

North Central PA Regional Freight and Mobility Strategic Plan

White Paper: Transitioning from a Coal-based Economy

June 2020



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Summary

This white paper addresses the impacts of the decline of the coal industry in North Central Pennsylvania and potential strategies to deploy to support and strengthen the region's economic outlook in the coming years. The white paper has been prepared as part of a regional freight plan prepared by the North Central Pennsylvania Regional Planning & Development Commission (NCPRPDC) Rural Planning Organization (RPO).

Facts

- Appalachia has been hard hit by the decline of the coal mining industry which has decreased 45% in the past 10 years, more than two times the national decrease of 21%.
- Pennsylvania Department of Environmental Protection (PADEP) reports coal industry employment in Pennsylvania's bituminous coal mines, those found in North Central Pennsylvania, peaked in 1923 at 200,538. In 2018 bituminous coal mine employment was just 4,401.
- In 1999 11% of bituminous coal mine workers were employed in North Central Pennsylvania. Today, just 5% or 241 of Pennsylvania's 4,401 coal mine workers are from the North Central Pennsylvania region.
- Over the past 20 years North Central Pennsylvania's coal mine employment dropped from 962 in 2008 to 241 in 2018.
- Pennsylvania is still the 3rd largest coal producing state in the nation; however, coal production in North Central Pennsylvania has decreased by 84.7% since 2006.
- Pennsylvania was 2nd only to West Virginia as the largest coal-exporting state in 2018.
- Companies in the coal industry's regional supply chain have been impacted by the downturn in coal, with up to 80% losses in coal focused product lines reported. This has required the supply chain to shift market focus, ultimately resulting in greater diversification of the region's industrial base.
- Over the past 10 years, over \$42.8 million has been invested in reclamation projects in the North Central Pennsylvania region through federal and state funds.
- Nearly 1,100 acres have been reclaimed with 74% of the acreage (805 acres) in Clearfield County.
- The Abandoned Mine Land Reclamation Economic Development Pilot Program has funded 3 projects totaling over \$3M in North Central Pennsylvania, each in Clearfield County.
- Pennsylvania and local governments do not own or control abandoned mine land; therefore, working with property owners is the best way to address abandoned mine lands in the future.

Estimates

- The loss of 100 North Central Pennsylvania coal mine jobs is estimated to result in the cumulative loss of 183 jobs total including direct, indirect, and induced jobs; lost wages totaling more than \$12.3 M; and lost output, including tax revenues, of over \$74.6 M.
- A contraction in coal industry employment impacts transportation including trucking, and especially rail. The loss of 100 coal mine jobs is estimated to result in the loss of 10 railroad jobs with an indirect output loss of \$1.7 M.
- Induced job losses would likely impact local health care, restaurants, real estate, retail, banking, lodging, and education establishments.

Transitioning from a Coal-based Economy

Trends

Global Energy

- Global energy demand is 10 times higher than it was in 1919 and fuel sources have diversified as well. Coal, wood, and oil are being replaced by a diverse array of energy sources including nuclear, natural gas, and renewables.
- Globally, 850 million people lack electricity, increasing demand as well as increasing opportunities to supply the demand. Africa is rapidly urbanizing with energy vital for the continent's development.
- Current global energy policies show that solar and other renewables are rapidly increasing and by 2040 renewable sources will account for nearly half of power generation.
- Continual energy sources such as gas and coal are being replaced by variable energy sources such as wind and solar.
- To ensure the future reliability of renewable energy sources, technology advances and improvements to legacy infrastructure systems are required.
- The use of oil and gas is continuing to be impacted by shale development.

U.S. Energy

- Petroleum, natural gas, and coal have accounted for close to 80% of energy consumption in the U.S. for more than a century.
- In 2019, renewable energy consumption exceeded coal for the first time since in over 130 years.
- The shift away from coal is driven by environmental, economic, and political/public factors.
- While U.S. energy consumption reached a record high of 101.3 quadrillion BTUs in 2018, it decreased slightly to 100.2 quadrillion BTUs in 2019.
- For the first time since the 1950s, the nation's energy production exceeded consumption in 2019.
- 2017 was the first year that zero-carbon energy sources (wind, solar, and geothermal; hydropower; and nuclear) were the leading source of power generation in the U.S.
- The use of abandoned mine lands for renewable energy is a current trend as communities across the country are starting to look at abandoned mined lands for energy source development.

Pennsylvania Energy

- Natural gas has rapidly replaced coal as an energy source in Pennsylvania.
- Coal accounted for 55% of the Commonwealth's energy generation in 2005, dropping to 21% in 2018. During the same time period the use of natural gas as an energy generation source increased from 5% to 35%.
- The bulk of coal mined in Pennsylvania for energy generation is sent to other states. Nearly half of the coal consumed by Pennsylvania power and industrial plants was brought in by nearby states.
- During the past two years, PA DEP's Energy Office reports that solar developers have been seeking locations throughout Pennsylvania to site solar installations. This is reportedly being driven by existing capacity in Pennsylvania's transmission infrastructure left vacant by coal as an energy source.
- In June 2019, the *Pittsburgh Post-Gazette* documented 11 potential solar farms across Pennsylvania, including one in Potter County.

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- From PA DEP's perspective, locating wind and solar generation on Pennsylvania's mine lands has been discussed, but activity has not moved past discussion level.
- The Appalachian Regional Commission has invested funds to revitalize abandoned mine lands through renewable energy projects.

Trade Policies

While geopolitical trade policies directly impact the export of Pennsylvania coal, Pennsylvania coal companies strive to remain agile, explore new markets, and position resources for future opportunities.

Partners

- County and regional workforce and economic development professionals actively work to diversify North Central Pennsylvania's economy and find employment opportunities for workers.
- NCRPDC has been working with industry to find new uses for coal, particularly in powdered metals manufacturing.
- PA DEP officials in both the mining and energy disciplines are available to work with the region to reclaim abandoned mine lands and seek creative solutions to promote economic growth.
- Through the POWER Initiative the Appalachian Regional Commission has invested over \$190 M in assisting Appalachia in revitalizing communities since 2016.
- The NCRPDC Export Marketing Program was identified as particularly helpful in providing entrance to international markets through overseas trade missions and technical assistance.

Opportunity

In summary, a coordinated effort should be undertaken to leverage the expansion of existing and potential industry opportunities to mitigate the rapid changes in the coal industry. This work is already well underway in North Central Pennsylvania through the efforts of economic development and workforce partners. This effort requires a continued focus on industries aligning with regional strengths as well as ensuring residents are trained to meet industry need. These efforts will result in a more resilient, diversified economy for the benefit of North Central Pennsylvania's communities now and in the future.

- Strategy 1 - Continue to position the North Central Pennsylvania region for future industrial growth
 - Strengthen specialized clusters such as plastics, information technology, and electric power in conjunction with county economic development organizations
 - Prepare for an inventory of shovel-ready sites and move-in-ready spec buildings
- Strategy 2 - Explore available opportunities for repurposing abandoned mine lands
 - Assess potential location for solar energy development or energy related manufacturing
 - Discover a potential location for ACR POWER initiative funding
 - Monitor the potential passage of Pennsylvania HB531 of 2019 which would enable community solar projects in Pennsylvania.
- Strategy 3 - Continue to advance North Central Pennsylvania's natural, cultural, and structural assets
 - Attract new businesses and workers by promoting the region's vast nature-based assets
- Strategy 4 - Continue to retrain workers and attract new workers
 - Continue to support Workforce Solutions' goals of attracting and retaining workers
- Strategy 5 - Collaborate to maximize funding & financing

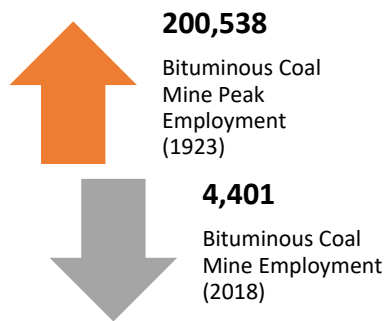
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- Leverage scarce funding resources by collaborating on projects at the local, regional, state, and federal levels

I. Background: North Central Pennsylvania Coal Industry

Fueling the Industrial Revolution

Pennsylvania is home to a proud coal heritage. The Commonwealth's coal industry provided power for the nation's Industrial Revolution, heated homes and businesses, supplied critical energy to manufacture supplies and equipment to fight two world wars, and employed over 380,000 people at its peak.¹ Within the bituminous coal mines of Western and North Central Pennsylvania counties alone, over 200,500 coal



miners worked in mines during peak employment in 1923. These jobs were the economic backbone for communities where mines were located.

The early coal mining industry did not, however, come without risks with over 51,000 coal miners losing their lives in mine related fatalities, including the first woman in the U.S. to lose her life in a deep mine accident in 1979 in Clearfield County.² Technological advances in mining coal improved mine safety and by the 1940s the industry saw a marked drop in fatalities. Technological advances

also lead to greater efficiencies and improved automation that like in many industries that experienced technological innovation, resulted in a decreased need for workers. Coal industry employment levels also dropped due to the decline of steel industry manufacturing in the United States. Much of the coal mined in the first half of the 20th century was directed into steel production, and by the latter half of the century coal use was redirected into electricity generation.

Anthracite & Bituminous Coal

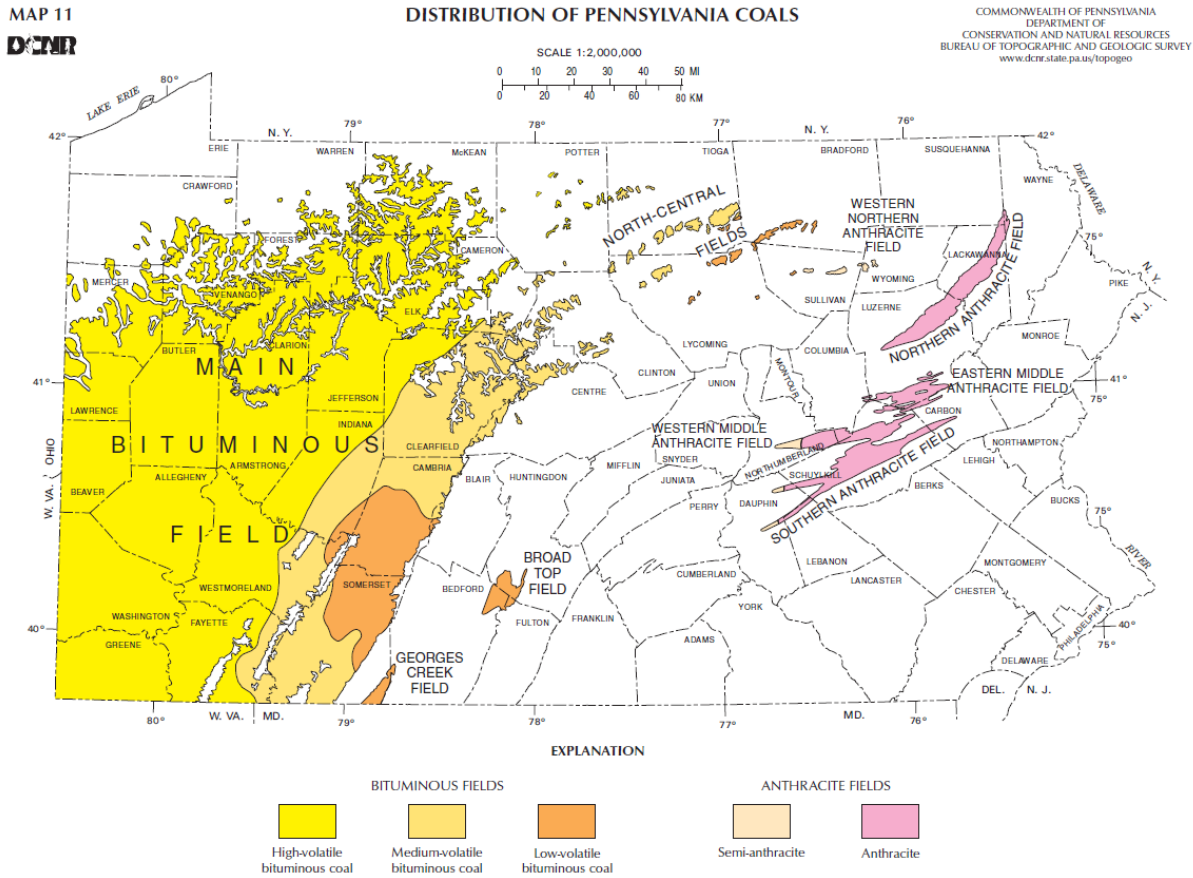
The majority of the North Central Pennsylvania region is underlain by bituminous coal seams. Bituminous coal extraction began in the late 1700s in Mount Washington near Pittsburgh. With its high heat value, bituminous coal is the most common type of coal used to generate electricity in the U.S. The rise of steel manufacturing in Pittsburgh in the late 1800s fueled the industrial revolution and began an intense period of coal extraction from Pennsylvania's western coal fields. Anthracite coal, often referred to as 'hard coal', burns with intense heat and is used primarily in metal production. Anthracite coal mining is concentrated in six eastern Pennsylvania counties.³

¹ PADEP, Bureau of Mining Programs, Anthracite and Bituminous Mining Activities 1870 – 2018.

² Clearfield County Comprehensive Plan 2006 Update, Chapter 4, p. 6.

³ PA DEP Office of Active and Abandoned Mining Operations Coal Mining in Pennsylvania. <https://www.dep.pa.gov/Business/Land/Mining/Pages/PA-Mining-History.aspx>.

Exhibit 1 – Pennsylvania’s Coal Fields



Source: PA DCNR, Distribution of Pennsylvania Coals.

HISTORICAL & ECONOMIC IMPORTANCE OF NORTH CENTRAL’S NATURAL RESOURCES

The region’s natural resources truly helped build this nation. While the focus of this white paper is coal, vast amounts of timber were forested to build communities not only in the region but throughout the world. Lumber continues to be an economic driver in the region. Fire clay was mined and used to manufacture refractory bricks, making Clearfield County a global leader in manufacturing during the late 1800s. These natural resources helped create economically prosperous communities throughout North Central Pennsylvania.

Coal Production & Distribution

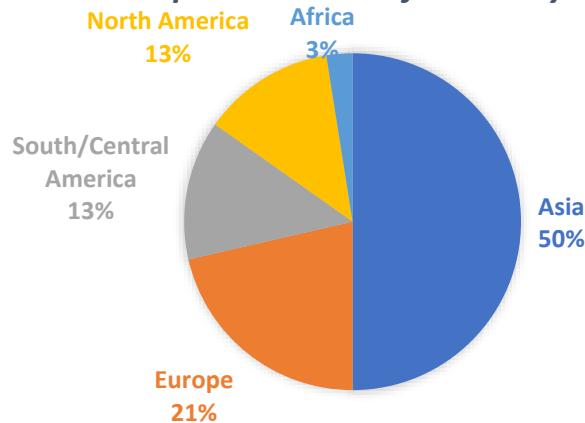
Pennsylvania is still the 3rd largest coal producing state; however, coal production in North Central Pennsylvania has decreased by 84.7% since 2006.

Pennsylvania's coal lies within the country's Appalachian coal producing region. Appalachia has been hard hit by the decline of the coal mining industry which has decreased 45% in the past 10 years, more than two times the national decrease of 21%.⁴

While coal production has taken a significant downturn, from a national perspective Pennsylvania is still a major coal producer, number 3 behind Wyoming and West Virginia as the top coal producing states in 2018.⁵

Pennsylvania's coal is transported by rail, barge, and truck around and out of Pennsylvania. From an export perspective, Pennsylvania was 2nd only to West Virginia as the largest coal-exporting state in 2018, with over one-quarter of the coal mined exported to other countries.⁶ Of that amount, over 98 percent was bituminous coal from western Pennsylvania counties.⁷ A total of 50% of Pennsylvania's coal is exported to Asia.⁸

Exhibit 2 – Top Destinations for Pennsylvania Coal



Source: USA Trade Online

Bituminous coal production peaked in 1918 at over 177 million tons. In the past twenty years, coal production in the North Central Pennsylvania region was the highest in 2006 at 7.3 million tons. The tonnage includes production from underground mines, surface mines, and coal refuse sites. As of 2018,

⁴ Kleinman Center for Energy Policy, Reimagining Pennsylvania's Coal Communities. May 23, 2018.

⁵ U.S. Energy Information Administration, State Profile and Energy Estimates, Rankings: Coal Production, 2018. Accessed at: <https://www.eia.gov/state/rankings/?sid=PA#series/48>.

⁶ U.S. EIA, <https://www.eia.gov/state/print.php?sid=PA>.

⁷ U.S. EIA, https://www.eia.gov/coal/distribution/annual/pdf/o_18foreign.pdf.

⁸ USA Trade Online. <https://usatrade.census.gov/data/Perspective60/View/dispsview.aspx>. Includes coal and petroleum gases.

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coal production in the North Central Pennsylvania region was only 1.1 million tons, an 85% decrease since 2006.⁹

North Central Active Mining Locations

The number of active coal mine operations within the North Central region is a fraction of what it once was. Operations are primarily focused in Clearfield County as reflected by permit totals and production tonnage. There are currently 49 active permits in the North Central Pennsylvania region, 65% of the permits are in Clearfield County. The following exhibit lists permit totals and production tonnage for active underground mines and surface mines by county. There are currently no active coal refuse reprocessing sites in the region.

Exhibit 3 – North Central Active Coal Mine Permits and Production (2018)

County	Number of Permits	Production (tons)
Cameron	N/A	N/A
Clearfield	32	723,556
Elk	3	0
Jefferson	14	455,856
McKean	N/A	N/A
Potter	N/A	N/A
Total	49	1,179,412

Source: PA DEP Bureau of Mining 2018 Coal and Industrial Minerals Mining Activities.

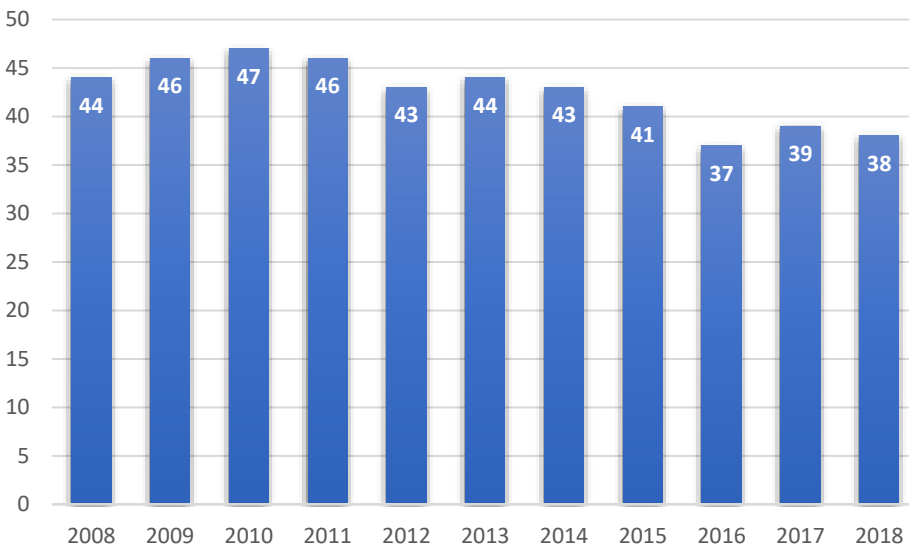
Since 1977 each permitted mine in Pennsylvania is required to be reclaimed per state and federal laws and regulations. Therefore, all active mines in the North Central Pennsylvania region will be reclaimed upon closure by each mining company (permit holder).

Mining Companies

The number of coal mining establishments has fluctuated over the past decade with a high of 47 in 2010 to a low of 37 in 2016. As the industry continues to feel the impact of changing energy policy and trade conditions, fluctuations in the number of companies are anticipated.

⁹ PA DEP Mining Reports, Bituminous Employees and Production Tonnage Listed by County.

Exhibit 4 – North Central Mining Companies (2008 – 2018)



Source: Workforce Solutions, JobsEQ®

Abandoned Coal Mine Sites

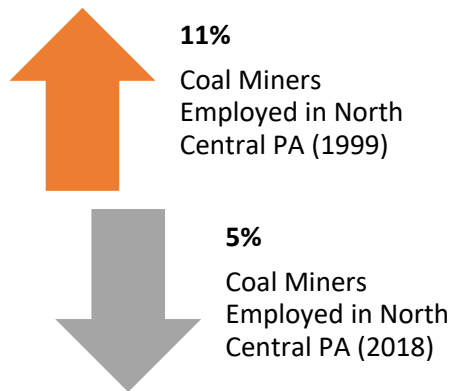
While coal mining helped shape the economic prosperity for many Pennsylvania families and communities, it has also left a lasting mark on the landscape of those same communities. Abandoned coal mines leave communities with environmental and safety hazards and according to PA DEP 250,000 acres of mine lands were left abandoned throughout Pennsylvania.¹⁰ Pennsylvania accounts for one-third of the country's abandoned mine lands (AML) resulting in varying environmental and safety concerns. Over \$1 billion of high-priority health and safety problems associated with Pennsylvania's abandoned mine lands have been identified in the federal Office of Surface Mining's AML Inventory System and are in need of reclamation.

Abandoned mine land sites have been identified in 43 of Pennsylvania's 67 counties. The North Central Pennsylvania region's abandoned mine lands are concentrated in the southern portion of the region. Clearfield and Jefferson counties have significant numbers of abandoned mine lands as do southern municipalities in Elk County. Few abandoned mine lands have been recorded in Cameron and McKean counties and no abandoned mine lands have been recorded in Potter County. PA DEP Abandoned Mine Land Inventory maps for [Clearfield](#), [Jefferson](#), [Elk](#), [Cameron](#), and [McKean](#) counties located in **Appendix A** demonstrate the extent of abandoned mine lands in the region.

¹⁰ PA DEP Bureau of Abandoned Mine Reclamation. PA's Mining Legacy and AML. <https://www.dep.pa.gov/Business/Land/Mining/AbandonedMineReclamation/AMLProgramInformation/Pages/PAs-Mining-Legacy-and-AML.aspx>.

II. Coal Industry Impact on Communities & Businesses

As noted earlier, the number of miners employed in Pennsylvania’s coal industry peaked in 1923. Bituminous coal mining production (tonnage) peaked in 1918 with over 158.8 million tons mined. This significant level of activity was a substantial economic driver, positively impacting all aspects of community life in coal communities throughout Appalachia. High paying jobs, active supply chains, tax revenues, and vibrant communities were facilitated in large part by the industry.



The economic prosperity delivered by the coal industry has waned, however. Since the mid-to-late 1940s, industry contraction led to a decline in community conditions. These impacts are documented in a report prepared by the Kleinman Center for Energy Policy at the University of Pennsylvania.¹¹ The report details the downturn of the industry based on research and stakeholder outreach with coal impacted communities and businesses. It identifies a series of high-level strategies communities can deploy to recover from the loss of the industry’s role as a significant job creator.

From a region-specific perspective, Workforce Solutions for North Central Pennsylvania (Workforce Solutions) and JobsEQ® have provided data demonstrating the economic impact of job loss in the region. The data estimates the current impact of losing 100 coal mine jobs in the region.

Employment and Wages

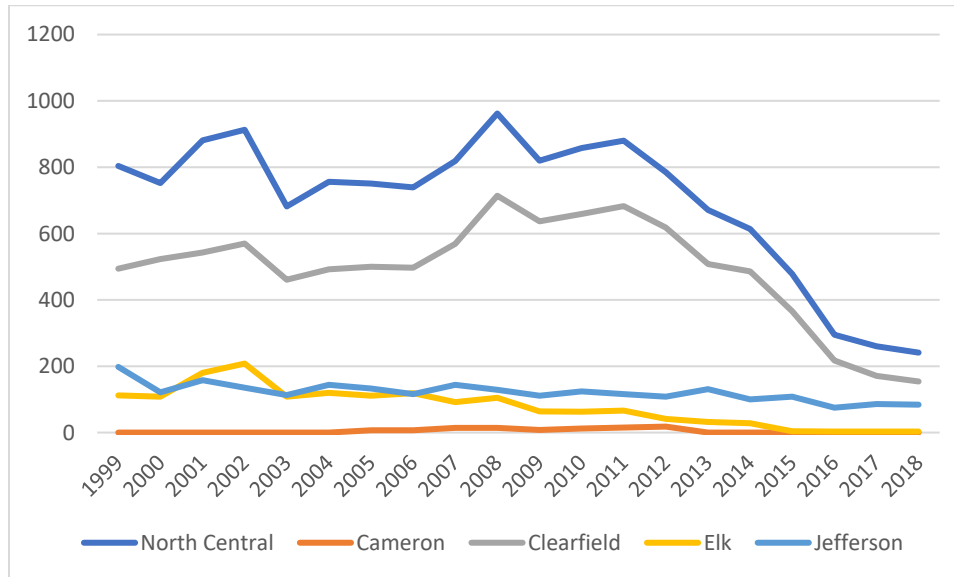
During the past 20 years, employment levels in Pennsylvania and the North Central region’s coal mining industry have declined significantly. Between 1999 and 2018, coal employment in the North Central Pennsylvania region decreased from 804 to 241, or 70%.¹² In 1999, 7,095 workers were employed in Pennsylvania’s bituminous coal mines with North Central Pennsylvania coal mine operations employing 11% of those workers. This percentage increased to nearly 14% in 2008 when 962 workers were employed in North Central Pennsylvania coal mines. Today, just 5%, or 241, of Pennsylvania’s 4,401 coal mine workers are from the North Central Pennsylvania region.

¹¹ Kleinman Center for Energy Policy, Reimagining Pennsylvania’s Coal Communities. May 23, 2018.

¹² PA DEP, Bureau of Mining Programs. Total employment includes underground mines, surface mines, and coal refuse sites.

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Exhibit 5 – North Central Coal Mining Industry Employment (1999 – 2018)



Source: PA DEP Bureau of Mining Programs.

A significant industry advantage to coal mining has been high-paying wages. Some jobs paying as much as \$80,000 per year, higher than Pennsylvania’s average industrial wage of \$51,848 in 2015.¹³

Data from the Pennsylvania Center for Workforce Information and Analysis (CWIA) confirms that mining industry wages continue to be higher than average wages in the North Central Pennsylvania region. The following table compares wages and the number of establishments in all industries and the mining industry in 2001 (the earliest year the data was reported by CWIA) and 2018. Mining industry wages in the North Central Pennsylvania region have continued to increase over time compared to average wage rates of all industries in the region.

Exhibit 6 – Mining vs. All Industries: Wages and Establishments (2001, 2018)

	2001		2018	
	All Industries	Mining	All Industries	Mining
Average Weekly Wage	\$508	\$616	\$791	\$1,121
Average Annual Wage	\$26,416	\$32,032	\$41,132	\$58,292
Number of Establishments	6,628	57	6,110	32

Source: PA Center for Workforce Information and Analysis, Quarterly Census of Employment and Wages.

Based on 3rd quarter 2019 data supplied by Workforce Solutions, wages are higher than reported in 2018 with average wages per worker of \$63,111, resulting in an average annual change of +2.7% over the past 10 years.

¹³ Kleinman Center for Energy Policy, Reimagining Pennsylvania’s Coal Communities. May 23, 2018. p. 17.

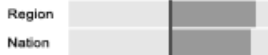
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\$63,111

Avg Wages per Worker / \$80,925 in the nation

2.7% 

Avg Ann % Change Last 10 Years / +2.5% in the US



Higher wages have made coal mining jobs particularly attractive, but the wages have also come with a wage premium that accounts for risk factors such as higher fatality rates, negative health impacts, and poor working conditions.¹⁴ While each of these risk factors has been mitigated over the past century with improved technology in both mining operations and health and safety, a coal miner nonetheless faces workplace risks, which are in turn compensated through higher wages. While high paying careers, such as medicine or law, require years of education and experience, a coal miner does not require an advanced

degree to succeed. With the shrinkage of the industry, displaced coal miners are faced with the challenge of trying to find a career with wages comparable to those found in the coal mining industry.¹⁵

NORTH CENTRAL PENNSYLVANIA COAL COMPANY SNAPSHOT

One coal company interviewed for this white paper reported wages with benefits averaging \$25.00/hour. When actively busy with customer projects, employees work five 10-hour days, translating to an annual salary with benefits of \$65,000. Company employees are seasoned, with many expected to retire in a few years. Workload is cyclical, particularly with changing coal industry regulations and trends. For the past 5 months, the company has cut back hours to four 10-hour days. The company's future growth and that of its over 100 employees is tied to fluid federal and state regulations and national and global environmental policy and trade trends.

For current coal miners, industry decline directly impacts their family's economic security. An experienced coal miner can earn \$100,000 a year along with benefits and likely a pension. Jobs in the industries often targeted by economic transition plans such as call centers, warehouses, and non-union manufacturing often pay much lower wages.¹⁶ Within the North Central region annual occupational wages are reported at \$35,330 for customer service representatives employed at call centers, \$37,680 for warehouse employees, and \$46,700 for manufacturing jobs.¹⁷

¹⁴ Kleinman Center for Energy Policy, Reimagining Pennsylvania's Coal Communities. May 23, 2018., p. 17.

¹⁵ Ibid., p. 17.

¹⁶ Time. Coals Last Kick. Accessed 12/12/19 at: <https://time.com/coals-last-kick/>.

¹⁷ PA L&I Center for Workforce Information & Analysis. Pennsylvania Occupational Wages, North Central Workforce Development Area. May 2018.

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Estimated Job and Wage Losses

The loss of 100 coal mine jobs is estimated to result in the loss of 183 jobs total. These include the 100 jobs attributed to the layoff of 100 coal mine workers; 44 indirect jobs, those jobs supported by business to business transactions between the coal mine company and its supply chain; and 38 induced jobs, jobs supported by household spending of individual coal mine workers.¹⁸

From a wage perspective, the loss of 100 coal mining jobs potentially equates to a region-wide reduction in wages totaling \$12,306,060 including:

- Lost wages from 100 coal mining jobs – \$7,450,038
- Lost wages from 44 indirect jobs – \$3,341,199
- Lost wages from 38 induced jobs – \$1,514,823

Population and Tax Revenues

A reduction in coal mining opportunities has left once prosperous communities with diminishing and limited job opportunities. Citizens are often forced to move out of communities, reducing real estate and per capita tax revenues as well. With the outmigration of businesses, once prosperous communities face declining tax revenues while needing to maintain aging infrastructure. To mitigate these negative impacts, county economic development strategies are focused on diversifying the industrial base.

Estimated Loss of Output

Reducing the region's workforce by 100 coal mine jobs is estimated to result in the loss of \$74,625,721 total output. Output includes company sales, labor income, and taxes.

- Lost output from 100 coal mining jobs – \$55,606,642
- Lost output from 44 indirect jobs – \$13,998,206
- Lost output from 38 induced jobs – \$5,020,873

Real Estate

Pennsylvania's coal communities are increasingly faced with remnant industrial structures and equipment, often with little opportunity to maintain and repair them. Residential structures may also be abandoned. Over time the outmigration of businesses and residents results in reduced property values, blighted properties and stagnant or distressed economies.

The loss of 74.6 million in output will likely impact the region's financial capacity to maintain and improve its stock of housing, structures, and infrastructure in the long term.

Supply Chain

Companies that support North Central Pennsylvania's coal mining companies have been impacted by the industry's contraction. As an example, Joy Global in Venango County was a manufacturer of equipment used in many underground mining production processes. The company closed in 2016, impacting 1,200

¹⁸ Workforce Solutions, JobsEQ®. *North Central Workforce Development Area Annual Impact of Mining (except Oil and Gas) (Event Size = 100)*. January 29, 2020.

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workers. Operations were eventually sold and transferred to Komatsu Global and while many jobs have been regained, employment has not reached levels prior to the downturn in the coal industry.

Similarly, Brookville Equipment, a locomotive manufacturer and refurbisher in Jefferson County, relied on the coal industry for 80% of its business until 2008. The company manufactured and serviced locomotives and personnel carriers for the coal industry. Facing the downturn of a significant industry base, the company has since pivoted to the manufacture of light rail transit (subway cars, street cars).

The transportation industry has also been impacted by coal industry decline, with trucking firms particularly vulnerable to the economic variability of the industries they serve. Local trucking firms report that downturn in resource intensive industries such as coal and timber/lumbering have impacted their bottom line. One local trucking firm with operations in Pennsylvania, New York, and North Carolina reports that only their North Carolina operation is expected to grow in the short term. The combination of current market conditions combined with North Central Pennsylvania's rural road network, is suppressing regional growth in the short term.

The region's short line rail roads and ultimately Class I railroads have also been impacted by the downturn in the coal industry. One railroad reports that its customer base has been impacted by regional industry decline, especially the coal industry. Coal companies report their use of short line rail roads for transporting coal to ports, typically to the Port of Virginia or Port of Baltimore, fluctuates based on market conditions. One company currently reports their customer base is 75% international which bodes well for the railroad industry. A contraction in the coal industry and the loss of jobs especially impacts rail transportation. The loss of 100 coal mine jobs is estimated to result in the loss of 10 railroad jobs with an indirect output loss of \$1,746,941.

Beyond transportation, other supply chain industries likely impacted by the contraction of the coal industry include machinery and equipment manufacturing, engineering, and administrative support. As of the 3rd quarter 2019, mining companies in the North Central Pennsylvania region are estimated to make \$134.9 M in annual purchases from U.S. suppliers, 28% or \$37.9 M is expected to be purchases from businesses within the region.

Exhibit 7 – Coal Mining Industry Supply Chain Annual Purchases (2019)

3-digit Supplier Industries	In-Region Purchases (M)	Out-of-Region Purchases (M)
Mining (except Oil and Gas)	\$18.1	\$2.2
Machinery Manufacturing	\$1.6	\$11.8
Professional, Scientific, and Technical Services	\$2.2	\$9.2
Petroleum and Coal Products Manufacturing	<\$0.1	\$9.2
Merchant Wholesalers, Durable Goods	\$0.8	\$5.2
Remaining Supplier Industries	\$15.1	\$59.4
Total	\$37.9	\$97.0

Source: Workforce Solutions, JobsEQ®

The supply chain impacts also stretch to retail and consumer services. Beyond direct coal jobs and the industry's supply chain, the industry decline impacts local health care, restaurants, real estate, retail,

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banking, lodging, and education. The loss of these jobs continues the hollowing out of communities. Stakeholders participating in the Kleinman Center for Energy Policy study reported that more jobs have been lost in the coal supply chain than in coal companies themselves.

While coal usage is in fact declining, a May 2019 study completed by the Allegheny Conference on Community Development for the Pennsylvania Coal Alliance reports that coal mining still contributes nearly \$7 billion in economic activity in Pennsylvania. This amount includes \$4.6 billion from direct mining operations and \$2.27 billion in indirect and induced economic impacts.¹⁹

Estimated Supply Chain Impacts

As noted previously, the loss of 100 North Central coal mining jobs is estimated to result in the loss of 44 indirect jobs from supply chain transactions, and 38 jobs from induced local spending transactions. In terms of output this equates to the loss of \$13,998,206 in indirect output and \$5,020,873 in induced output.

III. National and International Trends Impacting Coal

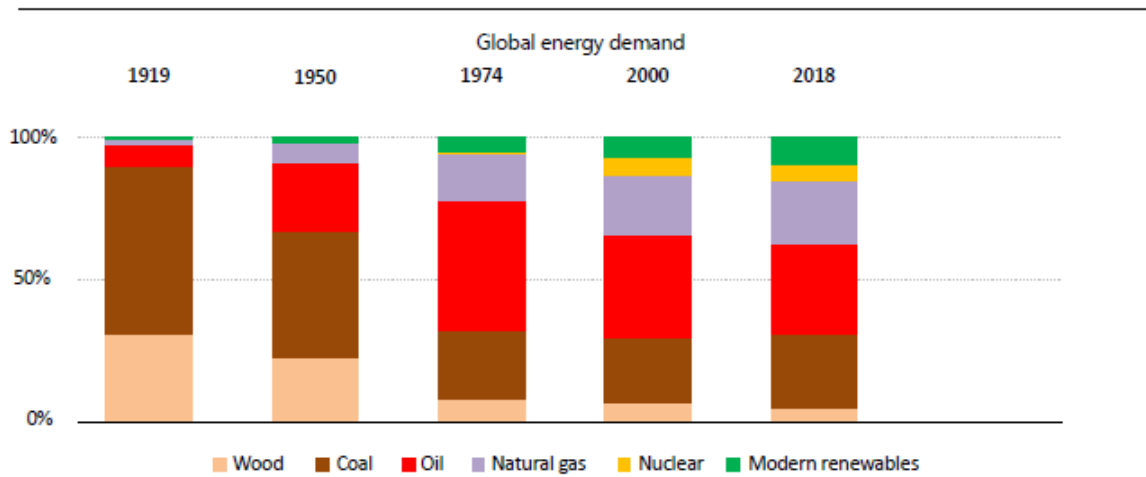
Energy policy decisions at the national and international levels have contributed to the decline in coal production and use. This section outlines trends and their implications in energy development in the future.

Rapidly Changing Global Energy Demand and Trends

In its World Energy Outlook 2019 (WEO) the International Energy Agency identified the rapid change in energy demand and consumption over the past 100 years. There has been a significant transition in energy sources over the last century coupled with rising demand which is 10 times higher than it was in 1919.

¹⁹ Trib Live. *Coal still fuels economic fire in Pennsylvania, industry study reports*. May 19, 2019.

Exhibit 8 – Energy Demand Sources over the Past Century



The last century has witnessed multiple transitions to and from different fuels and technologies

IEA 2019. All rights reserved.



Source: IEA, *World Energy Outlook 2019*.

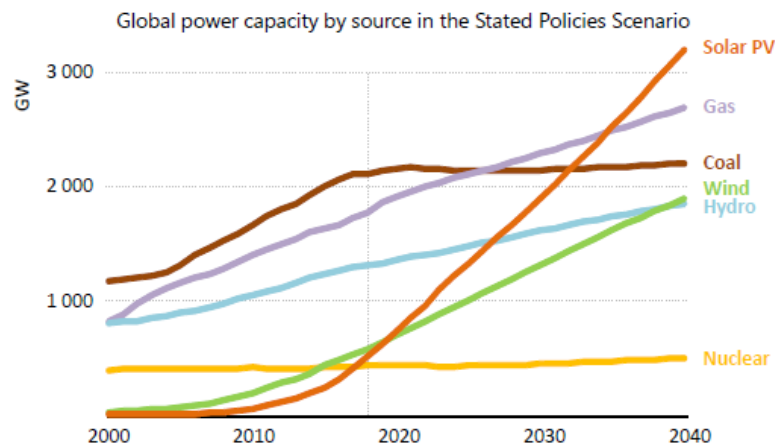
The WEO focuses on the implications of current energy decisions on tomorrow's energy systems and discusses a strategy for the world to attain climate, energy access, and air quality goals while at the same time maintaining an emphasis on energy reliability and affordability for a growing global population.²⁰ These global efforts are important as the U.S. and Pennsylvania chart their energy course for the future. Overarching themes in the 2019 World Energy Outlook (WEO) are key global disparities:

- Relative calm in well supplied oil markets versus geopolitical tension and uncertainty in other markets
- The need to rapidly cut carbon emissions, while emissions still reach historic highs
- The promise of energy for all and lack of electricity access to 850 million people around the world

Current global energy policies show that solar photovoltaic (PV) and other renewables are rapidly increasing and by 2040 renewable sources will account for nearly half of power generation.

²⁰ International Energy Agency. *World Energy Outlook 2019*. Executive Summary.

Exhibit 9 – Global Power Generation by Source (2000 – 2040)



The power mix is being re-shaped by the rise of renewables and natural gas. In 2040, renewables account for nearly half of total electricity generation.

IEA 2019. All rights reserved.



Source: IEA, *World Energy Outlook 2019*.

With the rise in renewable energy sources for power generation, continual energy sources (such as gas and coal) are replaced by variable sources (wind and solar). Technology advances in the energy sector need to occur to address fluctuations and flexibility in renewable source development, to ensure renewable source reliability like their continual energy counterparts.

A significant trend is the rapid development of the African continent. Current policy and investments in African countries are not sufficient to meet the energy needs of the continent's young and rapidly growing population. Currently, 600 million people in Africa do not have access to electricity and 900 million lack access to clean cooking facilities.²¹ The number of people residing in African cities is expected to increase by 600 million over the next two decades, much higher than the increase experienced by China's cities during that country's 20-year growth period. Overall African population is projected to exceed 2 billion before 2040.²²

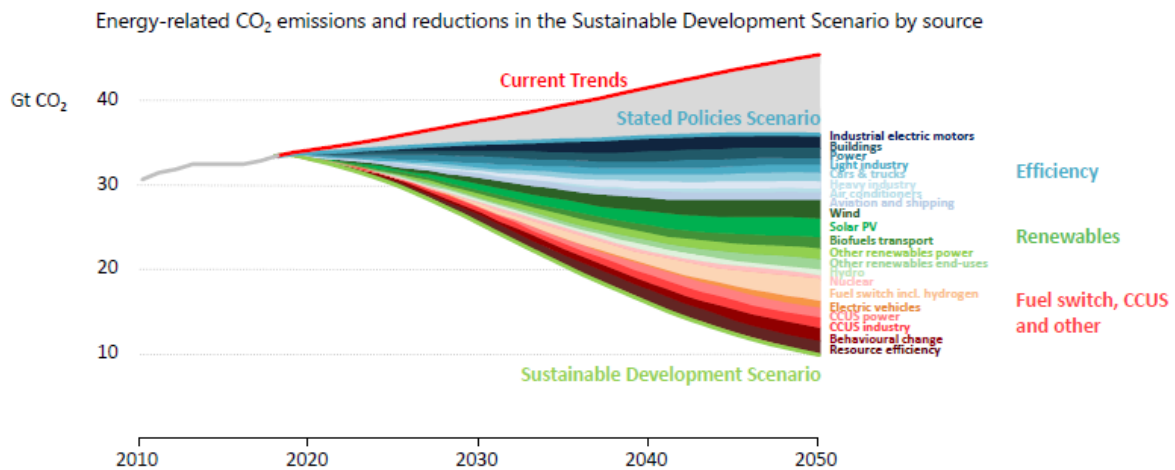
From the IEA's perspective, there is no single, simple solution for the world to reach sustainable energy goals. It suggests a diverse set of solutions is required by 2040 in order to reach sustainable energy goals.

²¹ IEA. *Africa's energy future matters for the world*. November 7, 2019.

²² Ibid.

Exhibit 10 – Reaching Global Sustainable Energy Goals

No single or simple solutions to reach sustainable energy goals



A host of policies and technologies will be needed across every sector to keep climate targets within reach, and further technology innovation will be essential to aid the pursuit of a 1.5°C stabilisation

IEA 2019. All rights reserved.



Source: IEA, World Energy Outlook 2019.

WORLD ENERGY OUTLOOK 2019 CONCLUSIONS

- Current global energy policies will not meet future global energy security and environmental threats.
- Oil and gas are being reshaped by shale development.
- Solar, wind, storage, and digital technologies are transforming electricity production, but legacy infrastructure systems need to be developed to ensure reliability.
- Africa is rapidly urbanizing and energy is vital for the continent's development.
- The future of secure and sustainable energy needs to be a global effort.

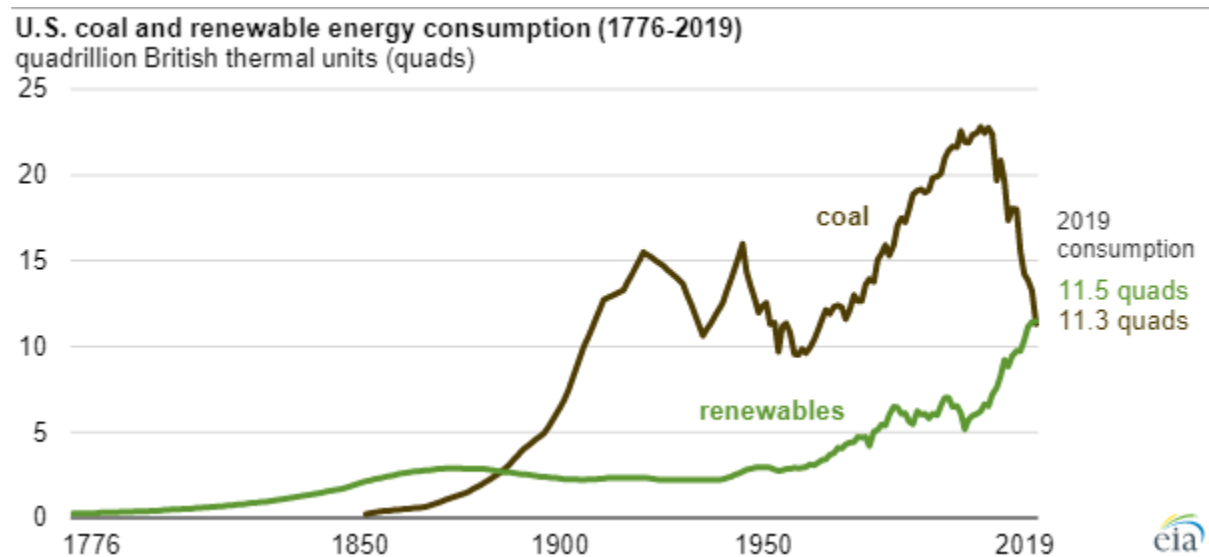
Transitioning from a Coal-based Economy

U.S. Energy Consumption Swiftly Shifts from Coal

The United States' energy consumption has undergone many changes in the nation's history, from wood as a primary resource in the 18th and 19th centuries, to the onset of coal and petroleum use. The 20th century saw the rise of nuclear power and renewables are taking hold in the early 21st century.

Fossil fuels such as petroleum, natural gas, and coal have accounted for close to 80% of energy consumption in U.S. for more than a century. Fossil fuels still account for most energy consumption in the country; however, coal consumption has dramatically decreased, and renewables continue to increase. In 2019 renewable energy consumption exceeded coal consumption for the first time since before 1885.²³ This trend indicates the decline of coal used in electricity generation over the past decade as well as the growth in renewable energy, primarily from wind and solar energy.

Exhibit 9 – Historic Coal and Renewable Energy Consumption



Source: U.S. Energy Information Administration. <https://www.eia.gov/todayinenergy/detail.php?id=43895>

Further, compared to 2018, coal consumption decreased nearly 15%, and total renewable energy consumption grew by 1%.²⁴

Balance Between U.S. Energy Consumption and Production

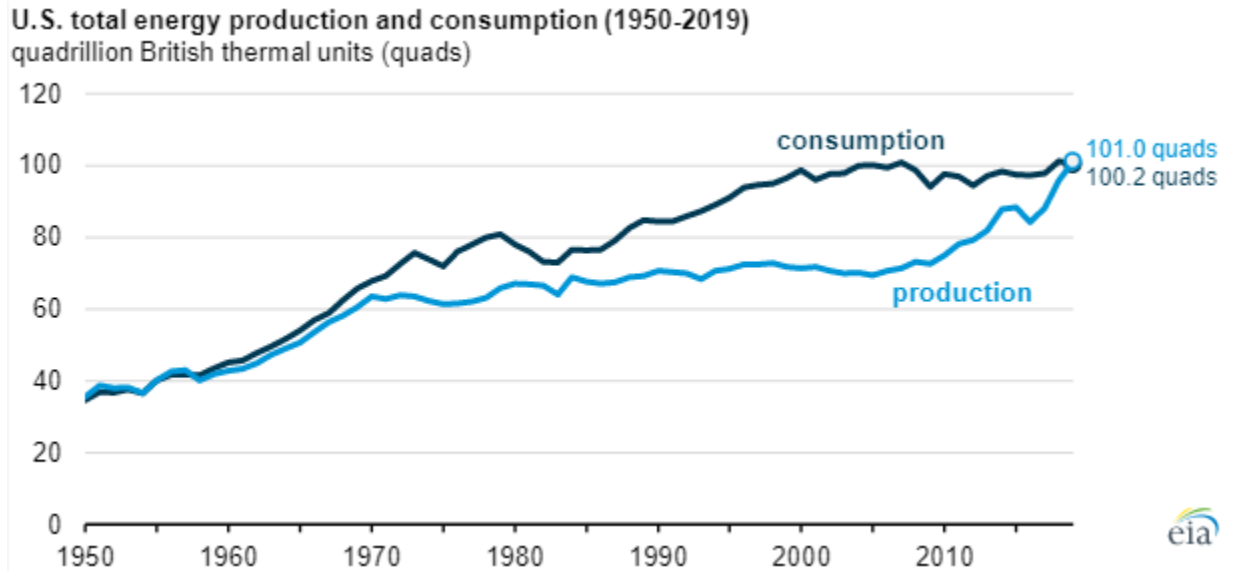
While U.S. energy consumption reached a record high of 101.3 quadrillion BTUs in 2018, it decreased slightly to 100.2 quadrillion BTUs in 2019. And for the first time since the 1950s, the nation's energy production exceeded consumption.

²³ U.S. Energy Information Administration, Today in Energy. May 28, 2020.

²⁴ Ibid.

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Exhibit 10 – U.S. Energy Production and Consumption (1950 – 2019)



Source: U.S. Energy Information Administration. <https://www.eia.gov/todayinenergy/detail.php?id=43515>

While increasing environmental regulations on the coal industry protect environmental resources and reduce carbon dioxide emissions, the regulations have impacted both coal-fired power plants and coal production. The regulations on coal-fired power plants combined with the rise in natural gas development have prompted either the conversion to natural gas or decommissioning of coal-fired power plants.

Why the change in regulations and a shift to new power generation sources? Coal as an energy generation source has accounted for nearly one third of the rise in average temperatures since the Industrial Revolution. Coal-fired power plants emitted nearly one-third of the world's total carbon dioxide in 2018.²⁵ Climatologists have lobbied for closure of all coal fired power plants by 2050 to keep global temperatures from increasing 1.5 degree Celsius above pre-industrial time.

While the shift from coal is rapidly occurring, governments supportive of coal face three threats:²⁶

- Environmental – Increased carbon emissions will increase global temperatures.
- Economic – An increasing number of private sector banks have signaled they will cease funding coal-fired plants. Banks in Asian countries like India are starting to invest in renewable projects instead of coal-fired projects.
- Political/Public Perception – Increasingly, the public does not support environmental and climate change impacts.

Today, through U.S. environmental policies there has been a shift in coal power production resulting in an increasingly diversified mix of fuels powering electricity. In 2017, zero-carbon resources (renewables such as wind, solar, and geothermal; hydropower; and nuclear) were reported as the leading source of power generation in the country (35%) for the first time.

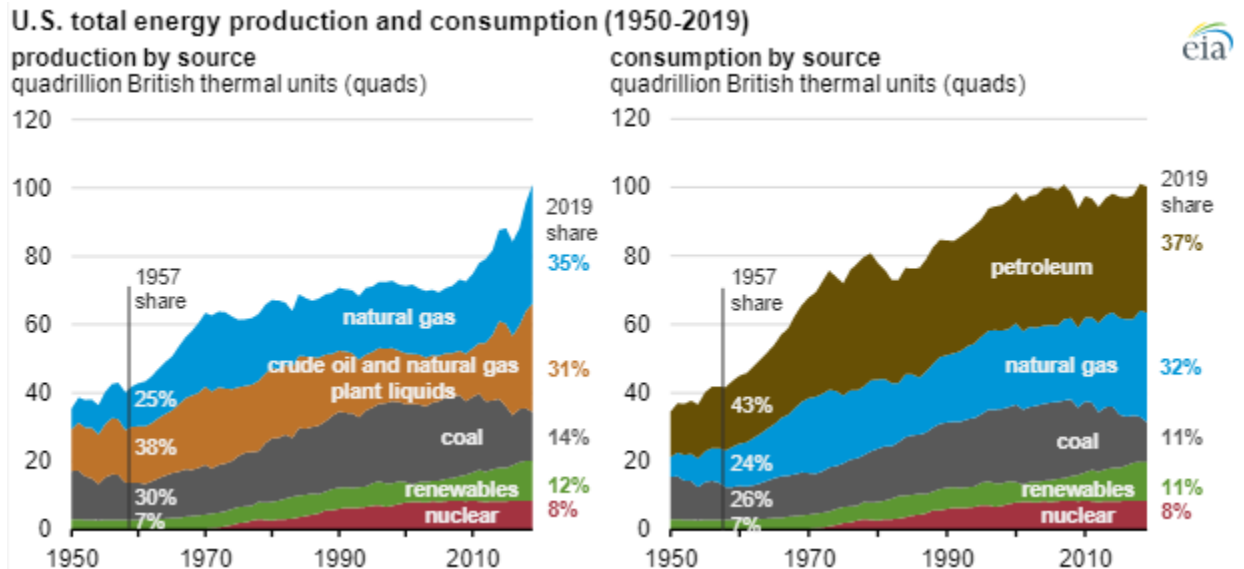
²⁵ The Economist, *Betting on Black*. August 24, 2019.

²⁶ Ibid.

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According to the U.S. Energy Information Administration (EIA), in both 2019 and 1957, the last year that nationwide production exceeded consumption, fossil fuels accounted for most of the energy production. The source has shifted; however, from coal to a mix of sources. From a consumption perspective, petroleum remains the largest source, but its share has decreased. Consumption of natural gas and zero carbon sources such as renewables and nuclear have increased.

Exhibit 11 – U.S. Energy Production and Consumption by Source (1950 – 2019)



In its 2020 Annual Energy Outlook the EIA has identified four key takeaways for policy makers to consider. The 2020 outlook includes projections to 2050:²⁷

- U.S. energy consumption grows more slowly than gross domestic product to 2050 as energy efficiency increases.
- The sources for U.S. electricity generation continue to change rapidly. Renewable sources are projected to continue fast growth due to declines in capital costs for solar and wind energy development and state and federal tax incentives. Generation from coal and nuclear generation will continue to decline.
- The U.S. will continue to produce high levels of natural gas and crude oil. Projected slow domestic consumption will lead to increased exports of crude oil, petroleum products, and liquefied natural gas.
- U.S. energy related carbon dioxide emission will grow slightly in the 2030s and will be driven by increases in the transportation and industrial sectors. However, by 2050 emissions are projected to be lower than 2019 levels.

²⁷ U.S. Energy Information Administration, Annual Energy Outlook 2020, p. 3.

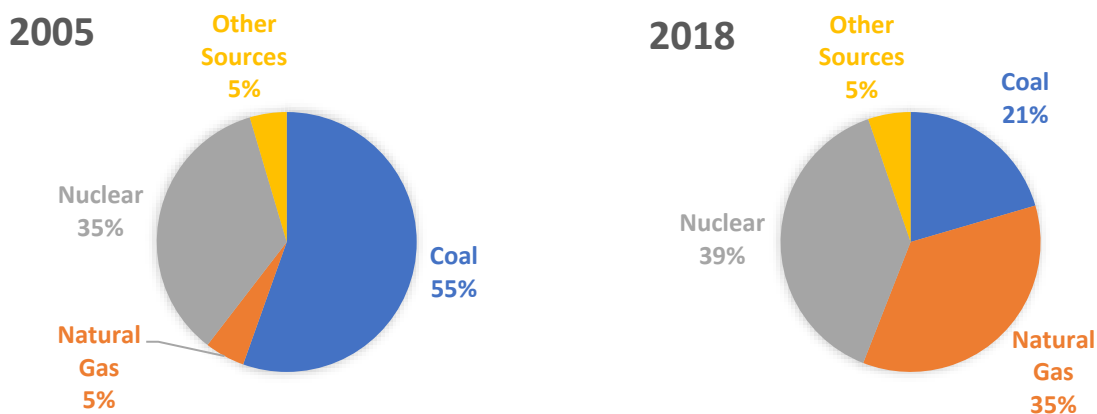
Transitioning from a Coal-based Economy

Pennsylvania's Energy Source Generation

One of the major trends impacting the rapid decline of Pennsylvania's coal industry has been the marked shift in the source of Pennsylvania's electric generation. Over the last 10 years electric generation has shifted from coal to natural gas due to the vast underground shale gas reserves in the Marcellus and Utica shales.

In 2005 coal was the main fuel source for 55.5% of Pennsylvania's electric generation power industry. By 2018 coal's share in Pennsylvania's power generation was just 20.5%. During the same time period, natural gas increased from 5% of total electric power generation to 35.5%. The retirement of coal-fired power plants was the catalyst for the shift to natural gas-fired plants.

Exhibit 12 – Shift in Pennsylvania's Electric Generation Fuel Sources (2005: 2018)



Source: U.S. Energy Information Administration, *Annual Generation by State, 1990 – 2018*.

The use of coal as a fuel source for electricity generation in Pennsylvania dropped below half in 2009 at 47.9%. In 2017, the use of coal for electricity generation dropped below one quarter of fuel source generation at 22.2%. From 2010 to 2018, Pennsylvania's share of electricity generated from natural gas more than doubled to 36%, while the share from coal fell by more than half to 21%.

According to the U.S. Energy Information Administration (EIA), four-fifths of the coal *consumed* in Pennsylvania was used for electricity generation, and the remaining was used for manufacturing. In 2017, more than 90% of coal *mined* in Pennsylvania was used for electricity generation. One-third of that coal was used at in-state power plants and the rest was transported and burned at generating facilities in 16 other states. Nearly half of the coal consumed by Pennsylvania's power plants and industrial plants was brought in from nearby states.

Pennsylvania's natural gas production, primarily from the Marcellus Shale, reached 6.2 trillion cubic feet in 2018, making the state the nation's 2nd largest natural gas producer after Texas. In 2018, Pennsylvania ranked 2nd in the nation in electricity generation from nuclear power, which supplied 38.9% of the state's net generation. About half of Pennsylvania households use natural gas as their primary home heating fuel, and its 49 underground gas storage sites (more than any state) are necessary to meet winter heating demand.

Transitioning from a Coal-based Economy

National and Geopolitical Trends Impacting Coal Trade

As noted throughout this document, coal mining as an industry is highly dependent on national and global energy policy. It is also impacted by national and international trade trends.

Due to tariffs and fluctuation in market conditions, coal companies note that contracts which were typically 3 years or more in length, are now typically 1 year in length. This requires that a business is agile enough to shift business opportunities as market conditions change.

One coal company reports that 75% of its coal produced is exported. The company's exports are typically sent to Italy, Scandinavia, Eastern Europe, and Japan for steel making.

Future coal industry growth/decline depends on the political climate and world economy. Local coal companies note that since the industry has not been growing; workers will seek other employment opportunities. In recent years the gas industry has attracted workers from the coal industry.

Impacts of Regulations and Public Perceptions

Coal companies report that the coal mining industry has been heavily impacted by worldwide climate change policies as well as national energy policies and regulations. While the current presidential administration views the coal industry more favorably, changes established in the previous administration currently impact how businesses operate. Coal companies are increasingly left with the impression that there is no place for coal in the marketplace.

Coal mining companies report significant changes in permitting requirements in recent years. Working with federal and state regulations is more complicated, citing at least 6 federal agencies with oversight. Primacy issues between federal and state regulatory oversight has led to conditions where the industry reports duplicative oversight. The amount of federal personnel overseeing mining operations has increased, resulting in more frequent inspections, and the perception that officials are actively looking for something to find wrong. It was reported by a company interviewed that 90% of the federal and state oversight does not improve the environment but is administrative in nature.

In addition, standards and timeframes were reported as consistently changing. If regulatory timeframes are exceeded by public officials, mining companies have no recourse. Oversight has reportedly increased and worsened over the last 4 years due to federal and state momentum on reducing the use of coal. Regulatory issues are becoming more frequent, increasing from once a month to once per week.

The increased regulatory oversight ultimately leads to increased company overhead costs. These expanded regulations combined with market conditions has reduced the number of companies that mine coal in the region.

Finally, coal mining businesses note that the perception of the coal industry and its workers has dramatically changed. Once considered true community heroes, workers are sometimes viewed negatively. "During the last 4 or 5 years coal has become a four letter word."

IV. Revitalizing Abandoned Coal Mine Sites

PA DEP Reclamation & Revitalization

PA DEP’s Bureau of Abandoned Mine Reclamation administers and oversees the reclamation of abandoned mine sites, including an inventory of abandoned mine lands revised as new problems are identified. The Bureau is responsible for addressing issues associated with abandoned coal mines (pre-1977) in accordance with requirements established by the federal Office of Surface Mining under authority of the Surface Mining Control and Reclamation Act (SMCRA).

While reclamation projects have been taking place throughout the region, additional mine reclamation would improve environmental, aesthetic, and economic conditions. According to PA DEP, the greatest constraints associated with site reclamation include willingness of property owners and funding. Neither Pennsylvania nor local governments own, or control abandoned mine lands; therefore, property owners cannot be compelled to address abandoned properties. This is confirmed by local economic development professionals. Further, funding sources to reclaim sites are limited.

Through SMCRA, the Abandoned Mine Land (AML) Trust Fund is used to for reclamation and restoration of formerly mined areas. The fund is established via fees collected from coal production nationally and grants are made back to states with approved Abandoned Mine Reclamation Programs. Pennsylvania receives funds via SMCRA to address health and safety issues at abandoned mines throughout the Commonwealth. Over the past 10 years, over \$42.8 million has been invested in reclamation projects in the North Central region through federal and state funds. Nearly 1,100 acres have been reclaimed with 74% of the acreage (805 acres) being in Clearfield County.²⁸

Pilot funding has been made available in recent years to address reclamation. In 2016 the Abandoned Mine Land Reclamation Economic Development Pilot Program (AML Pilot) was authorized by Congress. Administered by the Office of Surface Mining Reclamation and Enforcement (OSMRE) within the U.S. Department of the Interior, the AML Pilot provided \$30 million of US Treasury Funds to each of the three Appalachian states with the highest amount of unfunded coal-related problems that are classified as priorities (Kentucky, Pennsylvania, and West Virginia). The AML Pilot funds are used for community and economic development reuse goals.

Since the pilot program’s launch, three projects in the North Central region have been awarded funding. Each of the projects is in Clearfield County.

Exhibit 13- AML Pilot Projects

Project Name	Project Type	Municipality	Details
Eden East Waterline	Municipal Waterline Extension	Goshen and Girard Townships	\$4.3 million project awarded \$2.7 million in AML Pilot Funding Extend public water line and upgrade existing infrastructure to serve 25 homes 10 miles of waterline constructed

²⁸ PA DEP Bureau of Abandoned Mine Reclamation, North Central Region Abandoned Mine Reclamation projects (2009 – 2019).

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Project Name	Project Type	Municipality	Details
Morgan Run Recreational Facility - West Decatur Post Office	Surface Mine Reclamation	Boggs Township	\$500,000 project with total amount funded through AML Pilot Funding Reclamation of a dangerous 3,700 ft. high wall Construction of recreational trails, a parking lot, and amphitheater in support of the Morgan Run Recreation Facility
Pine Grove North (Glen Richey) – Waterline Extension	Waterline Extension Project	Lawrence Township	Construct Phase 1 of 3 of a waterline extension to serve approximately 153 homes and businesses impacted by pre- SMCRA underground coal mine operations

Source: PA DEP Bureau of Abandoned Mine Reclamation. Abandoned Mine Land (AML) Pilot Program.

Re-Energizing Abandoned Mine Lands

While most of the reclamation activities on abandoned mine lands have been focused on improving community health outcomes through water line extensions or recreation development, the use of abandoned mine lands for renewable energy purposes has been discussed for years and is a current trend.

Solar developers have been looking throughout Pennsylvania for locations to site solar installations

Communities across the country are starting to look at abandoned mined lands for new energy sources. A coal mine in southwest Virginia will be redeveloped as a solar farm. The proposed project will generate up to 3.5 megawatts of renewable energy to power data centers in the area. Solar developer, Sun Tribe Solar, partnered with the owner of an area data center to implement the \$4.6 million solar project on the former mine site which was last active in 1957.²⁹

From PA DEP’s perspective, locating wind and solar generation on Pennsylvania’s mine lands has been discussed, but activity has not moved past discussion. According to PA DEP’s Energy Programs Office, the transition from coal to clean energy is a Commonwealth goal and one that would help address climate change goals.

Solar developers have been actively looking throughout Pennsylvania for locations to site solar installations. With the retirement of coal-fired power plants, and even with the switch to natural gas electricity generation, overall energy generation is down. However, Pennsylvania’s transmission infrastructure is in place with capacity on the existing infrastructure for electricity generation. Solar developers are reportedly in a land rush mode, akin to what transpired when shale gas exploration was

²⁹ Energy News. *Federal funds to help turn Virginia coal mine into solar farm*. March 8, 2019. Accessed: 12/12/19 at: <https://energynews.us/2019/03/08/southeast/virginia-solar-farm-among-10-projects-to-receive-mineland-reuse-funds/>.

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underway in earnest a decade ago. According to PA DEP, between 2013 and 2017 natural gas was looked to as the energy source to fill excess capacity. Over the past two years, it has been solar.³⁰

New energy facilities that want to feed into the power grid are required to let PJM Interconnection (PJM), a regional electric transmission organization serving all or part of 14 states, know of their plans. PJM is the electric grid operator overseeing electricity flow in 14 states to make certain necessary infrastructure is in place. Many solar developers file plans that never materialize and that is thought to be the case with a large portion of the 4,496 megawatts of solar currently in the interconnection queue in Pennsylvania.³¹

Concurrent with PA DEP observations, solar developers are starting to make their way across the Commonwealth finding locations to invest in solar energy generation. In June 2019, the *Pittsburgh Post-Gazette* documented several potential solar farms throughout Pennsylvania.

Exhibit 14 – Potential Solar Farms in Development

County	Company	Potential Project
Beaver	LendLease Energy Development	Designing 20-megawatt Solar Farm on 161-acre site in Findlay Township called Gaucho Star.
Bradford	LendLease Energy Development	Lease option agreement
Potter	LendLease Energy Development	Lease option agreement
Lawrence	LendLease Energy Development	Lease option agreements
York	Dakota Power Partners	80-megawatt solar farm; estimated cost \$75 million
Blair	Dakota Power Partners	Lease option agreements
Northampton	Dakota Power Partners	Lease option agreements
Lebanon	Dakota Power Partners	Lease option agreements
Northumberland	Geronimo Energy LLC	Lease agreement; 77-acre site
Franklin	Lightsource BP	Lease agreement; 70-megawatt solar farm
Potter	Walden Renewables	Lease agreement; 400-acre, 183-megawatt solar farm (plus 90-megawatt wind farm)

Source: *Pittsburgh Post-Gazette*.

The search for land to site solar energy developments is also confirmed by Clearly Ahead, Clearfield County’s economic development organization. The organization has received at least 4 inquiries from solar developers over the past two years.

Similar to insight from PA DEP’s Energy Programs Office, a Penn State Extension representative points out that the recent movement to secure land for solar installations is similar to what occurred in the “oil and gas rush a decade ago.”³² Landmen assess territories to capture under lease options in speculation.

Consistent with PA DEP and Penn State Extension comments, a solar developer is currently seeking brownfield sites across Pennsylvania to locate community solar in large part due to pending Pennsylvania

³⁰ PA DEP Energy Programs Office. Telephone conversation 12/13/19.

³¹ Pittsburgh Post-Gazette. *Could Solar’s outlook in Pennsylvania be sunny, even if the skies are not?* June 10, 2019. Accessed 12/12/19 at: <https://www.post-gazette.com/business/powersource/2019/06/10/Pennsylvania-solar-energy-farm-land-lease-option-renewable/stories/201905260025>.

³² Ibid.

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legislation. Currently, the solar developer is working on a community solar project in Beaver County, Pennsylvania. In 2019 the Pennsylvania General Assembly introduced legislation (HB531) to enable community solar projects. Community solar would allow participants to subscribe to a portion of an offsite solar project and receive credit on their utility bill for the power produced. Rather than having solar panels or equipment on their property, a homeowner, farmer, or business would subscribe to renewable energy a solar developer would generate through installation of solar panels on land in proximity to a community. Specifically, the solar developer is seeking flat, dry, cleared property 25 to 35 acres in size and located within 2 miles of an electric substation.

PA DEP is also asking solar developers what it would take to develop on properties that are currently not so desirable such as tax delinquent properties in communities across the state or brownfield and formerly mined sites. If the Commonwealth and communities could help close the gap for solar developers, solar installations on formerly mined sites could be potentially feasible.

From a jobs perspective, while clean, renewable sources like wind and solar cannot replace every coal job, they can provide communities with the transition needed to stem the flow of workers from the region. According to the Brookings Institution, clean energy jobs provide wages higher than the national average and are available to workers without college degrees. A clean energy job could yield an 8% to 19% income increase, plus nearly half of all workers in clean energy production (e.g. electricians, installers, repairers, and power plant operators) would not require significant levels of retraining.³³

Several renewable energy related projects, not necessarily on abandoned mine lands have been awarded funding through the Appalachian Regional Commission’s (ARC’s) POWER (Partnerships for Opportunity and Workforce and Economic Revitalization) Initiative. This initiative is discussed in greater detail in the next section. An example of energy related projects awarded POWER funding is included in the following exhibit.

Exhibit 15 – Sample of ARC POWER Initiative Energy Related Project Awards

State	Project Name	Description
Alabama	Development of Advanced Energy in Coal Communities	Study of strategies to identify the advanced energy industry of coal-impacted areas, available jobs within that industry, workforce training and career center resources, and stakeholder engagement to explore additional careers in sectors such as aerospace, advanced manufacturing, entrepreneurship, healthcare and information technology.
Kentucky	Energy Efficiency for Homes	Improve the energy efficiency of low-income homes in coal-impacted communities across a nine-county region in eastern Kentucky while also creating entrepreneurial and skills-based training opportunities in the area.
North Carolina	Taking a Proven Energy Model to Scale	Provide technical assistance to grow the emerging solar energy cluster in Central Appalachia to help diversify the regional economy. Support a commercial-scale solar

³³ The Brookings Institution. *Advancing inclusion through clean energy jobs*. April 18, 2019. Accessed 12/12/19 at: <https://www.brookings.edu/research/advancing-inclusion-through-clean-energy-jobs/>.

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		group purchase program, include a multi-state market analysis of solar opportunities, and prepare an assessment of available financing.
Ohio	Appalachian Ohio Solar Supply-Chain Initiative	Formulation of a strategic plan and feasibility study for building a stakeholder partnership to develop a regional solar manufacturing supply-chain in response to a major utility's plan to deploy new solar resources in Ohio.

Source: Appalachian Regional Commission, POWER Award Summaries by State, October 2019.

V. Initiatives Improving Economic Outcomes in Coal-Impacted Communities

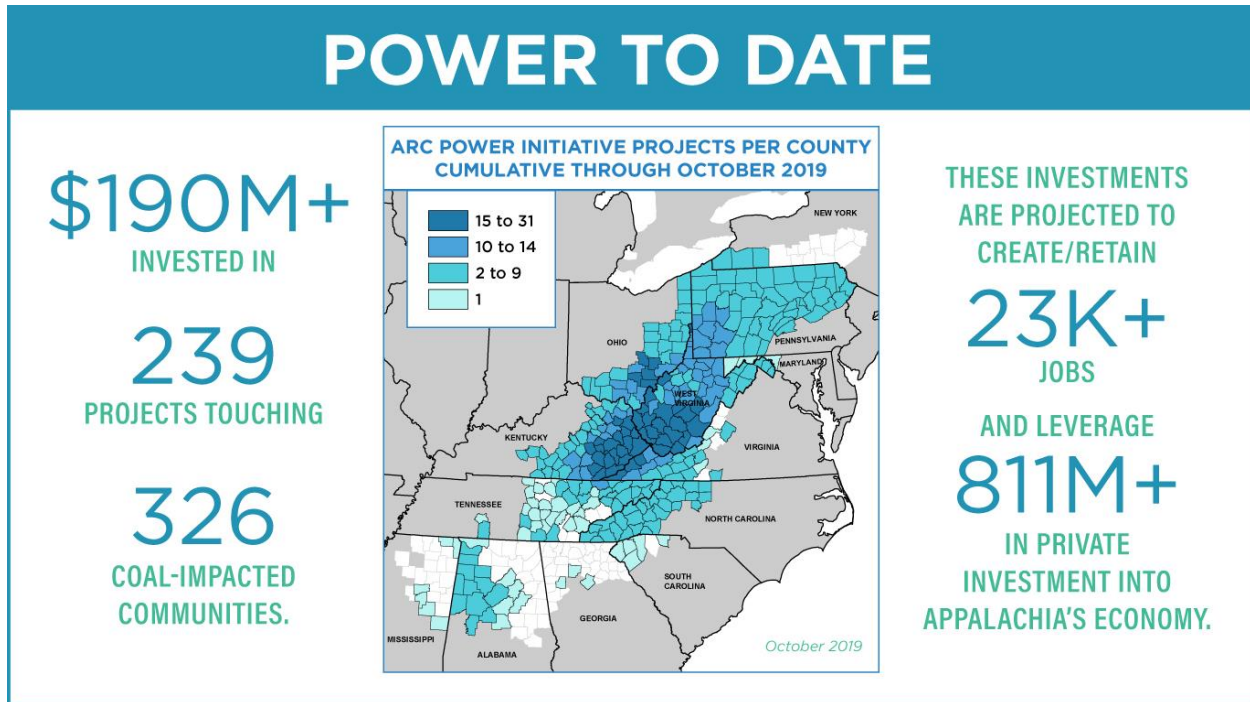
Improving economic outcomes in coal-impacted communities is addressed in several ways. In Appalachia's local development districts, comprehensive economic development strategies (CEDs) outline regional opportunities for economic improvements. In addition, the Appalachian Regional Commission has developed the POWER Initiative, introduced in the previous section, to proactively address the impact of Appalachia's coal industry.

Finally, active economic development and workforce development organizations are in place with a sole focus of improving county and regional outcomes.

Appalachian Regional Commission POWER Initiative

ARC targets resources to assist communities impacted by coal mining and coal mining supply chain job losses. Since 2015, ARC has invested over \$190 million in 239 projects touching 326 counties across Appalachia through the POWER Initiative. Together, these investments are projected to create or retain more than 23,000 jobs and leverage more than \$811 million in additional private investment into Appalachia's economy.

Exhibit 16 – Results of the POWER Initiative to Date



Source: Appalachian Regional Commission.

Thirty-one (31) POWER projects have been awarded in Pennsylvania with each of the counties in the North Central region benefiting. Projects differ in scope from technology to workforce training to startup capital to tourism. The region has strategically positioned itself to focus on assets aligned with natural, cultural, and structural resources.

North Central’s freight plan is funded in part through an ARC POWER grant to NCPRPDC. The freight plan will help impacted communities better understand the freight challenges they face as a result of the coal decline, inventory existing infrastructure and freight assets across transportation modes, and develop strategies to optimize the freight network in support of industry diversification and economic growth.

31 ARC POWER projects have been awarded in Pennsylvania benefiting each of the counties in the North Central Pennsylvania region.

Through the POWER initiative, ARC is focusing on asset-based economic development and the natural, cultural, and structural resources existing within the community.³⁴ *Natural and cultural resources* are a region's *inherent benefits and attributes* – outdoors, community history, sense of place. *Structural resources* are 'often overlooked by communities or perceived as liabilities' but are those *infrastructure assets such as buildings, roads – or in the case of North Central Pennsylvania's abandoned mine lands* – that can be repurposed for future use.³⁵

A few workforce related awards have been made through the POWER Initiative, several in and benefiting the North Central Pennsylvania region.

- **North Central PA Launchbox and Innovation Collaborative** - Awarded in October 2019, the project will equip the Collaborative's business incubator to offer three sets of services: a makerspace with sophisticated equipment; research and development services to help manufacturers solve problems; and a training center that offers opportunities in powdered metals, automation, and additive manufacturing. The Collaborative seeks to strengthen the entrepreneurial ecosystem, providing wraparound services that increase access to capital, up-skill local talent to secure advanced manufacturing jobs, and provide technical assistance and specialized manufacturing support services for businesses. In addition to NCRPDC, the project includes a broad network of partners, including Penn State DuBois and the Clarion Small Business Development Center.
- **PA MAKES** - A mini-grant program administered by Catalyst Connection in partnership with the IRCN, NWIRC, NEIRC and IMC. The project was awarded \$670,000 in October 2018. The PA MAKES Mini-grant is designed to assist coal impacted communities' responses to negative economic factors by diversifying and growing small and medium sized manufacturers through strategic efforts to build capacity, improve efficiencies and demand locally, stimulate job creation, and drive economic impact. Applicants in Pennsylvania's 52 ARC counties may request a grant up to 50% of the total advanced manufacturing technology project cost from a minimum of \$1,000 up to a maximum of \$10,000.
- **Nature Tourism Cluster Development**- The Pennsylvania Wilds Center for Entrepreneurship, Inc. received \$500,000 in 2016 for the Nature Tourism Cluster Development in the PA Wilds project. The project is focused on creating a coordinated regional cluster development system to capitalize on Pennsylvania's numerous nature tourism assets that spread across 2,000,000 acres in 12 counties. The strategy focuses on increasing attendance to these natural attractions and will be leveraged by \$500,000 in matching investments to develop a network of small businesses to support the increased demand for products and services in the area.

³⁴ Appalachian Regional Commission, Turning Liabilities into Assets.

³⁵ Ibid.

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Potter County is also benefitting from ARC POWER funds through the Northern Pennsylvania Broadband Connectivity Project. Led by Tioga County and Tri-County Rural Electric Cooperative, the project will expand broadband access to unserved residents and businesses within the electric cooperative's service territory.

Pennsylvania is also inspiring innovation on abandoned mine lands from a tourism perspective. Installation of water infrastructure at the new Appalachian Wildlife Center in Kentucky will be funded in part through POWER initiative resources. The facility will be located on 19 miles of reclaimed mine land and the project will feature an elk restoration and viewing area modeled on the Elk Country Visitor Center in Benazette, Elk County.

North Central's Comprehensive Economic Development Strategy (CEDS)

North Central's Comprehensive Economic Development Strategy (CEDS) touches on the impact the decline of the coal industry has had on the region. It notes that the industry was hard hit in Clearfield and Jefferson Counties, having a trickle-down impact on truck drivers, coal labs, machine shops, and suppliers.

The CEDS identifies actions which will help mitigate the decline of the coal industry by expanding employment and diversity of the region's economic base including:

- Determining productivity factors of existing and emerging industry clusters.
- Identifying and implementing opportunities for entrepreneurs to increase international transactions.
- Marketing access to capital improvements financing through the Economic Development Administration.
- Providing business start-up and expansion planning services to coordinate industrial development.
- Promoting use of existing industrial park locations.

In addition, actions to promote job training were identified such as:

- Identifying and publishing skills and knowledge needs of a diverse and educated workforce to meet requirements of regional employers.
- Partnering with educational institutions, employers, and other service providers to ensure implementation of necessary skills-development programs.
- Identifying state/federal programs and technical assistance for education, training, and technology transfer.
- Evaluating the education system and the relationship between vocational training and the skills required by regional employers.

The Southwestern Pennsylvania Commission's 2017 CEDS also recognizes the declining coal mining cluster. A 2015 study prepared by the Pennsylvania Economy League reports that the employment and total value-added impact of the coal industry and associated supply chain in Greene and Washington

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counties as \$1.9 billion in 2013.³⁶ The changes affecting the coal industry and the supply chains it supports will adversely impact the regional economy, especially more rural counties.

Economic Development Organizational Assets

Beyond NCRPDC, county economic development organizations serve existing and future businesses through locating sites, developing strategic connections, and identifying potential financing options for all industries. As the majority of coal industry development is focused in Clearfield and Jefferson counties, each county's economic development organization, Clearly Ahead and Jefferson County Development Council, were contacted for input.

- **Clearly Ahead** has actively worked with DEP BAMR on abandoned mine reclamation projects with one reclamation site located in the Clearfield Commerce Park. Over the past two years the organization has received inquiries from solar developers seeking large, flat sites near electric transmission lines. Clearly Ahead is interested in energy related projects such as wind and natural gas development. Due to Clearfield County's location within the Marcellus shale gas field, the county has worked with energy intense industries utilizing natural gas. The county's economic base is diverse with manufacturing, including attracting and retaining powdered metals companies, and food manufacturers such as Dannon. The county's location along I-80 enables it to attract warehouse distribution companies. With the impending open of the Shell cracker plant in Beaver County, Clearfield County is also keeping potential plastics opportunities in the forefront. The county constructed a 20,000 SF spec building in 2012 for the energy industry. The facility is fully occupied by tenants utilizing spaces sized between 1,400 SF to 3,000 SF. The county is interested in developing public private partnerships in the future to construct additional speculative space.
- **Jefferson County Development Council** notes that Jefferson County has done a good job in diversifying its economic base beyond coal, citing lumber, heavy manufacturing, trucking, and health care as having a strong presence in the county. General community discussion has occurred about repurposing abandoned mine lands and it needs to be addressed in the future.

Each economic development organization focuses on implementing their strategies through specific projects and funding sources as they become available. Both Clearfield and Jefferson County economic development partners have been successful at securing funding to leverage specific projects.

NCRPDC is also instrumental in facilitating regional economic growth and diversification. One coal company reports that NCRPDC recently facilitated a meeting in St. Marys with powdered metal companies. The meeting was convened to identify future opportunities to process tar pitch, carbon graphite, and carbon fiber for regional powdered metals companies. The long-term benefit would be the reduction of out-of-state carbon sources to manufacture powdered metals parts.

Designated Incentive Zones

While the North Central region's county economic development organizations work directly with DCED and the Pennsylvania Governor's Action Team to identify specific incentives to facilitate business

³⁶ Southwest Commission, Comprehensive Economic Development Strategy for Southwestern Pennsylvania, January 2017, p. I-51.

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expansion and attract new business to the region, the counties also promote economic growth through specific incentive zones. State and federal zones are located in the North Central region including a Foreign-Trade Zone, Qualified Opportunity Zones, and Keystone Opportunity Zones.

- Foreign-Trade Zone

A foreign-trade zone is a designated location where companies can use special procedures that help encourage economic activity by delayed or reduced duty payment on foreign merchandise. The North Central region’s foreign-trade zone (FTZ 254) has been in place at the DuBois Regional Airport since 2002. While it is currently inactive, it was actively used during the initial 3 – 4 years after designation to store imported equipment for locomotive construction and repair.

- Qualified Opportunity Zones

The federal tax bill passed in 2017 allowed states to designate certain census tracts as federal Qualified Opportunity Zones (QOZs). In a QOZ, the federal incentive allows the deferral of capital gains taxes on all capital invested and may include industrial, commercial, and residential projects or other direct business investments. In the North Central region, designated census tracts were identified in the following counties and municipalities. No census tracts were identified in Elk or Potter counties.

Exhibit 17 – North Central Region Counties and Municipalities with Qualified Opportunity Zones

County	Municipalities Hosting Designated Census Tracts
Cameron	Emporium
Clearfield	Sandy Township City of DuBois Clearfield Borough
Jefferson	Brockway Borough Heath Township Polk Township Snyder Township
McKean	City of Bradford

Source: PA Department of Community & Economic Development.

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- Keystone Opportunity Zones

The Keystone Opportunity Zone (KOZ) Program is a state program designed to incentivize development of abandoned, unused, or underutilized land and buildings into business districts and residential areas that present a well-rounded and well-balanced approach to community revitalization. Through broad-based tax abatements, total taxes on economic activity in KOZ zones are significantly reduced.

The North Central region includes active KOZs in Elk, Clearfield, Jefferson, and McKean counties.

Developing Alternative Uses for Coal

While the region's coal resources are being used for electricity generation and metallurgical coal for steel making, there are additional opportunities to use the region's coal resources for manufacturing purposes. Partnering with the region's powdered metals manufacturers, as noted above, is a prime opportunity that could easily be accomplished through existing industry partnerships.

Additional opportunities could also be explored. The U.S. Department of Energy has identified several products manufactured by coal and coal by products.

10 Things Made from Coal and Coal By-Products

- STEEL**
Metallurgical coal, or coking coal, is a vital component of steel making. In fact, about 3/4 of the steel produced today uses coal. And, in 2017 the U.S. produced **81.6 million metric tons of steel.**
- HIGH-TECHNOLOGY PRODUCTS**
Coal and its by-products are used to make materials that can be found in your computers, smartphones, DVDs, lasers, LEDs, and other consumer electronics. Not only are coal products used in the production of the metals needed by the technology sectors but these high-technology products are also made with rare earth elements (REEs). Many REEs can be found in coal basins, and FE has researched new processes to concentrate and extract REEs from coal-based materials.
- AUTOMOBILES**
Besides the steel, aluminum, and electronics found in the automobile, coal products are used in the value chains of rubber products used in tires, and they have been used to make transportation fuels.
- CHEMICALS**
Chemicals that are produced from coal are used for wood preservation, rubber products, and even shampoo. Other examples of chemicals from coal products include fertilizers and waxes, such as those that coat paper cups.
- FILTERS FOR WATER AND AIR PURIFICATION**
Coal products find applications in pollution prevention and other environmental processes. Activated carbon, a component of coal, has the ability to extract impurities and contaminants. Activated carbon is often used to make filters for water and air purification systems, and it's even used in kidney dialysis machines.
- ALUMINUM**
While anodes for the aluminum industry are currently made from petroleum coke and pitch, coal powder and coal pitch can be used as alternatives—which can help bring down the cost of aluminum.
- COSMETICS**
Coal is vital to creating silicon metal, which is used in a wide range of cosmetics including makeup, soaps, perfumes, and lubricants.
- CONSTRUCTION MATERIALS**
A common use of coal and coal ash is as feedstock for the production of cement. However, coal by-products are used in a variety of other construction practices. One example is carbon fiber, a by-product of coal that is extremely strong but also conveniently lightweight. It is not only used in construction materials, but also to make hard hats, mountain bikes, and tennis rackets.
- MEDICINE**
We've already talked about how activated carbon is used in kidney dialysis machines, but coal has other medical uses, too. For example, coal tar has been used to make aspirin and other similar medicines.
- NEW MATERIALS AND ADVANCED MANUFACTURING**
Besides their common use in the production of steel and aluminum, coal products are used to make advanced materials with advanced manufacturing processes, such as 3D printing.

Workforce Organizational Assets

Workforce Solutions of North Central PA (Workforce Solutions) is the Workforce Development Board for the North Central region. It is the region's facilitator of workforce development. It meets job needs of employers and delivers resource to job seekers to maximize career potential. The vision of the workforce development board is to be a "strategic workforce development leader focused on promoting economic prosperity and self-sufficiency of individuals by creating a workforce that is competitive in the global marketplace."³⁷

Specific dislocated worker programs and training that could benefit former coal mine industry and associated industry employees are in place and offered through federal and state programs. Coordinated by Workforce Solutions throughout North Central, PA CareerLink Centers provide a seamless workforce delivery system. The collective vision is to:

- Connect job-seekers to all workforce services available in their communities;
- Provide seamless, customer-focused, integrated service delivery across all programs; and
- Ensure that businesses and job-seekers have access to information and services that lead to employment.

Coal companies report that unemployed workers actively seek assistance and services offered by the region's CareerLink® centers.

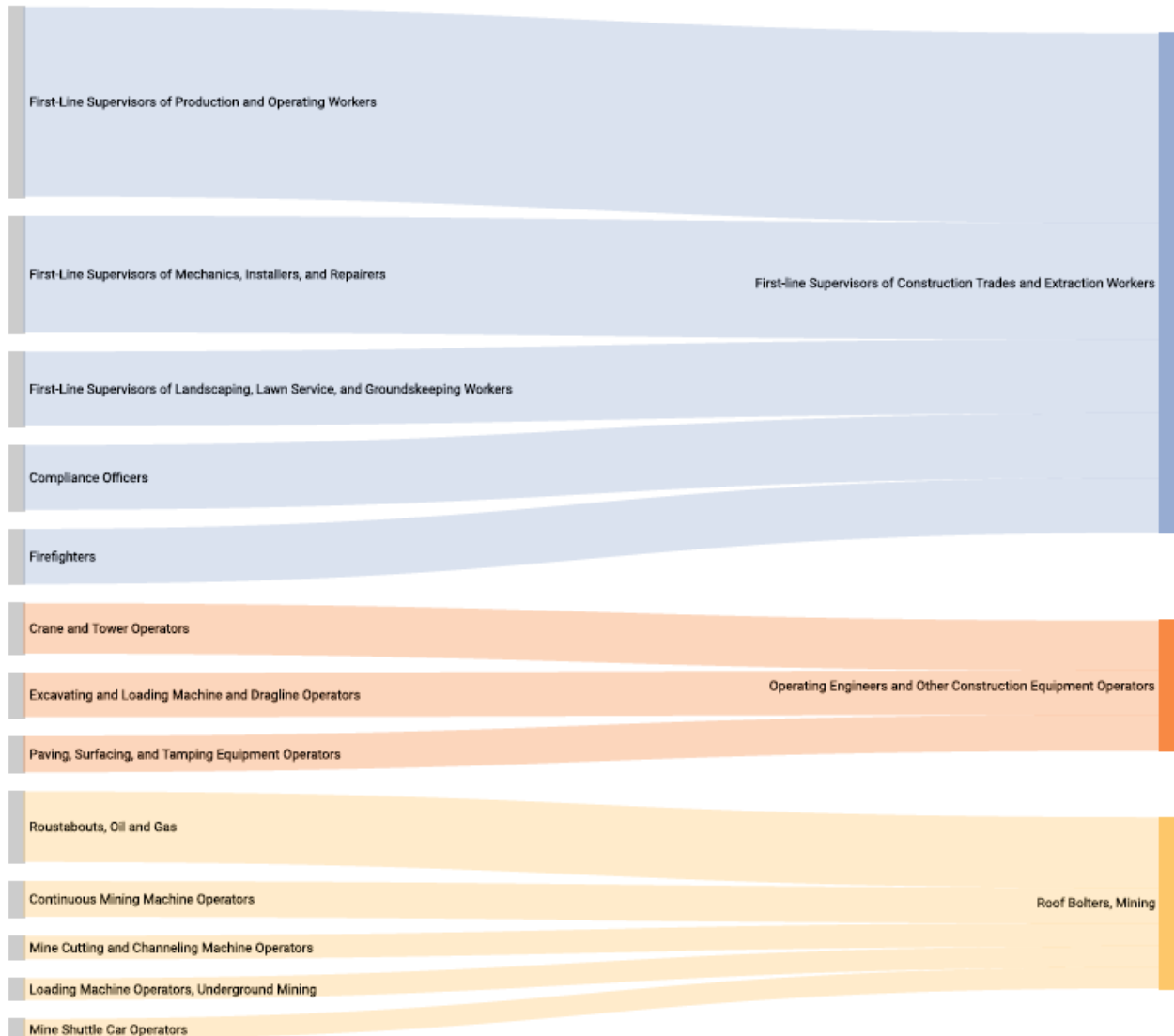
Workforce Solutions also facilitates delivery of on-the-job training for regional employers.

Important to note are potential opportunities for dislocated coal mine workers to move between occupations with similar skills sets. The sector strategy pathways for mining industry workers are useful to help direct workers to future careers. The following exhibit demonstrates relationships and potential movement (from left to right) between occupations that share similar skill sets with mining industry occupations. Developing career pathways as a strategy promotes industry employment growth.

³⁷ Workforce Solutions of North Central PA. Accessed 1/10/20 at: <https://workforcesolutionspa.com/about-us/>.

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Exhibit 18 - Mining Industry Sector Strategy Pathways



Source: Workforce Solutions, JobsEQ®

VI. Transitioning from a Coal-Based Economy

Determining next steps to continue the North Central region's transition from a coal-based economy requires the region to look at existing economic advantages and leverage those advantages in the future.

To identify regional industry economic strengths, the North Central region's industry clusters were briefly analyzed. A strong collection of a varied set of interrelated industry clusters throughout a region is a strength that enables communities to withstand economic downturns, such as the decline of the coal industry. The ability to withstand the economic downturns is part of building community resilience.

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Economic resilience can be defined in many ways, but in its simplest form it refers to the ability of a defined area to recover from or adjust to the negative impacts of extreme internal stresses or external economic shocks. These shocks and stresses can be natural disasters, human scale disruptions or long-term economic shifts.

Consistent with EDA, a regional focus on resiliency is advised and is already incorporated into North Central's CEDS. In encouraging economic resilience, organizations should include steady-state and responsive initiatives. While the responsive initiatives are fairly straight forward, responding when large employer layoffs are eminent, steady state initiatives require greater thought and long-term development.³⁸

Once the region's strong industry clusters were identified, existing economic and workforce development strategies were reviewed against energy trends and abandoned mine land reclamation trends to identify ways to match existing strategies going forward.

North Central's Industry Clusters

A cluster is a regional concentration of related industries in a location, making the region uniquely competitive for jobs and private investment. Clusters consist of companies, suppliers, and service providers, as well as government agencies and other institutions that provide specialized training and technical support. Clusters exist where and when the economic activities in a set of related industries reach a critical mass.

Looking at an economy via clusters rather than specific companies, industries, or sectors is helpful as clusters assess linkages between technology, skills, and information beyond industries. Assessing an area's clusters highlights opportunities for coordination and mutual improvement.³⁹

To analyze the North Central region's clusters, data from the U.S. Cluster Mapping project, a collaboration between the U.S. Economic Development Administration and Harvard University, was analyzed. The Cluster Mapping Project provides a set of benchmark cluster definitions (or cluster categories) that are the same in all U.S. regions (states, economic areas, metropolitan statistical areas, or counties). While the most recent data from the collaboration is from 2016, it nonetheless provides a snapshot of the region's industrial mix.

The Cluster Mapping project methodology includes two types of clusters – **Traded** and **Local**.

Traded clusters are groups of related industries serving markets beyond the region in which they are located, in other words they are exported out of a region. Traded clusters result in an influx of wealth to the region and are the "engines" of regional economies. If a region does not have strong traded clusters, identified by high employment specialization, it is difficult for a region to reach high levels of overall economic performance.

³⁸ U.S. Economic Development Administration, CEDS Content Guidelines, Economic Resilience. Accessed 12/12/19 at: <https://www.eda.gov/ceds/content/economic-resilience.htm>.

³⁹ U.S. Cluster Mapping, Institute for Strategy and Competitiveness, Harvard Business School.

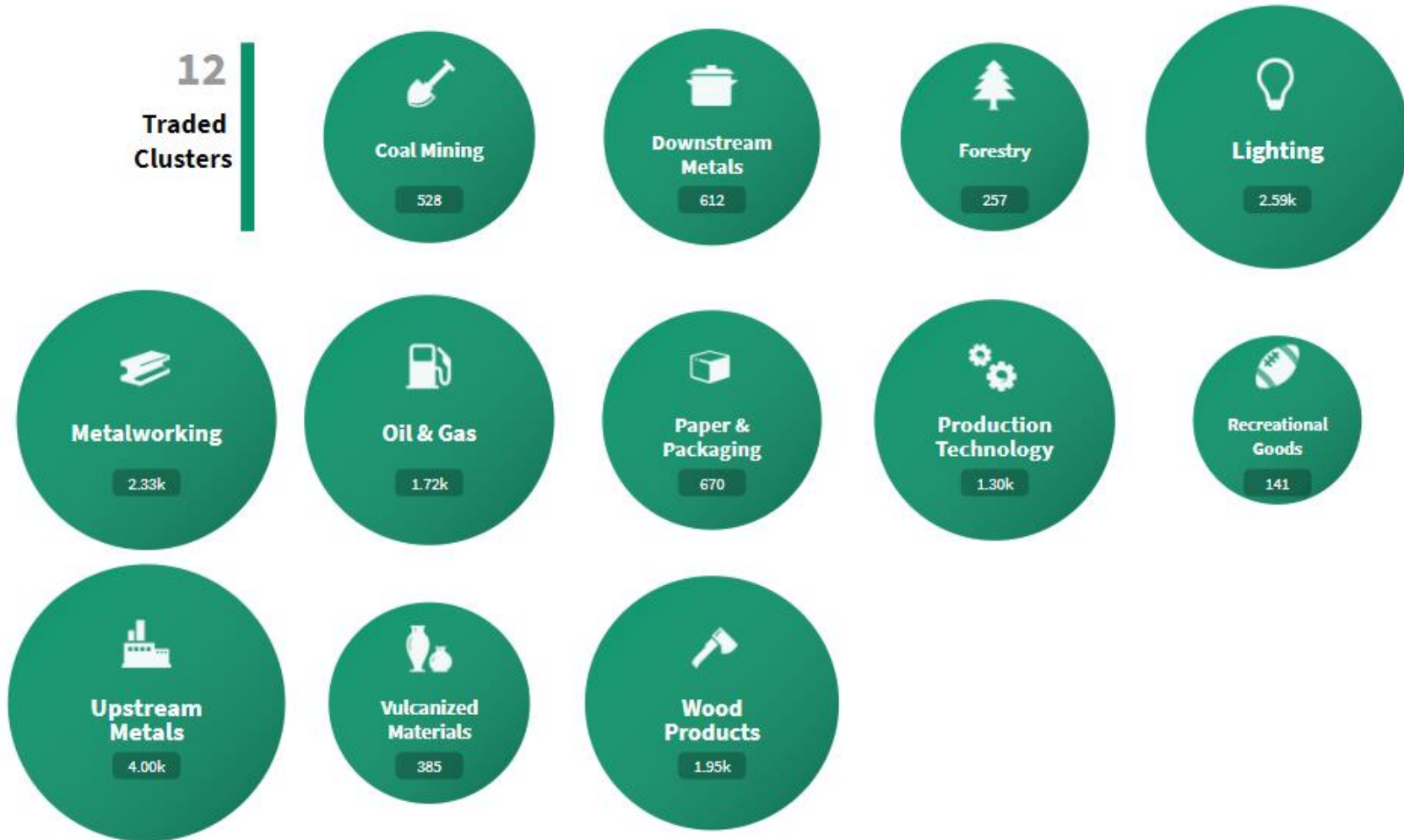
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Local clusters include industries that serve a local market. Local clusters exist in every region and are typically proportional to the region's population. Examples include local health services, restaurants, and retail and commercial services.

The Cluster Mapping Project divides counties in the North Central Pennsylvania region into two economic areas: State College, PA and Buffalo, NY. The cluster data tool allows for the creation of custom regions; therefore, a custom region including the six counties in the North Central region was created.⁴⁰ The following exhibit shows that the North Central Pennsylvania region includes twelve traded clusters – groups of industries serving markets beyond the region. The exhibit shows the number of workers employed in each of the twelve traded clusters.

⁴⁰ U.S. Cluster Mapping (<http://clustermapping.us>), Institute for Strategy and Competitiveness, Harvard Business School. Copyright © 2018 President and Fellows of Harvard College. All rights reserved. Research funded in part by the U.S. Department of Commerce, Economic Development Administration.

Exhibit 19 – North Central Pennsylvania’s Traded Clusters



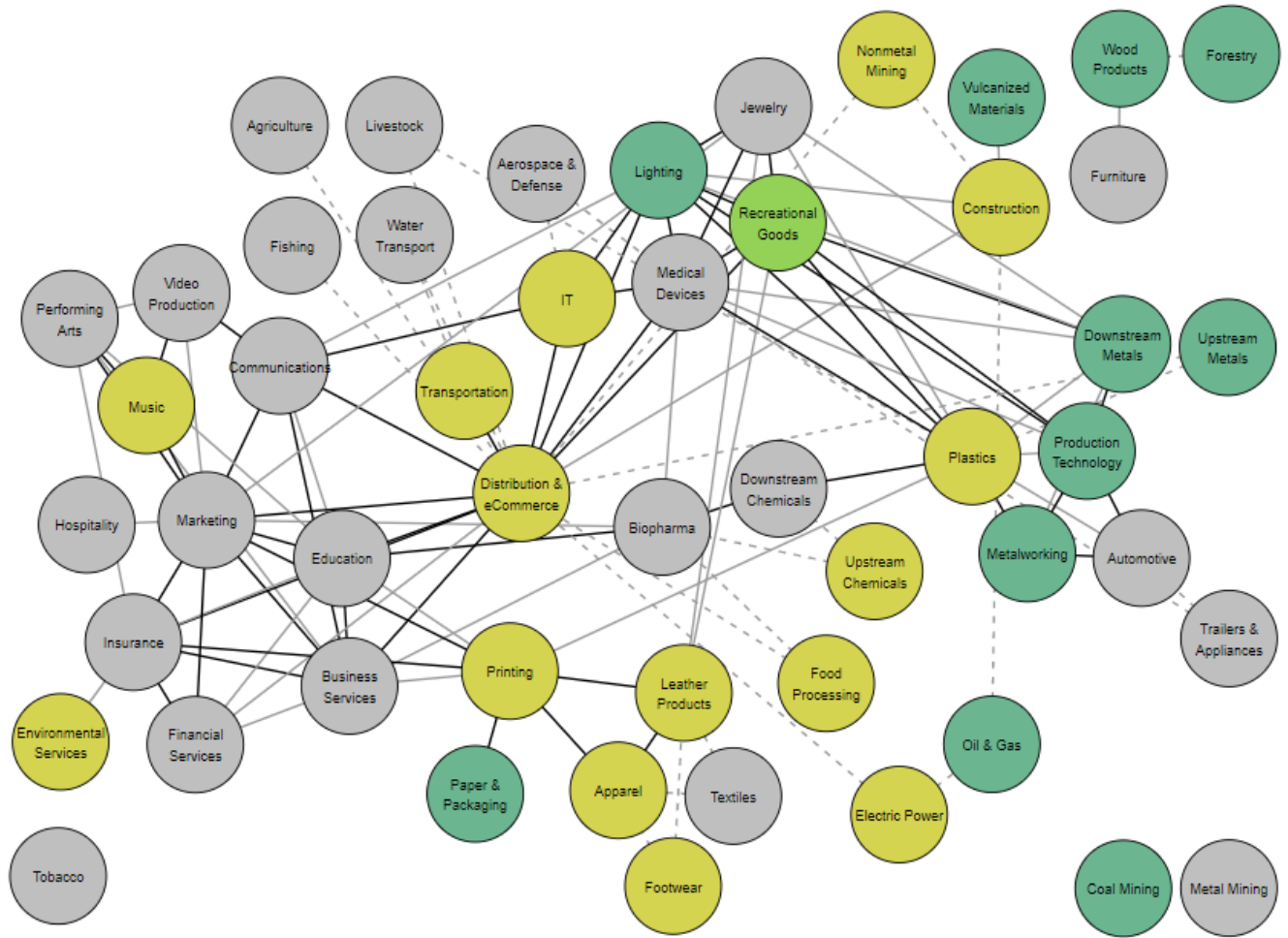
Source: U.S. Cluster Mapping, Institute for Strategy and Competitiveness, Harvard Business School.

The above cluster portfolio identifies the strongest traded clusters in the region. The larger the bubble, the stronger the industry. Coal is just one part of the region's industry mix and collectively the region includes a diversified mix of clusters. On their own the number of traded industry clusters in each county decreases. For example, Jefferson County has seven traded clusters; Clearfield County has four; and Cameron County has three. Cluster portfolios for each county in the North Central Region are included in Appendix B.

The following exhibit demonstrates the interrelationships between the North Central Pennsylvania's traded clusters. Strong traded clusters are shaded dark green and correspond to the traded clusters identified above. Other specialized clusters in the region are shaded in yellow. Efforts to promote stronger linkages between the clusters will strengthen the region's overall economic resiliency.

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Exhibit 20 – North Central Cluster Linkages and Economic Diversification



- Cluster Specialization**
- Strong clusters above 90th percentile specialization
 - Strong clusters above 75th percentile specialization
 - Other specialized clusters (LQ > 1.0)

Source: U.S. Cluster Mapping, Institute for Strategy and Competitiveness, Harvard Business School.

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Efforts to advance the growth of the North Central Pennsylvania region's traded clusters will increase economic competitiveness throughout the region

While the region exhibits strong traded clusters, the strongest clusters have not been gaining, but have been losing employment since 1998. A total of 7,861 jobs in traded clusters have been lost since 1998.

The cluster information paints a picture relatively consistent with the WIOA Multi-year Regional Plan.⁴¹ It identifies a 2016 labor force of just over 97,000 according to EMSI.⁴² The largest sector in the North Central Workforce Development Area is manufacturing, which employed 17,743 workers and represented 24% of the gross regional product (GRP). The next largest sector in the region was health care and social assistance (15,673 workers, 10% of GRP) and retail trade (10,478, 6% of regional GRP). The government sector (which includes education), employs 12,055, represents 11% of the GRP.

High location quotients (LQs) indicate industry sectors with high concentrations of employment compared to the national average. According to PA WIA, North Central regional sectors with the largest location quotients (LQ) are: Energy (LQ=2.94), Wood/Wood Products and Publishing (LQ=2.71), and Advanced Manufacturing (LQ=2.17).

In summary, efforts to advance the growth of the North Central Pennsylvania region's traded clusters will increase economic competitiveness throughout the region. With several specialized (LQ > 1.0) clusters such as plastics, upstream chemicals, information technology, and electric power, efforts to increase the diversification and economic linkages between these strong traded and specialized clusters should be a regional priority.

Plastics and information technology are strong traded clusters in the State College, PA Economic Area, of which four counties in the North Central region are a part. Similarly, plastics are a strong traded cluster in the Erie, PA Economic Area and electric power and information technology are strong traded clusters in the Pittsburgh, PA Economic Area, both adjacent to the North Central Pennsylvania region.

Achieving continued diversification is possible through the existing economic development and workforce assets in place within the region.

Next Steps

With existing assets and a changing energy landscape, the North Central Pennsylvania region should focus on achieving the following high-level goals.

- **Energy Replacement** - What opportunities exist to realistically replace some of the economic value associated with the coal mining industry?
- **Retraining Workers** - What types of regional industries need workers and how can former coal mining industry employees be retrained?
- **Redeveloping Formerly Mined Sites** - What sites should be prioritized for redevelopment in each county? What high level factors should be used to prioritize site redevelopment?

⁴¹ Workforce Solutions, North Central Workforce Development Area, 2017-2019 WIOA Multi-Year Regional Plan, p. 4.

⁴² Economic Modeling Specialists Intl.

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- **Funding and Technical Assistance** - What potential funding sources/technical assistance is available and how can the region leverage to facilitate the transition from a coal-based economy?
- **Capitalize on Plastics and Cracker Plant** – Caron Hub for Coal innovation – engage coal operators, carbon graphite manufacturers, research scientists, investors, policy makers and representatives from state and federal agencies

Several strategies to accomplish these goals have been developed for further regional consideration.

Strategy 1 - Continue to position the North Central Pennsylvania region for future industrial growth

Positioning the region’s industry clusters for future growth should be a priority. Individually, counties in the North Central Pennsylvania region do not exhibit a diverse set of industry clusters, but collectively they do. The coordination and cooperation that currently exists throughout the region should be continued and further defined in the CEDS planning process.

From a manufacturing perspective while the region is still fairly dependent on traditional manufacturing sectors, it can promote efforts to collaborate with neighboring regions to strengthen specialized clusters such as plastics, information technology, and electric power. For example, the North Central region can partner with the neighboring Southwest PA region to capitalize on the significant capital investment associated with the Shell petrochemical plant in Beaver County.

The North Central region should continue to explore uses of coal beyond electricity generation. The region is already assessing the use of coal for the region’s powdered metals companies. Assessing the viability of providing the region’s coal resources for the manufacture of technology products, chemicals, and other consumer products could also be explored.

Having manufacturing sites ready to go for prospective businesses is a priority with county economic development organizations and efforts should be made to partner at the regional level to the maximum extent possible. Issues such as land ownership and local land use regulations should be considered and addressed in each county to maximize the potential for shovel ready sites and move in ready spec buildings matching the size needed by small manufacturers.

Working with county economic development partners the region can explore the further use of designated incentives zones such as Pennsylvania Keystone Opportunity Zones and federal Qualified Opportunity Zones to incentivize business investment.

Strategy 2 - Explore available opportunities for repurposing abandoned mine lands

The region should explore, with the assistance from PA DEP, opportunities to repurpose abandoned mines lands. Structural resources, like abandoned mine lands, ‘often overlooked by communities or perceived as liabilities’ are present in the North Central region and are potential locations for new investment. Repurposing abandoned mines as well as older structures and abandoned railroads leverage limited resources by finding new uses for outdated infrastructure. Finding new purposes for the region’s abandoned mine lands is one structural asset that should be explored.

Recent trends in the energy sector reveal that solar developers are actively seeking locations to site solar farms in Pennsylvania. Site requirements generally include flat, dry, cleared land 25 – 35 acres in size located within 2 miles of a power substation. The interest has been documented in Clearfield County. This

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activity is reportedly occurring to take advantage of current capacity on Pennsylvania's existing electricity generation infrastructure as well as pending state legislation to site community solar projects.

Communities in North Carolina and Ohio have received funding through ARC's POWER initiative for solar related initiatives. Similar initiatives could be developed in the North Central region, focusing on repurposing of abandoned mine lands.

Strategy 3 - Continue to Advance North Central Pennsylvania's Natural, Cultural, and Structural Assets

The North Central Pennsylvania region has made significant advances in growing nature-based tourism while protecting and conserving natural resources. The region should continue to advance its natural, cultural, and structural assets.

The North Central Pennsylvania region should focus on the assets it has in place and capitalize on their potential. This is an approach embarked on by ARC, asset based economic development or focusing on the natural, cultural, and structural resources existing within the community.⁴³

Natural and cultural resources are the great benefits and attributes of the region. In the North Central Pennsylvania region, the vast natural resources have undoubtedly led to significant tourism opportunities. A \$500,000 ARC POWER initiative grant was awarded to the Pennsylvania Wilds Center for Entrepreneurship, Inc. in 2016 for the Nature Tourism Cluster Development in the PA Wilds project. The project is focused on creating a coordinated regional cluster development system to capitalize on Pennsylvania's numerous nature tourism assets that spread across 2,000,000 acres in 12 counties. The strategy focuses on increasing attendance to these natural attractions, leveraged by \$500,000 in match to develop a network of small businesses to support the increased demand for products and services in the area.

The region has benefitted and promoted a significant investment with the tourism based economic investment promoted through the PA Wilds. County comprehensive plans reference the economic development efforts resulting in industry diversification brought about by enjoying nature-based recreation such as hunting, fishing, elk watching, and the enjoyment of the natural beauty and undeveloped areas.

Beyond the PA Wilds, tourism efforts promoted by Pennsylvania's Lumber Heritage Region of Pennsylvania (LHR) highlights the historic, natural, cultural, and recreational resources of Pennsylvania's forests. PA Route 6 Alliance is also working on a national Scenic Byways/ All American Road designation to attract tourism dollars to the region. From a grass roots perspective, the local official tourism promotion agencies and designation marketing agencies in the region (Pennsylvania Great Outdoors Visitors Bureau, Allegheny National Forest Visitors Center, and Visit Potter-Tioga) have worked collectively to advance tourism throughout the North Central Pennsylvania region.

Strategy 4 – Continue to Retrain Workers and Attract New Workers

Since the coal industry has been in decline for decades, many workers have transitioned on to new industries. Over 2,600 North Central Pennsylvania coal mine workers have lost jobs since 1999. While the

⁴³ Appalachian Regional Commission, Turning Liabilities into Assets.

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coal industry “has been in an ebb and flow over many decades, ...the last six years saw an accelerated loss, particularly in Appalachia.”⁴⁴

Many communities are seeking a just transition for coal miners. “That is, the engineering of fair economic and environmental conditions for communities who have historically relied on fossil fuel extraction.”⁴⁵ The need is to build a better future for communities and workers that have historically relied on coal – and other resource intensive industries like lumbering for that matter.

While industry experts and economists largely believe coal jobs are lost forever and not coming back, the industry’s workforce has been able to some extent to diversify their skill sets and many skills gained as miners can translate to other positions.⁴⁶

That is where North Central Pennsylvania’s regional workforce development expertise comes into play. Significant efforts have taken place throughout the region to address workforce loss. Coordinated at the public sector level by Workforce Solutions, regional goals have been clearly defined:⁴⁷

- Attract people to commute to the North Central Pennsylvania Region for employment
- Attract people to live in the North Central Pennsylvania Region
- Attract young people to return and live in the North Central Pennsylvania Region after post-secondary education

Action items identified in Workforce Solutions’ 2018 Regional Action plan are projected to retain/attract over 7,500 people at a cost of \$35.3 million over 10 years or an investment of \$4,687 per person. The action items would help slow the projected population decrease that continues in the region. Several of the action items are pertinent to the discussion of displaced coal mine workers.

In addition, Workforce Solutions’ efforts to promote sector strategy pathways for dislocated coal mine workers is important to help workers transition between occupations with similar skills sets and position these citizens for new jobs within the region.

Strategy 5 - Collaborate to Maximize Funding & Financing

The North Central Pennsylvania region has been successful at evaluating and receiving public sector funding for project implementation. Achieving positive outcomes in the previously identified strategies will require concerted efforts to identify, apply for, obtain, and manage funding opportunities as they arise. In addition, the region should consider identifying foundational funding through foundations such as the Just Transition Fund to implement strategies as well.

⁴⁴ The Register-Herald. The ripple effect caused by the collapse of coal. March 4, 2018. Accessed 12/12/19 at: https://www.register-herald.com/news/money/the-ripple-effect-caused-by-the-collapse-of-coal/article_2ca75bbe-aa4f-5462-ab27-ab047ca82cd9.html.

⁴⁵ Grist. *How should communities cope with the end of coal? Advice from the frontlines*. December 12, 2017. Accessed 12/12/19 at: <https://grist.org/article/how-should-communities-cope-with-the-end-of-coal-advice-from-the-frontlines/>.

⁴⁶ The Register-Herald. *The ripple effect caused by the collapse of coal*. March 4, 2018. Accessed 12/12/19 at: https://www.register-herald.com/news/money/the-ripple-effect-caused-by-the-collapse-of-coal/article_2ca75bbe-aa4f-5462-ab27-ab047ca82cd9.html.

⁴⁷ Fourth Economy, MEEA/Workforce Solutions Action Items. September 6, 2018.

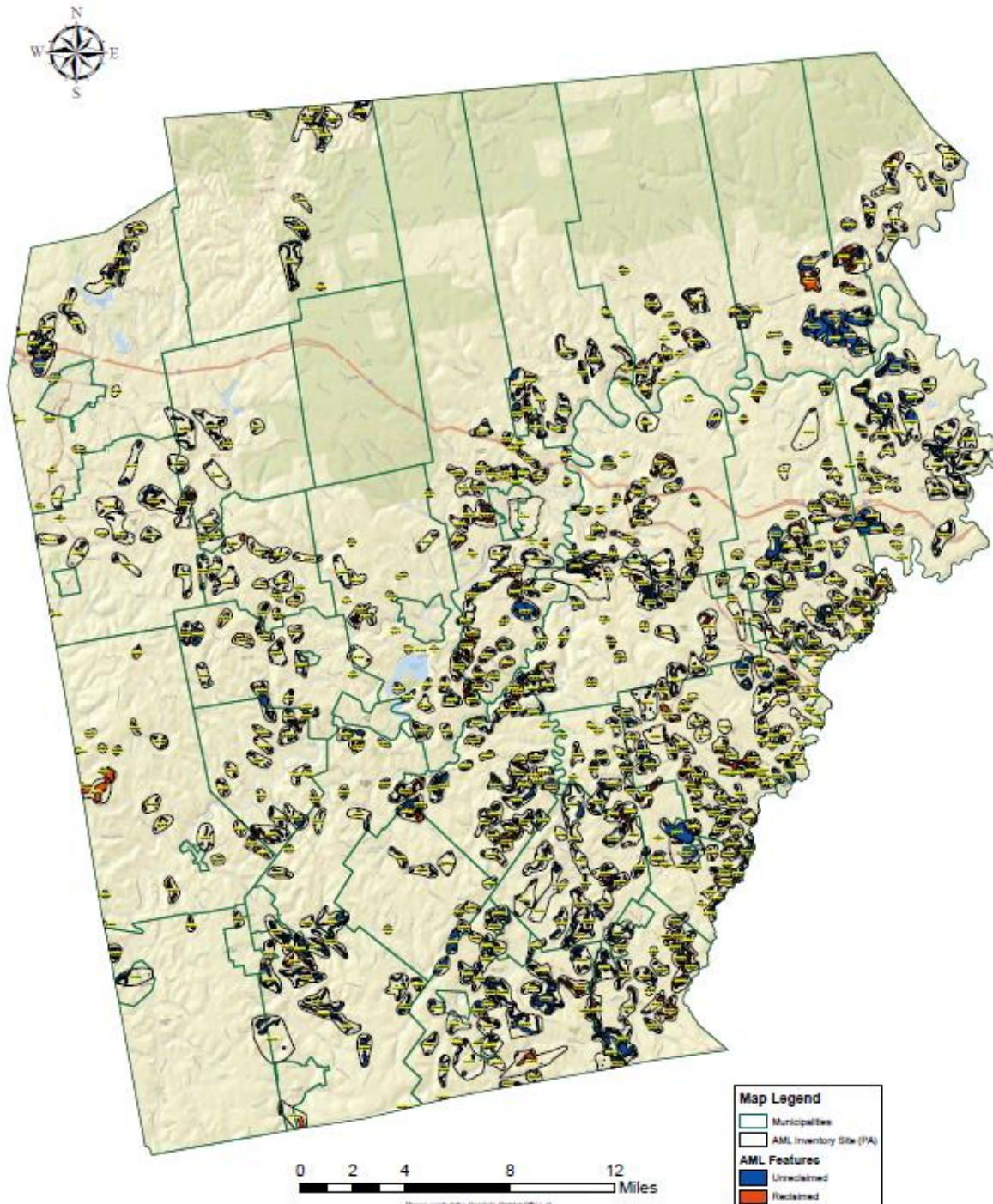
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While the ARC POWER initiative is a funding source that has been awarded to several projects in the region, partnership with PADEP through the Mining Deputate and Energy Office could lead to the identification of additional financial sources and partnerships.

Private sector financing through local and regional financial institutions could also be explored.

VII. Appendix A - County Abandoned Mine Inventory Mapping

Clearfield County Abandoned Mine Land Inventory



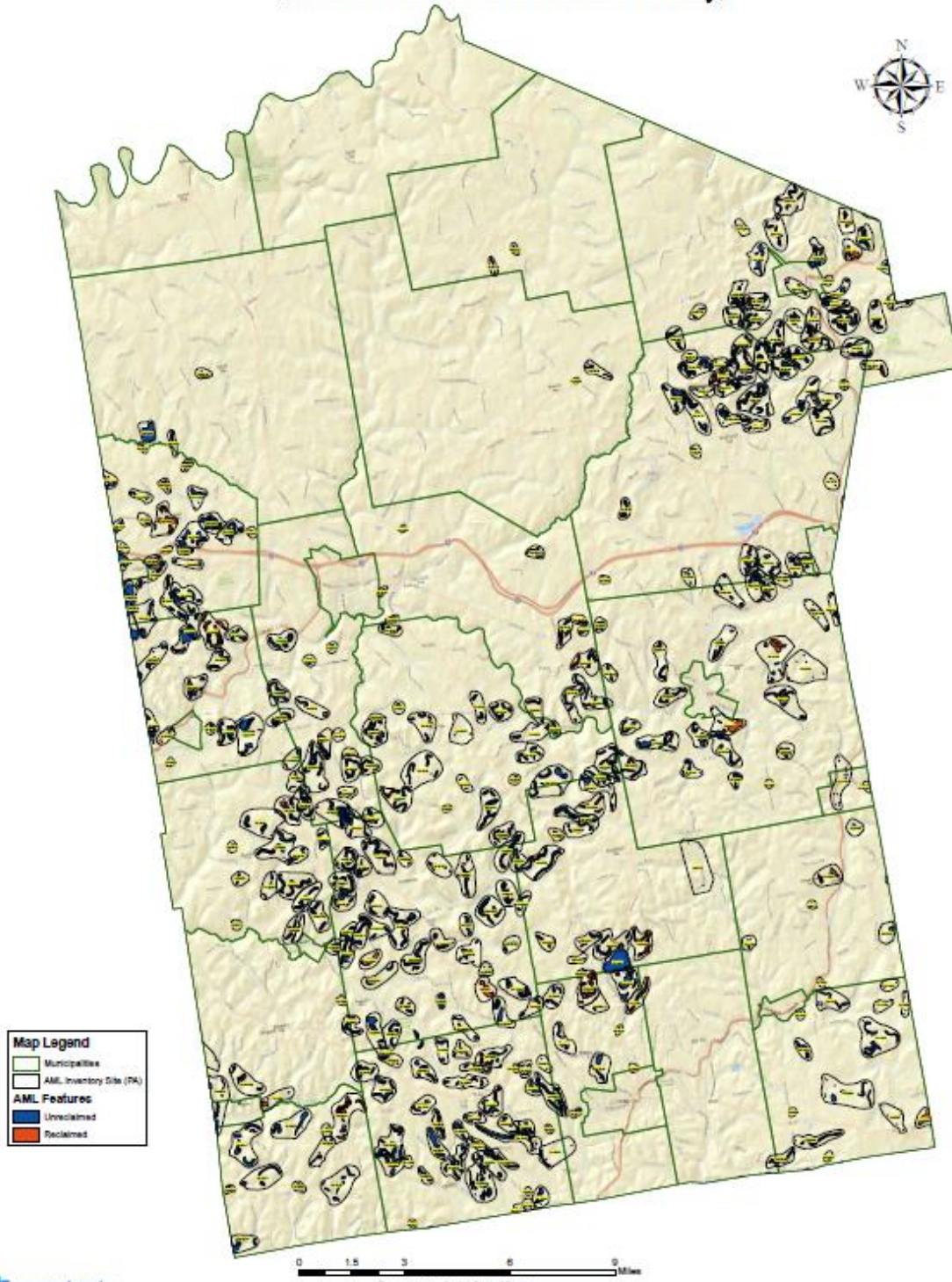
0 2 4 8 12 Miles

Please contact the Canisteota District Office at (814) 872-1822 concerning abandoned mine information.



For information only.
Priority 1 (P1) or 2 (P2) are all problems concerning the protection of public health, safety, and property from adverse effects of mining practices or adjacent land use activities.
Priority 2 (P2) are all problems concerning the protection of public health and safety from adverse effects of mining practices or adjacent land use activities.
Priority 3 (P3) are all problems concerning the reclamation of land and water resources and the protection (pasture, agriculture, etc.) of mining practices.

Jefferson County Abandoned Mine Land Inventory

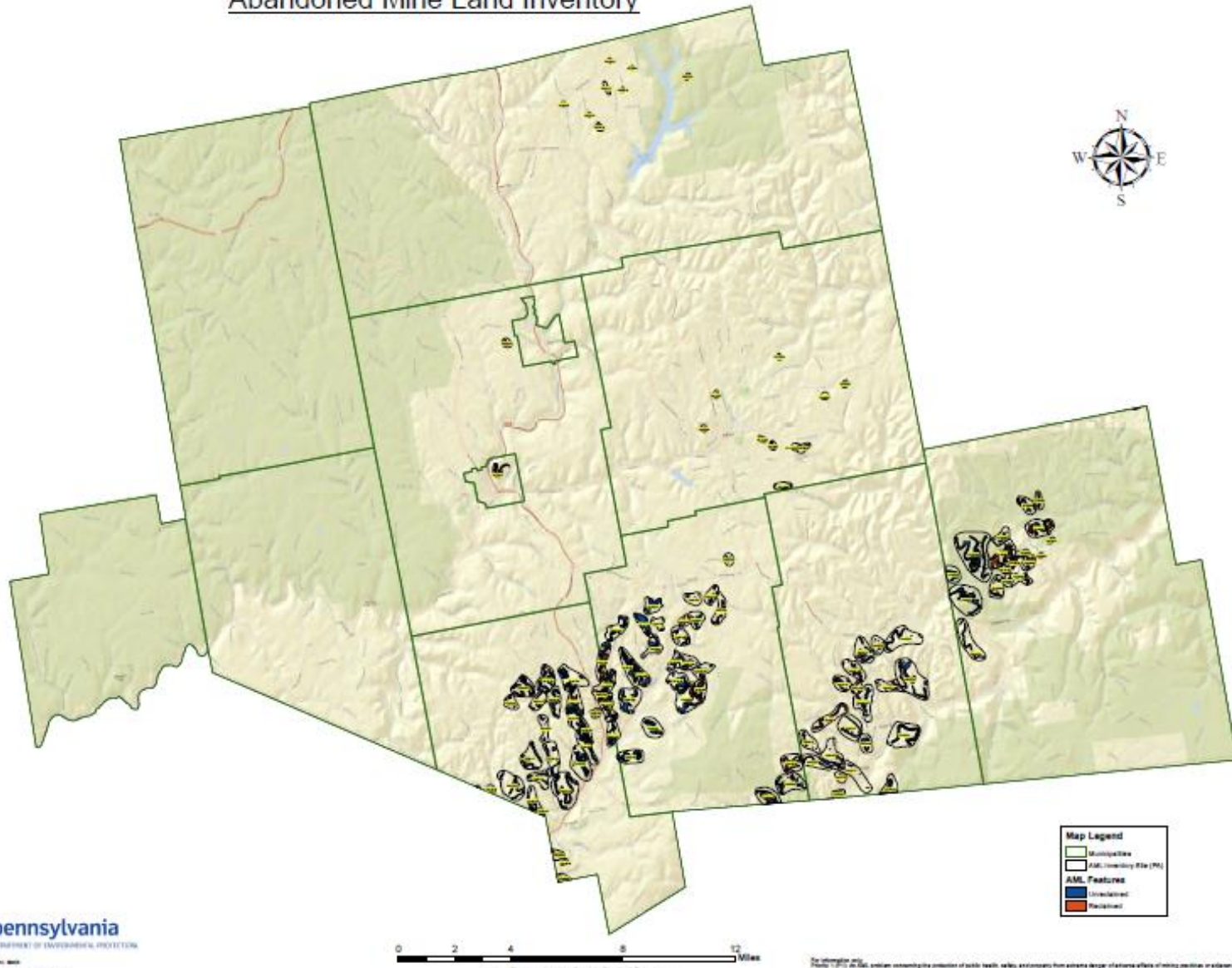


Please contact the Canfield District Office at
(814) 472-1800 concerning abandoned mine information.

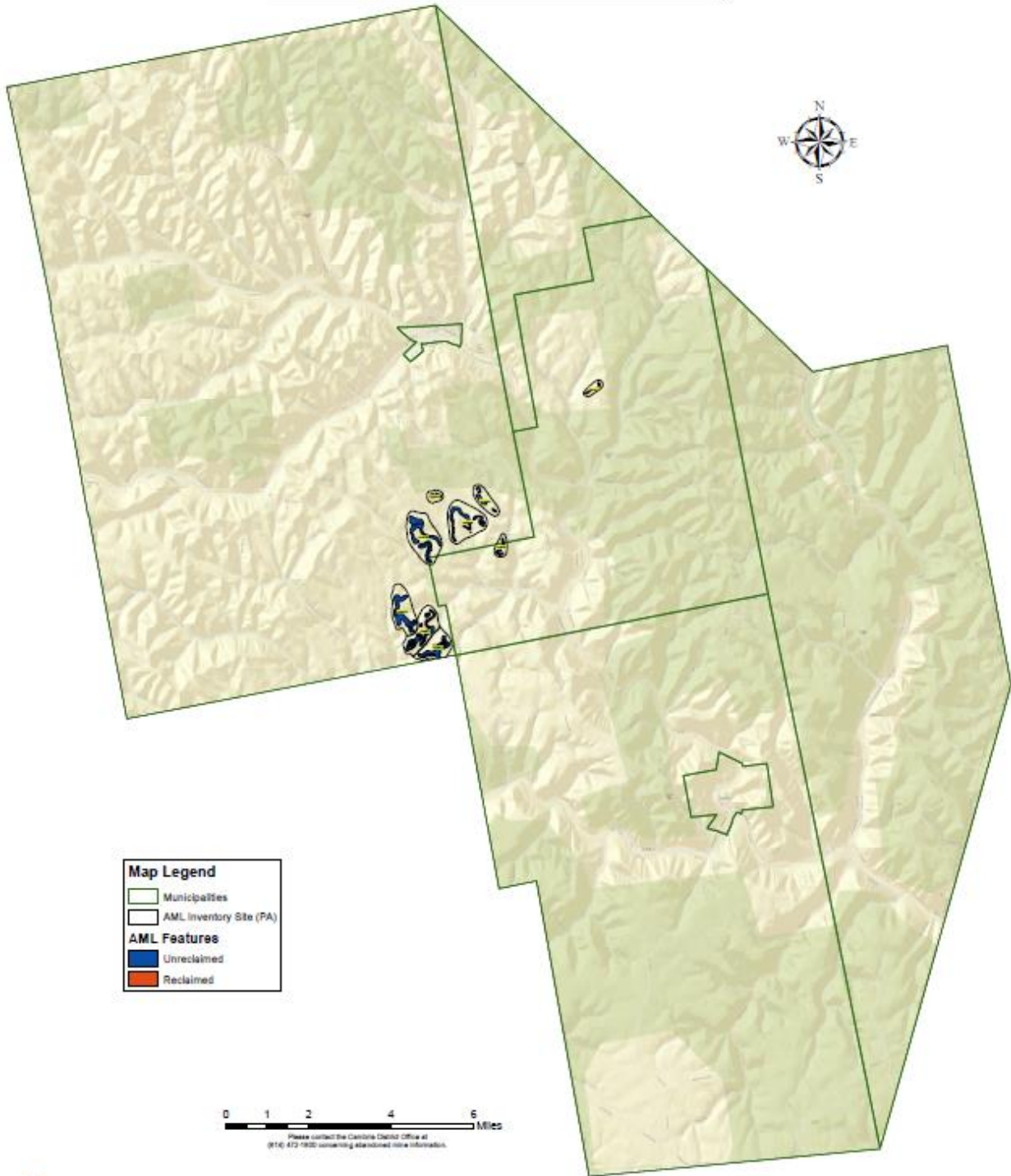
For information only:
Priority 1 (P1) in this program concerning the protection of public health, safety, and recovery from adverse effects of historic practices or adjacent land and water resources.
Priority 2 (P2) in this program concerning the protection of public health and safety from adverse effects of mining practices or adjacent land and water resources.
Priority 3 (P3) in this program concerning the restoration, effect and water resources and the environment previously degraded by adverse effects of mining practices.

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Elk County Abandoned Mine Land Inventory



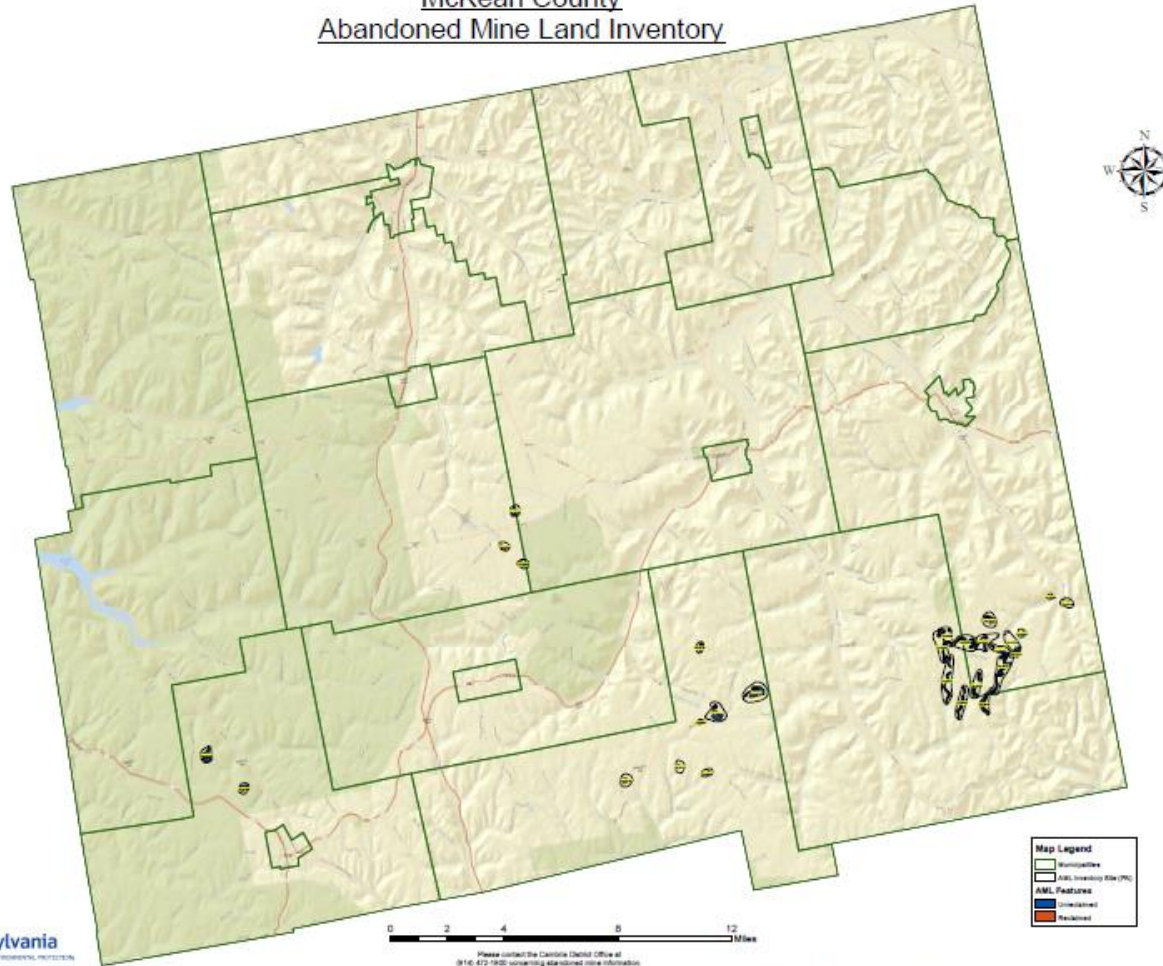
Cameron County Abandoned Mine Land Inventory



The information on this map was derived from the Pennsylvania Department of Environmental Protection's Abandoned Mine Land Inventory. Priority 1 (P1) is the AML problem concerning the protection of public health, safety, and property from adverse danger of adverse effects of existing practices on adjacent land and water resources. Priority 2 (P2) is the AML problem concerning the protection of public health and safety from adverse effects of existing practices on adjacent land and water resources. Priority 3 (P3) is the AML problem concerning the restoration of land and water resources and the environment previously degraded by adverse effects of existing practices.

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McKean County Abandoned Mine Land Inventory



0 2 4 8 12 Miles
Please contact the Central District Office at
(814) 472-1900 concerning abandoned mine information.

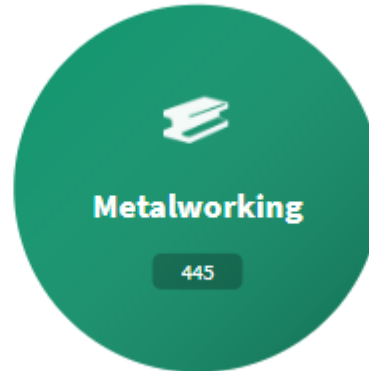
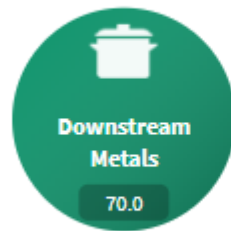
For information only.
Priority 1 (P1) on this map denotes the presence of public health, safety, and property from adverse danger of adverse effects of mining practices or adjacent land and water resources.
Priority 2 (P2) on this map denotes the presence of public health and safety from adverse effects of mining practices or adjacent land and water resources.
Priority 3 (P3) on this map denotes the restoration of land and water resources and the protection previously degraded by adverse effects of mining practices.

VIII. Appendix B – Cluster Portfolios for North Central Region Counties

Transitioning from a Coal-based Economy

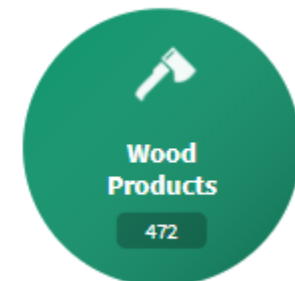
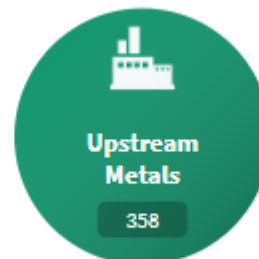
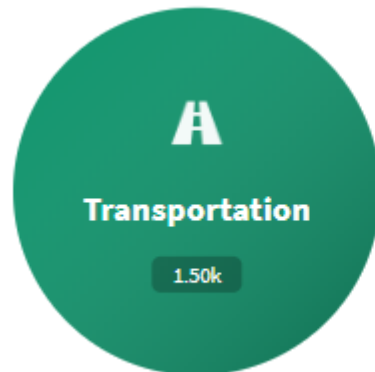
Cameron County

3
Traded
Clusters



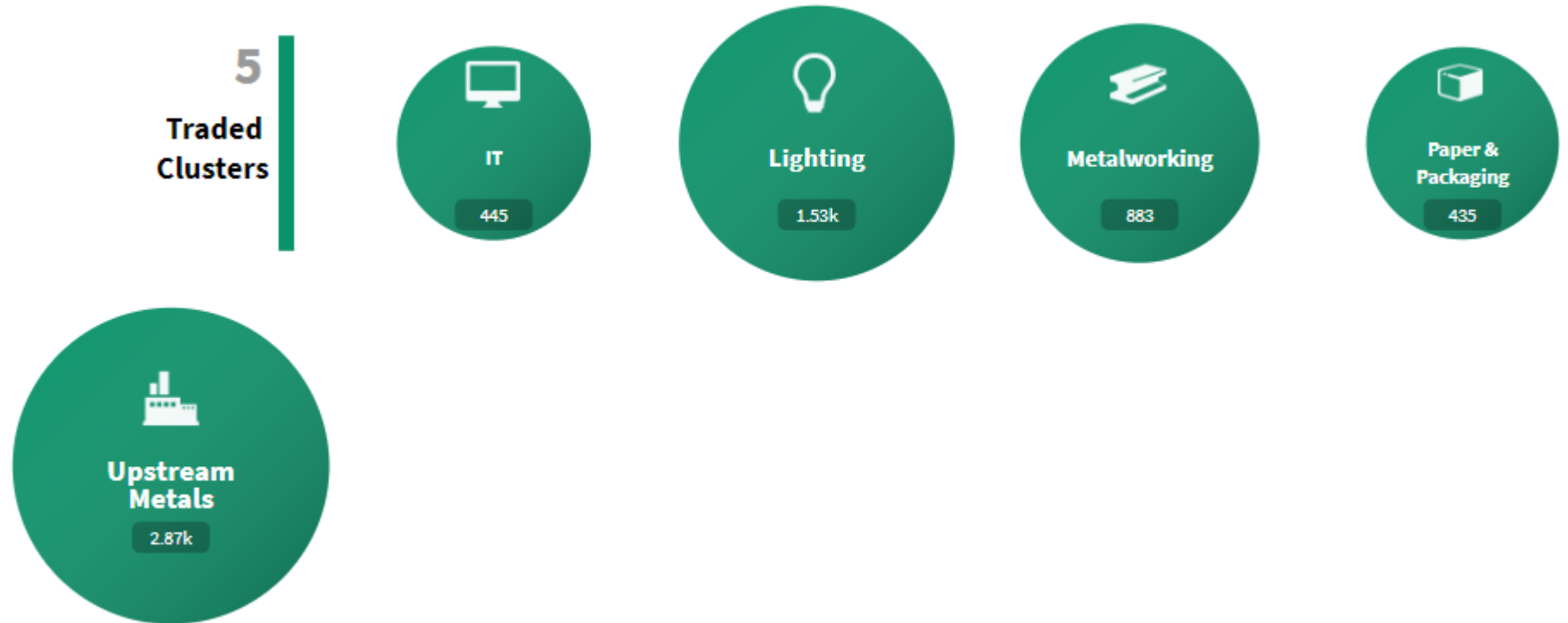
Clearfield County

4
Traded
Clusters



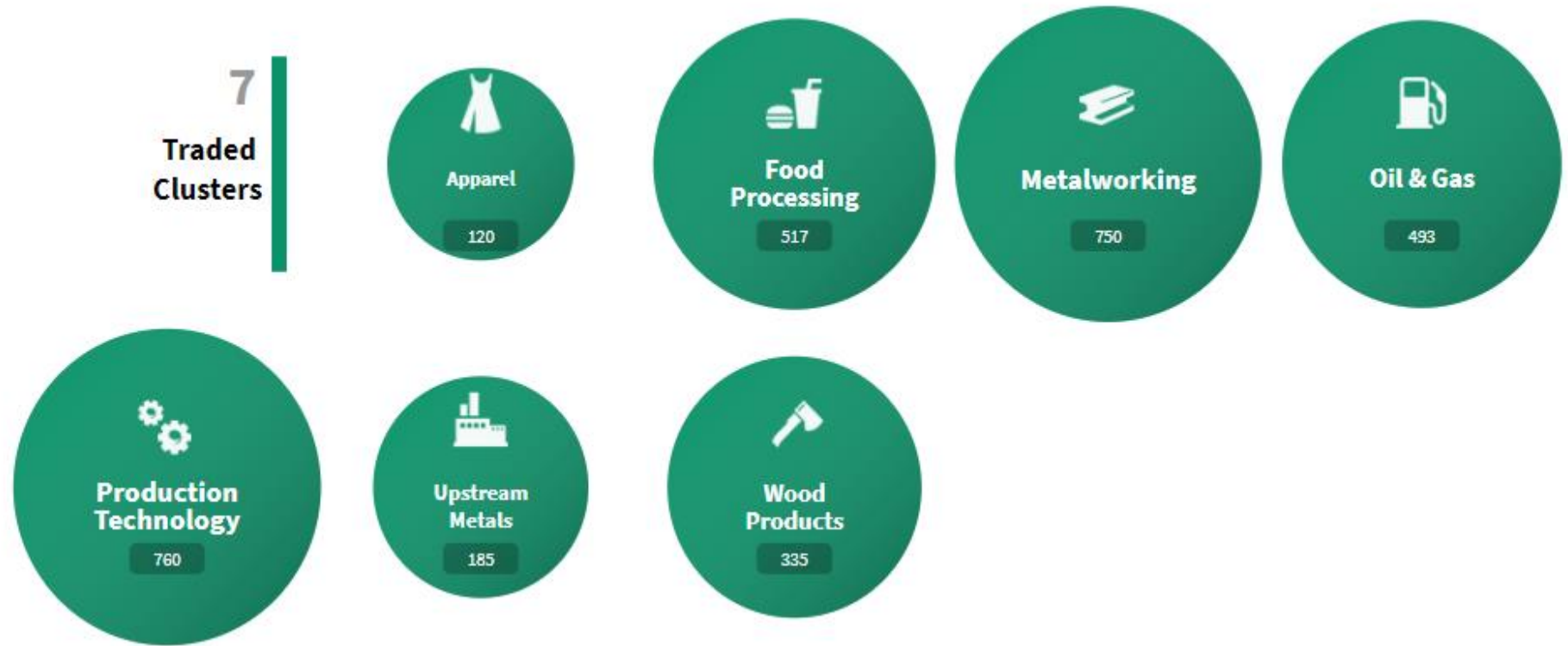
Transitioning from a Coal-based Economy

Elk County



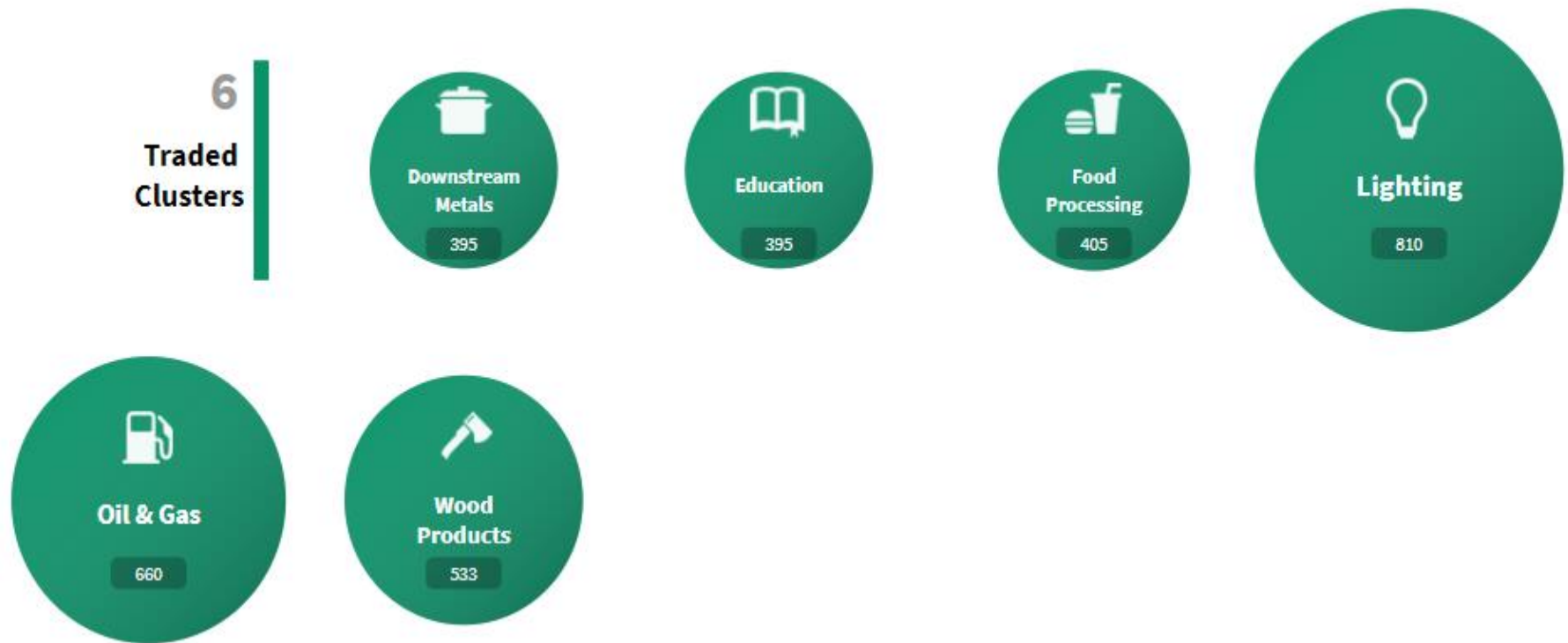
Transitioning from a Coal-based Economy

Jefferson County



Transitioning from a Coal-based Economy

McKean County



Transitioning from a Coal-based Economy

Potter County

