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COAL SHINES A LIGHT ON THE NEED FOR A JUST ENERGY TRANSITION IN THE UNITED STATES

Patrick R. Baker[†] & Blake Tims^{††}

I. INTRODUCTION

This article examines the Appalachian Regional Commission (“ARC”) and its role in both offsetting and aiding Appalachia’s crisis as the U.S. transitions to a low carbon economy. First, this article explains the history of ARC as well as examines ARC’s roles, responsibilities, and power. Second, this article examines the government’s tangled and tortured relationship with ARC by illustrating several special projects and programs formed by the ARC and detailing the struggles with implementation and outcomes.

Third, this article analyzes how other countries are tackling the shift to a low carbon economy and draws upon these examples to

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help advise and direct ARC, U.S. policy makers, and the citizenry. Further, the article examines how to implement the successful elements of those strategies. Also, the article examines how the changes these countries have made are affecting their economies, and how they are attempting to soften what is to be an extremely hard landing. Finally, this article concludes with words of caution and summations for the U.S. and its global contemporaries.

II. BACKGROUND: APPALACHIAN REGIONAL COMMISSION (ARC) AND ITS HISTORY

A. ARC's History, Impact, and Future

ARC was formed in 1963 by President John F. Kennedy.¹ The Kennedy administration charged ARC with developing a comprehensive program to benefit the Appalachian region by working with local, state, and federal governments to target and support economic development.² Appalachia has been plagued by poverty and economic obstacles since it was settled in the late 1700's.³ In 1963, one of every three Appalachians lived in poverty and their per capita income was twenty three percent below the national average.⁴

Appalachia is a remote region running from northeastern Mississippi to western New York comprised of thirteen states with only seven having coal reserves.⁵ Out of those seven, five have substantial coal reserves that make up Appalachia's Coal Country: Pennsylvania, Ohio, Virginia, Kentucky and West Virginia.⁶ Affordable natural gas has largely been the most substantial obstacle for coal consumption, but renewables, such as wind and solar, have also

¹ *ARC History*, APPALACHIAN REGIONAL COMMISSION, <https://www.arc.gov/about/ARCHistory.asp> [hereinafter ARC History].

² *Id.*

³ *Appalachia*, ENCYCLOPEDIA.COM (May 19, 2020), <https://www.encyclopedia.com/places/united-states-and-canada/us-physical-geography/appalachia>.

⁴ ARC History, *supra* note 1.

⁵ Patrick R. Baker, *Decommissioning Coal in an Extraction Culture: The Aftermath and Lessons Learned*, 11 J. WORLD ENERGY L. & BUS. 237 (2018).

⁶ *Id.*

contributed to the shift away from coal.⁷ Additionally, it is extremely difficult to effectively and efficiently build new highways, water lines, sewage treatment facilities and basic infrastructure to dramatically improve Appalachia due to its topography.⁸

The region is a large geographic area rich in natural resources, however, the proceeds of exploitation and extraction were rarely reinvested back into the region for the eventual decommissioning of coal.⁹ Many factors have contributed to the decline of coal, including: affordable and plentiful natural gas, renewables, consumers' awareness of climate change and demand side conservation, the geology of Appalachian coal, flat electricity demand, the Great Recession and coal's environmental impacts.¹⁰

It is important to note coal has been in a steady decline since the conclusion of World War II.¹¹ Specifically, Appalachian mineable coal is in short supply.¹² For example, from 2005 to 2015, the U.S. experienced a severe downturn in coal production from Appalachia, where coal production dropped by 176 million tons, a downturn of almost forty five percent.¹³ Coal has been replaced by inexpensive, plentiful natural gas. In 2016 it surpassed coal as the country's largest source of electricity generation.¹⁴ In October 2018, it provided more than thirty eight percent of power generation in the US, according to the Energy Information Administration, while coal

⁷ *Id.*

⁸ *Id.*

⁹ Baker, *supra* note 5.

¹⁰ *Id.*

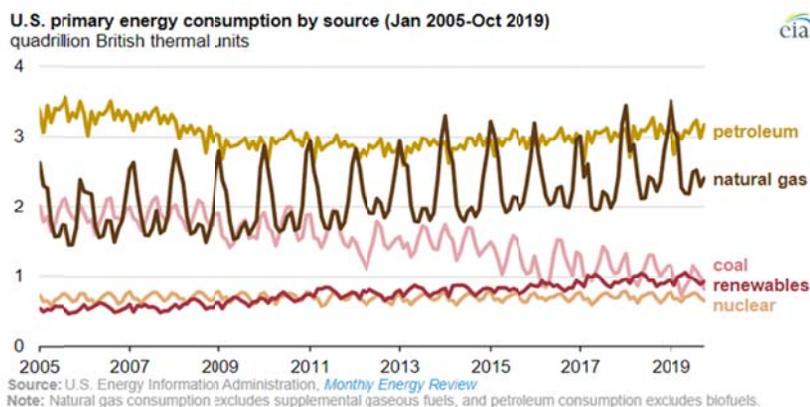
¹¹ Courtney Balestier, *Coal Is Dying—Coal Country Doesn't Have To: Creating the Post-Coal Economy in Appalachia* Fast Company, FAST COMPANY (Dec. 12, 2016), <https://www.fastcompany.com/3065766/coal-is-dying-coal-country-doesnt-have-to-creating-the-post-coal-economy-in-appalachia>.

¹² Baker, *supra* note 5.

¹³ ERIC BOWEN ET AL., AN OVERVIEW OF THE COAL ECONOMY IN APPALACHIA APPALACHIAN REGIONAL COMMISSION (2018).

¹⁴ *Natural Gas Expected to Surpass Coal in Mix of Fuel Used for U.S. Power Generation in 2016*, U.S. ENERGY INFORMATION ADMINISTRATION (Mar. 16, 2016), <https://www.eia.gov/todayinenergy/detail.php?id=25392>.

provided less than twenty seven percent.¹⁵ By summer 2019, forty two percent of the US electricity generation was produced by natural gas.¹⁶



ARC's territory includes a total of thirteen states.¹⁷ ARC developed a mission and strategic plan in 2016, but the plan is set to expire in 2020.¹⁸ Their strategic plan includes five strategic investment goals: economic opportunity, ready workforce, critical infrastructure development, preserving natural and cultural assets, and leadership and community capacity.¹⁹

Economic opportunity includes creating opportunities for local ventures by supporting business development in existing and emerging sectors and to help communities transform their economies.²⁰ "To achieve the greatest impact, ARC's investments in entrepreneurial development will create and strengthen the ecosys-

¹⁵ Felix Todd, *US to Close Three of Its Biggest Coal Power Plants as Global Phase Out Gathers Pace*, NS ENERGY (Aug. 19, 2019), <https://www.nsenenergy.com/features/us-coal-2019/>.

¹⁶ *U.S. Natural Gas Consumption has Both Winter and Summer Peaks*, U.S. ENERGY INFORMATION ADMINISTRATION (Feb. 13, 2020), <https://www.eia.gov/todayinenergy/detail.php?id=42815>.

¹⁷ APPALACHIAN REG'L COMM'N, INVESTING IN APPALACHIA'S FUTURE (2015).

¹⁸ *Id.*

¹⁹ *Id.*

²⁰ *Id.*

tems that provide broad based support for business development, especially in economically distressed counties and areas.”²¹

To possess a ready workforce, ARC plans to connect education, workforce, and business interests to a system that prepares young people to succeed in existing and emerging sectors, and creates new opportunities for workers transitioning to new employment.²² To achieve this, ARC plans to employ strong educational programs, and ensure students have the basic skills, as well as the soft skills, needed for productive employment or entrepreneurship. Particular emphasis will be placed on providing education and training matched to the region’s current sectors and jobs, while increasing access to advanced skills training for the jobs of the future.

To develop infrastructure, ARC plans to develop and improve infrastructure necessary for economic development including broadband, telecommunications, water and wastewater systems, diversified energy, housing, and transportation.²³ ARC also supports investments in multi-modal transportation systems that strengthen connections to regional, national, and global markets.²⁴

Investments in natural and cultural assets can catalyze other economic development activities in the Region, including the growth of entrepreneurial ventures and high-tech companies, and create an environment that helps attract and retain workers.²⁵ ARC takes a long-term view of local assets and emphasizes the balanced use of those assets to generate sustainable economic benefits for local communities.²⁶ The restoration and development of natural and cultural assets can become a critical economic driver in economically distressed counties and areas.²⁷ ARC plans to work with existing and emerging economic opportunities throughout the Region to ensure the assets are utilized properly.²⁸

²¹ *Id.*

²² *Id.*

²³ *Id.*

²⁴ *Id.*

²⁵ *Id.*

²⁶ *Id.*

²⁷ *Id.*

²⁸ *Id.*

ARC believes leadership and community capacity building will help communities create, develop, execute a common vision for local development.²⁹ The plans will be based on model practices in engaging residents in the visioning and implementation processes and will promote effective collaboration and partnerships across geographic and other boundaries.³⁰ The emerging development plans will provide a guide for future investments to capture new economic opportunities and create positive community change.³¹

ARC has proven to be a valuable tool in aiding Appalachia's transition away from an overreliance on natural resource extraction. Between 1970 and 2012, in counties that received ARC investments, employment increased at a 4.2 percent faster pace and per capita income increased at a 5.5 percent faster pace than in similar counties and municipalities that did not receive funding.³² As of September 2017, ARC had invested a total of over \$94 million specifically to diversify the economy in 250 coal-impacted counties across eleven Appalachian states.³³ These investments are projected to create or retain approximately 8,800 jobs, benefit thousands of workers and students, and infuse an additional \$210 million into the region's economy.³⁴ In fiscal year 2019, ARC had supported 482 projects in Appalachia totaling \$176.8 million.³⁵ The investments were matched by \$246.8 million with an additional \$542.6 million in leveraged private investments.³⁶ Over 17,300 jobs were created, 51,000 students and workers were trained and educated, and 25 million residents benefited from the support of ARC in 2019.³⁷

²⁹ *Id.*

³⁰ *Id.*

³¹ *Id.*

³² *Id.*

³³ APPALACHIAN REG'L COMM'N, INVESTING IN COAL-IMPACTED APPALACHIA (2017).

³⁴ *Id.*

³⁵ APPALACHIAN REG'L COMM'N, FISCAL YEAR 2019 APPALACHIAN REGION (2019).

³⁶ *Id.*

³⁷ *Id.*

B. The Responsibilities and Powers of ARC

ARC is a regional economic development agency represented by a partnership of federal, state, and local government.³⁸ ARC has vast responsibilities, but very few powers as a typical U.S. administrative agency. Specifically, U.S. Code Title 40 Subtitle IV focuses on Appalachian Regional Development and spells out ARC's responsibilities and limitations.³⁹ For example, 40 U.S.C. § 14101 lists promoting energy efficiency and increasing renewable resources.⁴⁰ The ARC code contains a definitive statement of current ARC policy and reflects Commission decisions.⁴¹ The ARC Code outlines many powers and responsibilities of ARC. ARC's general policies include general planning, regional development, state development, an annual strategy statement, and provisions for an area development program.⁴²

C. Government Involvement in ARC

ARC has invested \$75.5 million to date in order to help the region transition from coal to a more diverse and sustainable economy.⁴³ In 2016, ARC stated that since its POWER initiative was first developed, it has received over \$280 million in funding requests to revitalize Appalachia's economy.⁴⁴ POWER ("Partnerships for Opportunity and Workforce and Economic Revitalization") is a congressionally funded initiative that makes federal resources available to help communities and regions that have been affected

³⁸ Establishing the Federal Development Committee for Appalachia and Prescribing Other Arrangements for Coordination with the Appalachian Regional Commission, 30 Fed. Reg. 3929-01 (Mar. 26, 1965).

³⁹ 40 U.S.C. § 14101 (2002).

⁴⁰ *Id.*

⁴¹ See APPALACHIAN REG'L COMM'N CODE, APPALACHIAN REGIONAL COMMISSION CODE (2018).

⁴² *Id.*

⁴³ Sarah Jones, *Appalachia Is Trying to Diversify Its Economy. Trump Isn't Helping*. NEW REPUBLIC (2017), <https://newrepublic.com/minutes/141679/appalachia-trying-diversify-economy-trump-isnt-helping>.

⁴⁴ *Id.*

by job losses in coal mining, coal power plant operations, and coal-related supply chain industries due to the changing economics of America's energy production.⁴⁵ However, the Commission was only able to fulfill one quarter of the requests.⁴⁶

In 2017, President Trump's list for the federal budget proposed eliminating nineteen independent agencies, including ARC.⁴⁷ Ironically, during President Trump's election, ten of thirteen states covered by ARC supported President Trump during the election.⁴⁸ Most notably, both West Virginia and Kentucky overwhelmingly voted for President Trump.⁴⁹ These two states heavily rely on ARC and would suffer the greatest detriment with its eradication. With Trump's new proposal to eliminate ARC was shocking for a region that overwhelmingly supported the President.⁵⁰ The proposed cuts to ARC would have shifted the responsibility for economic development from a national emphasis to a state focus.⁵¹ While these budget cuts failed, President Trump still proposed to cut ARC and could have adversely impacted the development and growth ARC has had in the region.⁵²

D. Specific ARC Projects

For the purposes of this article, only a portion of states where a just transition is most urgent will be discussed including those found in the central Appalachian region. The shift to preserve the environment and offset the ravages of climate change will have

⁴⁵ *POWER Initiative*, APPALACHIAN REGIONAL COMMISSION, <https://www.arc.gov/funding/power.asp>.

⁴⁶ Jones, *supra* note 43.

⁴⁷ Elaine Godfrey, *Trump's Proposal to Scrap the Agency Devoted to Developing Appalachia*, ATLANTIC (Mar. 16, 2017), <https://www.theatlantic.com/politics/archive/2017/03/why-the-appalachian-regional-commission-matters/519876/>.

⁴⁸ *Id.*

⁴⁹ *Presidential Election Results: Donald J. Trump Wins*, NY TIMES (Aug. 9, 2017), <https://www.nytimes.com/elections/2016/results/president>.

⁵⁰ Godfrey, *supra* note 47.

⁵¹ Alana Abramson, *President Trump's Budget Proposes Eliminating This Commission. 95% of Counties It Helps Voted for Him*, TIME (May 24, 2017), <https://time.com/4793315/donald-trump-budget-appalachian-regional-commission/>.

⁵² *Id.*

dire consequences for traditional labor markets. No area or industry will be more impacted than the natural resource extraction sector, specifically, coal production and Central Appalachia (Kentucky, Virginia, and West Virginia), also known as the coal fields. In order to make this transition to a low carbon world and economy the worker and traditional markets and industries cannot simply be forsaken, ignored, or forgotten. The result will be cataclysmic, and that crisis is currently unfolding in the coal fields of Appalachia. Therefore, “[s]ustainable development means that the needs of the present generation should be met without compromising the ability of future generations to meet their own needs. Sustainable development has three dimensions-economic, social and environmental-which are interrelated, of equal importance and must be addressed together.”⁵³ ARC’s underlying mission is offset and support the growth of new industries and economics in the coal fields in order ensure a just transition.

The coal fields have been largely dependent on the production of coal for a century. In 2014, over ninety percent of electricity generation in Kentucky and West Virginia was from coal.⁵⁴ In 2018, West Virginia reported over ninety percent of electricity generation from black gold.⁵⁵ While Kentucky decreased its electricity production attributable to coal to approximately seventy eight percent.⁵⁶

Kentucky has been a leader in facilitating projects that include increasing access to technology to offset underfunding of education and high unemployment rates. Through projects such as the Eastern Kentucky Coal County Transformation Project, ARC has supported communities in launching a comprehensive,

⁵³ John Cartwright, *Toward a Just Transition*, WORLD RESOURCES INSTITUTE, <https://www.wri.org/climate/expert-perspective/toward-just-transition>.

⁵⁴ Niall McCarthy, *The U.S. States Most Dependent On Coal Power*, STATISTA (Mar. 29, 2017) <https://www.statista.com/chart/8730/the-us-states-most-dependent-on-coal-power/>.

⁵⁵ Frederick Reese, *States Producing the Most Electricity from Coal*, STACKER (July 30, 2019), <https://thestacker.com/stories/3356/states-producing-most-electricity-coal#51>.

⁵⁶ *Id.*

employer-driven workforce development program focused on building the digital economy and strengthening digital innovation and entrepreneurship across a sixteen-county region in eastern Kentucky.⁵⁷ The project will specifically engage dislocated workers from the coal industry through targeted advertisements and provide adults with basic education as needed to ensure these individuals can participate in the training courses.⁵⁸

However, relying on technology to facilitate this transition is not without its delays and failures. Retraining coal miners is possible but without guaranteed jobs, retraining programs remain flawed in their design and there's little convincing evidence that planners and funders have learned lessons from their past efforts.⁵⁹ For example, "one \$1.4 million ARC project to teach laid-off miners in Greene County and in West Virginia computer coding has signed up only twenty people for ninety five slots."⁶⁰ Retraining is especially difficult in Appalachia because economic development and diversification moves slowly, and relocation is difficult.⁶¹ The isolated geography and poor education in Appalachia place it far behind the rest of American society. Lack of funding combined with isolation and lack of education leads to slow economic development and relocation. While training can be subsidized, there's little enthusiasm for subsidizing workers' income during retraining, relocation costs, independent career counselors, or wage differentials, factors that

⁵⁷ *POWER Award Summaries by State as of June 2017*, APPALACHIAN REGIONAL COMMISSION (June 2017), <https://www.arc.gov/images/grantsandfunding/POWER2017/ARCPowerAwardSummariesbyState6-14-2017.pdf> [hereinafter *POWER Award Summaries*].

⁵⁸ *Id.*

⁵⁹ Elizabeth Catte, *In Appalachia, Coding Bootcamps That Aim to Retrain Coal Miners Increasingly Show Themselves to Be 'New Collar' Grifters*, BELT MAGAZINE (Jan. 11, 2018), <https://beltmag.com/appalachia-coding-bootcamps/>.

⁶⁰ Valeria Volcovici, *Awaiting Trump's Coal Comeback, Miners Reject Retraining*, REUTERS (Nov. 1, 2017), <https://www.reuters.com/article/us-trump-effect-coal-retraining-insight/awaiting-trumps-coal-comeback-miners-reject-retraining-idUSKBN1D14G0>.

⁶¹ Catte, *supra* note 59.

some economists believe would make retraining programs more successful.⁶²

Virginia has taken steps to tackle these issues, but on a much smaller scale than Kentucky. A POWER grant was awarded Southwest Virginia Community College to help dislocated coal miners.⁶³ The grant aids displaced workers in developing the necessary skills to be competitive in today's market.⁶⁴ Training will be focused on three sectors with local employment opportunities: advanced manufacturing, construction, and health technology. The program will certify 165 new trainees over the life of the award.⁶⁵

West Virginia has produced trillions of dollars in coal; however, it consistently ranks at the bottom of the US for employment, education, health, and environment.⁶⁶ ARC recently awarded Bluefield State College a grant for the Center of Excellence in Manufacturing Engineering.⁶⁷ These activities may collectively create a strong manufacturing sector in an area that has been largely dependent on coal and the center will serve fifteen businesses, 210 students, and create approximately 100 jobs.⁶⁸ Simply put, while these baby steps may offset some of the pending challenges, it is not enough to fairly and equitably address the human and environmental injustice.

III. ANALYSIS: GLOBAL DECOMMISSION AND COMPARATIVE EXAMINATION OF ARC

A. Australia

Over the last decade the U.S. has dramatically decreased coal production.⁶⁹ In its place, Australia has become the world's

⁶² *Id.*

⁶³ POWER Award Summaries, *supra* note 57.

⁶⁴ *Id.*

⁶⁵ *Id.*

⁶⁶ GALLUP-SHARECARE WELL-BEING INDEX, 2017 STATE WELL-BEING RANKINGS (2018).

⁶⁷ POWER Award Summaries, *supra* note 57.

⁶⁸ *Id.*

⁶⁹ *Annual Coal Report*, U.S. ENERGY INFORMATION ADMINISTRATION (Oct. 3, 2019), <https://www.eia.gov/coal/annual/>.

largest coal exporter.⁷⁰ Coal production accounts for approximately \$67 billion, equivalent to 3.5 percent of Australia's Gross Domestic Product (GDP).⁷¹ While most larger coal producing countries and regions have taken exhaustive efforts to reduce coal consumption, production, and find cleaner and safer alternatives, Australia has ramped up production to meet the world's demand. Specifically, Australia provides most of its coal to Asia, supplying major economic powers like Japan, India, and China.⁷² Australia, shows no indication of pacing itself and some government officials and policy makers are looking to increase production in the Galilee Basin which could more than double Australia's current coal exports.⁷³

The Galilee Basin site, which is to be known as the Carmichael Mine, will begin shipping new coal by 2022.⁷⁴ The site is approximately 247,000 square kilometers and located in the central region of the Australian state of Queensland.⁷⁵ It is one of the largest untapped coal reserves on the planet. While extremely controversial, Australia is not showing any signs of decreasing coal production. In order to avoid the economic shift and transition, Australia has instead decided to fill the void left by other large coal producers. Economically, if the coal production was decreased Australia would face major financial turmoil.⁷⁶ As Lucas Dow, chief executive of Adani Group's Australian Mining Division, said "[t]he stark reality is you would actually exacerbate [the projects]. Coal is abundant worldwide

⁷⁰ Michelle Cunningham et al., *The Changing Global Market for Australian Coal*, RESERVE BANK OF AUSTRALIA (Sept. 19, 2019), <https://www.rba.gov.au/publications/bulletin/2019/sep/the-changing-global-market-for-australian-coal.html>.

⁷¹ *Id.*

⁷² *Id.*

⁷³ Jason Scott, *The Land Where Coal Remains King*, BLOOMBERG (May 7, 2019), <https://www.bloomberg.com/news/features/2019-05-07/in-australia-coal-remains-king-despite-climate-fears>.

⁷⁴ Somini Sengupta, *Australia, in a Victory for Coal, Clears the Way for a Disputed Mine*, NY TIMES (June 13, 2019), <https://www.nytimes.com/2019/06/13/climate/adani-australia-carmichael-mine.html>.

⁷⁵ See Scott, *supra* note 73.

⁷⁶ *Id.*

so if Australia doesn't supply it, somewhere else will, but it will be of a lesser quality."⁷⁷

While Australia has increased coal production and delayed the eventual energy transition, there are some in the country who are planning for the eventual decommissioning of coal and aspiring for a just transition. Australia's Greens Plan is led by an Australian political party, the Greens, and aims to phase out thermal coal exports by 2030.⁷⁸ Under this proposal, by 2030, it will no longer be legal to dig, burn, or ship thermal coal.⁷⁹ The plan is to put yearly limits on coal exports, each ton of coal to be exported will require a permit and have a floor price of one dollar per ton.⁸⁰ According to the Greens, the price per ton would raise at least \$268 million in the first five years, helping to smooth a transition into new sources of export revenue.⁸¹ Australia's biggest importers of coal have reported switching to hydrogen as opposed to coal, the Greens plan aims to do the same by developing a hydrogen export infrastructure to meet this demand.⁸² In order to switch to a hydrogen export infrastructure, through electrolysis wind and solar would be turned into emission-free hydrogen and exported overseas.⁸³

Additionally, the Greens plan to place Renewable Energy Zones around the country backed by a \$6 billion Grid Transformation Fund.⁸⁴ Although the details are not yet known, the zones will create new construction and jobs around the country to offset the eventual decline of coal while encouraging a switch elsewhere.⁸⁵ While it is unlikely all the goals will be met, especially with the recent addition of the Carmichael Coal Mine, it does provide some hope that Australia is planning for the eventual shift to a lower-carbon world.

⁷⁷ *Id.*

⁷⁸ THE GREENS, RENEW AUSTRALIA 2030 (2019).

⁷⁹ *Id.*

⁸⁰ *Id.*

⁸¹ *Id.*

⁸² *Id.*

⁸³ *Id.*

⁸⁴ *Id.*

⁸⁵ *Id.*

While the U.S. has started the shift to a low carbon economy very little was done to prepare for the transition. Also, the decline happened so quickly under the Obama Administration that policy-makers, regulators, and leaders have struggled to fill the void created by such a key economic driver in large rural swaths of the U.S. Thus far, the transition has been anything but just.

Contrary to the U.S., Australia has adopted a different strategy and policy direction. In the U.S., coal production declined due to increased regulation, market shifts, and dwindling mineable coal. However, Australia is not decreasing coal production until they have a viable path forward evidenced by the coal export tax and Renewable Energy Zones.

However, in the U.S., coal excise taxes were found to be unconstitutional. Internal Revenue Code § 4121 imposes an excise tax on domestically produced coal.⁸⁶ In December 1998, a court ruling deemed the excise tax to be unconstitutional when applied to coal exports in *Ranger Fuel Corp. v. United States*.⁸⁷ There, the tax was found to be unconstitutional due to the blanket prohibition imposed by the Export Clause in Article 1, Section 9, Clause 5 of the United States Constitution.⁸⁸ This issue needs to be reexamined and a coal export tax should be implemented to fund the transition. The tax would supply ARC with additional funding needed to ensure an equitable and just transition for Appalachia and America's most impoverished regions. For a century, coal has externalized the cost of coal and the people of Appalachia have suffered. It is now time to internalize that cost.

B. The U.K. & Europe

The U.K. became the first country in the world to officially commit to phasing out its coal operations in 2015.⁸⁹ By 2025, the country will set a limit on the amount of emissions coal-fired plants

⁸⁶ INTERNAL REVENUE SERVICE, COAL EXCISE TAX: AUDIT TECHNIQUE GUIDE (2005).

⁸⁷ *Ranger Fuel Corp. v. United States*, 33 F. Supp. 2d 466 (E.D. Va. 1998).

⁸⁸ *Id.*

⁸⁹ Todd, *supra* note 15.

are allowed to produce, forcing those without carbon capture technology to shutter.⁹⁰ Carbon capture involves removing greenhouse gases (“GHGs”) from an emitting source, packaging them in some form to be transported to a final destination, and ultimately storing or sequestering the GHGs on a relatively permanent basis.⁹¹ Since Britain introduced a tax on power plant CO₂ emissions in 2013, coal power generation has plummeted, with the country seeing its first day of coal-free power generation in 2017 since the industrial revolution in the nineteenth century.⁹²

Germany has historically been one of Europe’s top coal producers with an installed capacity of almost fifty GW, but by 2038 it plans to phase-out all coal-fired facilities.⁹³ Currently, Germany relies on coal for around a one-third of its electricity needs.⁹⁴ However, the government is set to pay billions in subsidies to utility companies to accelerate the shutdown of their coal-fired power fleet and begin a massive expansion of wind and solar energy.⁹⁵ The government has a target of generating sixty five percent of Germany’s electricity from renewable sources by 2030.⁹⁶ Environment Minister Svenja Schulze acknowledged Germany will need a massive expansion of renewable energy as the country is also in the process of exiting atomic power, with the last nuclear reactor set to go offline at the end of 2022.⁹⁷ Germany’s phase out is largely due to the 2011 Fukushima nuclear disaster in Japan which led to

⁹⁰ *Id.*

⁹¹ Patrick R. Baker & Henry Webb, *The Mine Void and Pore Space Conundrum Posed by the Anti-Kelo Movement*, 66 OIL, GAS & ENERGY Q. 1, 8 (2017).

⁹² Susanna Twidale, *Britain Outlines Plans for 2025 Coal-Power Phase Out*, REUTERS (Jan. 5, 2018), <https://www.reuters.com/article/us-britain-coal-phase-out/britain-outlines-plans-for-2025-coal-power-phase-out-idUSKBN1EU11P>.

⁹³ Todd, *supra* note 15.

⁹⁴ *Germany Reaches Agreement to Phase Out Coal by 2038*, EURONEWS (Jan. 1, 2020), <https://www.euronews.com/2020/01/16/germany-reaches-agreement-to-phase-out-coal-by-2038>.

⁹⁵ *Id.*

⁹⁶ *Id.*

⁹⁷ *Id.*

widespread anti-atomic-power protests across Germany.⁹⁸ Two months after the accident, Chancellor Angela Merkel announced all plants would be closed over the next decade.⁹⁹

The European Green Deal is a response to the economic challenges set forth by the transition from reliance on fossil fuels to a low-carbon world. The Green Deal aims to transform the EU into a prosperous society, with a competitive economy where by 2050 there will be no emissions of greenhouse gases.¹⁰⁰ Achieving the 2030 target will require €260 billion of additional annual investment.¹⁰¹ The Investment Plan for Europe (“InvestEU”) has an aim to remove obstacles to investment, provide visibility and technical assistance to investment projects, and to make smarter use of financial resources.¹⁰²

InvestEU will work with the European Investment Bank (“EIB”) Group, national promotional banks and institutions, along with other international financial institutions.¹⁰³ The EU budget will also give support to protecting citizens and workers vulnerable to the transition by providing access to re-skilling programs, jobs in new economic sectors, or energy-efficient housing.¹⁰⁴ The commission will work with the Member States and regions to help put in place territorial transition plans.¹⁰⁵

Unlike the EU that can take a more holistic or regional approach, ARC is forced to work in the confines of America’s

⁹⁸ *Germany Shuts Down Atomic Plant as Nuclear Phase-out Enters Final Stretch*, EURONEWS (Dec. 31, 2019), <https://www.dw.com/en/germany-shuts-down-atomic-plant-as-nuclear-phase-out-enters-final-stretch/a-51845616>.

⁹⁹ *Id.*

¹⁰⁰ *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: The European Green Deal*, COM (2019) 640 final (Dec. 11, 2019) [hereinafter European Green Deal].

¹⁰¹ *Id.*

¹⁰² *What Is the Investment Plan for Europe?*, EUROPEAN COMMISSION https://ec.europa.eu/commission/priorities/jobs-growth-and-investment/investment-plan-europe-juncker-plan/what-investment-plan-europe_en.

¹⁰³ European Green Deal, *supra* note 100.

¹⁰⁴ *Id.*

¹⁰⁵ *Id.*

cooperative federalism framework. ARC must pigeonhole each project into the confines of each state it services. If ARC had greater regulatory authority and policy-making ability, it could more adequately take on the challenges that face coal country. ARC needs the ability to take a more regional approach to what is a national problem.

A regional approach in the U.S. is nothing new and is achievable. In 2005, The Council of Great Lakes Governors and Premiers, consisting of the governors of the eight states and two Canadian Provinces included in the agreements, signed the Great Lakes Compact–St. Lawrence River Basin Sustainable Water Resources Agreement, and at the same time endorsed the companion Great Lakes Compact.¹⁰⁶ The purpose of the Compact was to join regions and states together under one umbrella and holistically deal with the challenges facing the watershed. Water conservation and efficiency programs will be developed by each state in order to reduce waste by all users.¹⁰⁷ The Economic Development Administration’s investment policy is designed to establish a foundation for sustainable job growth and the building of durable regional economies throughout the United States.¹⁰⁸ If ARC is to meet the challenges of today, U.S. policymakers and elected officials will need to think and act bigger. ARC should model their strategy after an EU approach, and the Great Lakes Compact demonstrates it can be done in the U.S.

C. China

Finally, China is the world’s leading producer of coal, using around seventy percent of their energy from coal.¹⁰⁹ Asian countries

¹⁰⁶ *Great Lakes Agreement and Compact*, GREAT LAKES ST. LAWRENCE GOVERNORS & PREMIERS <https://www.gsgp.org/projects/water-management/great-lakes-agreement-and-compact/>.

¹⁰⁷ *Great Lakes Compact*, Ind. Dep’t of Nat. Res., <https://www.in.gov/dnr/water/5216.htm>.

¹⁰⁸ *Overview: Mission*, U.S. Econ. Dev. Admin., <https://www.eda.gov/about/>.

¹⁰⁹ Benjamin E. Sawe, *Coal Usage by Country*, WORLD ATLAS (Nov. 5, 2018), <https://www.worldatlas.com/articles/15-countries-most-dependent-on-coal-for-energy.html>.

are required to produce vast amounts of coal to meet the large demands of their country.¹¹⁰ Indonesia's need for coal in power generation has been increasing steadily and expects to peak in 2021 with a phase back by 2025.¹¹¹ China, being the world's largest producer of coal, also is the world's largest producer of renewable energy forms.¹¹² The Nationality Determined Contributions ("NDCs") has set power demands and renewable power targets for these Asian countries.¹¹³

China's 2030 Paris Agreement NDC is rated "Highly Insufficient" but the country is headed in a slightly better direction towards an "Insufficient" rating, indicating potential to increase its NDC level of ambition.¹¹⁴ Recently, there had been signs that China's CO² emissions were flattening but increased fossil fuel consumption drove an estimated 2.3 percent increase in Chinese CO² emissions in 2018 and four percent in the first half of 2019, marking a three consecutive years of growth after emissions had appeared to level out between 2014 and 2016.¹¹⁵ Additionally, China started construction of twenty eight gigawatts of new coal-fired power capacity in 2018 after lifting a previous construction ban, bringing its total coal capacity under construction to 245 gigawatts.¹¹⁶ This increased coal consumption and development is inconsistent with the Paris Agreement, which provides for Asia coal power generation to be reduced sixty three percent by 2030, leading to a phase-out by 2037.¹¹⁷

China has successfully enforced some of strictest standards for emissions from coal power plants back in 2011, topping even the

¹¹⁰ ANISSA SUHARSONO ET AL., TACKLING COAL-DRIVEN AIR POLLUTION IN CHINA AND INDIA: LESSONS LEARNED FOR INDONESIA INTERNATIONAL INSTITUTE FOR SUSTAINABLE DEVELOPMENT (2019).

¹¹¹ *Id.*

¹¹² Sawe, *supra* note 109.

¹¹³ SUHARSONO ET AL., *supra* note 110.

¹¹⁴ *China*, CLIMATE ACTION TRACKER, <https://climateactiontracker.org/countries/china/>.

¹¹⁵ *Id.*

¹¹⁶ *Id.*

¹¹⁷ *Id.*

European Union's standards.¹¹⁸ China's national standards have reduced levels of nitrogen oxide and sulfur dioxide emissions from the coal-based power sector as compared to 1990 levels, despite the growing demand in the power generation sector.¹¹⁹ While fossil fuel production is expected to decrease due to the NDCs renewable power target, coal is still expected to play a significant role in Asian Countries.¹²⁰ However, while China seems as if they are attempting to make moves toward safer energy, the country is under criticism for investing in hundreds of coal-fired power plants in other countries.¹²¹ Out of the \$244 billion in energy investments since 2000, more than \$50 billion has gone toward coal.¹²² However, it is extremely difficult to ascertain or gain information from China. There is no doubt the shift to a low-carbon world and economy will impact China, what remains unclear is China's preparation for that eventual reality.

IV. CONCLUSION

Many countries and regions are shifting to a low-carbon reality, one of the greatest challenges, and maybe the greatest in the history of mankind, is tackling climate change. However, dealing with the collateral issues that will emerge as a result will be just as challenging. One of the most critical issues will be aiding those regions and countries that have traditionally relied upon coal and underinvested in its demise. The U.S. is a great example of overproduction, development, and underinvestment. Those countries that have prepared for this eventuality will be in the best position to reduce the economic and social catastrophe being faced by the U.S.

¹¹⁸ SUHARSONO ET AL., *supra* note 110.

¹¹⁹ *Id.*

¹²⁰ *Id.*

¹²¹ Akane Okutsu, *Asia's Appetite for Coal Grows, with China the Key Decider*, NIKKEI ASIAN REVIEW (Jan. 13, 2020) <https://asia.nikkei.com/Business/Markets/Commodities/Asia-s-appetite-for-coal-grows-with-China-the-key-decider>.

¹²² Steve Inskeep & Ashley Westerman, *Why Is China Placing a Global Bet on Coal?*, NPR (Apr. 29, 2019) <https://www.npr.org/2019/04/29/716347646/why-is-china-placing-a-global-bet-on-coal/>.

The U.S. and ARC would be wise to shape a just transition based on an EU model by taking a more regional and holistic strategy rather than the current state-by-state approach. Further, the U.S. has consistently underinvested in the eventual decline of coal by not taxing exports and producers. However, there is still time to reexamine this issue and explore new ways to adequately fund ARC to meet the challenges in this transition. ARC needs the regulatory tools of today to meet the current challenges. The stakes are too high for business-as-usual.