

COAL MINING IN TODAY'S CLIMATE CRISIS

Climate Change Law, Research & Writing (Spring 2025): Final Paper

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I. Introduction

Coal is a combustible sedimentary rock that is formed through the accumulation and compression of plant matter over millions of years.¹ Since it is a highly compostable material it can be used to produce different sources of energy such as heat and electricity.² Coal mining has been happening around the world for longer than most people believe. Aristotle's mention of “combustible bodies” in his work *Meteorologica* is believed to refer to coal since it is a combustible material.³ There is also evidence of Ancient Chinese civilizations using coal for heat and metal working. Coal has been a prominent source of energy for a long before the United States even gained its independence, but the U.S. eventually became the number one exporter for coal. Given coal’s longstanding significance in the U.S. economy since the rise of capitalist industrialization, its phased-out use due to environmental harm must be carefully planned to ensure that affected communities experience a just and equitable transition.

Given coal’s long-standing role in the U.S. economy, particularly since the onset of capitalist industrialization, its phased removal due to environmental concerns must be carefully planned to ensure that affected communities experience a just transition. This paper argues that such a transition is essential for three main reasons: (a) coal mining has historically contributed significant economic value to the country, and it is only fair that those who built their livelihoods around it are supported through the shift; (b) the environmental costs of continued coal mining are too severe to justify its persistence; and (c) a just transition aligns with the broader principles of climate action—adaptation, mitigation, and prevention—of which fair social and economic restructuring is a crucial part.

¹ EnviroLiteracyTeam, *What is Coal Mining*, (Mar 28, 2024), ENVIROMENTAL LITERACY COUNCIL, <https://enviroliteracy.org/what-is-coal-mining/>

² Id.

³ Id.



II. Coal mining has historically contributed significant economic value to the country, and it is only fair that those who built their livelihoods around it are supported through the shift

Coal mining has been a huge source for U.S. energy and the economy even before the nation gained its independence. Coal deposits in the United States were first discovered in Chesterfield County, Virginia in 1701.⁴ By the 1730s commercial coal mining was happening all over the country. The industrial revolution brought along a higher demand for coal as a way to quickly manufacture railroads and steam engines.⁵ In 2022, 21 states produced 594 million short tons of coal. A short ton is defined as “a unit of weight equal to 2,000 pounds”.⁶ Five of these twenty-one states contributed to seventy-three percent of the coal production in the United States.⁷ These top five states (in descending order) are: Wyoming, West Virginia, Pennsylvania, Illinois, and Kentucky.⁸

Historically Appalachian states have been the largest producers of coal accounting for fifty-four percent of all coal production since 1800 with Pennsylvania contributing one-fifth alone.¹⁰ Coal mining in Pennsylvania helped fuel the state’s western steel industry boom. There is no doubt that coal has provided a lot of energy and economic stability, but the environmental and social impacts have raised concerns.

Coal is a nonrenewable resource. This means that coal is being used quicker than it can replenish itself.⁹ However, coal is also the Earth’s most abundant fossil fuel making it easily

⁴ Blueprints of America: The First Coal Mine in the U.S, GEOGRIT.COM, <https://www.geogrit.com/blogs/trail-stories/the-first-coal-mine-in-the-u-s>.

⁵ 5 Cutler Cleveland, The History of Coal Production in the United States, (Sep. 18, 2023), VISUALINGENERGY.ORG, <https://visualizingenergy.org/the-history-of-coal-production-in-the-united-states/>

⁶ Coal Explained: Where our coal comes from, EIA.GOV, <https://www.eia.gov/energyexplained/coal/where-our-coal-comes-from.php> (last updated Dec. 22, 2023). “Short ton”, EIA Glossary, [https://www.eia.gov/tools/glossary/index.php?id=Short%20ton%20\(st\)](https://www.eia.gov/tools/glossary/index.php?id=Short%20ton%20(st))

⁷ Rajeev Dhir, Nonrenewable Resource: Definition, Features, and Example, INVESTOPEDIA.COM, <https://www.investopedia.com/terms/n/nonrenewableresource.asp>, (Last updated Jun. 17, 2024)

⁸ Id.

⁹ Coal Mining”, (Apr. 15, 2025), BRITANNICA, <https://www.britannica.com/technology/coal-mining>



accessible and profitable for most of the world.¹² Coal mining has faced increased levels of scrutiny in recent years due to the higher amounts of damage because of climate change and competition from cleaner energy resources like solar, wind, and hydro power. Additionally, regions where coal mining was prevalent have suffered adversely from things like Black Lung disease among coal miners, environmental degradation, and social challenges including high rates of drug abuse. These issues have disproportionately affected these communities.

While coal mining has historically contributed to U.S. energy and economic development, its environmental, economic, and societal consequences today demand a transition away from coal – one that must be managed through a just and equitable process.

There is no doubt that coal has been used to power the world. In 2019 coal comprised 36.4% of all the electricity generated in the world.¹⁰ The U.S. has the world's largest coal reserve base¹¹ which means that coal is a huge export for the U.S. In the U.S. in 2022 469.9 million short tons -- 91.7% of the coal produced in the U.S. -- was used for electricity.¹² Since 1950 there had been a gradual increase of coal consumption which peaked in 2005; since the peak there has been a general decline.¹³

¹⁰ 13 Coal's Importance to the World, SOCIETY FOR MINING, METALLURGY & EXPLORATION, <https://www.smenet.org/What-We-Do/Technical-Briefings/Coal-s-Importance-in-the-US-and-Global-Energy-Supp>

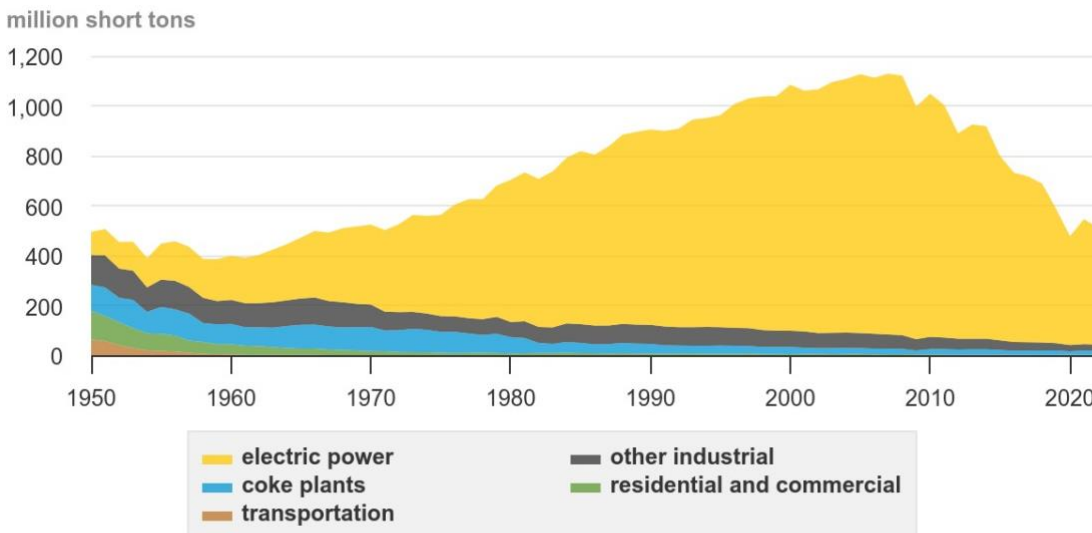
¹¹ Id.

¹² Id.

¹³ Id.



U.S. coal consumption by major end users, 1950-2022



Data source: U.S. Energy Information Administration, *Monthly Energy Review*, Table 6.2, June 2023, preliminary data for 2022

Note: Coke plants are industrial coking coal plants; other industrial includes all other, non-coking coal industry use.



Figure 1 - coal consumption by industry

Here you can see the increase of coal consumption until 2005 and then the general decline since. The chart also shows which industry consumed most of the coal in the country and it has always been electricity.

In recent decades coal production has decreased significantly. From 2005 to 2015 coal mining employment has dropped 45% in Appalachia alone.¹⁴ 33,500 coal jobs have been lost since 2011, this is 82% of the nation's coal jobs and the bulk of those losses have taken place in just sixteen Appalachian counties.¹⁵ The loss of these jobs causes the towns near coal mines to lose population. A lot of rural towns deep in Appalachia were built around coal mines so when mines began to close families that have lived in the area for generations are having to move

¹⁴ *Appalachian Pennsylvania*, CENTER FOR ENERGY AND ENVIRONMENTAL POLICY RESEARCH, <https://ceepr.mit.edu/case-studies/appalachian-pennsylvania/>

¹⁵ Tim Carmichael, *Why Are Appalachian People Having to Move From Their Homes in Coal Mining Areas*, (Nov 29, 2024), ECHOES OF APPALACHIA, <https://appalachianmemories.org/2024/11/29/why-are-appalachian-people-having-to-move-from-their-homes-in-coal-mining-areas/>



because they can no longer make ends meet.¹⁶ Since the towns were built around coal mines they typically lack the infrastructure to create new jobs so people have to leave the communities to find other jobs.¹⁷ Since there are fewer jobs available it causes more of the younger generation to migrate to different towns or cities to have a better opportunity to work.¹⁸ The unemployment rate in these rural communities is higher than most places in the country because of the isolating nature and the fact that these miners have been mining coal for the most of their lives and do not have skills that are easy to transfer over to a different industry.¹⁹ In 2013 eastern Kentucky had an unemployment rate of 10.3% which was higher than the nation's unemployment rate of 7.4% that same year.²⁰

Even if workers are able to continue working in coal mines or they are able to get new jobs they are generally paid less than they have been. Coal miners that had been employed in mining full time prior to 2011 faced a loss of earnings.²¹ On average, they ended up making about 20% less each year from 2012 to 2019.²²

In 2021, a nonpartisan climate policy think tank, Energy Innovation, found that 72% of U.S. coal capacity is more expensive than renewables.²³ The think tank also found that 99% of the country's coal plants are more expensive to keep running than they would be if they were replaced by newer forms of energy like local solar, wind, and battery.²⁴

¹⁶ *Id.*

¹⁷ Jonathan Colmer & Eleanor Krause, *For US Coal Workers, Earning Losses From the Decline of Their Industry Have been Large and Lasting*, (Apr 28th, 2025) THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE, <https://blogs.lse.ac.uk/usappblog/2025/04/28/for-us-coal-workers-earnings-losses-from-the-decline-of-their-industry-have-been-large-and-lasting/>

¹⁸ *Id.*

¹⁹ *Id.*

²⁰ *Id.*

²¹ *Id.*

²² *Id.*

²³ Frank Ackerman and Tyler Comings, *Employment After Coal: Creating New Jobs in Eastern Kentucky*, LABOR NETWORK FOR SUSTAINABILITY, https://labor4sustainability.org/files/KYcleanenergy_final_03032016.pdf

²⁴ Michelle Solomon & Mike O'Boyle, *The Coal Cost Crossover 3.0*, (Jan. 30, 2023), ENERGY INNOVATION, <https://energyinnovation.org/report/the-coal-cost-crossover-3-0/>



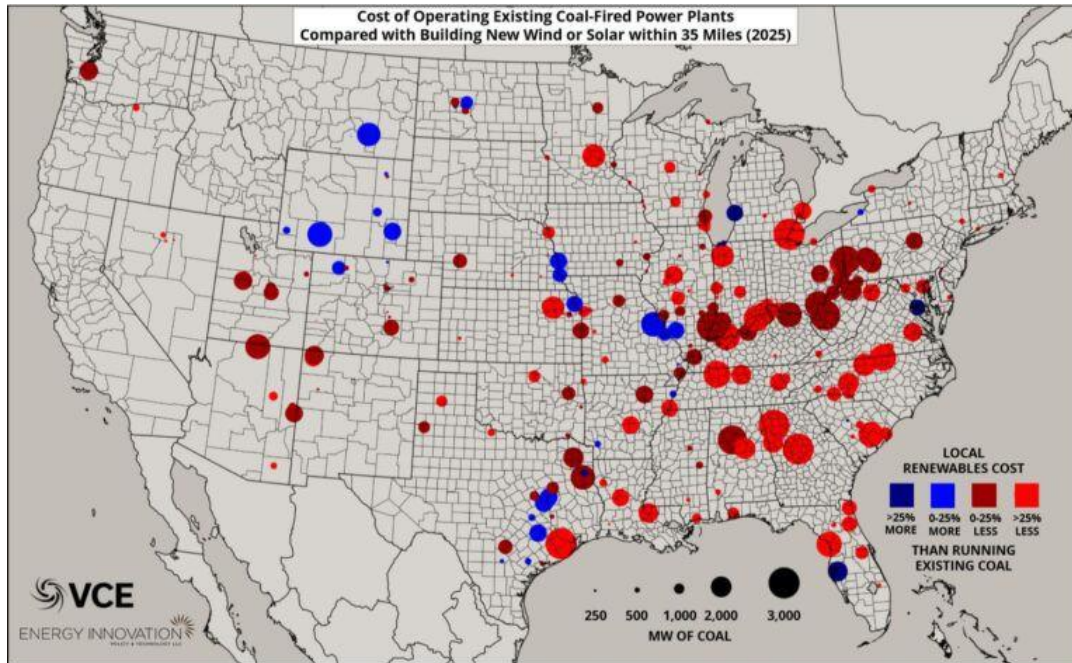


Figure 2 - cost of current coal plants v wind/solar plants

The figure above was done by Energy Innovation, and it shows the price difference between switching to cleaner energy or continuing to operate the current coal plants. Within most of the Appalachian region the costs to open local wind or solar plants is anywhere between 0 to 25% cheaper than it is to continue operating the coal plants that are in the areas.²⁵

²⁵ *Id.*

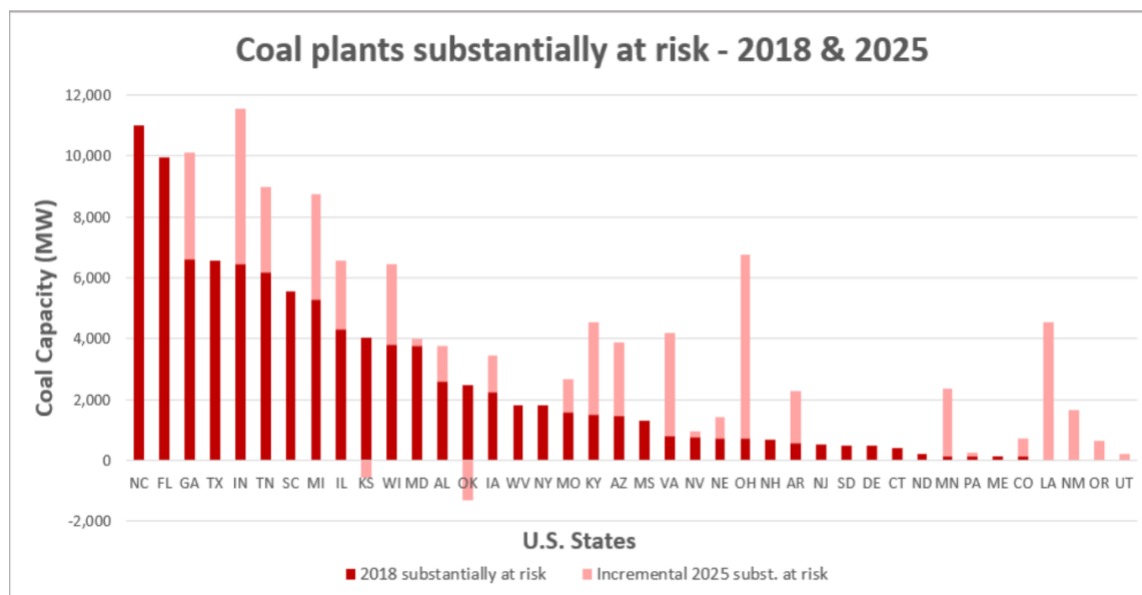


Figure 3 - at risk coal plants

The figure above represents the “substantially at risks” coal plants in the United States in 2018 and 2025. Energy Innovation defines substantially at risk to mean that “local wind or solar could replace the coal plant’s total output at an all-in cost more than 25% lower than the existing coal plant’s ongoing marginal costs.”²⁶ Even in 2018 there were some plants that are more expensive to keep running than making the switch. By 2025 there were some states that had a significant increase in at risk plants, typically in areas where renewable resources are strong, like the Midwest being a huge proponent for wind.

A significant cause of the decline of coal mining in the U.S. is due to environmental regulations such as the Clean Air Act of 1970.²⁷ Another cause is President Obama’s “war on coal” who ran on the platform of “bankrupt[ing]” the coal industry.²⁸ Essentially, Obama set up a

²⁶ *Id.*

²⁷ For an overview of the Clean Air Act, see, e.g., Dana Neacsu, Applying Bentham's Theory of Fallacies to Chief Justice Robert's Reasoning in *West Virginia v. EPA*, 61 Duq. L. Rev. 95 (2023). Available at: <https://dsc.duq.edu/dlr/vol61/iss1/8>.

²⁸ Doc Hastings, *Obama’s Campaign Against Coal*, (Sep. 11, 2012, 9:20 PM),



plan that requires states to meet specific carbon emissions reductions and if they did not meet it they would be met with fees, bankrupting them.²⁹ Obama claimed that “power plants are the single biggest source of harmful carbon pollution that contributes to climate change, [and] until now, there have been no federal limits to the amount of carbon pollution plants dump in the air.”³⁰ During Obama’s first term 400 coal mines were closed and 50,000 coal jobs were lost.³¹ Since Obama, the Democratic Presidential candidates have run on the campaign of closing coal mines to help combat climate change and while coal mining is a huge cause of climate change there are better ways to make the transition away from coal.

III. The environmental costs of continued coal mining are too severe to justify its persistence

There are different approaches to coal mining, and both are damaging the environment. The two most common ones are surface mining and underground mining. Both types of mining affect ecosystems by contributing to more erosion.³²

Surface mining is a method that uses heavy machinery to access underground coal by removing soil and rocks.³³ Pennsylvania statute § 3303 defines surface mining as: The extraction of minerals from the earth, from waste or stockpiles or from pits or from banks by removing the strata or material that overlies or is above or between them or otherwise exposing and retrieving

²⁹ Daily Caller, *Obama Kept His Promise, 83,000 Coal Jobs Lost And 400 Mines Shuttered*, (Sep. 06, 2016), COUNT ON COAL, <https://www.countoncoal.org/2016/09/obama-kept-promise-83000-coal-jobs-lost-400-mines-shuttered/>

³⁰ Allie Mallory and Sunlen Serfaty, *Obama Unveils Major Climate Change Proposal*, CNN, <https://www.cnn.com/2015/08/02/politics/obama-climate-change-plan/index.html?iid=EL> (last update Aug. 03, 2025, 4:23 PM) ; POLITICO, <https://www.politico.com/story/2012/09/obamas-campaign-against-coal-081047>

³¹ Id.

³² Ellen Montgomery, *How coal mining harms the environment*, (Aug. 23, 2024), ENVIRONMENTAMERICA.ORG, <https://environmentamerica.org/center/articles/how-coal-mining-harms-the-environment/>

³³ 52 Pa. Stat. Ann. § 3303 (LexisNexis, Lexis Advance through 2025 Regular Session Act 2; P.S. documents are current through 2025 Regular Session Act 2)



them from the surface.³⁴ This removal process uproots trees and displaces wildlife. The removing of vegetation ruins the soil causing it to run into waterways or end up where it's not supposed to be and further ruin the ecosystems. In 2023 there were a total of 342 surface mines operating in the United States.³⁵ In the same year the total number of coal mines operating was 560.³⁶ Over half of the mines in the United States were surface mines.

A type of surface mining that has gained popularity in recent years is mountaintop removal. The land is cleared off and then the top of the mountain is blasted to access the coal underneath. The blasting can remove more than 600 feet of elevation in a single blast – this is more than the height of the Washington Monument.³⁷ The excess rock and soil from the blasts are dumped into large downward sloped paths where it falls and buries headstreams. Over 2,000 miles of headstreams have been buried which has contributed to the loss of wildlife habitats. In addition to the loss of habitats, burying these headstreams also pollutes the water and causes reduced flood control, which as shown by the damage to the Appalachian area from hurricanes this past summer can cause devastating flooding.

Valley fills significantly raise salinity and metal levels in downstream waters threatening sensitive species, such as salamanders and certain fish that help keep the ecosystem thriving. This water contamination is further intensified by acid mine drainage, which occurs when water becomes polluted after meeting mining activity. Acid mine drainage forms when surface or groundwater reacts with sulfur-bearing minerals in rocks, producing sulfuric acid. The water

³⁴*Id.*

³⁵*Table 1. Coal Production and Number of Mines by State and Mine Type, 2023 and 2022, Supra*, Coal Explained: Where Our Coal Comes from

³⁶ *Id.*

³⁷ *Abandoned Mine Drainage*, EPA, <https://www.epa.gov/nps/abandoned-mine-drainage#:~:text=Heavy%20metals%20can%20be%20leached,on%20humans%2C%20animals%20and%20plants>



becomes so acidic that it is undrinkable and, in extreme cases, can burn human skin. It is easy to see what waters have been polluted by acid mine drainage because the water typically becomes an orange or red color.³⁸ Acid mine drainage degrades over 12,400 miles of rivers and streams in the United States.

The pollution of water sources not only causes death and deformities in fish and birds but also contributes to serious illness in humans.³⁹ Scientists have studied streams in central Appalachia and have discovered that the streams that have been impacted by coal mining has had a thirty-two percent decline in the number of species present and a fifty-three percent decline in the total number of invertebrates, fish, and salamanders when compared to streams that have been unaffected by coal mining. There are regions of British Columbia and Montana where heavy coal mining activity takes place there have been records of fish that are missing gills, have misshapen skulls, and crooked spines. The deformities of these fish can affect organisms further up the food chain.

Humans are also at risk from acid mine drainage, although less research has been done on human health risks. Therefore, we look at the effects that acid mine drainage from gold mines have had on residents in Soweto, South Africa. Acid mine drainage has contaminated the streams, irrigation sources, and the soil on the land by the Klip River, which is near Soweto.⁴⁰ Research shows that mild exposure to “acid mine drainage can cause dehydration and abdominal pain.”⁴¹ Serious exposure can cause miscarriages, birth defects, brain damage, and cancer. Since

³⁸ *How Coal Mining Harms the Environment*, (Aug. 23, 2024) ENVIRONEMT AMERICA, <https://environmentamerica.org/center/articles/how-coal-mining-harms-the-environment/>

³⁹ *Coal production has adverse impacts on both land and water ecosystems*, ALBERTAWILDERNESS.CA, <https://albertawilderness.ca/issues/wildlands/energy/coal/>

⁴⁰ Lesego Khomo, *South Africa: Gold mine pollution is poisoning Soweto’s water and soil – study finds food gardens are at risk*, THECONVERSATION.COM, (May 23, 2024, 9:59 AM), <https://theconversation.com/south-africa-gold-mine-pollution-is-poisoning-sowetos-water-and-soil-study-finds-food-gardens-are-at-risk-229775>

⁴¹ *Id.*



the acid mine drainage from gold mines has the same formation process as acid mine drainage from coal mines it is safe to assume that humans living in the stream and river adjacent areas are at risk of the same health issues.

Underground mining is the method that most people think about when they think about coal mining. PA code §86 defines underground coal mining as: operating shafts to access coal seams that are too far below the surface to surface mine.⁴² A coal seam is a deposit of coal that can typically be seen in layers of rock.⁴³ In Pennsylvania there are two ways to mine underground. The first is Room-and-Pillar.⁴⁴ Room-and-Pillar mining happens when “pillars” of coal are left in the “rooms” that are being mined to support the weight of the layers above the room.⁴⁵

The other way mining happens in Pennsylvania is longwall mining. Longwall mining occurs when a mechanized coal shearer is installed between a “conveyer system and a series of self-advancing hydraulic roof supports. The automated machine operates along coal panels that are up to 820 feet in length. As the coal is extracted and transported via the conveyor, the roof supports are removed which causes the roof to collapse into the void. From this type of mining at least 90% of the seam is extracted but can cause the surface to change and sink or collapse.

Health risks of acid mining drainage are not the only risks that occur from coal mining. A more direct threat to health caused by mining is Black Lung disease.⁴⁶ Black lung disease is a type of pneumoconiosis that occurs from a continuous exposure to coal dust. It is inflammation

⁴² 52 Pa. Stat. Ann. § 3303 (LexisNexis, Lexis Advance through 2025 Regular Session Act 2; P.S. documents are current through 2025 Regular Session Act 2).

⁴³ *Coal Seam*, ENERGY EDUCATION, https://energyeducation.ca/encyclopedia/Coal_seam#:~:text=A%20coal%20seam%20is%20a,their%20proximity%20to%20the%20surface

⁴⁴ *Underground Coal Mining*, DEPARTMENT OF ENVIRONMENTAL PROTECTION, <https://www.pa.gov/agencies/dep/programs-and-services/mining/bureau-of-mining-programs/underground-coal-mining.html>

⁴⁵ *Id.*

⁴⁶ *Coal Worker's Pneumoconiosis (Black Lung Disease)*, AMERICAN LUNG ASSOCIATION, <https://www.lung.org/lung-health-diseases/lung-disease-lookup/black-lung>.



and fibrosis (thickening or scarring) of the lungs.

The cases of black lung disease have been increasing since the 1990s⁴⁷. There are eleven cases of black lung disease per every 1,000 United States residents and there are four deaths per every 1,000 residents.⁴⁸ The Appalachia region has higher rates than the rest of the nation – in 2016, NPR looked at eleven black lung clinics in Virginia, West Virginia, Pennsylvania, and Ohio and discovered that there were 926 cases of Black lung disease reported from 2010.⁴⁹ However, the true number is suspected to be higher because some clinics had incomplete records.⁵⁰ NPR also reported that in 2018 one in five coal miners from central Appalachia who worked for twenty-five years suffer from black lung disease.⁵¹

In 2024, the federal Mine Safety and Health Administration (MSHA), a department within the U.S. Department of Labor finalized the Silica Rule.⁵² The purpose of the rule was to limit coal miner's exposure to crystalline silica, the main cause of black lung disease. The rule states that coal mines will have to lower exposure from 100 micrograms to 50 micrograms over an eight-hour shift. The enforcement of the rule was supposed to begin April 14, 2025, but the National Sand, Gravel and Stone Association asked the 8th U.S. Circuit of Appeals for an emergency stay of the rule, which the federal judge agreed upon pushing the enforcement date until August of 2025.⁵³ Republicans in Congress have tried to prohibit the MSHA from spending any funds to

⁴⁷ *Black Lung Disease (Coal Workers' Pneumoconiosis)*, CLEVELAND CLINIC, <https://my.clevelandclinic.org/health/diseases/25135-black-lung-disease>

⁴⁸ *Black Lung Incidence Study*, DEPARTMENT OF LABOR, <https://www.dol.gov/sites/dolgov/files/OASP/evaluation/one-pagers/Black-Lung-Incidence-Study-Final-Report-and-LitReview-OnePager.pdf>

⁴⁹ Howard Berkes, *Advanced Black Lung Cases Surge in Appalachia*, (Dec. 15, 2016 6:13 PM), NPR, <https://www.npr.org/2016/12/15/505577680/advanced-black-lung-cases-surge-in-appalachia>

⁵⁰ Howard Berkes, *Black Lung Rate Hits 25-Year High In Appalachian Coal Mining States*, (Jul. 19, 2018 4:01 PM), NPR, <https://www.npr.org/2018/07/19/630470150/black-lung-rate-hits-25-year-high-in-appalachian-coal-mining-states>

⁵¹ *Id.*

⁵² *Mine Safety and Health Administration*, DEPARTMENT OF LABOR, <https://public-inspection.federalregister.gov/2024-06920.pdf>

⁵³ Curtis Tate, *Mining Group Seeks To Block Silica Dust Rule Before It Takes Effect*, (Apr. 4, 2025 4:12 pm), WV PUBLIC BROADCASTING.



enforce the Silica Rule and the Trump Administration has been downsizing the agency by cancelling leases.

In Morgantown, West Virginia 200 employees have been laid off from another agency that has been trying to improve the safety and health of coal miners called the National Institute for Occupational Safety and Health (NIOSH). One employee named Scott Laney has worked for NIOSH and helped reveal an epidemic of advanced stage of Black Lung Disease in central Appalachia, but he also helped the response to the Ebola outbreak in Africa. NIOSH helps keeps American employees safe by researching “deaths in industries from fishing to firefighting” and they develop guidelines to make all jobs safer. They have been able to train doctors to better identify Black Lung Disease on X-rays to provide better support and benefits to the workers affected; in Pittsburgh’s lab the office was able to prove that coal miners are dying by the inhalation of silica dust.⁸¹ The reduction in the Morgantown office is part of a larger reduction of 900 employees; two-thirds of the workforce. The work NIOSH does saves workers lives and under the current Trump Administration American employees -- from miners to firefighters -- are being abandoned and left to die.

Coal miners face many risks besides Black Lung, including frequent mining explosions due to the high flammability of coal. In a borough in Columbia County, Pennsylvania called Centralia there has been an underground fire for over sixty years.⁵⁴ Once home to 2,500 residents and fourteen active coal mines in the early 20th century, by 1962 the abandoned coal mines caused the population to drop to 1,000. That same year, the borough’s fire department set a landfill fire to clear out the landfill in anticipation of the borough’s Memorial Day celebration. Prior to starting the fire, they lined the pit with incombustible material and after the landfill had burned, they

⁵⁴ Katie Serena, *Inside the Eerie Ghost Town of Centralia, Pennsylvania That’s Been on Fire Since 1962*, ALL THATS INTERESTING, (Feb. 8, 2024), <https://allthatsinteresting.com/centralia-pa>



doused the ashes with water. Two days later borough residents saw flames; this happened again a week later. After digging around firefighters found a concealed 15-foot-wide hole that wasn't sealed and provided a direct pathway to the borough's old underground mines.

After the fire spread the residents noticed foul odors and smoke seeping from the ground. Once an inspector stated that the smoke and the smell was carbon monoxide caused by the fire there were multiple attempts to extinguish the fire. The attempts included excavation and flushing the fire out with crushed rock and water, but all failed largely due to underestimation and loss of funding. By the 1980s the fire had caused dangerous levels of carbon monoxide and infrastructure damage to the borough, the most serious incident happened in 1981 when a 150-foot-deep sinkhole opened and nearly swallowed a 12-year-old boy. By 1983 the state of Pennsylvania had spent more than \$7 million trying to put out the fire but had been unsuccessful so the federal government appropriated \$42 million to purchase the borough and relocate the residents, although some refused to leave. By 2013 fewer than ten residents lived in the borough and won a settlement to remain until they die, even then the fire was still burning.⁹⁴ Experts estimate that the fire can burn for 250 years, and while the borough is essentially abandoned its legacy inspired the events of the 2006 *Silent Hill* movie.

In November 1968 a coal mine right outside Farmington, West Virginia, a town that is 100 miles south of Pittsburgh, had an explosion that killed seventy-eight miners.⁵⁵ On that day, 99 miners were in that mine and only 21 survived. In that year alone 311 coal miners died in "work-related accidents."⁵⁶

The Fairmont explosion sparked national outrage and the joint effort of the coal miners'

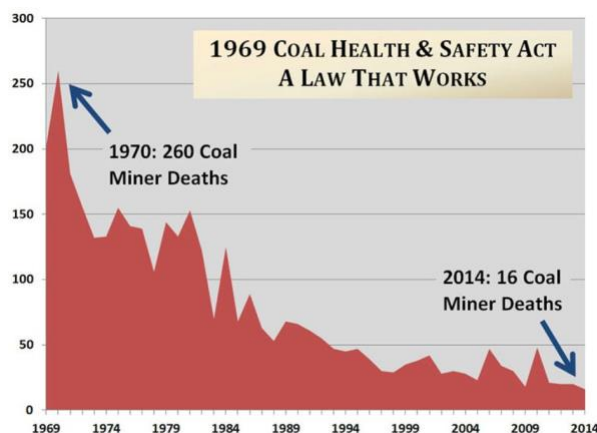
⁵⁵ Molly Born, *How a 1968 Disaster in a Coal Mine Changed the Industry*, NPR, (Nov. 23, 2018, 4:03 PM), <https://www.npr.org/2018/11/23/670147046/how-a-1968-disaster-in-a-coal-mine-changed-the-industry>

⁵⁶ Mine Disaster: 1968 Farmington Explosion Anniversary, MINE SAFETY AND HEALTH ADMINISTRATION, <https://www.msha.gov/mine-disaster-1968-farmington-explosion-anniversary>



widows testifying in front of Congress and 40,000 West Virginia coal miners staging a wildcat strike to protest better health benefits helped the Federal Coal Mine Health and Safety Act of 1969 get signed into law. Section 2 of The Federal Coal Mine Health and Safety Act highlights the reasoning for the Act is to show that the health and safety of the coal miners is the number one priority; unsafe conditions cause suffering, hinders industry growth, and burdens commerce; operators and miners share equal responsibility to prevent hazards.⁵⁷ The Act established and enforced mandatory health and safety standards and expanded research and training in an attempt to reduce mining related documents.

Title I, section 103 of the Act established the power of the Secretary of the Interior Department to set health and safety standards and inspect the mines to ensure that the standards were being followed. ⁵⁸ The Act also added health protections for workers injured and those that have been victims of Black Lung Disease.⁵⁹ On average since the Act was passed coal miner deaths



have decreased.⁶⁰ The figure below shows the general decrease of deaths. In recent years the number of deaths has dropped as low as five deaths, but even *Coal Fatalities for 1990 Through 2023, UNITED STATES*

DEPARTMENT OF LABOR,

<https://arlweb.msha.gov/stats/centurystats/coalstats.asp>

that is too many.

The passing of the Federal Coal Mine Health and Safety Act led to the enactment of the Black Lung Benefits Act of 1972.⁶¹ The Black Lung Benefits Act allows miners and their

⁵⁷ Federal Coal Mine Health and Safety Act of 1969, P.L. 91-173 § 2 (1969)

⁵⁸ *Id.* at § 103

⁵⁹ *Federal Coal Mine and Safety Act of 1969*, MINE SAFETY AND HEALTH ADMINISTRATION, <https://www.msha.gov/federal-coal-mine-and-safety-act-1969>

⁶⁰ *Federal Coal Mine and Safety Act of 1969, Supra.*

⁶¹ *Federal Coal Mine and Safety Act of 1969, Supra.*



surviving dependents to file claims and receive monthly payments as well as having their medical costs covered.⁶² The benefits that are received is set forth in Section 412(a)(1) of the Federal Coal Mine Health and Safety Act and the Act says that the rate is 37.5% of the base salary of a Federal employee at level GS-2, Step 1, which in 2025 is \$785.70 a month for just a primary beneficiary, but can increase up to \$1,571.40 if the beneficiary has three or more dependents.

The economic benefits gained from mining do not outweigh the environmental or societal costs; worldwide mining causes \$3 trillion worth – roughly \$9,200 per person in the U.S. – worth in damage every year.⁶³ 18% of the harm caused by mining is caused by coal and 43% of the costs is from environmental harm while 21% of the harm is related to human health. If we take the 962 cases from 2010-2016 from the NPR article “Advanced Black Lung Cases Surge in Appalachia” and multiply it by the lowest rate of \$785.70 from 2025 we would get \$755,843.40 at the very least paid every month for benefits attributed to coal mining.⁶⁴

Some of the harm that coal communities face is not as direct as black lung disease or mining accidents. A huge issue that plagues the Appalachian region that can be linked to coal mining is substance abuse. A lot of areas within Appalachian have seen an uptick in drug usage and this ties to coal mining because coal mining is a physically demanding job and causes more injuries and strains allowing more pain killers to be described.⁶⁵ For example, West Virginia, which has always been a high producer of coal, has opiate and heroin deaths at twice the national average. It is not just injury that causes higher rates of drug usage amongst coal miners. It is also the way coal mining work is divided. Typically, there are intense two-week shifts in the middle of nowhere

⁶² *Office of Workers' Compensation Program*, U.S. DEPARTMENT OF LABOR, <https://www.dol.gov/agencies/owcp/dcmwc/regs/compliance/blbenact>

⁶³ Anastasiia Zagoruichyk, *Emissions from mining cause 'up to £2.5tn' in environmental damages each year*, (Jul. 6, 2022), CARBON BRIEF, <https://www.carbonbrief.org/emissions-from-mining-cause-up-to-2-5tn-in-environmental-damages-each-year/>

⁶⁴ Berkes, *Supra*.

⁶⁵ *Mining: Dealing with Substance Abuse in the Workplace* (Feb. 09, 2018), GO CONTRACTOR, <https://gocontractor.com/blog/dealing-with-substance-abuse-in-mining/>



increasing boredom and mental health issues which are linked to substance abuse.

The substance abuse happens in more areas than just Appalachia. The Substance Abuse and Mental Health Services Administration (SAMHSA) reported that the heavy alcohol use within the mining industry is double what it is among the rest of the full-time workers in the country.⁶⁶ The SAMHSA also reported that substance abuse among miners is “the third highest of all industries” and that 1 in 100 miners have an opioid use disorder; another rate higher than the national average.¹¹⁴ Substance abuse can also be linked to poverty. Since the coal industry is declining a lot of people are losing their jobs and their ability to support themselves and their families. As people lose their jobs they are more likely to resort to adverse coping mechanisms. The more stressed and depressed they become the more money they spend on substances such as opioids and alcohol and the cycle continues.

While the research shows that closing coal mines harms these communities there are steps that can be taken to ensure they continue to advance as the country does.

IV. A just transition aligns with the broader principles of climate action—adaptation, mitigation, and prevention—of which fair social and economic restructuring is a crucial part.

A way to protect coal workers and communities around these mines as the country retires more coal mines and stop the cycle is to focus on a “just transition”. The term “just transition” refers to “protecting workers and communities from the unintended side effects of such changes” such as climate change regulations and closing of coal mines.⁶⁷ It has been around since the 1980s when it

⁶⁶ Michael Kaliszewski, *The Mining Industry and Addiction*, (Jan. 28, 2025), AMERICAN ADDICTION CENTERS, <https://americanaddictioncenters.org/workforce-addiction/blue-collar/miners>

⁶⁷ Jeremy Brecher, *How to Protect Workers While Protecting the Climate*, LABOR NETWORK FOR SUSTAINABILITY <https://www.labor4sustainability.org/just-transition/how-to-protect-workers-while-protecting-the-climate/>



was used by U.S. Trade unions to protect workers affected by new water and air pollution regulations that were put into place.⁶⁸ The main idea is to have a way that communities and families who have depended on coal their whole lives are not being left behind as the country continues to retire more coal mines every year.

Colorado passed the Just Transition law that helped create a just transition Office in the Department of Labor and Employment with the purpose of administering benefits to transition coal workers that allows them to support themselves and their families while giving them access to higher education and retraining that allows them to get rehired in higher paying jobs. It will also make grants for qualifying organizations in coal dependent communities aimed at fostering a more diverse, fair, and thriving economy for displaced coal miners.

As mentioned in Claim 1, one of the fundamental issues that coal miners face when plants shut down is the difficulty of transferring their specialized coal skills to other industries. Implementing a transition plan in the major coal regions can help provide support so the workers are able to not work for a bit and learn new skills. As mentioned at the end of Claim 1, Obama's first Presidential term led to the loss of 50,000 coal jobs.⁶⁹ Without a federal just transition plan this just further burdens these workers were left stranded and abandoned without a way to move onto different jobs.

The U.S. would not be the first country to implement a just transition plan at the federal level. Just transition gained global momentum when it was mentioned in the Paris Climate Agreement in 2015.⁷⁰ Since the mention in the agreement the number of countries that mention

⁶⁸ *What is just transition? And why is it important?* (Nov. 03, 2022), CLIMATE PROMISE, <https://climatepromise.undp.org/news-and-stories/what-just-transition-and-why-it-important>

⁶⁹ Hastings, *Supra*.

⁷⁰ Chelsea Gómez, Cynthia Elliott, Mikayla Pellerin, Neelam Singh & Ginette Walls, *What Is a 'Just Transition,' and Are Countries Really Making Progress*, (May 1, 2025), <https://www.wri.org/insights/what-is-just-transition-tracking-progress>



just transition in their nationally determined contribution (their climate plans) rose from one country (South Africa in 2015) to sixty-six countries by April 2025; the U.S. is not one of them. The degree of the mentions vary; some countries mention it in passing while some dedicate whole sections to it. Some countries have even begun developing their plans – the U.K. created an Office of Clean Energy Jobs that would support plentiful opportunities for its energy workforce and they also created an initiative aimed at “upskilling or reskilling” workers so they can work the new jobs in the clean energy economy.

Another example of a developing plan was Canada’s creation of the Coal Community Transition Fund.⁷¹ The purpose of this fund is to support both the municipalities and First Nations that have been impacted by coal phase out in the Western province Alberta. The funding has supported efforts such as assessing social and economic impacts, planning for community transitions, and launching initiatives to strengthen local businesses.

The goals for each country’s transition differ slightly based on the challenges that they face. South Africa puts its focus into creating “a quality life for all South Africans” by putting the focus on those who have been most impacted while Scotland focuses more on employment and skill training to allow workers to enter new jobs.⁷² While there is no clear blueprint for the U.S. to follow, they can base their plan by looking at other countries’ ideas and build a foundation. President Joe Biden’s Justice40 Initiative was a step towards a federal plan.

The Justice 40 Initiative was part of the Executive Order *Tackling the Climate Crisis at Home and Abroad* and it stated: “40 percent of the overall benefits of certain Federal climate, clean energy, affordable and sustainable housing, and other investments flow to disadvantaged

⁷¹ *Id.*

⁷² *Id.*



communities that are marginalized by underinvestment and overburdened by pollution.”⁷³ The types of benefits that communities would receive varied, but included things such as community resilience plans, improved public health, and clean energy job training programs.⁷⁴

Federal agencies were supposed to be able to track what communities qualify for Justice40 benefits using the Climate and Economic Justice Screening Tool within Justice40 communities. Justice40 communities were defined as places where “more than 65 percent of households were at or below twice the federal poverty level” and they also face another health, environmental, or economic burden.⁷⁵ Nearly 29 percent of the nation’s population qualifies as well as all the federally recognized Tribes. The Screening Tool allowed users to view what burdens specific regions have under eight categories:” climate change, energy, health, housing, legacy pollution, transportation, waste and wastewater, and workforce development.”⁷⁶ With this tool, federal agencies can see what communities need the most and ensure the programs designed for that burden are employed there. The Biden-Harris Administration took a similar approach to South Africa and wanted to focus on a quality of life for everyone in the country. The Screening Tool was implemented to make sure that the most vulnerable communities in the nation -- especially those that have already been affected by climate change and pollution -- are not even more disproportionately left behind as the country transitions away from coal.

President Donald Trump killed the Justice40 Initiative on his first day of his second term along with rescinding seventy-seven other President Biden executive orders and actions.⁷⁷ The

⁷³ *Justice40: A Whole-of-Government Initiative*, <https://bidenwhitehouse.archives.gov/environmentaljustice/justice40/>

⁷⁴ *Justice40 Resource Guide*, EQUITABLE & JUST: NATIONAL CLIMATE PLATFORM, https://ajustclimate.org/justice40_guide.html

⁷⁵ Courtney Lindwall, *What is Justice40 Initiative?*, (Dec. 04, 2023), NRDC, <https://www.nrdc.org/stories/what-justice40-initiative>

⁷⁶ *Climate and Economic Justice Screening Tool (CEJST)*, NDC PARTNERSHIP, <https://ndcpartnership.org/knowledge-portal/climate-toolbox/climate-and-economic-justice-screening-tool-cejst>

⁷⁷ *Initial Rescissions of Harmful Executive Orders and Actions*, <https://www.whitehouse.gov/presidential-actions/2025/01/initial-rescissions-of-harmful-executive-orders-and-actions/>



Presidential Action that overturned these actions and orders states that the purpose of rescinding these actions is because: “Climate extremism has exploded inflation and overburdened businesses with regulation.”⁷⁸ The dismantling of the Justice40 Initiative does not fight “climate extremism”, but instead once again allows communities that relied heavily on coal mines to be left behind as more and more coal plants have retired.

On April 8, 2025, President Trump signed an executive order titled “Reinvigorating America’s Beautiful Clean Coal Industry and Amending Executive Order 14241”.⁷⁹ The purpose of this executive order is to show that to be able to increase “America’s economic prosperity... and lower the cost of living” the country needs to increase our coal production.⁸⁰ The executive order states that since coal is cheap to produce, can happen no matter the type of weather, and has historically employed “hundreds and thousands of Americans” supporting the production is the best option. Under the Executive Order, all regulations and programs that attempt to transition the nation from coal must be dismantled and any loans, grants, etc. that seek to discourage investing in coal-production must be rescinded.

The current Administration claims that supporting the production of coal will “increase our energy supply, lower electricity costs, stabilize our grid, create high-paying jobs, support burgeoning industries, and assist our allies.”⁸¹ However, as seen from the research and the trends above, the heavy amount of coal production harms the environment, coal miner workers, and communities around these coal mines to the extent that coal production needs to be slowed. If the Trump administration wanted boost the American economy as the Executive Order claims they

⁷⁸ Id.

⁷⁹ *Reinvigorating America’s Beautiful Clean Coal Industry and Amending Executive Order 14241*, <https://www.whitehouse.gov/presidential-actions/2025/04/reinvigorating-americas-beautiful-clean-coal-industry-and-amending-executive-order-14241/>

⁸⁰ Id.

⁸¹ Id.



do, they would stop cutting programs that are meant to benefit these communities.

V. Conclusion

Coal mining has had a rich and long history throughout the world, especially within the United States. It has been an economic and energy powerhouse for thousands of Americans by providing jobs and building communities. However, due to how harmful coal has also been to the environment and people around the world there is a justified need to transition away from coal. Communities that are extremely coal dependent need to implement just transition plans to ensure that those who rely the most on coal are not left in the dust as the country and the world move forward to cleaner alternatives.

