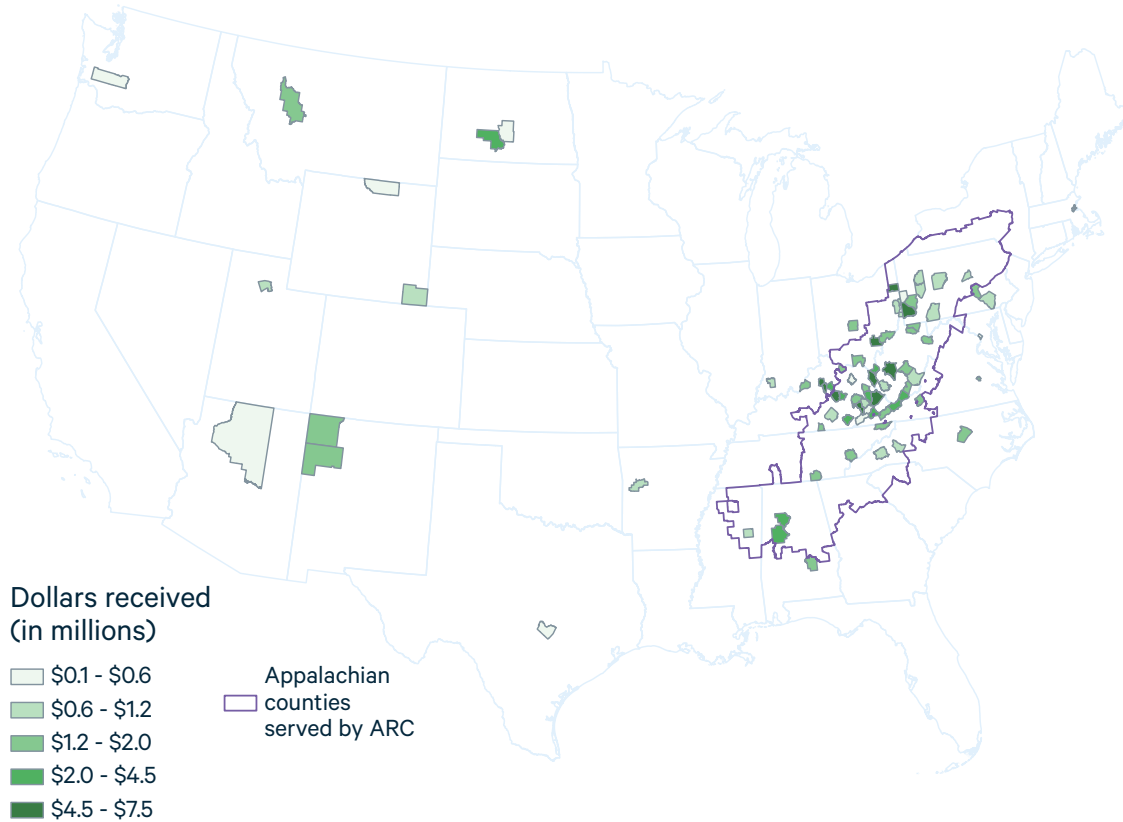
**Table 9. Total Spending and State with Highest Spending, by Project Type**

Project type	Total funds	Highest recipient
Education and workforce development	\$165,478,258	Kentucky
Business development	\$160,678,447	West Virginia
Economic asset development	\$83,123,795	West Virginia
Health	\$44,294,936	Kentucky
Research, planning, feasibility studies	\$36,135,211	West Virginia
Leadership and community capacity development	\$11,572,732	Kentucky



At the county level, **education and workforce development** funds were again concentrated in central Appalachia (Figure 10). Pike County, Kentucky, received the most funds—in the form of two large awards (\$4.9 million from EDA and \$2.5 million from ARC) to the University of Pikeville. The funding was invested in equipment and materials to support the development of a training program in the field of optometry.

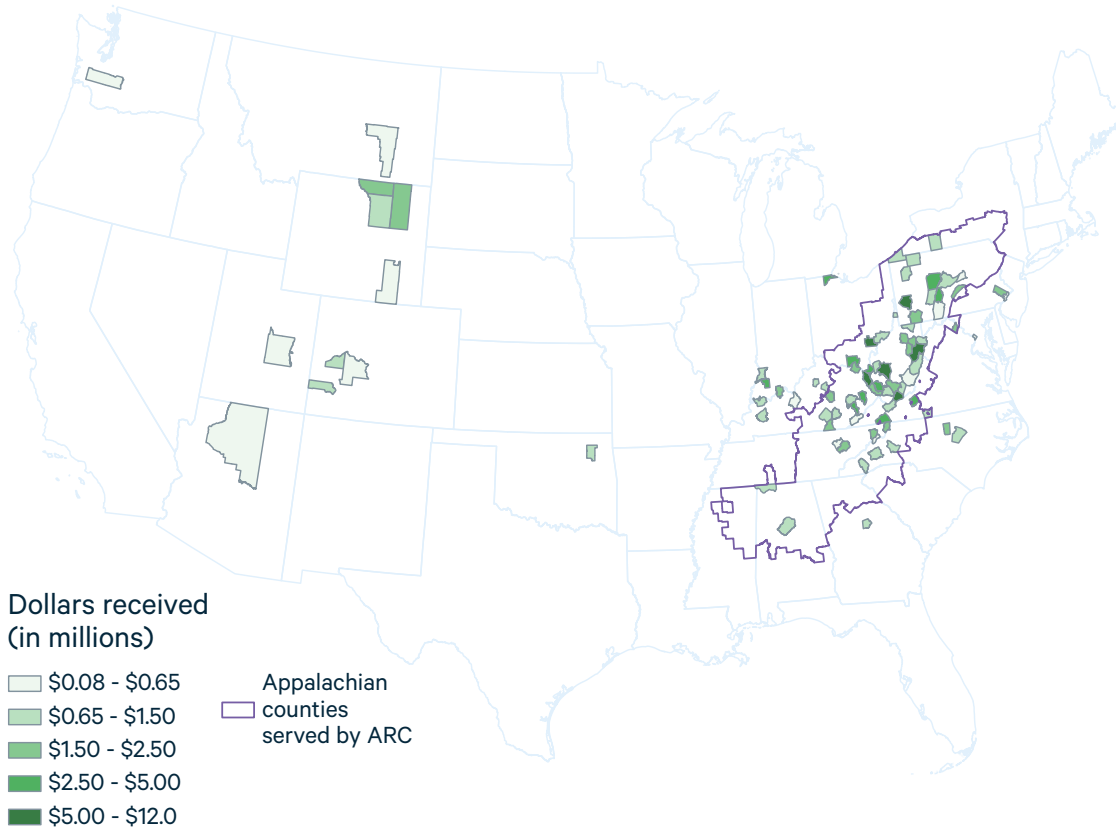
**Figure 10. Funds for Education and Workforce Development Projects, by Grantee County**



As indicated in Figure 11, grantees in West Virginia received the most business development funding (\$52.6 million)—more than twice that of the states receiving the next highest awards, Pennsylvania (\$25.3 million) and Kentucky (\$20.8 million). We also noticed that across the four funding agencies, proportionally, EDA invested more in business development projects than any other project type. The strong focus on education and workforce development projects in Kentucky versus business development in West Virginia warrants further investigation to better understand varied approaches to workforce transition. Kentucky appears to have a heavier emphasis on specific skills training and credentialing for emerging sectors, whereas other states have invested more in entrepreneurial support services. Only five Kentucky projects appeared to offer entrepreneurial development and support services, compared with 15 in West Virginia and 12 in Pennsylvania.

The county with the highest business development investment was Athens County, Ohio (\$11.5 million), followed by Kanawha County, West Virginia (\$6.8 million). In Athens County, several projects led by Ohio University are investing in social and physical infrastructure to support entrepreneurs and building the capacity of social enterprises in the region. Projects led by other grantees include the establishment of a community development financial institution and a grant focused on developing businesses associated with hardwoods (Raimi et al. 2021). Projects in Kanawha County also include support for entrepreneurs through the development of a venture capital investment fund, support for food-products entrepreneurs through market and supply chain development, development guidance to information technology entrepreneurs and businesses, and investments in infrastructure to support business development, including expanded broadband access for a regional technology park, and sewage system upgrades and expansions.

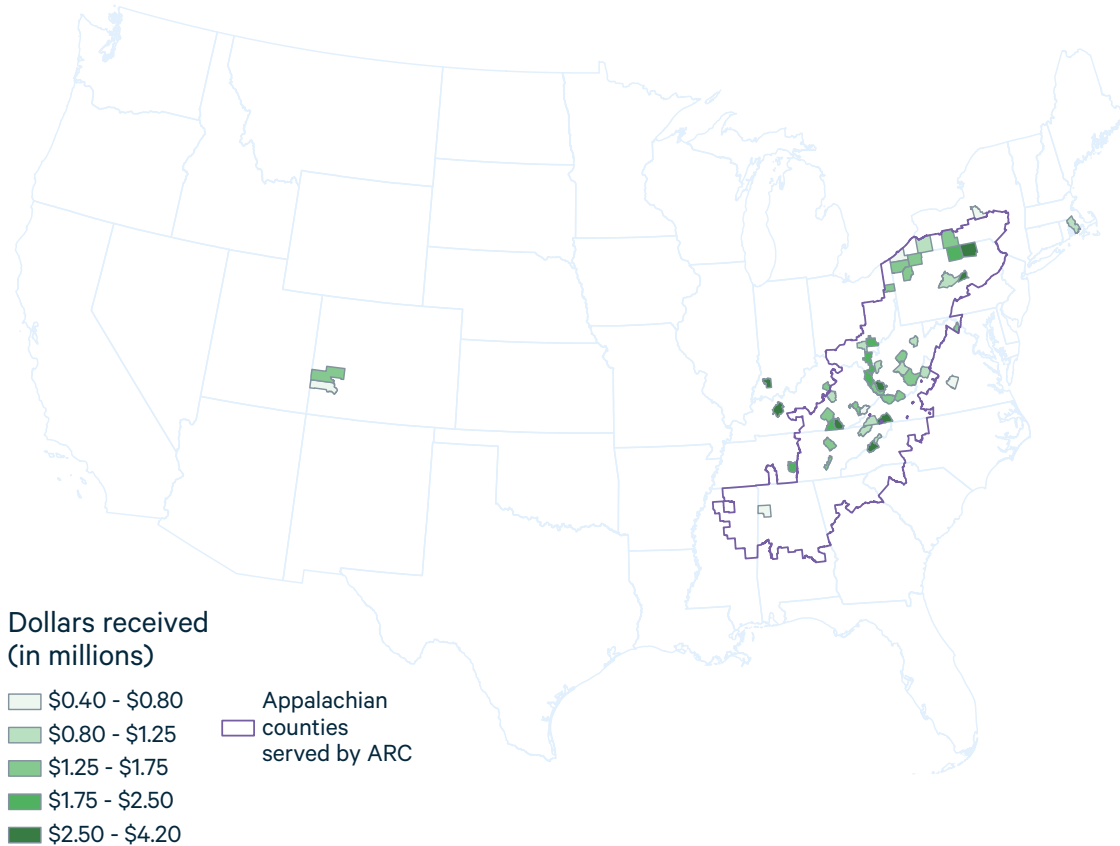
**Figure 11. Funds for Business Development Projects, by Grantee County**



West Virginia received the greatest amount of economic asset development funding (Figure 12). The majority of the investments were trail development, water and wastewater, and broadband infrastructure. The county with the overall highest funding was Pike County, Indiana, where approximately \$4.2 million was invested in water infrastructure (including a new well, treatment facility, storage tank, and distribution

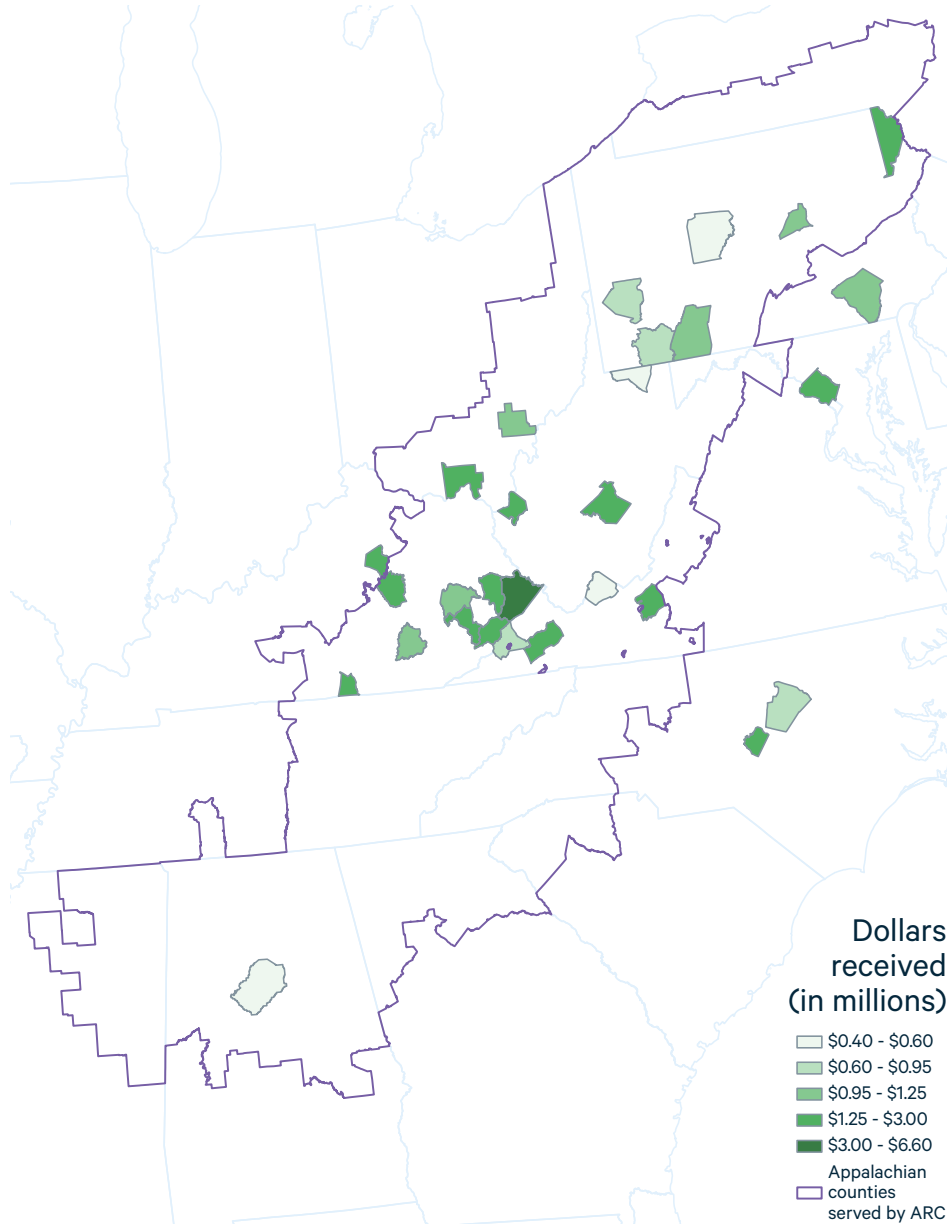
system) to support manufacturing businesses and attract private investment. In general, many economic asset development grants have been devoted to broadband and water and wastewater infrastructure. We found little spending on such projects outside ARC territory.

**Figure 12. Funds for Economic Asset Development Projects, by Grantee County**



In our data set, **health** grants were all concentrated in Appalachia; no coal communities in the West received such funding (Figure 13). ARC has explicitly supported health projects, particularly those related to substance abuse—hence the concentration of health projects in central Appalachia. Kentucky received the most grant funds for health-related projects—almost three times as much as the next state, Pennsylvania. Pike County, Kentucky, was the county with the highest investment in this category: two awards were made to Pikeville Medical Center and three awards to WestCare Kentucky. Pikeville Medical Center used the awards to support renovation of its heart institute and to fund development of a children’s hospital. WestCare Kentucky provides substance abuse treatment programs. More than half of all health projects address substance abuse.

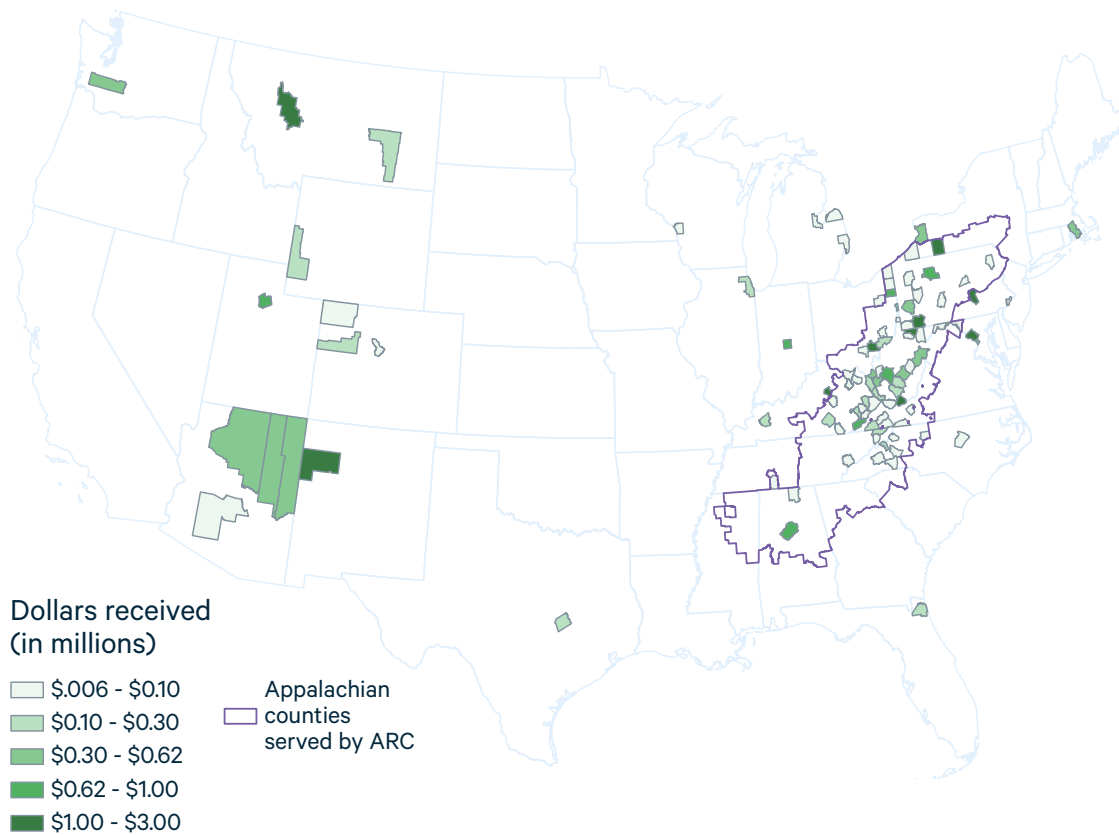
**Figure 13. Funds for Health Projects, by Grantee County**



EDA has not made health investment an explicit priority. Health-related economic development investments arguably warrant EDA consideration in the future, since health care is in great demand in many current and former coal communities. Coal mining is dangerous work that has left many individuals disabled by physical impairments such as black lung disease (Blackley et al. 2018) and opioid addiction (Metcalf and Wang 2019). Indeed, almost half of all health projects (17 of 37) were also education and workforce development projects, suggesting that the health care industry is important for economic diversification strategies. Health care is one of the largest economic sectors in Kentucky (US Census Bureau 2018).

The greatest investment in **research, planning, and feasibility studies** was in West Virginia. However, compared with the other project types, investment across eastern and western counties for these project types was relatively similar (Figure 14). This may suggest that counties in the West have received planning grants from EDA but, being ineligible for ARC funding, have received comparatively fewer implementation grants to support the planning investments. The grantee that received the most funding for this project type is based in Maryland and is the recipient of \$3 million for an ongoing National Institutes of Health study on substance abuse. The project has received multiple awards and is supporting substance abuse research in Kentucky and West Virginia.

**Figure 14. Funds for Research, Planning, and Feasibility Study Projects, by Grantee County**



Compared with the other project types, there were few **leadership and community capacity development** projects. Such projects aim at helping community leaders or decisionmakers carry out economic development and community revitalization efforts, provide educational or professional development opportunities, or help coordinate and direct resources to flow into communities. Both leadership and community capacity projects and research, planning, and feasibility projects received smaller grants than the other project types. Leadership and community capacity development likely plays an important role in addressing economic diversification in coal country (Community Strategies Group 2019; Look et al. 2022) and may warrant future emphasis in federal programs like POWER.

## 7. Types of Infrastructure Funded

Investments in construction projects, such as broadband, water, and transportation infrastructure, are particularly important for transitioning energy communities because they have the potential to provide both near- and long-term jobs while laying the foundation for new economic activity and improving quality of life. Furthermore, some skills used for coal mining are transferable to construction, infrastructure maintenance, and engineering jobs. Indeed, the US Census Job-to-Job (J2J) flow data for all states from 2012 and 2016—a time of economic downturn in the coal industry (Figure 3)—indicate that mining, quarry, and oil and gas extraction workers most commonly transitioned into construction. Construction was also one of the top destinations for transitioning utility (including electric utility) workers (US Census Bureau 2022).

Because of the economic importance of infrastructure investments, in addition to classifying POWER grants by project type (Section 6), we classified grants by nine types of infrastructure (Table 10).

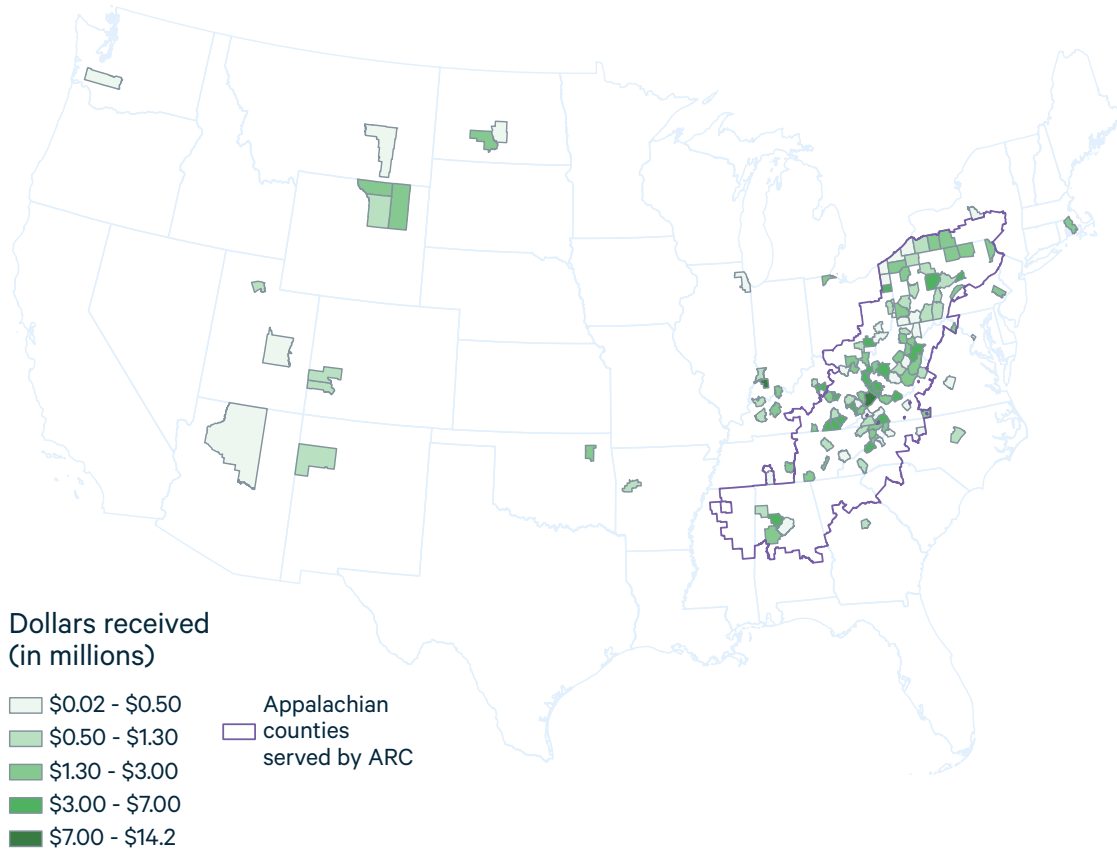
**Table 10. Infrastructure Components of Funded Projects**

<b>Infrastructure type</b>	<b>Total funds</b>
Building construction or renovation	\$89,164,842
Water and wastewater	\$51,848,225
Broadband	\$39,431,498
Equipment and materials	\$33,690,984
Trail construction	\$9,786,592
Downtown revitalization	\$8,418,918
Transportation and transit infrastructure	\$7,376,800
Energy infrastructure	\$6,830,685
Site preparation	\$5,464,031
Unspecified	\$1,100,000

More than half of all POWER funding was awarded to projects that involved infrastructure. The infrastructure categories receiving the highest investment were building construction or renovation, followed by water and wastewater, broadband, and equipment and materials (Table 9). Geographically, investment in infrastructure has been greater in Appalachian coal counties than in western coal counties (Figure 15).



**Figure 15. Total Funds for Infrastructure Projects, by Grantee County**



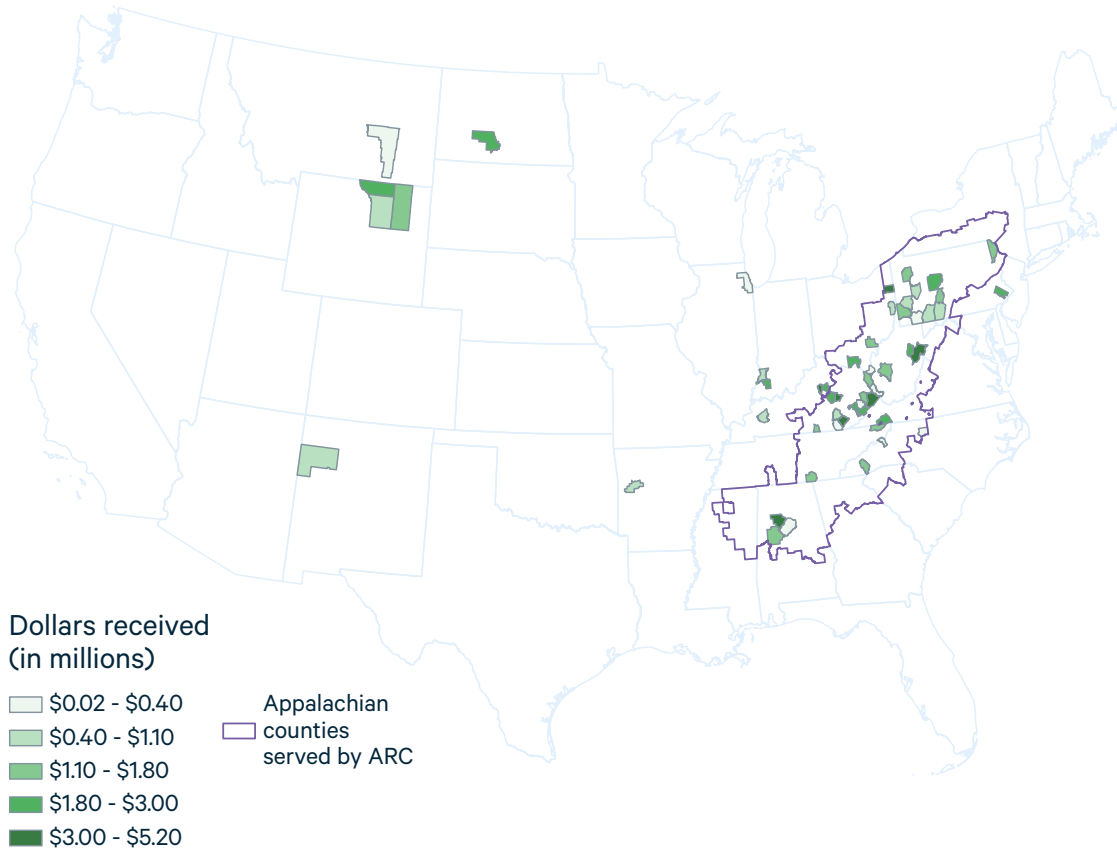
Kentucky received the most investment from the POWER program in infrastructure, at \$61.8 million, followed by West Virginia (\$52.3 million), Pennsylvania (\$31.2 million), Ohio (\$20.7 million), and Tennessee (\$13.4 million) (Table 11).

**Table 11. Total Infrastructure Funding for Top Five States**

<b>Infrastructure type</b>	<b>Kentucky</b>	<b>West Virginia</b>	<b>Pennsylvania</b>	<b>Ohio</b>	<b>Tennessee</b>
Broadband	\$135,500	\$3,353,788	\$12,165,246	\$6,242,124	\$5,722,121
Building construction or renovation	\$29,563,677	\$10,244,950	\$13,660,626	\$9,931,048	\$3,068,426
Downtown revitalization	\$4,964,251	\$3,454,667	\$0	\$0	\$0
Energy infrastructure	\$1,484,000	\$0	\$0	\$49,950	\$3,647,125
Equipment and materials	\$14,065,479	\$7,917,880	\$725,850	\$1,586,031	\$1,920,013
Site preparation	\$0	\$1,750,000	\$20,000	\$2,716,716	\$0
Trail construction	\$0	\$3,474,082	\$2,043,843	\$1,235,727	\$0
Transportation and transit infrastructure	\$2,990,700	\$2,058,500	\$60,000	\$30,000	\$0
Water and wastewater	\$11,041,379	\$20,542,980	\$4,890,000	\$2,716,716	\$4,272,832
<b>State total</b>	<b>\$61,810,895</b>	<b>\$52,322,872</b>	<b>\$31,183,722</b>	<b>\$20,720,392</b>	<b>\$13,416,465</b>

Kentucky received more than twice the spending of the next state, Pennsylvania, for **building construction or renovation** (Table 11 and Figure 16). In Kentucky, buildings were constructed or renovated primarily to provide facilities for new health care services and education and workforce development training programs. In contrast, in Pennsylvania, construction was generally associated with business development projects: several grants supported economic diversification by creating entrepreneurial incubator spaces or renovating buildings to host new businesses.

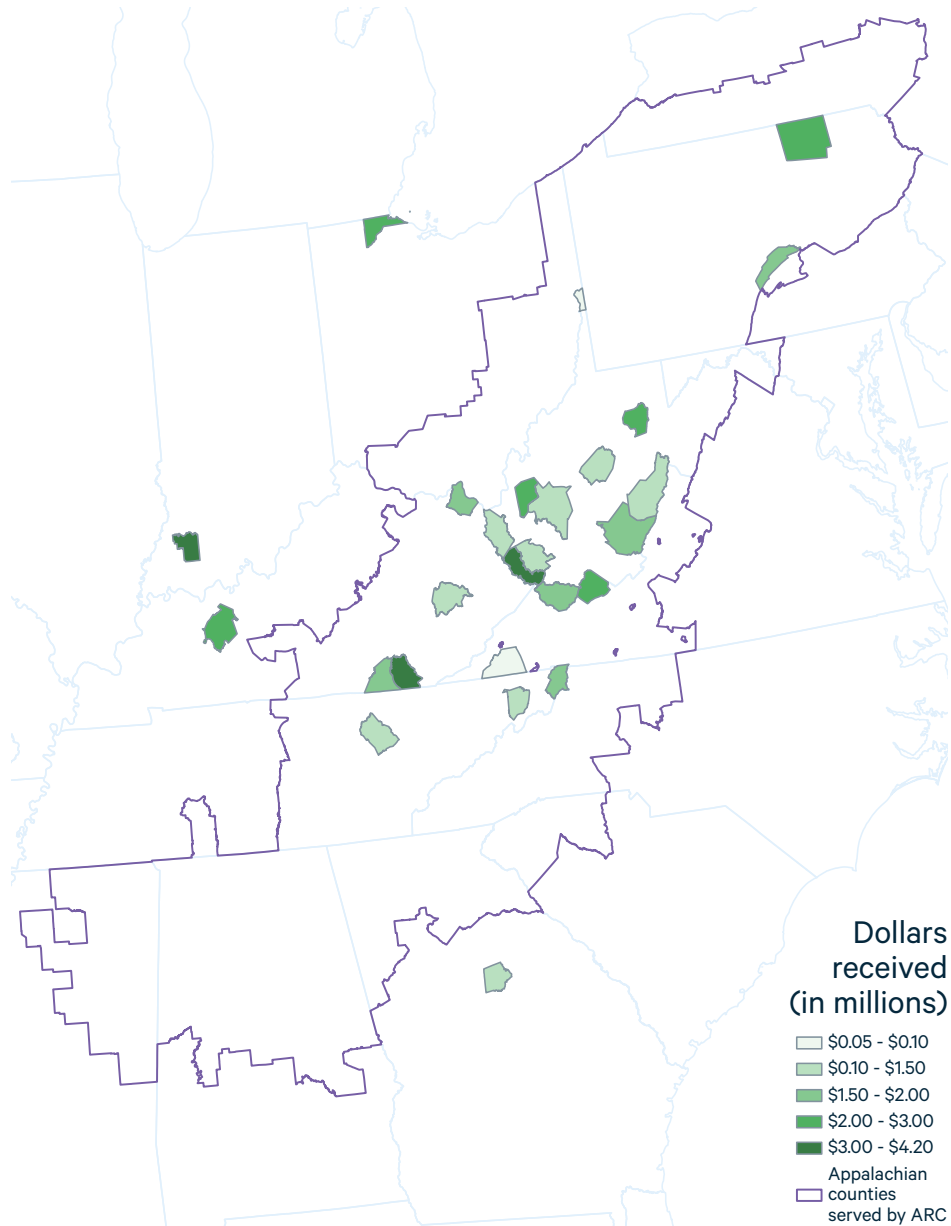
**Figure 16. Total Funds for Building Construction or Renovation, by County**



West Virginia received the most funding (\$20.5 million) for projects with **water and wastewater** infrastructure components, across 11 counties (Figure 17). This level of investment may not be surprising, given that the American Society of Civil Engineers in 2020 gave West Virginia water systems a D grade and reported that more than half of drinking water was lost through leaks in the state’s degraded water infrastructure (West Virginia Section of the American Society of Civil Engineers 2021). However, other coal states in the Appalachian region—Kentucky, Pennsylvania, Ohio—have similarly poor drinking water and wastewater infrastructure (American Society of Civil Engineers 2021). Maintaining water infrastructure is a challenge in Appalachia because of the mountainous terrain, pollution from extractive industries, and communities’ low fiscal capacity (Hughes et al. 2005). Functioning water and wastewater systems

are critical for economic development. For example, though not granted a POWER award, Paintsville, Kentucky, had a sewer system that was at 100 percent capacity and could not handle new connections. Without system expansion, no new businesses or households could move into the city. The City of Paintsville was awarded an Abandoned Mine Land Pilot grant (Kentucky Energy and Environment Cabinet 2019). This example shows the intimate connection between water and wastewater infrastructure and economic development.

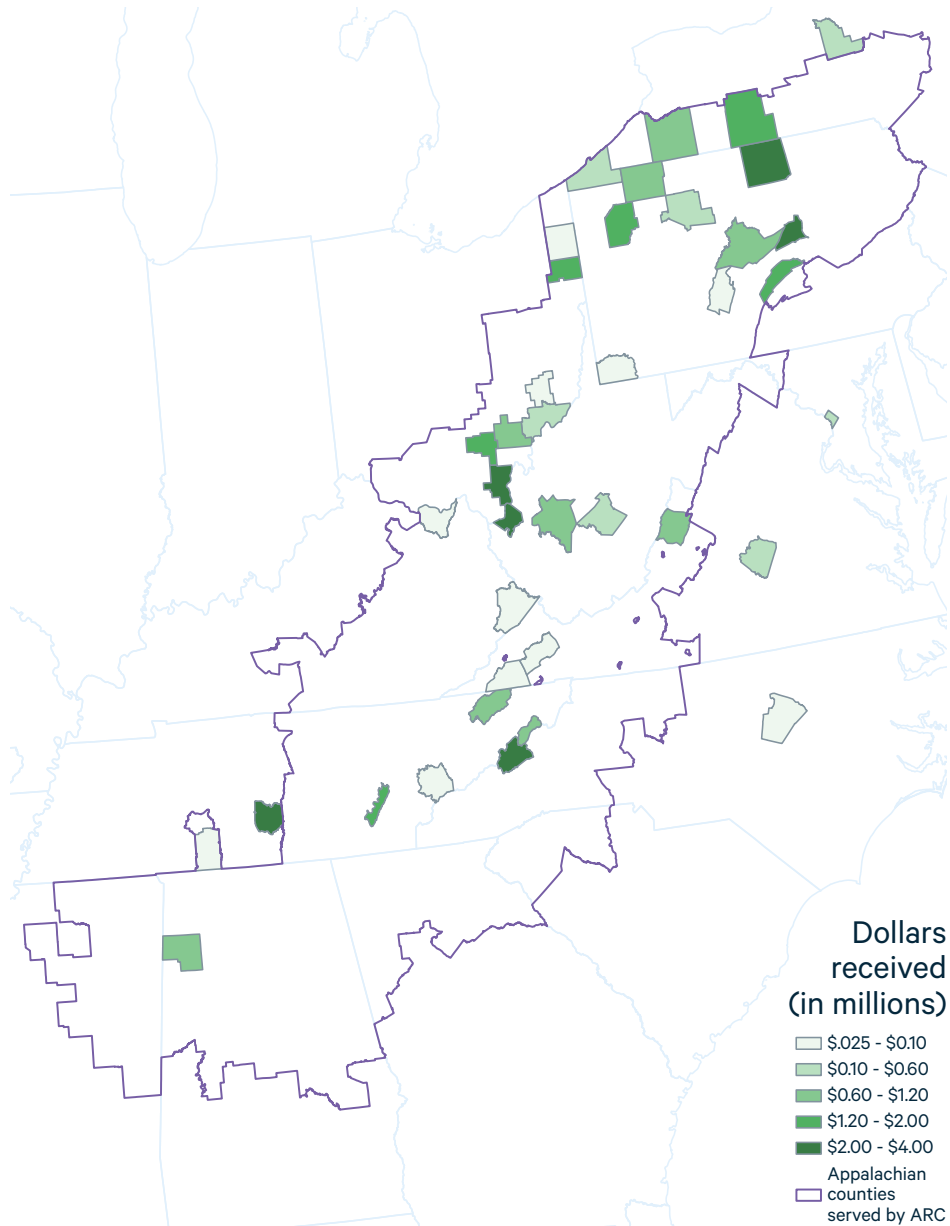
**Figure 17. Total Funds for Water and Wastewater, by County**



As early as 2016, investment in **broadband** was a funding priority for the ARC POWER program. Beginning in 2019, the ARC set aside funding from the POWER program

money specifically for broadband investments: \$15 million in 2019, and up to \$16.67 million in 2020 and 2021. Because of heavy emphasis on the need for broadband investment in rural communities, there are many federal funding streams outside the POWER programs that support broadband projects. Thus, it is not surprising that although broadband is a priority, it is not the most common type of infrastructure for POWER funding. Pennsylvania and Ohio received the most funds for broadband (Figure 18).

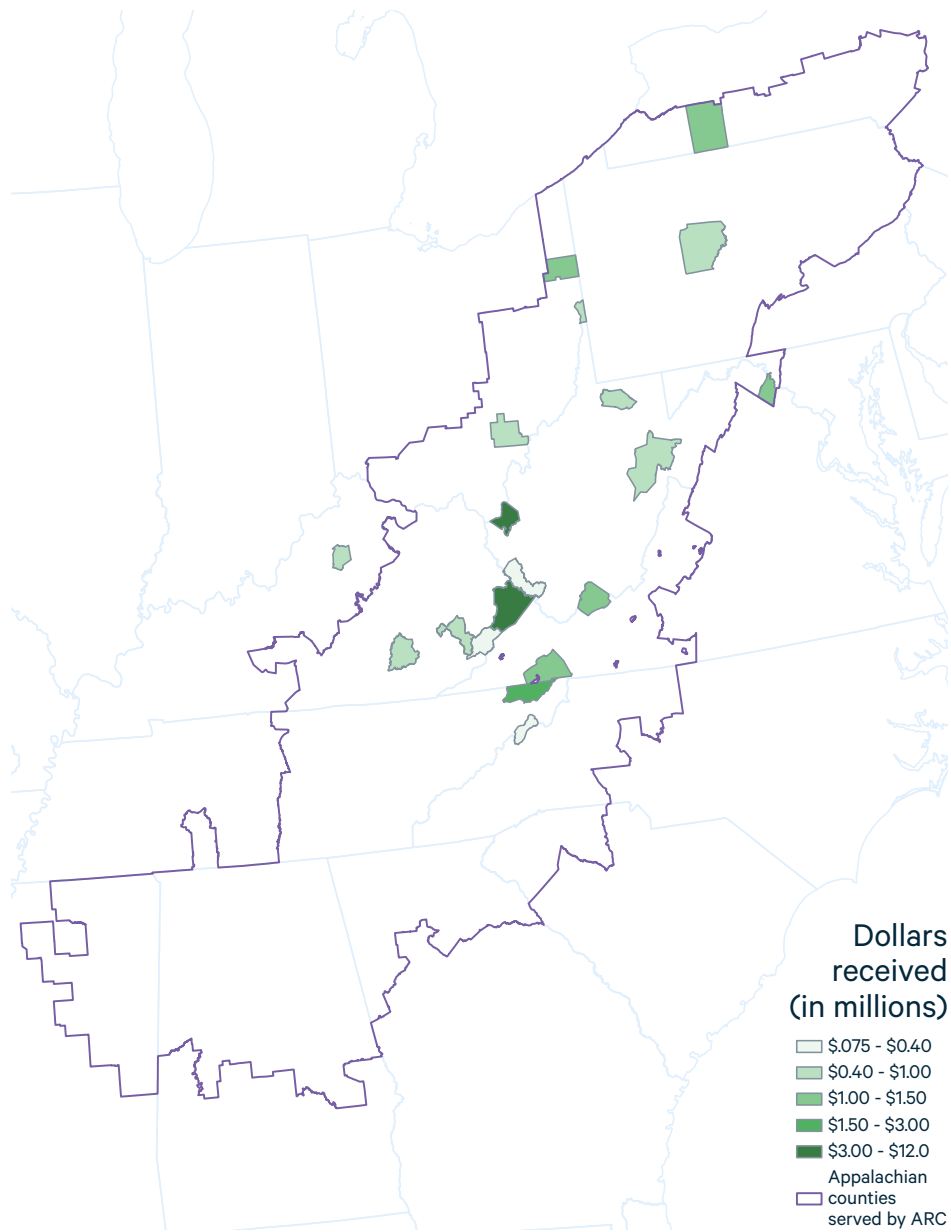
**Figure 18. Total Funds for Broadband, by County**



Investments in **equipment and materials** were also a top infrastructure spending category. In particular, these investments were made to support education and

workforce development and business development projects. In Kentucky, the state with the highest spending on equipment and materials, the majority of funding was used to purchase expensive health care equipment to support the optometry education program and the new Heart Institute at Pikeville Medical Center. Projects in West Virginia, the state with the second-highest investment, purchased manufacturing equipment to be shared across multiple businesses, startup equipment for a food hub, lab equipment for manufacturing workforce development, and equipment for aviation training.

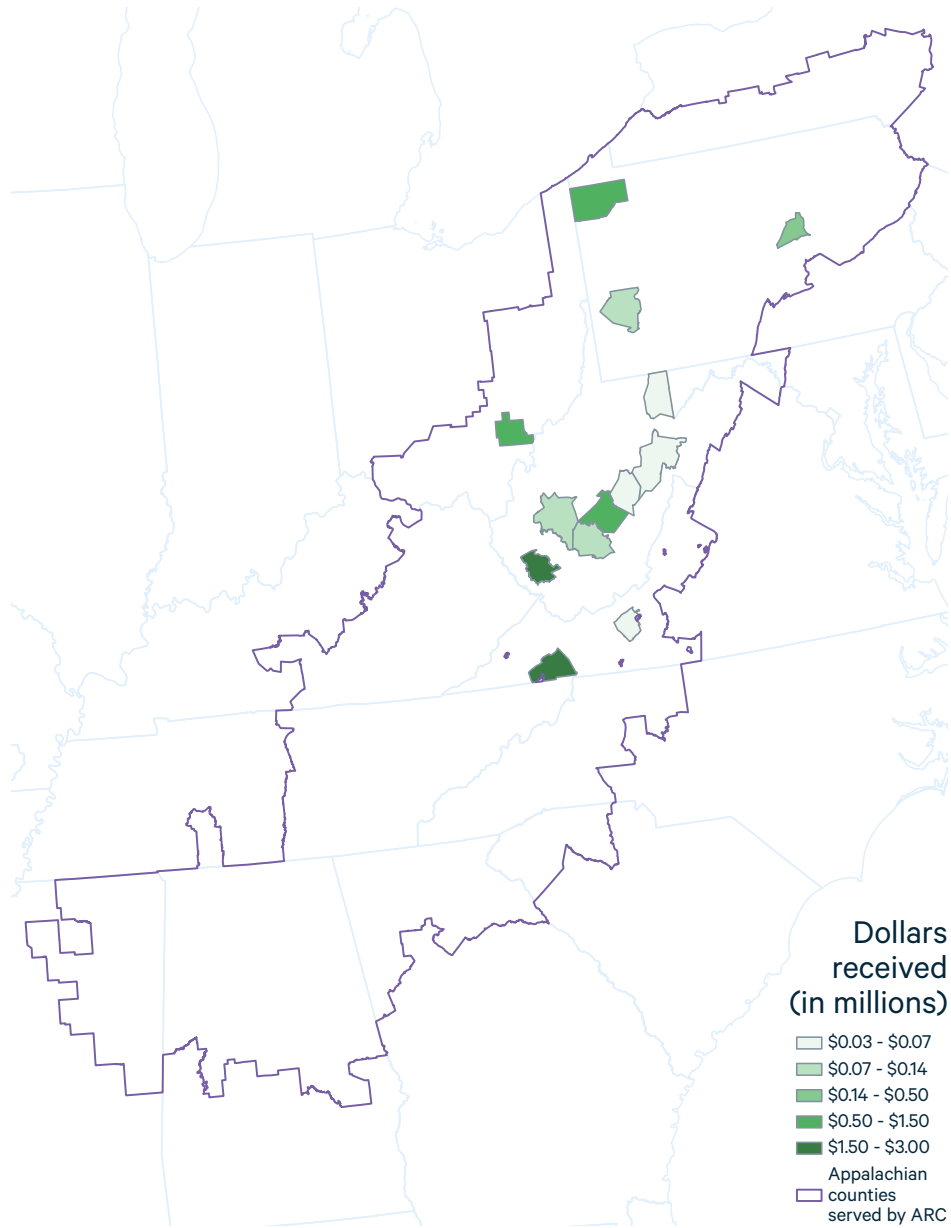
**Figure 19. Total Funds for Equipment and Materials, by Grantee County**





Last, this analysis reveals some of the innovative ways that coal communities are developing natural assets to support economic and community revitalization. A series of projects have been funded for **trail construction** and outdoor recreation and tourism. This type of development is being explored in many coal communities, but our analysis shows that grantees in West Virginia have been particularly successful in accessing POWER funds for such projects (Figure 20).

**Figure 20. Total Funds for Trail Construction Projects, by Grantee County**



## 8. Career Sectors Targeted

To get a sense for how various regions have been using POWER funds, we also categorized projects according to the sector that each award serves over the long-run. For example, a project that funded water infrastructure would benefit the construction sector in the short term, but if the water infrastructure supported the development of a manufacturing business, we categorized that project as manufacturing. Similarly, a workforce training program that credentialed individuals in water infrastructure installation would initially serve the education sector but ultimately support a critical infrastructure industry and was categorized as such. We did not categorize programs that developed skills nonspecific to a career, such as adult literacy, interview skills, entrepreneurial skills, or digital literacy. The majority of sector-focused grants were made to communities in Appalachia, and so the following figures come from that region.

We identified 15 prominent sectors, plus one category for undefined projects (Table 12). The majority of projects were classified as just one sector, but 70 projects served two or more sectors and were double-counted, given our inability to determine the percentage of funds that served each (see the Appendix, Section C, for the subcategories in each sector). The five most common sectors served by POWER investments were manufacturing; health and social services; tourism and hospitality; information technology; and agriculture and forestry (Table 12).

**Table 12. POWER Awards by Career Sector**

Sector	Total award amount	Projects	Average spending per project
Manufacturing	\$102,596,563	84	\$1,221,388
Health and social services	\$81,197,779	71	\$1,143,631
Tourism and hospitality	\$42,919,267	51	\$841,554
Information technology	\$40,016,794	27	\$1,482,103
Agriculture and forestry	\$33,435,754	33	\$1,013,205
Transportation, logistics, and supply chain management	\$24,229,078	21	\$1,153,766
Critical infrastructure	\$19,376,821	13	\$1,384,059
Fossil fuels and chemicals	\$19,016,239	24	\$792,343

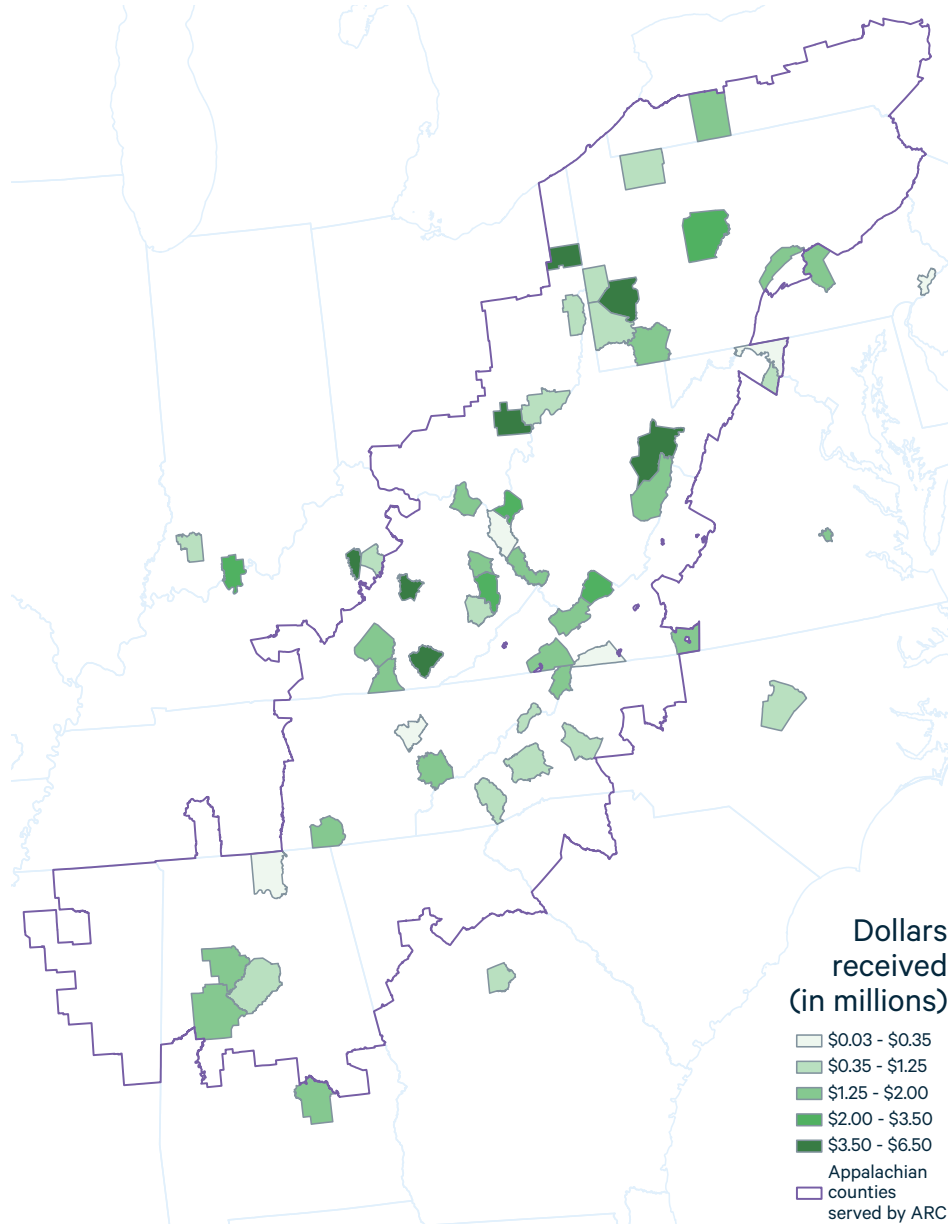
**Table 12, continued. Infrastructure Components of Funded Projects**

Industry	Total award amount	Projects	Average spending per project
Building construction	\$17,221,921	14	\$1,230,137
Aviation and aerospace	\$14,552,136	13	\$1,119,395
Equipment operation and maintenance	\$14,131,651	11	\$1,284,696
Welding*	\$12,665,847	12	\$1,055,487
Renewable energy	\$8,999,081	14	\$642,792
Arts, design, and entertainment	\$2,802,815	5	\$560,563
Education and public service	\$2,428,373	4	\$607,093
Undefined or nonspecific	\$150,583,920	220	\$684,472

\*Though welding is more a skill than an industry, we list it as a standalone category because welders are employed in numerous industries.

Nearly 17 percent of the 484 POWER grants (81 awards), and up to 25 percent of the total funding (\$102.6 million) represented in our data set, was associated with projects that had a **manufacturing** sector component. In terms of the number of awards, 20 percent of both education and workforce development projects and business development projects (see Section 6) supported manufacturing. The manufactured products included metals, textiles, aviation technology, automobile parts, hardwoods, secondary wood products, flooring, artisanal instruments, polymers, and food products. Kentucky received the most funds for manufacturing projects, followed by Pennsylvania (Figure 21). Grantees in Woodford County, Kentucky, received the highest amount of investment in manufacturing.

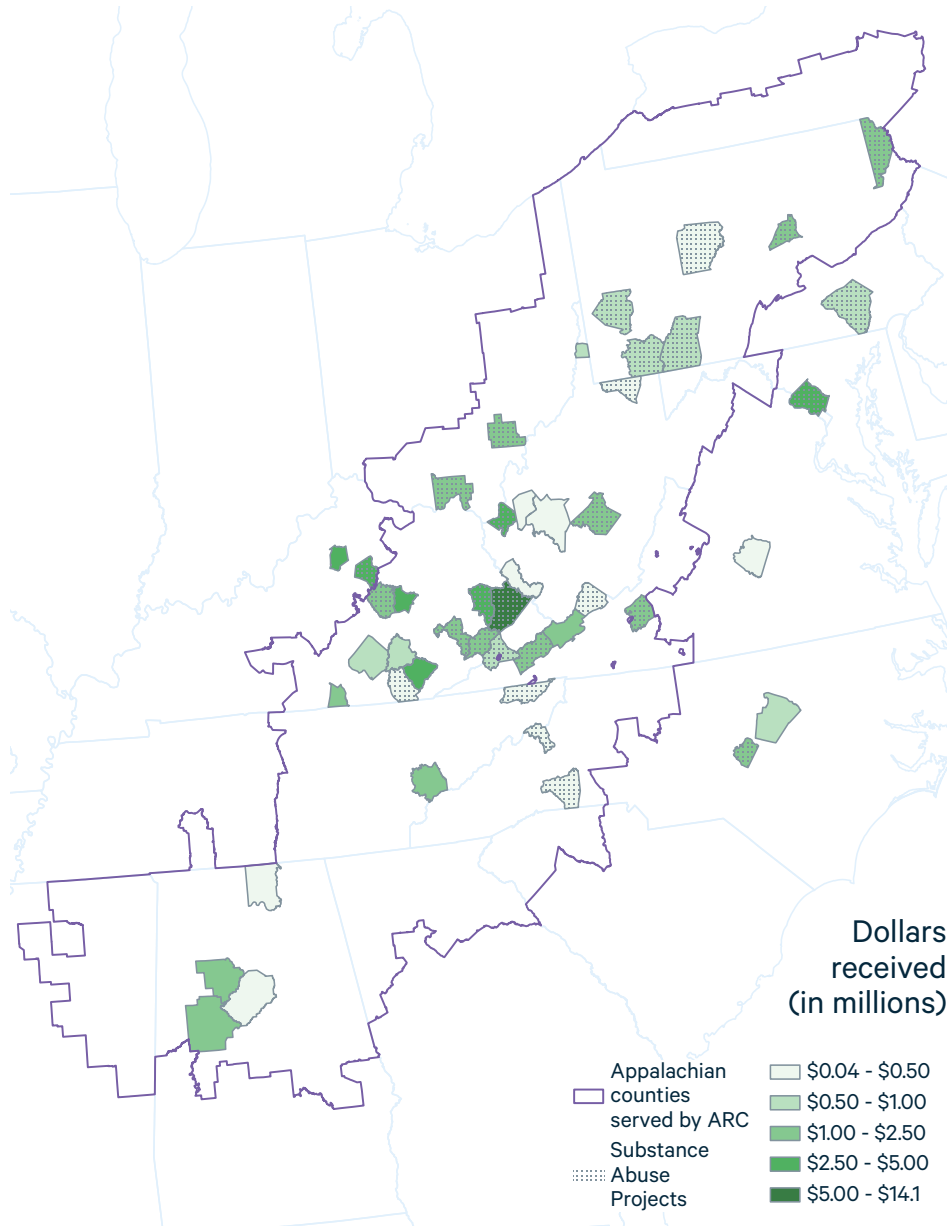
**Figure 21. Total Funds to Support Manufacturing**



Nearly 15 percent of the 484 grant awards (71 awards) and 20 percent of total funding represented in our data set was associated with a project that had a health and social services component. Over half of these projects, and all awards to grantees in Pennsylvania, were associated with addressing substance abuse. In addition to manufacturing, Kentucky also received the largest amount of health and social services-focused funds, more than six times the amount of the next highest state, West Virginia. Eight of the top 10 counties for spending on such projects were in Kentucky (Figure 22). As discussed in previous sections, Pike County has made substantial investments in the health care sector. Just two of these types of projects were in coal counties in the western US, and both supported training programs in the

health sector. Overall, 27 percent of education and workforce development projects supported training programs for health and social services.

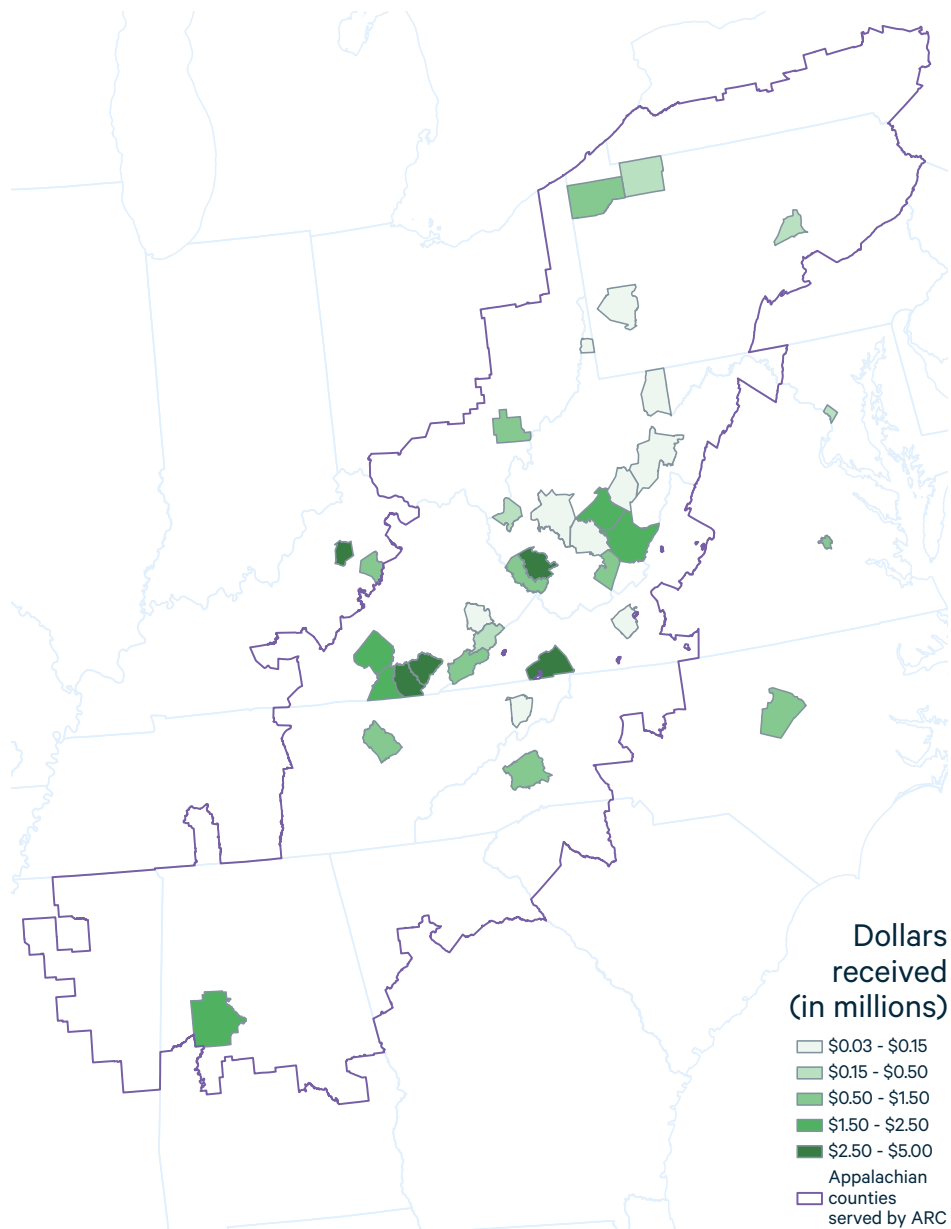
**Figure 22. Total Funds to Support Health and Social Services**



Fifty-one grants supported projects in the **tourism and hospitality** sector (Figure 23), such as tourist attractions, outdoor recreation facilities, museums, food service, hospitality, and culinary training. West Virginia has made a notable investment in trail construction in a central corridor of the state. An organization called Friends of Southwest Virginia received four grants to develop, market, and brand outdoor recreation opportunities, such as developing access points to a river, a tourism

gateway center adjacent to a popular outdoor recreation area, and multiuse trail systems. In Kentucky, millions of dollars have been invested in Boone's Ridge, a wildlife-based tourism destination that has been in development for the past five years. Most of the tourism and hospitality projects were economic asset development or research, planning, and feasibility projects (see Section 6). Unlike manufacturing and health and social services, only 13 projects invested in workforce training for this industry.

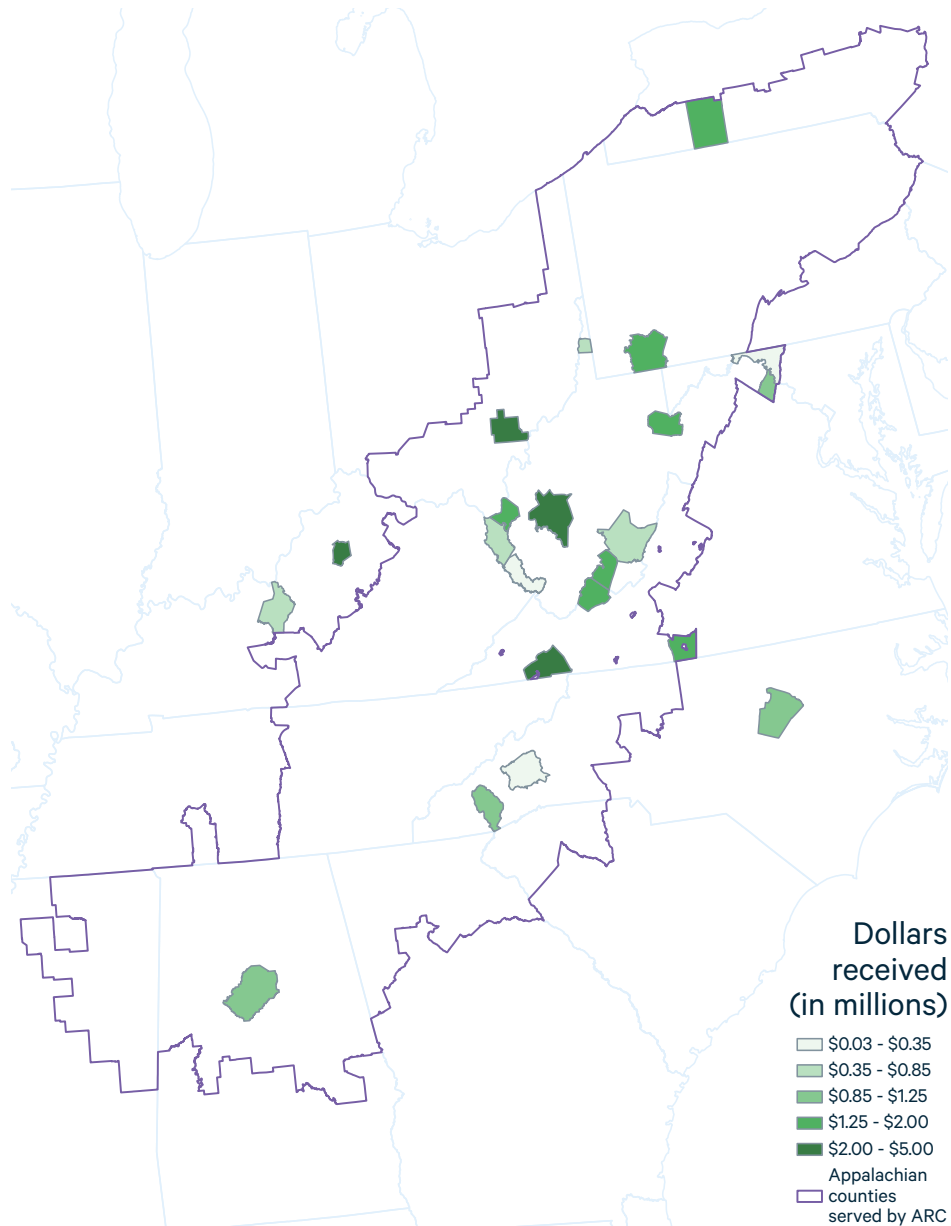
**Figure 23. Total Funds to Support Tourism and Hospitality**





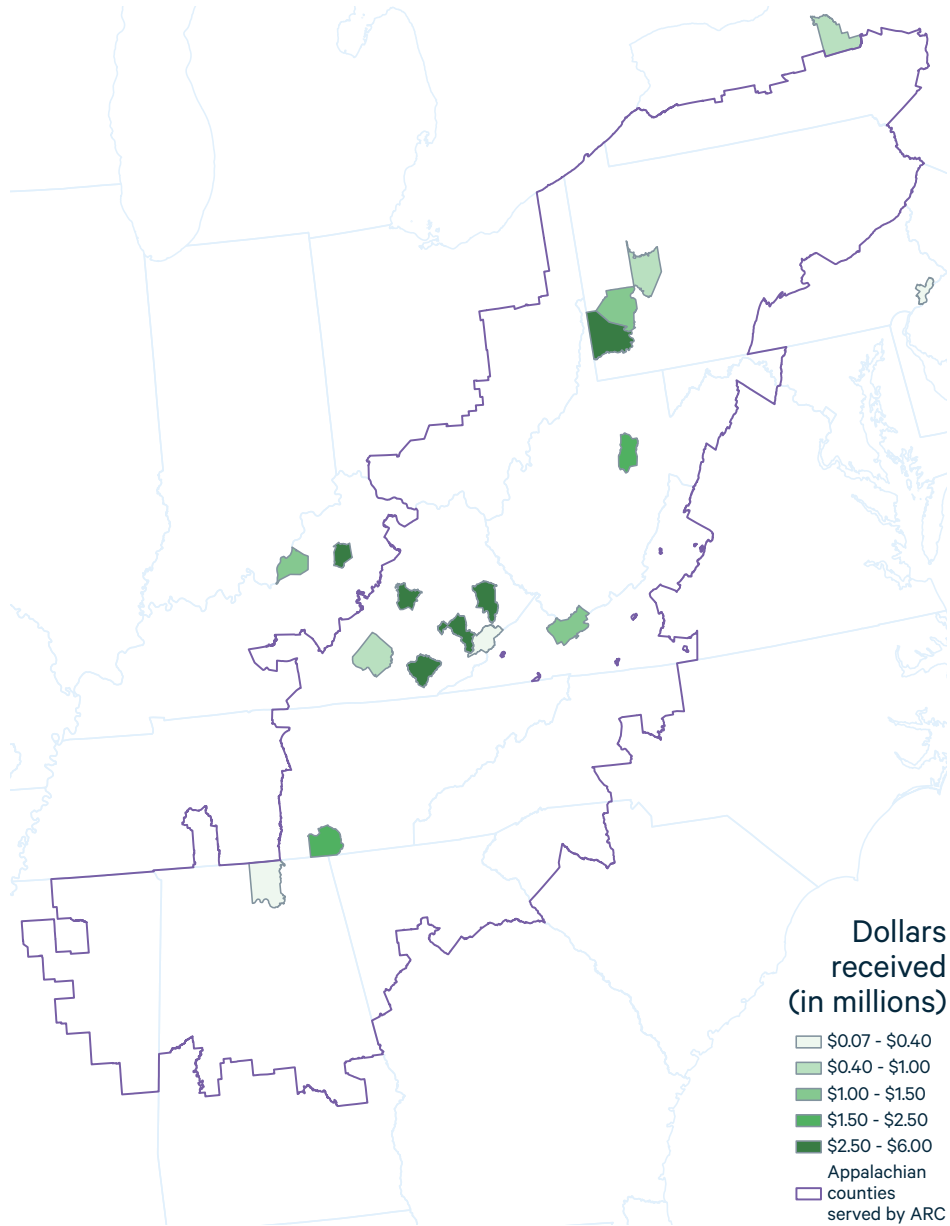
Agencies made 33 awards supporting **agriculture and forestry** projects. Attention to this sector has been concentrated in West Virginia (Figure 24). The majority of projects have business development aspects (see Section 6), providing capacity and resources to support small farming enterprises and develop markets.

**Figure 24. Total Funds to Support Agriculture and Forestry**



Twenty-seven awards supported **information technology**, such as career training or business development support for programming, cybersecurity, and artificial intelligence. Kentucky received the most funding to support development of the IT industry—five times that of the next highest state, Pennsylvania. Six of the top 10 counties that received funds for IT were in Kentucky (Figure 25). The majority of IT projects were education and workforce development projects.

**Figure 25. Total Funds to Support Information Technology**



Our findings reveal that little POWER funding went to support the **renewable energy** industry. Across all projects, we found that investments in the fossil fuel and chemical industry, particularly in Pennsylvania, were greater than those in the renewable energy sector. This could be due to many factors, including differences in the maturity of the industries, challenges for solar site suitability, or structural policy barriers that can reduce renewable energy deployment (Kentucky Energy and Environment Cabinet 2021; Shoemaker et al. 2019).

Lastly, we noticed very little support for **arts and design** and for **education and public service** sectors. These kinds of investments are important to consider as part of a comprehensive approach to inclusive community transition and economic and cultural development (Blankenship 2016; Fink 2020; Moayerian 2018; Taylor, Hufford, and Bilbrey 2017).

## 9. Conclusion

The US economy has been undergoing a major transition in how it produces and consumes energy. This transition has largely been driven by the rise of cheap natural gas and, to a lesser extent, by the increasing competitiveness of renewable energy technologies, lower-than-projected electricity demand, and other factors. In 2015, President Obama created the POWER Initiative, a multi-agency effort to assist coal communities experiencing job losses and economic decline because of the shift away from coal. This report provides a brief review of this trend from the perspective of the US coal economy, summarizes the features of the POWER Initiative (and its umbrella program, POWER Plus), and examines how POWER funds awarded between 2015 and 2020 were distributed in terms of geography, county economic status, project type, infrastructure type, and career sector. Our goal is to help policymakers and stakeholders better understand how policies to assist coal communities in transition have been implemented to date, and how they can be improved going forward.

An important finding is that relatively little federal funding has explicitly supported coal community transition. For example, if the available POWER funds we estimate through our research<sup>11</sup> were divided evenly across all 641 eligible coal counties we identify,<sup>12</sup> each county would have received approximately \$638,213 for the energy transition over a five-year period. According to our analysis, however, the POWER Initiative reached only 200 counties, and only 134 of these were counties we designated as coal counties.<sup>13</sup>

That said, POWER is not the only source of federal funds available to coal communities: various other programs, offered by Agriculture, Interior, Energy, Commerce, Labor, Transportation, Treasury, and other agencies support basic social safety net policies (including Medicare and Medicaid and unemployment insurance), workforce training, economic development, environmental remediation, and infrastructure expansion. Few of these programs, however, explicitly focus on coal communities and energy transition, as POWER did.

We also found an uneven geographic distribution of POWER funds across the country. Significantly more funding has been available to coal communities in Appalachia than in other parts of the country. For example, between 2015 and 2020, ARC granted \$236.8 million in POWER funding, whereas the EDA, ETA, and SBA together granted just \$172.9 million—some of which also reached Appalachian counties. Some of this disparity arises because Appalachian coal counties face especially challenging economic, environmental, and social circumstances associated with energy transition and therefore have legitimately pressing needs.

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11 See Section 5 for a description of our POWER grant data set.

12 See Section 3 for a description of our method for identifying coal counties.

13 Some of the misalignment between funding and coal county status may be a function of how we geo-locate funding: we link to the location of the primary grantee, which may serve a coal county but be located outside that coal country. See Section 5 for a more detailed description of how we designate the locus of grant awards.

We also found a wide spread in cumulative award amounts received by individual counties—from \$30,000 to \$15.9 million. And we found that some coal counties, including those hurt by high job losses and those that are especially economically disadvantaged, received little to no direct POWER funding. Funding agencies should seek to understand whether these funding gaps are associated with communities' low capacity to apply for or manage grant funding, or whether some other kind of administrative or selection barrier prevents applications from these counties from being successful.

POWER-affiliated agencies between 2015 and 2020 awarded roughly \$410 million through a total of 484 grants across 200 counties in 30 states. The funds were applied to a diversity of projects—from workforce training and entrepreneurial support, to economic development planning and infrastructure development, to public health investments (such as substance abuse programs to deal with the opioid epidemic) and environmental remediation. POWER uniquely coordinated multiple agencies to offer a multipronged approach that has the potential to address the systemic challenges of energy transition and seize the new opportunities it presents. As federal energy transition policies are developed, it is important to learn from innovative programs like the POWER Initiative to determine best practices and thus serve the workers and communities who themselves have served our energy needs for—in many cases—more than a century.

# 10. Appendix

## A. Power Eligibility Requirements of ARC, EDA, and ETA

### *ARC Power Eligibility*

States serve as the gatekeepers for public and private nonprofit organizations that apply for grant funding through the ARC POWER Initiative, deciding which projects will be prioritized.

As of 2021, the following organizations are eligible for ARC's POWER Initiative:

- local development districts;
- Indian tribes or a consortium of Indian tribes;
- states and political subdivisions of states (e.g., counties, cities), including special-purpose units of a state or local government engaged in economic or infrastructure development activities, or a consortium of political subdivisions;
- institutions of higher education or a consortium of institutions of higher education; and
- public or private nonprofit organizations or associations.

Projects funded by ARC must benefit the Appalachian region, which comprises certain counties in Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, and West Virginia.

Projects are eligible for ARC POWER funding only if they are targeted in Appalachian communities that have been or will be affected by declines in the coal industry (including mining and coal-fired power production, as well as the supply chain of either). ARC considers economic indicators, labor market analyses, official announcements made by local and regional industries and firms, demographic data, and industry data for applicants to demonstrate the impact of the transition away from coal in their communities (Appalachian Regional Commission 2021).

### *EDA POWER and Assistance to Coal Communities (ACC) Eligibility*

EDA funds distributed under POWER and ACC were part of the agency's Economic Adjustment Assistance program, which requires that eligible projects be located in economically distressed areas and be based on a comprehensive economic development strategy<sup>14</sup> or similar document.

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14 For more information on comprehensive economic development strategies, see 13 C.F.R. § 303.7 and/or <https://eda.gov/ceds/>.



A region is deemed economically distressed by EDA if it demonstrates one of the following:

- an unemployment rate that is, for the most recent 24-month period, at least one percentage point greater than the national average;
- per capita income that is 80 percent or less of the national average; or
- a “special need” (severe unemployment or economic adjustment challenges), as determined by EDA (13 CFR § 301.3 2014; US Economic Development Administration 2016a).

#### *ETA POWER Dislocated Worker Grant Eligibility*

To be eligible for POWER Dislocated Worker Grants (no longer active), communities had to demonstrate that they had been impacted or were likely to be impacted by coal industry–related closures and layoffs considered a “qualifying event.” In a qualifying event, at least 50 job losses (from one or multiple layoffs) could be directly or indirectly attributed to the decline in the coal economy and had occurred in the previous 18 months. In some cases, an applicant could receive funding if the economy has been greatly impacted even if fewer than 50 jobs had been lost. Geographies or regions of need were not defined.

Two types of applicants were eligible for POWER Displaced Worker Grants: state agencies responsible for administering WIOA Title I activities, and tribal governments eligible for WIOA Section 166 programs. The grants required strategic planning and alignment with the economic development activities of ETA (Employment and Training Administration 2016).

## B. All Counties Receiving POWER Grants

**Table 13. POWER Awards, by County**

<b>County</b>	<b>State</b>	<b>Awards</b>	<b>Total funding</b>
Athens	Ohio	17	\$15,854,200
Pike	Kentucky	9	\$14,201,484
Kanawha	West Virginia	20	\$13,660,684
Cabell	West Virginia	13	\$10,911,753
Perry	Kentucky	10	\$10,196,294
Mercer	West Virginia	8	\$8,527,000
Allegheny	Pennsylvania	11	\$8,437,498
Washington	Virginia	9	\$8,005,527
Wayne	West Virginia	7	\$7,608,267
Mahoning	Ohio	8	\$7,355,944
Franklin	Kentucky	4	\$7,043,573
Pike	Indiana	3	\$7,038,018
Madison	Kentucky	6	\$6,586,060
Woodford	Kentucky	2	\$6,441,376
Floyd	Kentucky	3	\$5,274,500
Randolph	West Virginia	7	\$5,215,000
Fayette	Kentucky	4	\$5,127,966
Washington	Pennsylvania	5	\$5,057,559
Knox	Kentucky	2	\$4,500,000
Logan	West Virginia	4	\$4,450,410
Montgomery	Virginia	3	\$4,339,500
Scioto	Ohio	2	\$4,289,977
Pulaski	Kentucky	6	\$4,231,983
Union	Pennsylvania	4	\$4,030,343
Estill	Kentucky	1	\$4,000,000
Wise	Virginia	3	\$3,963,500
Madison	North Carolina	2	\$3,872,314
Jefferson	West Virginia	3	\$3,820,000
McCreary	Kentucky	2	\$3,779,760
Tazewell	Virginia	3	\$3,425,666
Walker	Alabama	2	\$3,420,000
Monongalia	West Virginia	8	\$3,359,570
Mingo	West Virginia	5	\$3,318,980

**Table 13, continued. POWER Awards, by County**

<b>County</b>	<b>State</b>	<b>Awards</b>	<b>Total funding</b>
McKinley	New Mexico	4	\$3,304,400
Clearfield	Pennsylvania	3	\$3,225,850
Whitley	Kentucky	3	\$3,155,200
Ohio	Kentucky	1	\$3,000,000
Montgomery	Maryland	4	\$3,000,000
Bradford	Pennsylvania	1	\$3,000,000
Tuscaloosa	Alabama	2	\$2,960,145
Blair	Pennsylvania	5	\$2,883,315
Nicholas	West Virginia	4	\$2,873,345
Morton	North Dakota	1	\$2,866,400
Barbour	West Virginia	2	\$2,826,400
Sheridan	Wyoming	2	\$2,758,559
Lucas	Ohio	1	\$2,716,716
Fayette	Pennsylvania	3	\$2,687,368
Breathitt	Kentucky	2	\$2,656,419
Putnam	West Virginia	4	\$2,522,989
Gallia	Ohio	1	\$2,500,000
Tioga	Pennsylvania	1	\$2,500,000
Centre	Pennsylvania	2	\$2,447,898
Jefferson	Alabama	4	\$2,391,017
Warren	Pennsylvania	3	\$2,374,730
Montgomery	Pennsylvania	1	\$2,350,000
Dauphin	Pennsylvania	3	\$2,314,100
Upshur	West Virginia	1	\$2,285,149
Letcher	Kentucky	5	\$2,281,320
Washington	Tennessee	3	\$2,272,265
Laurel	Kentucky	2	\$2,240,510
Greenbrier	West Virginia	2	\$2,158,280
Bedford	Tennessee	1	\$2,147,125
Perry	Indiana	1	\$2,037,600
Greenup	Kentucky	1	\$2,000,000
Lewis and Clark	Montana	1	\$2,000,000
Franklin	Ohio	2	\$2,000,000
Marion	West Virginia	4	\$1,978,245
Harrison	West Virginia	1	\$1,960,000

**Table 13, continued. POWER Awards, by County**

<b>County</b>	<b>State</b>	<b>Awards</b>	<b>Total funding</b>
Washington	Ohio	4	\$1,921,274
Juniata	Pennsylvania	1	\$1,890,000
Raleigh	West Virginia	4	\$1,845,800
Wake	North Carolina	3	\$1,832,213
McDowell	West Virginia	2	\$1,819,700
Montgomery	Alabama	1	\$1,750,000
Orange	North Carolina	1	\$1,747,806
Campbell	Wyoming	2	\$1,700,877
Sullivan	Tennessee	3	\$1,675,640
San Miguel	Colorado	2	\$1,604,966
Venango	Pennsylvania	2	\$1,600,000
Blount	Tennessee	2	\$1,581,400
Knox	Tennessee	3	\$1,577,320
Russell	Virginia	2	\$1,561,603
Steuben	New York	1	\$1,552,554
Bristol	Massachusetts	3	\$1,527,125
Richmond City	Virginia	3	\$1,511,755
Marion	Tennessee	1	\$1,501,499
Johnson	Tennessee	1	\$1,501,400
Clinton	Kentucky	1	\$1,500,000
Jefferson	Kentucky	1	\$1,500,000
Johnson	Kentucky	1	\$1,500,000
Allegany	New York	1	\$1,500,000
Lee	North Carolina	1	\$1,500,000
Rogers	Oklahoma	1	\$1,500,000
Crawford	Pennsylvania	1	\$1,500,000
Erie	Pennsylvania	2	\$1,500,000
Wayne	Pennsylvania	1	\$1,500,000
Meigs	Tennessee	1	\$1,500,000
Henry	Virginia	1	\$1,500,000
Pocahontas	West Virginia	1	\$1,500,000
Summers	West Virginia	1	\$1,499,993
Tucker	West Virginia	1	\$1,499,400
Unicoi	Tennessee	4	\$1,496,065
Radford*	Virginia	1	\$1,494,000

**Table 13, continued. POWER Awards, by County**

<b>County</b>	<b>State</b>	<b>Awards</b>	<b>Total funding</b>
Braxton	West Virginia	1	\$1,478,100
District of Columbia	District of Columbia	6	\$1,415,691
San Juan	New Mexico	1	\$1,400,000
Mason	Kentucky	1	\$1,290,000
Cambria	Pennsylvania	1	\$1,281,900
Morgan	Tennessee	1	\$1,271,432
Montrose	Colorado	1	\$1,257,800
Jackson	North Carolina	1	\$1,250,000
Vinton	Ohio	2	\$1,229,000
Hopkins	Kentucky	3	\$1,227,893
Lewis	Washington	5	\$1,175,916
Scott	Virginia	4	\$1,167,315
Coconino	Arizona	4	\$1,118,377
Putnam	Georgia	1	\$1,116,675
Clarion	Pennsylvania	1	\$1,100,000
Hancock	West Virginia	3	\$1,100,000
Laramie	Wyoming	1	\$1,080,465
Burke	North Carolina	2	\$1,076,150
Wyoming	West Virginia	1	\$1,055,001
Lancaster	Pennsylvania	1	\$1,000,000
Somerset	Pennsylvania	1	\$1,000,000
Bath	Virginia	1	\$1,000,000
Lauderdale	Alabama	1	\$997,150
Henderson	Kentucky	1	\$990,700
Harlan	Kentucky	3	\$976,250
Buncombe	North Carolina	2	\$974,487
Knott	Kentucky	2	\$917,582
Hawkins	Tennessee	1	\$862,017
Ohio	West Virginia	2	\$846,924
Jefferson	Ohio	1	\$836,332
Cattaraugus	New York	2	\$821,304
Armstrong	Pennsylvania	2	\$800,000
Davis	Utah	1	\$800,000
Salt Lake	Utah	1	\$790,118
Marion	Alabama	1	\$774,912

**Table 13, continued. POWER Awards, by County**

<b>County</b>	<b>State</b>	<b>Awards</b>	<b>Total funding</b>
Knox	Indiana	1	\$732,080
Oktibbeha	Mississippi	1	\$730,559
Delta	Colorado	1	\$680,000
Elk	Pennsylvania	2	\$660,000
Bedford	Pennsylvania	1	\$616,758
Beaver	Pennsylvania	1	\$587,950
Gunnison	Colorado	1	\$576,271
Travis	Texas	1	\$559,005
Rosebud	Montana	6	\$550,000
Rowan	Kentucky	2	\$547,305
Hardin	Kentucky	2	\$543,635
Lincoln	West Virginia	1	\$540,000
Lawrence	Ohio	1	\$538,200
Erie	New York	2	\$522,500
Buckingham	Virginia	1	\$459,764
Burleigh	North Dakota	1	\$415,256
Madison	New York	1	\$404,170
Navajo	Arizona	3	\$386,506
Apache	Arizona	2	\$301,916
Fayette	West Virginia	4	\$261,481
Anderson	Tennessee	1	\$250,000
Maricopa	Arizona	2	\$219,145
Milam	Texas	1	\$212,500
Garfield	Colorado	1	\$200,000
Cook	Illinois	1	\$200,000
Emery	Utah	1	\$200,000
Philadelphia	Pennsylvania	2	\$180,142
Duval	Florida	1	\$150,000
Mitchell	North Carolina	2	\$150,000
Lincoln	Wyoming	1	\$138,950
Summit	Colorado	1	\$100,000
Suffolk	Massachusetts	1	\$100,000
Albany	Wyoming	1	\$100,000
Norton*	Virginia	1	\$99,670
Forsyth	North Carolina	1	\$99,000

**Table 13, continued. POWER Awards, by County**

<b>County</b>	<b>State</b>	<b>Awards</b>	<b>Total funding</b>
Madison	Alabama	1	\$77,680
Trumbull	Ohio	2	\$77,450
Lewis	Kentucky	1	\$76,000
Bay	Michigan	1	\$63,000
Chautauqua	New York	1	\$60,000
Webster	West Virginia	1	\$60,000
La Crosse	Wisconsin	1	\$50,222
Moffat	Colorado	1	\$50,000
Carter	Kentucky	1	\$50,000
Washington	Maryland	1	\$50,000
Huron	Michigan	1	\$50,000
St. Clair	Michigan	1	\$50,000
Rutherford	North Carolina	1	\$50,000
Noble	Ohio	1	\$50,000
Greene	Pennsylvania	1	\$50,000
Lackawanna	Pennsylvania	1	\$50,000
Preston	West Virginia	1	\$50,000
Watauga	North Carolina	1	\$49,940
Allegany	Maryland	1	\$48,000
Stark	Ohio	1	\$41,065
Lawrence	Tennessee	1	\$35,000
Grayson	Virginia	1	\$34,750
Pulaski	Virginia	1	\$32,940
Ashtabula	Ohio	1	\$30,000

\*Incorporated city in Virginia, added to its surrounding county for mapping calculations.

## C. Sectors Targeted by POWER Grants

**Table 14. Industry and Career Categories, by Sector**

Industry	Associated occupations, businesses, training, and services
Digital or technology services	Cyber security Computer programming (includes software school and software engineering) Artificial intelligence Information technology Business technologies
Critical infrastructure	Telecommunications Electric utility infrastructure maintenance and development Water and wastewater Broadband service and technology Broadband fiber installation Environmental reclamation and remediation Electrical metering services
Manufacturing (metals, food, aviation, automobiles, textiles)	Machining Food processing Pneumatics Hydraulics Industrial maintenance Automation Electronics Robotics Mechatronics Automotive Electrician services
Equipment operation and maintenance	Diesel mechanics and technology Heavy equipment operations Automotive maintenance
Tourism and hospitality	Tourism and hospitality Outdoor recreation Culinary training and arts Food service Museum or visitor center
Agriculture and forestry	
Fossil fuels and chemicals	Extraction, processing, and distribution of fossil fuels Alternative coal product research and development Chemicals and petrochemical industry



**Table 14, continued. Industry and Career Categories, by Sector**

Industry	Associated occupations, businesses, training, and services
Health and social services	Substance abuse therapy Optometry Neonatal intensive care Cancer treatment and care Telehealth expansion Pediatrics and childcare Urgent care and emergency response Cardiology Community health
Transportation, logistics, and supply chain management	Trucking Freight (rail, riverport) Supply chain management
Building construction	Building construction HVAC Energy efficiency Electrician services
Aviation and aerospace	Drone operation Aviation maintenance Pilot certification Aerospace certification
Arts, design, and entertainment	Multimedia design Craftworkers
Education and public service	Education Local leadership
Fossil fuels and chemicals	Extraction, processing, and distribution of fossil fuels Alternative coal product research and development Chemicals and petrochemical industry
Welding*	

\*Though welding is more a skill than an industry, we list it as a standalone category because welders are employed in numerous industries.

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