

# CLIMATE CHANGE AND THE WAR ON COAL: EXPLORING THE DARK SIDE

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To see coal purely as a gift from God overlooks the many dangerous strings attached to that gift. Similarly, to see it as just an environmental evil would be to overlook the undeniable good that accompanies that evil. “Failing to recognize both sides of coal—the vast power and the exorbitant costs—misses the essential, heartbreaking drama of the story.”<sup>1</sup>

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1. BARBARA FREESE, *COAL, A HUMAN HISTORY* 13 (Perseus Publishing 2003) [hereinafter “FREESE”].

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## INTRODUCTION

The shadow cast by the threat of climate change clouds the world’s path to a sustainable energy future. In a relatively short time, hundreds of millions of people around the world have recognized global warming as a threat of potentially catastrophic proportions. This paper seeks to provide a small measure of illumination to facilitate informed decision-making as future energy options are explored. Informed decisions are necessary if the potential disasters attendant to climate change are to be avoided. Ignorance is no longer an option.

Careful, objective consideration of the full range of costs and benefits of each option will effectively serve the public interest. It is imperative that public policy decision-makers accurately address the true range of costs and

benefits of all energy options—including those relating to coal. However, in the past, such a cost-benefit analysis could easily overlook the externalities of coal mining and burning, as those costs have historically been obscure. As discussed below, public policy researchers and analysts have begun to examine and document coal's impacts. A recent scholarly report prepared by university economists gives voice to long-expressed concerns of coalfield citizens:

Each stage in the life cycle of coal—extraction, transport, processing, and combustion—generates a waste stream and carries multiple hazards for health and the environment. These costs are external to the coal industry and are thus often considered “externalities.” We estimate that the life cycle effects of coal and the waste stream generated are costing the U.S. public a third to over one-half of a trillion dollars annually. Many of these so-called externalities are, moreover, cumulative. Accounting for the damages conservatively doubles to triples the price of electricity from coal per [kilowatt hour] generated, making wind, solar, and other forms of nonfossil fuel power generation, along with investments in efficiency and electricity conservation methods, economically competitive.<sup>2</sup>

The following discussion recognizes “both sides of coal” with an emphasis on those aspects of coal mining and burning that falls on what coal historian Barbara Freese calls “the dark side.”<sup>3</sup> Her book, *COAL: A HUMAN HISTORY*, acknowledges the extraordinary contribution coal has made to modern civilization, observing that “[l]ike a good genie, coal has granted many of our wishes enriching most of us in developed nations beyond our wildest pre-industrial dreams.”<sup>4</sup> Importantly, Freese also acknowledges the costs of coal, asserting that: “also like a genie, coal has an unpredictable and threatening side[;] . . . although we have always

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2. Paul R. Epstein, *Full Cost Accounting for the Life Cycle of Coal*, 119 *Ann. N.Y. Acad. Sci.*, 73-98 (2011) [hereafter, *Full Accounting*]. See also, Julia M. Gohlke, et al., *Estimating the Global Public Health Implications of Electricity and Coal Consumption*, 119 *Env. Health Perspect.* 821-826 (2011) [hereafter *Global Health*] (“Increased electricity consumption in countries with IM < 100/1,000 live births does not lead to greater health benefits, whereas coal consumption has significant detrimental health impacts.”).

3. FREESE, *supra* note 1.

4. *Id.*

known that, we are just beginning to realize how far reaching that dark side is.”<sup>5</sup>

The modern coal and power industries—“Big Coal”—have no difficulty being heard by public policy decision-makers.<sup>6</sup> Coal, power generation interests, and those associated with them, have millions at their disposal to promote and spread the positive side of coal’s story.<sup>7</sup> However, the “dark side” of coal—its obscured externalities—is little appreciated or understood by the public. These externalities are the primary focus of this essay. Even while recognizing coal’s contributions to world industrialization, the following discussion identifies and discusses coal’s history of socio-economic, environmental, workplace safety, and public health externalities. No argument is made here for or against coal’s use in meeting the world’s demand for energy. The modest hope is that public policy decision-makers will weigh in the balance both the costs and the benefits of coal as the climate change debate focuses on future energy options.

### I. COAL AT THE MILLENNIUM

The International Energy Agency’s Coal Industry Advisory Board (“IEA”) has concluded that “[d]iverse, secure, affordable and environmentally acceptable energy supplies are essential to sustainable development.”<sup>8</sup> The IEA Advisory Board emphasized that “[r]esponding

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5. *Id.*

6. The term “Big Coal” was coined by author Jeff Goodell who defined it as “shorthand for the alliance of coal mining companies, coal-burning utilities, railroads, lobbying groups, and industry supporters that make the coal industry such a political force in America.” Goodell is highly critical of these interests. JEFF GOODELL, *BIG COAL: THE DIRTY SECRET BEHIND AMERICA’S ENERGY FUTURE*, xxvii, (2006) (Goodell emphasizes that the term is not meant to suggest the industry is monolithic or that its proponents meet in secret to plan grand strategies. Rather, he posits, the coal industry like many other industries “can be identified by certain common goals and pursuits” and thus, he uses the term to suggest that commonality as well as to remind the reader of the power and influence of “the players involved.” It is in this specific sense the term “Big Coal” is used in this paper. Throughout this paper the term is used interchangeably with “Coal,” each term intended to have the same meaning.).

7. As explained below, climate change constitutes an enormous concern of Big Coal. Coal’s strategic response has been to tout its affordability, availability, and adaptability, arguing that these benefits should guarantee coal’s share of future energy markets. *See, e.g.*, Hal Quinn, President & CEO, National Mining Association, Address at the United States Energy Association Eighth Annual State of the Energy Industry Forum (January 18, 2012) *available at* [http://www.nma.org/pdf/speeches/011712\\_usea\\_hal.pdf](http://www.nma.org/pdf/speeches/011712_usea_hal.pdf) (discussing the future of coal in America and globally).

8. International Energy Agency, *Reducing Greenhouse Gas Emissions: The Potential of Coal* 9 (2005) [hereinafter IEA Coal Industry Advisory Board].

effectively to the risks of global climate change while continuing to meet the high energy demands of mature economies and the rapidly increasing energy demands of developing economies is a significant international challenge.”<sup>9</sup>

In meeting this challenge, fuel choices will no doubt include some mix of coal and its competitors, including oil, natural gas, solar, hydro, wind, biomass, and nuclear. The composition of the future mix is presently unclear. What is clear is the contribution coal currently makes to the world energy market and to the greenhouse gas emissions that raise climate change concerns.

In the last two decades of the twentieth century, world coal production increased by thirty eight percent to four billion tons.<sup>10</sup> Coal production has steadily increased in Asia while European production has declined steadily.<sup>11</sup> World coal production increased one and a half times as much from 2003 to 2007 as it did over the previous twenty-three years.<sup>12</sup> By 2030, annual world coal production is projected to grow to seven billion tons—China accounting for half of the increase.<sup>13</sup> United States reserves amount to 30% of the world’s coal and the nation produced more coal annually than any other country but China. China, by far the largest producer, possesses only half the reserves of the U.S.<sup>14</sup>

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9. *Id.* at 9.

10. The geographic extent of mineable coal reserves is reflected in statistics identifying leading coal producing nations. Thirty-four countries produce one million tons of coal per year. The leading coal producers are China (1119.8); United States (595.1); India (209.7); Australia (203.1); South Africa (144.8); Russia (144.5) (numbers represent million tons oil equivalent). See THE GEOHIVE, [http://www.geohive.com/charts/en\\_coalprod.aspx](http://www.geohive.com/charts/en_coalprod.aspx) (last visited June 3, 2012).

11. Asia is the source of fifty-four percent of current global coal production. *International Energy Agency Report, International Coal Production, 1980-2007*, ENERGY INFORMATION ADMINISTRATION, (Oct. 17, 2008), <http://www.eia.doe.gov/emeu/international/coalproduction.html> [hereinafter IEA Production Rep’t].

12. *Id.*

13. WORLD COAL INSTITUTE, *THE COAL RESOURCE: A COMPREHENSIVE OVERVIEW OF COAL* 13 (2009) [hereinafter THE COAL RESOURCE].

14. See ENVIRONMENTAL WORKING GROUP, *COAL: RESOURCES AND FUTURE PRODUCTION* (2007), available at [http://www.energywatchgroup.org/fileadmin/global/pdf/EWG\\_Report\\_Coal\\_10-07-2007ms.pdf](http://www.energywatchgroup.org/fileadmin/global/pdf/EWG_Report_Coal_10-07-2007ms.pdf) (last visited June 3, 2012) [hereinafter EWG COAL RESOURCES AND PRODUCTION]. The EWG reports that the:

[l]argest coal producers in descending order are: China, USA (half of Chinese production), Australia (less than half of US production), India, South Africa, and Russia. These countries account for over 80 percent of global coal production. Coal consumption mainly takes place in the country of origin. Only 15 percent of production is exported, 85 percent of produced coal is consumed domestically.

*Id.*

In 2006, Big Coal had plans to build as many as 150 new coal-burning power plants in the United States.<sup>15</sup> None of these proposed facilities had concrete plans for carbon capture and sequestration.<sup>16</sup> Chinese plans for constructing new facilities for generating electricity by coal combustion are more ambitious. China is planning to construct the equivalent of two five hundred megawatt, coal-fired power plants *per week* with a capacity comparable to the entire power grid of the United Kingdom *each year*.<sup>17</sup> Worldwide, hundreds of new coal-fired power plants are currently under construction or are in various stages of planning that will put them on-line in the next few decades.<sup>18</sup>

Today, coal produces 39% of the world's electricity with natural gas, hydro, and oil far behind.<sup>19</sup> 93% of South Africa's electricity is produced by coal, 78% in China, 80% in Australia, 69% in India, and 47% in Germany.<sup>20</sup> Until recently, 50% of the electricity generated in the United States was generated from coal, but the Energy Information Association expects electric power sector coal use to continue to decline significantly.<sup>21</sup> The

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15. See Mary Wood, *Nature's Trust: A Legal, Political and Moral Frame for Global Warming*, 34 *Mary Christina Wood, Nature's Trust: A Legal, Political and Moral for Global Warming*, 34 B.C. ENVTL. AFF. L. REV. 577, 590 (2007) (citing News Release, Nat'l Energy Tech. Lab., *Department of Energy Tracks Resurgence of Coal-Fired Power Plants* (Aug. 2, 2006) [http://www.netl.doe.gov/publications/press/2006/06046-Coal-Fired\\_Power\\_Plants\\_Database.html](http://www.netl.doe.gov/publications/press/2006/06046-Coal-Fired_Power_Plants_Database.html)).

16. More than 20 proposed coal-fired power plants were cancelled in 2007 and more than three dozen other plants were delayed, primarily because of financing concerns. See INTERFAITH CENTER ON CORPORATE RESPONSIBILITY, *DON'T GET BURNED: THE RISKS OF INVESTING IN NEW COAL-FIRED GENERATING FACILITIES* 9 (2008), available at <http://www.synapse-energy.com/Downloads/SynapseReport.2008-02.GRACE.Don't-Get-Burned-Risks-of-New-Coal.07-014.pdf> [hereinafter SYNAPSE REPORT].

17. MASS. INST. OF TECH., *THE FUTURE OF COAL, OPTIONS FOR A CARBON CONSTRAINED WORLD* ix (2007) [hereinafter *FUTURE OF COAL*], available at <http://web.mit.edu/coal/>.

18. Mark Clayton, *Global boom in coal power — and emissions*, THE CHRISTIAN SCIENCE MONITOR (March 22, 2007), available at <http://www.csmonitor.com/2007/0322/p01s04-wogi.html>.

19. IEA Production Rep't, *supra* note 11. Coal generates electricity in many nations across the globe. Thirty-four countries consume more than a million tons oil equivalent per year. The biggest coal consumers are: China (1191); United States (567.3); India (237.7); Japan (119.1); Russian Federation (112.5); South Africa (93.8); Germany (82.4); Poland (58.4); South Korea (54.8); Australia (51.5); United Kingdom (43.8); Ukraine (39.6); Taiwan (39.5); Canada (35.0); Kazakhstan (29.7); Turkey (28.8); Indonesia (27.7); (numbers represent million tons oil equivalent). See [http://www.xist.org/charts/en\\_coalcons.aspx](http://www.xist.org/charts/en_coalcons.aspx) (last visited June 3, 2012). Percentages of market share of other fuels are natural gas (19%), nuclear (17%), hydro (16%), and oil (7%). *Id.*

20. DR. MARK DEISENDORF, WORLD WILDLIFE FUND, *COAL-FIRED ELECTRICITY AND ITS IMPACT ON GLOBAL WARMING* 6, available at [www.wwf.org.au/publications/australias\\_polluting\\_power.pdf](http://www.wwf.org.au/publications/australias_polluting_power.pdf).

21. See *FUTURE OF COAL*, *supra* note 17. But see ENERGY INFORMATION ADMINISTRATION, *Short Term Energy Rep't* (February 7, 2012), at 9; available at [http://www.eia.gov/forecasts/steo/pdf/steo\\_full.pdf](http://www.eia.gov/forecasts/steo/pdf/steo_full.pdf) (projecting a drop in electric generation coal consumption declining to 41.2 percent in 2013 as other generation sources are developed to meet

average age of the more than 500 coal-burning power plants in this country is 35 years.<sup>22</sup>

Just one 500 megawatt coal-fired power plant produces approximately three million tons of carbon dioxide (“CO<sub>2</sub>”) per year.<sup>23</sup> As of 2008, the United States’ coal-burning power plants were producing CO<sub>2</sub> at an annual rate of about one and a half billion tons.<sup>24</sup> Coal contributes more climate change-inducing greenhouse gases than any other fossil fuel.<sup>25</sup> Coal burning is the world’s largest source of carbon dioxide emissions, accounting for 40.3 percent of the total.<sup>26</sup> Moreover, as far as perceptions go, coal has a well-established reputation in the public eye as a “dirty” fuel, long synonymous with smoke and air pollution.<sup>27</sup> Thus, in making its case for future energy market share, Big Coal starts with major disadvantages even without factoring in the other serious externalities discussed below.

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electricity supply demands); ENERGY INFORMATION ADMINISTRATION, *Coal’s Share of Total U.S. Electricity Generation Falls Below 40% in November and December* (March 9, 2012), available at <http://www.eia.gov/todayinenergy/detail.cfm?id=5331&src=email> (stating that “[t]he last time coal’s share of total generation was below 40% for a monthly total was March 1978. A combination of mild weather . . . and the increasing price competitiveness of natural gas relative to coal contributed to the drop in coal’s share of total generation.”).

22. *Id.* (explaining how these power plants produce, on average, five hundred megawatts).

23. *Id.*

24. *Id.*

25. *See, EPA: Power Plants Main Global Warming Culprits*, (Assoc. Press, Jan. 11, 2012), available at <http://wvgazette.com/News/201201110192>. Data reported to USEPA on emissions of heat-trapping gases indicate U.S. power plants responsible for 72 percent of greenhouse gases that contribute to climate change. *Id.* *See also* Greenhouse Gas Reporting Program Data for Calendar Year 2010, available at <http://1.usa.gov/zO2wd7>; <http://epa.gov/climatechange/emissions/ghgdata/>.

26. World carbon dioxide emissions from the consumption of coal totaled 12.1 billion metric tons of carbon dioxide in 2006, up 42 percent from the 1996 level of 8.5 billion metric tons. China and the United States were the two largest producers of carbon dioxide from the consumption of coal in 2006 accounting for 41 and 18 percent, respectively, of the world total. India, Japan, and Russia together accounted for an additional 14 percent. U.S. ENERGY INFO. ADMIN., WORLD ENERGY OVERVIEW (2006), available at <http://www.eia.doe.gov/iea/overview.html> (last visited June 3, 2012). Petroleum ran a close second to coal as a source of CO<sub>2</sub> emissions from the consumption and flaring of fossil fuels. In 2006 petroleum accounted for 38.4 percent of the total. *Id.*

27. *See, e.g.*, Editorial, *Clean Power or Dirty Coal*, N.Y. TIMES, Feb. 10, 2008, at WK;); Craig Whitlock, *Dependent on a Dirty Fuel, German Coal Mines Thrive Despite Push for Cleaner Energy*, WASH. POST, at D1 (Feb. 8, 2008), available at <http://www.washingtonpost.com/wp-dyn/content/article/2008/02/07/AR2008020703755.html>. Coal combustion produces significantly greater CO<sub>2</sub> emissions than oil and natural gas. *See* FUTURE OF COAL, *supra* note 17, at 5. CO<sub>2</sub> emissions from coal-fired electricity generation comprise nearly 80 percent of the total CO<sub>2</sub> emissions produced by the generation of electricity in the United States. Fifty-one percent of electricity generation is fueled by coal. *See* DEPT. OF ENERGY, ENV’T’L PROTECTION AGENCY, CARBON DIOXIDE EMISSIONS FROM GENERATION OF ELECTRIC POWER IN THE UNITED STATES 3 (July 2000) available at [http://www.eia.doe.gov/cneaf/electricity/page/co2\\_report/co2emiss.pdf](http://www.eia.doe.gov/cneaf/electricity/page/co2_report/co2emiss.pdf).

## II. HISTORY OF COAL

### A. *Early History*

Coal is a natural resource found in seams in underground layers throughout the world; it underlies every continent—including Antarctica.<sup>28</sup> Coal has been exploited as an energy source for millennia.<sup>29</sup> It is mentioned in the annals of Roman occupiers of the British Isles in the third to fifth centuries A.D.<sup>30</sup> Coal use began in earnest in Europe at the end of the middle ages.<sup>31</sup> By the early fourteenth century, coal use had become common as well as problematic in English cities. London streets in the summer of 1306 were filled with coal smoke from blacksmith and artisan fires. The air contamination was so offensive that it led to laws in the reign of Edward I that banned coal burning and imposed “great fines and ransoms” on violators.<sup>32</sup>

### B. *Coal and the Industrial Age*

Two centuries later, population had significantly increased and the great forests of the British Isles had been decimated to provide wood for heating, cooking, and other domestic uses. England turned to coal as its primary source of fuel.<sup>33</sup> Elizabethan England’s transition from wood to coal has

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28. Coal is found in significant if not necessarily mineable quantities in many countries. The nations with the most estimated reserves (in million tons) are: United States (243,069 ); Russian Federation (156,994); China (113,209); India (57,955); Australia (76,367); South Africa (30,713); Ukraine (32,988); and Kazakhstan (31,626). Europe’s ENERGY PORTAL, <http://www.energy.eu/#non-renewable> (last visited June 3, 2012).

29. See THE COAL RESOURCE, *supra* note 13, at 19 (Mining in northeastern China provided coal to fuel a copper smelter whose metal product was cast into coins around 1000 B.C. The World Coal Institute asserts that “one of the earliest known references to coal was made by the Greek philosopher and scientist Aristotle, who referred to a charcoal like rock.”).

30. There is evidence of use of coal by Roman occupiers of the British Isles from 300-500 A.D. BARBARA FREESE, COAL, A HUMAN HISTORY 12–13 (Penguin 2003) (citing J.U. NEF, 1 THE RISE OF THE BRITISH COAL INDUSTRY 2 (Frank Cass & Co., 1966)).

31. See FREESE, *supra* note 1, at 15–42 (discussing use of coal in the British Isles from the 13th time of Roman occupation *circa*. 300 B.C until the end of the reign of Queen Elizabeth I).

32. *Id.* at 1 (citing ROBERT GALLOWAY, 1 ANNALS OF COAL MINING AND THE COAL TRADE 10 (1999)).

33. By the end of the Sixteenth century coal use increased dramatically as sources of wood for fuel were depleted. Before the end of the reign of Elizabeth I in 1603, coal surpassed wood as the primary source of English fuel. GALLOWAY, *supra* note 32, at 10 (citing JOHN HATCHER, 1 THE HISTORY OF THE BRITISH COAL INDUSTRY, BEFORE 1700: TOWARDS THE AGE OF COAL (Oxford Univ. Press 1993)).

been identified as a pivotal turning point in world history.<sup>34</sup> It is seen by one commentator as a transformational event:

[The English] went on to spark a coal-fired industrial revolution that would transform the planet. The industrial age emerged literally in a haze of coal smoke, and in that coal smoke we can read much of the history of the modern world.<sup>35</sup>

Coal-fired industrialization expanded in the late eighteenth and early nineteenth centuries as the market for coal increased dramatically following the perfection of steam-engine technology.<sup>36</sup>

The coal market expanded exponentially in England and other industrializing European nations in order to meet the increasing demands of iron and, later, steel production, train transportation, and steam-powered ships.<sup>37</sup>

Domestic coal fueled Great Britain's rise to become a global commercial and military superpower—a position it held for the better part of two centuries.

### *C. Coal and Industrialization in the United States*

Beyond the far-flung British Empire, the industrial revolution took root most quickly in the coal-rich United States. America's vast coalfields contained more coal than all of England and were the largest, easiest to

34. *Id.* at 2, 30–32. Robert Galloway explained:

Had the coal ban held up . . . human history would have been radically different. As it happened, though, in the late 1500s the English faced an energy crisis . . . they learned to tolerate what had been intolerable, becoming the first western nation to mine and burn coal on a large scale. In so doing, they filled London and other English cities with some of the nastiest urban air the world had yet seen.

FREESE, *supra* note 1, at 2, 230–32 (citing ROBERT GALLOWAY, 1 ANNALS OF COAL MINING AND THE COAL TRADE 10 (1898, *reprinted*, 1999)).

35. FREESE, *supra* note 1, at 2.

36. SALLY B. GENTILE, REINVENTING ENERGY: MAKING THE RIGHT CHOICES 3 (Diane Pub. Co. 1996). The steam engine was patented in 1769; coal-fired steam energy jump-started the industrial revolution.

37. *Id.* Coal was also used extensively to fuel gas lights in many urban areas. Coal gasification triggered exponential growth in gas lighting in urban areas in the early nineteenth century, especially in London. Electricity eventually replaced coal gas street lighting at the end of the century as electric generation and transmission became common.

access, and highest quality coal reserves in the world.<sup>38</sup> It was near the end of the nineteenth century when invention and ingenuity in the United States led to another surge in world demand for coal.

Tinkering at his Menlo Park, New Jersey, laboratory, Thomas A. Edison developed the electric light bulb that helped propelled worldwide industrialization. Yet, alone, Edison's invention was of little value. To fulfill its promise, the bulb required stimulation by electric current.

Edison was a pioneer in the development of a system for efficient electricity generation and transmission.<sup>39</sup> Edison designed and oversaw the construction of an electricity generating station that began commercial operation in New York City in 1882.<sup>40</sup> To fuel his system, Edison turned to coal—which was readily available, discovered in seemingly limitless quantities, and found in convenient locations reachable by rail and waterways.

Coal's entrepreneurs, politicians, laborers, and financiers sprang into action. The importance of the agrarian economic base, a defining characteristic of the nation since its colonial period, rapidly declined as engines whirred and factories spewed mass-produced goods out into the markets of the new American industrial age.

Thus, at the turn of the twentieth century, Edison's genius brought coal and electric generation together, effectively triggering an inexorable expansion of the market for coal that continues today. Comfort was no longer strictly the province of the wealthy. The lives of many Americans improved dramatically. From the Atlantic to the Pacific, coal was the fuel providing light to America's cities and farms, and powering her factories. Coal's time had come in America.

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38. Today, after well over a century of mining billions upon billions of tons of coal, the United States coal reserves are still greater than that of any other nation of the world. Estimates of the remaining minable coal in the nation run between one and two hundred years. There is a measure of controversy concerning the accuracy of world and national coal reserve estimates. *See, e.g.*, EWG COAL RESOURCES AND PRODUCTION, *supra* note 14.

39. The genius of Thomas Edison was aimed not only at electric lighting, but necessarily at designing an efficient mechanism for generating electricity and transmitting current long distances to activate his invention. *See* FRANCIS ROLT-WHEELER, THOMAS ALVA EDISON, 125–136 (MacMillan 1915).

40. *Id.* The Edison plant generated electricity that was transmitted around the city to provide residential lighting. THE COAL RESOURCE, *supra* note 13, at 19.

## III. COAL'S DARK SIDE: EXAMINING ITS EXTERNALITIES

Air pollution caused by coal mining and combustion is only one of many externalities adversely impacting the environment and coalfield communities.<sup>41</sup> Coal's consequences are neither well known nor understood outside the world's coal mining regions. Most people in developed nations have long been unaware of the connection between coal's costs and the simple act of flipping on a light switch to illuminate a room. The public is generally oblivious to coal's negative impacts on the environment, including soil erosion, landslides, sulfuric acid water pollution, stream sedimentation, and loss of potable water. They are also unaware of the workplace injuries, diseases, and fatalities associated with coal mining. Nor is the public aware of coal's socio-economic impacts, which include: family and community disruption; economic stagnation; and accompanying lack of educational, employment, and economic development opportunities.<sup>42</sup> Sadly, many or all of these burdens are often borne by coalfield communities.<sup>43</sup>

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41. The externalities discussed herein are limited to those experiences in the Appalachian coalfields in the United States. Other coal mining regions of the world, notably China, also have experienced similar serious adverse impacts from coal mining and burning. China consumes more coal than any other nation. It consumes one fourth of the world's total coal production. Half the recent increase of world coal consumption is attributable to China. *See, e.g.,* HE YOUNGUO, CHINA'S COAL DEMAND OUTLOOK FOR 2020 AND ANALYSIS OF COAL SUPPLY CAPACITY, International Energy Agency, available at <http://www.iea.org/Textbase/work/2003/beijing/4Young.pdf>. For articles discussing China's coal-related externalities, *see* Simon Elegant & Zhangjiachang, *Where the Coal Is Stained with Blood*, TIME MAGAZINE, Mar. 2007, available at <http://www.time.com/time/magazine/article/0,9171,1595235,00.html> (stating that "20,000 miners die in accidents each year. And that count doesn't include tens of thousands more of the country's estimated 5 million miners who die of lung afflictions and other work-related diseases every year."); Keith Bradsher & David Barboza, *Pollution from Chinese Coal Casts a Global Shadow*, N.Y. TIMES, June 11, 2006, available at <http://www.nytimes.com/2006/06/11/business/worldbusiness/11chinacoal.html> (noting that "[t]he sulfur dioxide produced in coal combustion poses an immediate threat to the health of China's citizens, contributing to about 400,000 premature deaths a year. It also causes acid rain that poisons lakes, rivers, forests and crops."); YANG YANG, A CHINA ENVIRONMENTAL HEALTH PROJECT RESEARCH BRIEF: COAL MINING AND ENVIRONMENTAL HEALTH IN CHINA (2007), available at [http://www.wilsoncenter.org/topics/docs/coalmining\\_april2.pdf](http://www.wilsoncenter.org/topics/docs/coalmining_april2.pdf).

42. *See generally* P. McGinley, *From Pick and Shovel to Mountaintop Removal: Environmental Injustice in the Appalachian Coalfields*, 34 ENVTL. L. 23 (2004). *Cf.* KYM ANDERSON, WARWICK J. MCKIBBIN, REDUCING COAL SUBSIDIES AND TRADE BARRIERS: THEIR CONTRIBUTION TO GREENHOUSE GAS ABATEMENT 3-4 (The Brookings Institution, July 1997), available at [http://www.brookings.edu/~media/Files/rc/papers/1997/11globaleconomics\\_anderson/bdp135.pdf](http://www.brookings.edu/~media/Files/rc/papers/1997/11globaleconomics_anderson/bdp135.pdf) hereinafter REDUCING COAL SUBSIDIES].

43. *See generally* P. McGinley, *supra* note 42.

*A. The Socio-Economic Costs of Coal Mining and Burning*

## 1. Industrial Awakening in the Coalfields

The coming of the industrial age impacted the awakening coalfields of Appalachia differently than it did the distant cities. As Edison innovated in Menlo Park, the vast underground coalfield of Appalachia rested largely undisturbed—as it had for millennia. The industrial activities of America’s burgeoning cities lay in sharp contrast with the solitude of Appalachia’s mountains:

Great forests of oak, ash, and poplar covered the hillsides with a rich blanket of deep hues, and clear, sparkling streams rushed along the valley floors. No railroad had yet penetrated the hollows. The mountain people lived in small settlements scattered here and there in the valleys and coves. Life on the whole was simple, quiet, and devoted chiefly to agricultural pursuits.<sup>44</sup>

Within three decades the quiet rural life in the coal-laden mountains of the region had vanished. Young men and their families fled hard-scrabble subsistence farming, flocking to work in underground coal mines and live in one of the multitude of “coal camps”—coal company-built and -owned towns tucked up remote valleys and hollows in West Virginia, Kentucky, and Pennsylvania.<sup>45</sup> From sunrise to sundown, miners wielding picks and shovels loaded coal into mule and horse drawn carts that hauled coal to the surface and on to industrial markets.<sup>46</sup> Miners spent long hours underground

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44. Ronald D. Eller, *Miners, Millhands, and Mountaineers: Industrialization of the Appalachian South, 1880-1930* 161.

45. *Id.*

46. A history of the Pennsylvania bituminous coalfields explains the work performed by men and boys:

Coal mining was arduous work, especially before mechanization. Miners labored in coal seams that were two-to twenty-feet thick, many spent the work day hunched over in narrow seams. Before mechanization they used crude hand tools and explosives to break coal from the vertical face. A skilled miner, usually lying on his side, used his pick and wedges to remove chunks of coal without shattering them. If he could not dislodge coal with his hand tools, a skilled miner drilled holes into the rock face with a hand-powered auger, placed explosives in the holes, and detonated the explosives. . . . Laborers . . . shoveled dislodged coal into wooden cars, which . . . animals . . . pulled along rails to the surface or to a mine elevator in a shaft. Boys often led the draft animals, and opened and closed tunnel doors to regulate the flow of fresh air through mines. The wooden cars delivered coal to . . . the surface . . . .

engaged in back-breaking work. They found solace and refuge above ground in the coal-camp homes rented from their employer.

New coal-camp communities sprouted throughout the remote wilderness overlying the vast coal deposits.<sup>47</sup> The great virgin forest was clear-cut with a vengeance, and pristine mountain streams, only a few decades earlier teeming with native trout, were polluted by coal-mine drainage.<sup>48</sup>

In short order, coal mining transformed the Appalachian landscape and “civilized” the region’s inhabitants:

[E]vidence of change was to be found on every hand. Coal-mining village after coal-mining village dotted the hollows along every creek and stream. The weathered houses of those who worked in the mines lined the creeks and steep slopes, and the black holes themselves gaped from the hillsides like great open wounds. Mine tipples, headhouses, and other buildings straddled the slopes of the mountains. Railroads sent their tracks in all directions, and long lines of coal cars sat on the sidings and disappeared around the curves of the hills. . . . The once majestic earth was scarred and ugly, and the streams ran brown with garbage and acid runoff from the mines. A black dust covered everything. Huge mounds of coal and “gob” piles of discarded mine waste lay about. The peaceful quiet of three decades before had been replaced by a cacophony of voices and industrial sounds.<sup>49</sup>

Historian David Alan Corbin observed that “[o]wnership of the land and resources gave coal companies enormous social control over the miners. ‘You didn’t even own your own soul in those damnable places,’ recalled one elderly miner. ‘The company owned everything, the houses,

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King            Coal:            Mining            Bituminous,            EXPLOREPAHISTORY.COM,  
<http://explorepahistory.com/story.php?&storyId=1-9-18&chapter=2> [hereinafter *Pennsylvania History*]  
(last visited June 5, 2012).

47. U.S. Senate Reports and Bureau of the Census information indicate that at the zenith of the early twentieth century coal boom, almost four-fifths of southern West Virginia mine workers and more than two-thirds of mining families in southwestern Virginia and eastern Kentucky lived in the nearly 500 company towns distributed throughout the region. *Id.* at 162–63. In contrast, less than 100 independently incorporated towns existed in the same region. *Id.* at 163.

48. See generally MINERS AND MILL HANDS, *supra* note 43, at 161. See also Patrick C. McGinley, *supra* note 40, at 24–46.

49. MINERS AND MILL HANDS, *supra* note 43, at 161–162. Professor Eller dedicates an entire book chapter to an examination of life in coal company towns. See *id.* at 161–98.

the schools, churches, the stores—everything.”<sup>50</sup> Indeed, the coal camp came to symbolize the rapid industrialization of rural Appalachia. Historian Ron Eller observed:

[C]ompany town[s] became for thousands of mountaineers the dominant institution of community life—a vital social center around which the miners’ world revolved. Not only was the coal camp the site of one’s work, the source of one’s income, and the location of one’s residence, but for many it also provided an introduction to organized community life and the setting in which new attitudes, values, and social institutions evolved. Completely owned and tightly dominated by the coal companies, the mining towns also reflected the underlying transition in land ownership and social power which had swept the region with the coming of the industrial age.<sup>51</sup>

With ownership of the towns came coal-company administrative responsibility for providing public services.<sup>52</sup> Only two percent of company towns possessed a sewer system; the vast majority simply dumped community wastes into nearby creeks.<sup>53</sup> Streams running through coal camps were often polluted by a combination of raw sewage and acid mine runoff that completely eliminated all biological life.<sup>54</sup> Water pollution affected human health. During hot, humid summers the polluted stream stank, and diseases like typhoid ravaged children of the coal camps.<sup>55</sup>

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50. THE WEST VIRGINIA MINE WARS: AN ANTHOLOGY 1 (David Alan Corbin ed., Un. Pittsburgh Press 1990) [hereinafter W. VA. MINE WARS]. In the coal camps, “company rule included the company police in the form of mine guards, who would toss the miners in jail when they got disruptive, or administer the company beating when they attempted to unionize.” *Id.* The coal company towns provided a complete cradle to grave system which provided a company doctor to deliver babies, the mines in which boys and men worked and cemeteries where camp inhabitants were eventually buried. *Id.*

51. MINERS AND MILL HANDS, *supra* note 48, at 162.

52. Winthrop D. Lane, The Denial of Civil Liberties in the Coal Fields 2 (1924); Jerry Bruce Thomas, An Appalachian New Deal: West Virginia in the Great Depression 91–106 (Un. Press of Kentucky 1998) [hereinafter Appalachian New Deal].

53. MINERS AND MILL HANDS, *supra* note 48, at 184.

54. *Id.* at 186.

55. *Id.* (citing Jerry Bruce Thomas, *Coal Country: The Rise of the Southern Smokeless Coal Industry and Its Effect on Area Development, 1872–1910* (1971) (unpublished Ph.D. dissertation, University of North Carolina at Chapel Hill)). At the time coal companies’ responded to criticism “arguing that coal could not be mined economically if they concerned themselves with ecology.” *Id.*

“Civilization [had] come into the mountains” Professor Eller noted—with no small hint of irony.<sup>56</sup>

## 2. Early Labor–Management Coalfield Conflicts

Industrial strife was common in the coalfields from 1900 to the 1930s when the “New Deal” Administration of President Franklin Delano Roosevelt began to level the playing field between labor and management.<sup>57</sup> Unionization played a central role in coal-camp residents’ struggle for economic and social justice during repeating cycles of boom and bust. While miners engaged in strikes both in support of unionization and higher wages they also struck “for their dignity and freedom.”<sup>58</sup> For decades, miners battled anti-union coal operators who dominated the Southern Appalachian coalfields.

In West Virginia, from 1912 to 1921, a virtual war existed between coal-company forces and miners.<sup>59</sup> On several occasions, martial law was declared and the state militia was summoned. Miners were arrested and tried by military tribunals.<sup>60</sup> Once, in September 1921, President Warren G. Harding sent federal troops to intervene in the conflict.<sup>61</sup>

Contemporaneously, a political battle raged across the region’s coalfields as miners fought for the right to unionize.<sup>62</sup> Appalachian historian and sage Harry Caudill observed that:

In 1931, for all practical purposes, the only law for the miners . . . was the mining companies’ law as interpreted by deputies sheriff selected and paid directly by the

56. *Id.* at 162.

57. Conflicts between company and Union continued on a slowly diminishing scale until the 1990s where an era of rapprochement between coal industry and labor brought relative peace to coal field labor relations.

58. Jerry Bruce Thomas, *An Appalachian New Deal: West Virginia in the Great Depression 91-106* (Un. Press of Kentucky 1998) [hereinafter *Appalachian New Deal*].

59. *See generally* W. VA. MINE WARS, *supra* note 50, at 1.

60. Arthur Warner, *Fighting Unionism with Martial Law*, THE NATION, Oct. 12, 1921, at 395, 396. Local newspapers referred to this conflict as an “industrial controversy.” *Id.* at 395. Warner reminds us, however, that “the home folks resent the words ‘civil war’ as describing the situation, but they seem to forget that the phrase is that [of West Virginia’s] Governor . . . in proclaiming martial law in Mingo County on May 19 [1921], [who] said that ‘a state of war, insurrection, and riot and bloodshed is and has been for some time in existence.’” *Id.*

61. *The War in West Virginia*, INDEPENDENT, Sept. 17, 1921, *reprinted* in W. VA. MINE WARS, *supra* note 50, at 106.

62. James M. Cain, *The Battle Ground of Coal*, ATLANTIC MONTHLY, Oct. 1922, *reprinted* in W. VA. MINE WARS, *supra* note 50, at 151, 157.

companies . . . . The system was simply law enforcement stripped of any pretense of impartiality, and it is difficult to imagine a more effective device for promoting violence and engendering resentful hatred among a people bred in the free air of the Kentucky hills.<sup>63</sup>

The 1932 election of President Roosevelt and the advent of the “New Deal” did not end coalfield violence nor the terrible poverty and oppression of the coal camps. Labor unrest and strikes continued to pit miners against nonunion coal operators during the 1930s. Some coal operators recognized and bargained with the United Mine Workers Union. Others “resolved to fight the menace so long as they had a shot to fire.”<sup>64</sup> Historian Caudill chronicled the tactics of those coal operators who resisted unionization:

[T]hey proceeded step by step along the road to intimidation and coercion. Miners suspected of joining the union, harboring its agents or spreading its propaganda were summarily ordered out of company houses and off company property. The detailed leases covering the camp residences, as interpreted by the docile courts, authorized such summary evictions. Many unfortunate coal diggers found their possessions and families thrust out of doors when they were practically without funds and with no place to go. If another miner took such a dangerous family into his own house for even the shortest period he risked the same fate.<sup>65</sup>

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63. HARRY M. CAUDILL, *NIGHT COMES TO THE CUMBERLANDS: A BIOGRAPHY OF A DEPRESSED AREA 195–96* (Jesse Stuart Foundation 1962) (quoting Russell Briney of the *COURIER-JOURNAL* (Louisville, Kentucky)) [hereinafter *NIGHT COMES*].

64. *Id.* at 195.

65. *Id.* Coal Company owners contradicted these reports. One operator testified before a federal commission that “In all cases, regard has been paid to the health and comfort of those persons whom it was found necessary to evict.” See *W. VA. MINE WARS*, *supra* note 50, at 9 (quoting BITUMINOUS OPERATORS’ SPECIAL COMMITTEE, *THE COMPANY TOWN: REPORT SUBMITTED TO THE U.S. COAL COMMISSION 36–37* (1923)). In *W.VA. MINE WARS*, Corbin also cites other evidence from an early effort to unionize coal camps in Kanawha County, West Virginia that contradicts coal operator denials:

[M]ine guards arrived in the early morning and threw breakfasts out with the furniture. During the process the mine guards destroyed over \$40,000 worth of furniture. In the town of Banner, the mine guards came to the house of Tony Seville, whose wife was pregnant. The head of the squadron shouted, “Get out!” Mrs. Seville, in bed and in labor when ordered out, responded, “My God! Can’t you see I am sick; just let me stay here until my baby is born.” The guard leader

The onset of the Great Depression aggravated existing management–labor conflicts, and distressed an already depressed coal market. Widespread bankruptcies hit banks and coal operators alike.<sup>66</sup> Coal-company managers slashed miners’ already meager wages and then reverted to paying workers on a “piecework” basis.<sup>67</sup> Miners were permitted to stay underground for as long as they wished, resulting in ten-hour to twelve-hour workdays.<sup>68</sup>

The Depression’s effects were bad for most American workers, but even more devastating to Appalachian coal miners and their families. “People who have never lived in mining communities cannot comprehend the feeling of captivity and helplessness that lay so heavy in the coal camps through these years.”<sup>69</sup> Although aided by New Deal labor legislation granting rights to organize and strike, it was not until the late 1930s that unions gained a semblance of parity with coal industry management.<sup>70</sup> The coalfield economy did not revive until war clouds began gathering over Europe prior to World War II.

### 3. Economic Boom–Bust Cycle in Coalfield Communities: 1940-2009

By 1940, ninety percent of the nation’s coal came from union mines.<sup>71</sup> The federal government nationalized and ran coal mines during World War II, and its negotiations with the union produced an agreement to pay miners generous wages.<sup>72</sup> The war-time demands for coal-fired industrial production resulted in a coalfield economic boom.<sup>73</sup> “Empty camps filled again and the ghastly, painted houses swarmed with new brigades of ragged irrepressible children. . . . The coal camps had been rejuvenated by 1945,

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replied, “I don’t give a damn, get out or I’ll shoot you out.” Mrs. Seville gave birth to her baby two hours later, in a tent furnished by the UMWA.

W.VA. MINE WARS, *supra* note 50, at 10.

66. NIGHT COMES, *supra* note 63, at 171–174.

67. *Id.* at 170.

68. *Id.* at 170–71.

69. *Id.* at 174–75.

70. See JOHN ALEXANDER WILLIAMS, APPALACHIA: A HISTORY 272 (Univ. of North Carolina Press, 2001) [hereinafter APPALACHIA HISTORY]; The New Deal Congress enacted the National Labor Relations Act, 29 U.S.C. §§ 151–169 (2000) (“NLRA”). Section 157 of the NLRA guaranteed employees “the right to form, join, or assist labor organizations.” 29 U.S.C. § 157.

71. Richard A. Couto, *The Memory of Miners and the Conscience of Capital*, in FIGHTING BACK IN APPALACHIA: TRADITIONS OF RESISTANCE AND CHANGE 165, 167 (Stephen L. Fisher ed., Temple Univ. Press 1993) [hereinafter *Memory of Miners*]. UMWA membership grew from a few thousand in 1931 to almost 300,000 in 1940. APPALACHIA HISTORY, *supra* note 70, at 280.

72. *Memory of Miners*, *supra* note 71, at 167.

73. NIGHT COMES, *supra* note 63, at 220–21.

and union miners and their families were enjoying unparalleled freedom and prosperity.”<sup>74</sup>

The government relinquished control of the mines to their owners following the war. However, as the country welcomed returning veterans, the coal market collapsed. Coal prices plummeted. The glut of coal stockpiled for wartime consumption collided with the severely contracting demand of a peacetime economy.<sup>75</sup> Adding greatly to this dysfunctional coalfield economy, coal began to lose its market share as railroads and home furnaces were increasingly fueled by cheaper and cleaner-burning oil and natural gas.<sup>76</sup>

A new period of labor-management conflict followed in the wake of this coalfield “bust” economy. Eventually, after a long, hostile strike in 1950 and 1951, coal companies and the union agreed to a revolutionary contract that significantly increased miners’ wages and benefits in return for union acquiescence to mine mechanization.<sup>77</sup> By the beginning of the 1960s, the new mining machines had greatly increased coal production while drastically reducing the need for skilled and unskilled labor.<sup>78</sup>

By 1960, coal industry consolidation, a poor coal market, loss of mining jobs and a concomitant immigration from coalfield communities “made for a severe and chronic economic predicament” for West Virginia’s coalfield communities.<sup>79</sup> The depressed job market drove up unemployment in these communities. West Virginia’s unemployment rate was the nation’s

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74. *Id.*

75. *Id.* at 247.

76. *Id.*; *Memory of Miners*, *supra* note 71, at 168.

77. APPALACHIA HISTORY, *supra* note 70, at 318; *Memory of Miners*, *supra* note 71, at 168–69. See also NIGHT COMES, *supra* note 63, at 258–264 (describing the mechanization of coal mining). See generally KEITH DIX, WHAT’S A COAL MINER TO DO? THE MECHANIZATION OF COAL MINING (Univ. Pittsburgh Press 1988).

78. OTIS K. RICE, STEPHEN W. BROWN, WEST VIRGINIA: A HISTORY 280 (Univ. Press of Ky., 2d ed. 1993) [hereinafter W.VA. HISTORY]. Coal production per man-day increased from 5.57 tons in 1945 to 10.05 tons in 1957. In 1948, 117,104 miners were at work in West Virginia. In 1957, only 58,732 miners were employed; by 1961 the number of miners had shrunk to only 42,557 in West Virginia and less than 200,000 nationwide. *Id.* at 280, 284. See also APPALACHIAN NEW DEAL, *supra* note 58, at 238.

79. See APPALACHIAN NEW DEAL, *supra* note 58, at 239 (1998). During this period of economic distress the character of the company town relationship between company and residents changed. See generally McGinley, *supra* note 42, at 35–36. Many houses were sold to their occupants and others were rented to anyone who could pay the meager rent (in 1987, as little as \$15 per month) for the dilapidated structures. Indeed, this relationship continues today in some of the former coal camps that remain. See *id.* citing, Jules Loh, *The Longstanding Paradox of Eureka Hollow*, CHARLESTON GAZETTE, Jan. 4, 1987, at A4 [hereinafter *Longstanding Paradox*]; Jules Loh, *Despite Billions In Aid, Poverty Still Plagues Appalachia*, THE DALLAS MORNING NEWS 6A, 1987 WLNR 1943627 (January 4, 1987).

highest—triple that of the nation.<sup>80</sup> As the coal-based economy continued to collapse, tens of thousands left the coalfields in search of work in the industrial plants of the Northeast and the nonunion textile and manufacturing plants of the Sunbelt.<sup>81</sup> Some miners and their families elected to stay and hope for better times. One man described the quandary faced by unemployed coal miners:

It's rough, buddy. . . . This is home. This is where we were both born and raised. We like it here. Until I can find work, we stay. If the program I'm on runs out, well, then I guess we'll have to think about moving on. Where to? Where can a man with a family go with no place to set out for and no money to get there? Hard as it is, we want to stay here. This hollow is home.<sup>82</sup>

The beleaguered, poverty-stricken coalfield communities of Central Appalachia did receive a measure of assistance via the food stamp and public assistance programs launched by the administrations of Presidents John F. Kennedy and Lyndon Johnson.<sup>83</sup>

The future of the coal regions appeared brighter by 1970 when a new coal “boom” took hold. The United States faced an “energy crisis” brought on by a Middle-Eastern oil cartel’s price fixing.<sup>84</sup> In the coalfields of Appalachia, the hiring call went out for miners for the first time in decades as electric generating power companies shifted from more expensive oil to coal—which was not only cheaper, but also more reliable because it was

80. *Id.* at 239.

81. See W.VA. HISTORY, *supra* note 78, at 280 (“[t]housands of young men, who normally would have entered the mines . . . left for Pittsburgh, Cleveland, Akron, Chicago, Detroit, and other cities.”); APPALACHIA HISTORY, *supra* note 70, at 394 (recounting the southward exodus to the “sunbelt”). See generally CHAD BERRY, SOUTHERN MIGRANTS, NORTHERN EXILES (Univ. of Ill. Press 2000)(describing Appalachian migration during times of economic distress); see generally HARRY K. SCHWARTZKELLER *et al.*, MOUNTAIN FAMILIES IN TRANSITION: A CASE STUDY OF APPALACHIAN MIGRATION (Pa. State Univ. Press 2<sup>nd</sup> ed. 1971). (describing the “exodus” of residents from Beech Creek, Ky.).

82. Longstanding Paradox, *supra* note 79.

83. See generally APPALACHIA HISTORY, *supra* note 70, at 339–52, 366–79. Professor Williams quotes Harry Caudill as expressing the concern that the Kennedy-Johnson Administration’s “War on Poverty” threatened to “turn Appalachia into a giant welfare reservation.” *Id.* at 369 (citing HARRY CAUDILL, THE WATCHES OF THE NIGHT (1976)).

84. See generally DAVID YERGIN, THE PRIZE: THE EPIC QUEST FOR OIL, MONEY, AND POWER 607–09 (Free Press 1993). The per barrel cost of oil quickly escalated as the Organization of Petroleum Exporting Countries (OPEC) ratcheted up prices in response to the “Yom Kippur War” and the shut-down of oil fields of Iran after the country’s leader was overthrown in a 1978 coup. *Id.* at 607–09, 635, 685.

not subject to international political intrigue and terrorism. Thousands of miners were hired or re-hired and the region sprang back to life:

During those fabulous days in the mid-seventies, thousands of men who had left the mountains came home from distant cities to dig coal. In West Virginia, Virginia, Kentucky, and Tennessee, small truck mines that had been abandoned for years were reopened. Nearly anybody who had or could borrow money to buy a dump truck and a road grader could become a strip mine operator. Bootleggers mined without permits and got good money for gray mixtures of coal, slate, and rock. Spot market prices soared to nearly \$100 a ton and suddenly-rich independent operators lived in opulence, bought luxury cars for their wives, and concluded business deals on the golf course.<sup>85</sup>

The 1970s coal boom was short-lived. By 1980, the boom subsided and economic hard times returned once again to the coalfields. By 1984, West Virginia experienced the nation's highest unemployment rate and "economic indicators pointed to continuing difficulties, with recovery trailing far behind that of the other states."<sup>86</sup>

In 1987 a journalist described the condition of the old coal camp in Eureka Hollow, West Virginia:

The village on its trash-strewn banks at the mouth of the hollow is Eckman. You won't find it on a road map. Eckman consists of a grocery store, filling station and a one-room post office. Wooden planks thrown over a ditch at the uphill edge of town mark the start of the road up Eureka Hollow. Woebegone wooden houses, many of them falling down, dot the hillsides along the road. Tree limbs, like crutches, prop up porches. Abandoned houses crumble alongside inhabited mobile homes. Coal dust trodden into black gum replaces grass. Red dog, a rust-colored mine waste turned into coarse gravel, paves driveways.

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85. Rudy Abramson, *New Coal Isn't Old Coal*, 20 APF REPORTER 1 (2001), available at <http://www.aliciapatterson.org/APF2001/Abramson/Abramson.html> [hereinafter Abramson].

86. W.VA. HISTORY, *supra* note 78, at 238; See generally Ry Bearak, *Numbers Worsen Poverty: Toll Grows Amid Aid Cutbacks*, L.A. TIME, July 28, 1985, at A1, available at 1985 WLNR 947120 (describing how coal mining slump in West Virginia lead to man becoming unemployed).

Automobile carcasses rot beneath clotheslines burdened with patched jeans and faded shirts.<sup>87</sup>

The streets of Whitesville, West Virginia were clogged with shoppers and traffic during the 70s boom; by 2002, they were usually empty. A reporter described the town: “Vacant stores dot the town’s main drag and windows are covered with dust from coal trucks that rumble through night and day. Traffic lights work intermittently. Parking meters were removed long ago.”<sup>88</sup>

During the period from 1982 to 2011, the Appalachian coalfield economy has continued to experience an extended decades-long bust phase. Midwestern utility companies eschewed Appalachian coal for cheaper western coal, and loss of mining jobs in Appalachian underground mines continued as a result of further mechanization.<sup>89</sup>

West Virginia’s coal economy typified that of the Central Appalachian coal region. In 1980, coal jobs in the State had dropped by 7,000 from the boom high of almost 63,000 in 1978; five years later only 35,813 miners were at work in West Virginia.<sup>90</sup> In 1990, coal-miner employment dipped to less than 29,000. By 2000, coal-mining jobs in West Virginia declined to 14,925. In the first decade of the new century, coal-mine employment in the state cycled between 15,000 and 21,000 jobs with a slightly upward trend.<sup>91</sup> Today, less than 22,000 miners are at work in the state.<sup>92</sup>

As the number of coal jobs decreased, Appalachian coal production reached record levels by the beginning of the millennium. However, coal production is projected to decline over the next three decades.<sup>93</sup> Ironically, high levels of coal production and unemployment coincided—a paradox explained by new technologies and large scale mining methods that utilize far fewer workers.<sup>94</sup>

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87. *Longstanding Paradox*, *supra* note 79. Reporter Loh’s description of Eureka Hollow cannot be generalized to all former coal camps. Some coal company lessors maintained their properties and often remodeled houses they owned keeping them in good repair. See NIGHT COMES, *supra* note 63, at 263–268; GERALD M. STERN, THE BUFFALO CREEK DISASTER: HOW THE SURVIVORS OF ONE OF THE WORST DISASTERS IN COAL-MINING HISTORY BROUGHT SUIT AGAINST THE COAL COMPANY—AND WON, 41–2 (Vintage Books ed. 1977) [hereinafter BUFFALO CREEK DISASTER].

88. Abramson, *supra* note 85.

89. McGinley, *supra* note 42, at 44.

90. *Id.*

91. Randall A. Childs & George W. Hammond, *Consensus Coal Production Forecast for West Virginia 2009-2030* 1 (2009), available at <http://www.be.wvu.edu/bber/pdfs/BBER-2009-14.pdf>.

92. *Average Number of Employees by State and Mine Type*, U.S. ENERGY INFORMATION ADMINISTRATION, <http://www.eia.gov/cneaf/coal/page/acr/table18.html> (last visited June 3, 2012).

93. Childs, *supra* note 91.

94. *Id.*

Dan Radmacher, former editor of the Charleston Gazette in West Virginia, has examined this paradox, finding that the coal-producing counties in West Virginia, Kentucky, and Virginia are much poorer than coal-producing counties in western states.<sup>95</sup>

In Mingo County, West Virginia, the heart of the so-called “Billion Dollar Coalfields,” Radmacher found that, in 2001, the median household income was \$12,000 less than the national average and the area is filled with “empty houses and businesses[,] . . . which has to be a psychological burden as well as a barrier to economic development.”<sup>96</sup> A local bank’s profile of the area observed that “[t]oday, a large percentage of the coal mined in West Virginia is from strip [mining], requiring fewer people. This means fewer jobs, lack of a well-planned infrastructure for communities and an educational system that suffers from all of these factors.”<sup>97</sup>

One study of the economics of Appalachian coal counties has observed:

The bottom line is that these are poor counties with poverty rates substantially above the national median, particularly for white families, children, and dependent populations . . . . These counties have populations with low median levels of education and high levels of unemployment. In 2003, median household income was substantially below the national median. Per-capita disability and supplemental Social Security income levels are high by national standards.<sup>98</sup>

Government projections suggest that, as coal reserves in Central Appalachia are depleted over the next two decades, coal production will shift to Great Plains states and to the northern part of the basin.<sup>99</sup> The

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95. Dan Radmacher, *The Curse of Coal: Out West, Counties Fare Better*, SUNDAY GAZETTE-MAIL (Charleston, W. Va.), June 10, 2001, at 1C, available at 2001 WL 6672917.

96. *Id.* See also Amy K. Glasmeier, *Living in Coal Country: What Kind of Life Is That?* (Jan. 8, 2006), available at <http://www.npr.org/documents/2006/jan/sagoeconomicprofile.pdf> (stating that “[i]n Upshur County, labor force participation rates are low by state and national standards. Almost half of the working-age population is not in the labor force.”).

97. *Coalfield Counties Rich in Potential: Bank President Says Tourism Vital to Growth*, DISCOVER: THE REAL W. VA. FOUND., Summer 2002, at 6, available at <http://www.drwvfoundation.org/pdf/DiscoverSummer02.pdf>.

98. Glasmeier, *supra* note 96 (explaining that “[f]or those living in mining communities, low levels of education, poor health conditions, unstable work histories, and limited access to jobs paying a living wage explain why people work in the mines. With few alternatives, it is no wonder that when the price of coal goes up people risk their lives to take jobs in the mines”).

99. See U.S. ENERGY INFO. ADMIN., ANNUAL ENERGY OUTLOOK 2011 85 (2011), available at <http://www.eia.gov/forecasts/aeo/pdf/0383%282011%29.pdf> [hereafter *Outlook 2011*] (predicting that

prospects of coalfield communities, East and West, will continue to cycle between boom and bust if forecasts of regional sagging and/or declining coal production are credible. Indeed, the first three decades of the twenty-first century portend yet another generation of coal country families experiencing the industry's economically debilitating boom-bust cycle—likely more “bust” than “boom.”<sup>100</sup>

### B. Environmental Impacts of Coal

#### 1. Limited Public Awareness of Coal's Externalities

The contributions of coal burning to global warming has increasingly been the focus of intense scientific study and growing public concern. The enormous consumption of billions of tons of coal for electric generation pollutes the Earth's atmosphere with green house gases including sulfur dioxide, carbon dioxide and ozone.<sup>101</sup> Other constituents of coal-fired power plant emissions, including mercury, arsenic, and dioxin, raise serious public health concerns.<sup>102</sup> Recent research by public health scholars suggest

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Western coal production will increase slowly through 2035 as demand for coal grows slowly). The agency forecasts that “low-cost supplies of coal from the West [will] satisfy much of the additional fuel needs at coal-fired power plants east of the Mississippi River” while “coal produced from the extensively mined, higher cost reserves of Central Appalachia is supplanted by lower cost coal from other supply regions.” The EIA predicts that “increased production from substantial reserves of mid- and high-sulfur bituminous coal in in the northern part of the basin” (Illinois, Indiana and Western Kentucky) will “help to moderate the overall production decline in Appalachia.” *Id.* See also Childs & Hammond, *supra* note 91, at 21 (indicating that coal production in central Appalachia will gradually decrease through 2030). (W.Va. Dep't. Env'tl. Protection, 2009) <http://www.be.wvu.edu/bber/pdfs/BBER-2009-14.pdf> (last visited June 3, 2012); RORY MCILMOIL & EVAN HANSEN, DOWNSTREAM STRATEGIES REPORT, THE DECLINE OF CENTRAL APPALACHIAN COAL AND THE NEED FOR ECONOMIC DIVERSIFICATION (2010), available at [http://www.downstreamstrategies.com/documents/reports\\_publication/DownstreamStrategies-DivideOfCentralAppalachianCoal-FINAL-1-19-10.pdf](http://www.downstreamstrategies.com/documents/reports_publication/DownstreamStrategies-DivideOfCentralAppalachianCoal-FINAL-1-19-10.pdf).

100. See generally, S. O'Leary, T. Boettner, *Boom and Bust: the Impacts of West Virginia's Energy Economy*, (W.Va. Center on Budget and Policy, 2011); Dylan Lovan, *Appalachia faces steep coal decline* (Associated Press, Sept. 27, 2011), available at <http://theglobalrealm.com/2011/09/29/appalachia-faces-steep-coal-decline/>.

101. In addition, underground coal mining operations release into the atmosphere enormous amounts of methane gas from strata adjacent to buried coal seams. Methane Gas is more than 20 times as effective as CO<sub>2</sub> at trapping heat in the atmosphere. U.S.E.P.A., INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990–2006 ES-9 (2008), available at [http://epa.gov/climatechange/emissions/downloads/08\\_CR.pdf](http://epa.gov/climatechange/emissions/downloads/08_CR.pdf).

102. See, M. Houyoux, M. Strum, Memorandum: Emissions Overview: Hazardous Air Pollutants in Support of the Final Mercury and Air Toxics Standard, (EPA-454/R-11-014, November, 2011), available at <http://www.epa.gov/mats/pdfs/20111216EmissionsOverviewMemo.pdf>. See generally U.S. ENVTL. PROT. AGENCY, STUDY OF HAZARDOUS AIR POLLUTANT EMISSIONS FROM ELECTRIC UTILITY STEAM GENERATING UNITS—FINAL REPORT TO CONGRESS (EPA-453/R-98-004b)

a correlation between coal mining pollution and various health problems of coalfield residents.<sup>103</sup> However important coal burning's contribution to global warming is, generation of greenhouse gases is not the fuel's only adverse environmental consequence. Coal's adverse effects on natural resources and coal-related human health effects have long been documented, if not generally recognized by the public. As discussed below, there are many other serious adverse environmental and socio-economic consequences of coal. These adverse externalities have failed to gain major traction in public discourse of the world's energy future.

## 2. Environmental Impacts of Early Coal Mining

When coal was first mined in the United States, its impact on the environment was minimal. American coal was hand-mined underground from the late nineteenth century to the nineteen twenties by men with the help of animals including mules, ponies, oxen, goats, and even dogs.<sup>104</sup> Mine tunnels originally were dug by pick and shovel, aided by use of explosives to clear the path through rock layers to the coal.<sup>105</sup>

Because most of the coal mined prior to World War II came from underground pits,<sup>106</sup> the environmental impacts of coal mining were limited to surface subsidence and water pollution.<sup>107</sup> Mines and the number of miners grew as tunnels were dug deeper and deeper underground. The industry's footprint grew with the severity of its environmental effects.

## 3. Post-World War II Impacts of New Mining Technologies and Methods

At the conclusion of World War II, mining technology evolved quickly as did the adverse impacts of coal. Strip mining accelerated as equipment

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(1998), available at <http://www.epa.gov/ttn/caaa/t3/reports/eurtc1.pdf> (stating that arsenic, mercury, and dioxin emitted from coal-fired power plants are considered "hazardous air pollutants" by the EPA); see also Robert B. Finkelman, Harvey E. Belkin, Baoshan Zheng, *Health impacts of domestic coal use in China*, 96 PROC. NATL. ACAD. SCI., 3427-3431 (1999), available at <http://www.pnas.org/content/96/7/3427.full.pdf> (last visited June 3, 2012) (describing the health risks of arsenic and mercury exposure as a result of coal combustion).

103. *Global Health*, *supra* note 2.

104. GEOFACTS, HISTORY OF COAL MINING IN OHIO, OHIO GEOLOGICAL SURVEY, Ohio Dep't Natural Res., <http://www.dnr.state.oh.us/Portals/10/pdf/GeoFacts/geof14.pdf> (last visited June 3, 2012).

105. *Pennsylvania History*, *supra* note 46.

106. Steam engines and improved mechanization made strip mining of coal feasible from 1940 onward. APPALACHIA HISTORY, *supra* note 70, at 257.

107. Of course mining coal did cause some serious air pollution in industrial cities. Pittsburgh earned the sobriquet "the smoky city" because it was common for streets to be lit at mid-day due to the smoked-filled air.

grew larger and more efficient. In the late 1940s, highly productive “continuous mining” machines were introduced and rapidly adopted as the underground mining equipment of choice.<sup>108</sup> These new mining methods and technologies dramatically boosted production per miner/hour. Correspondingly, coal mining required substantially less manual labor than it had only a decade earlier.<sup>109</sup>

During the next two decades, the most visible adverse impacts of the new mining technologies appeared on the surface as a consequence of the growing use of strip mining. Not as visible, but similarly destructive, are the environmental impacts of modern underground mining.

Surface mining gashed scars in Appalachian mountainsides, stripping away the forest on thousands of acres and causing erosion and attendant stream sedimentation, siltation, and flooding.<sup>110</sup> Stripping was almost completely unregulated, so coal operators rarely reclaimed disturbed land. Surface mining smothered stream aquatic life.

In some coalfield regions, drainage from strip and underground mining, laced with iron-laden sulfuric acid, sterilized watercourses, staining them red and orange with iron and manganese precipitants.<sup>111</sup> Underground and strip mining fractured strata and depleted aquifers. Wells and springs used by many coalfield families were contaminated or went dry with severe effects on domestic home life.<sup>112</sup>

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108. *Mechanization of the Coal Industry in Appalachia*, KENTUCKY COAL EDUCATION (May 1997), <http://www.coaleducation.org/coalhistory/Jenkinshis.htm> (last visited June 3, 2012).

109. See, e.g., W.VA. HISTORY, *supra* note 78, at 280. In 1940 130,457 miners produced 126,619,825 tons of coal. In 1955, 54,321 miners produced 137,073,372 tons. W. VA. OFFICE OF MINERS’ HEALTH, SAFETY AND TRAINING, PROD. OF COAL AND COKE IN W. VA. 1863–2007, available at <http://www.wvminesafety.org/historicprod.htm>.

110. J.R. Ferrari, et al., *Surface mining and reclamation effects on flood response of watersheds in the central Appalachian plateau region*, 45 Water Resources Research WO 0447, (2009). (“[F]indings indicate that mine reclamation leaves the landscape in a condition more similar to urban areas rather than does simple deforestation, and call into question the effectiveness of reclamation in terms of returning mined areas to the hydrological state that existed before mining.”)

111. See CHAD MONTRIE, *TO SAVE THE LAND AND PEOPLE: A HISTORY OF OPPOSITION TO SURFACE COAL MINING IN APPALACHIA 3* (Un. of North Carolina Press 2003) [hereinafter HISTORY OF OPPOSITION]. See generally, Patrick C. McGinley, *Acid Coal Mine Drainage: Past Pollution and Current Regulation*, 17 Duq. L. Rev. 67–97 (1979) For a brief technical explanation of Acid Mine Drainage, see U.S. GEOLOGICAL SERVICE, *ACID MINE DRAINAGE: AN INTRODUCTION*, available at [http://energy.er.usgs.gov/health\\_environment/acid\\_mine\\_drainage/](http://energy.er.usgs.gov/health_environment/acid_mine_drainage/).

112. COMMISSION ON ENGINEERING AND TECHNICAL SYSTEMS, *SURFACE COAL MINING EFFECTS ON GROUNDWATER RECHARGE 4* (1990) (describing destruction of aquifers in Kentucky caused by surface mining);

Loud noise and dust from blasting and earth-moving activities disturbed nearby communities and wildlife.<sup>113</sup> During mining, explosives used to facilitate coal extraction threw clouds of dust and debris into the air, affecting nearby homes.<sup>114</sup> Indiscriminate dumping of mine spoil on steep mountainsides caused landslides, sometimes killing people and burying cars and homes.<sup>115</sup>

On occasion, mine site coal-slurry impoundments, containing wastes generated by coal processing and cleaning, have been breached or collapsed, causing loss of life and severe economic and ecological damage.<sup>116</sup> The most poignant example is the 1972 collapse of a huge coal waste impoundment at Buffalo Creek, West Virginia.<sup>117</sup> Pittston Coal Company denied responsibility for the disaster, claiming the flood was an “Act of God.”<sup>118</sup> Investigations, however, showed that the dam was not

113. J. BARTIS, F. CAMM, DAVID ORTIZ, PRODUCING LIQUIDS FROM COAL: PROSPECTS AND POLICY ISSUES, Rand Corp., 78-79 (2008) [http://www.rand.org/pubs/monographs/2008/RAND\\_MG754.pdf](http://www.rand.org/pubs/monographs/2008/RAND_MG754.pdf) (last visited June 3, 2012) [hereinafter Rand Corp. Report] (citing U.S. ENVTL. Prot. Agency, *Mountaintop Mining/Valley Fills in Appalachia: FINAL Programmatic Environmental Impact Statement* (2005), available at <http://www.epa.gov/region03/mtntop/eis2005.htm>).

114. *Id.*; see also H.R. Rep. No. 95-218, at 58-59 (1977) (detailing the devastating impacts of surface mining which inspired Congress to pass SMCRA), reprinted in 1977 U.S.C.C.A.N. 539, 596-97 (hereafter *House Report*). A House report accompanying an earlier, 1974 version of a bill that would ultimately become the SMCRA was emphatic in its condemnation of coal industry practices that wreaked havoc on the environment and coalfield communities for decades:

The social and environmental impacts of surface and underground coal mining have been enormous. The most serious effects are to be seen in the Appalachian region, where the entire socio-economic infrastructure of parts of Pennsylvania, West Virginia, Ohio, Kentucky, Virginia and Tennessee and Alabama has been profoundly affected by decades of extracting coal from the rich bituminous deposits. As a consequence of the hazardous environment associated with both underground and surface mining of coal, the health and safety of people living and working near the coal mines of the region are in more or less constant peril . . . Tragically, coal mining in America has left its crippling mark upon the very communities which labored most to produce the energy which once impelled the Nation's industrial plant and now generates much of its electrical power.

H.R. Rep. No. 93-1072, at 56-7 (1974).

Some in the coal industry today seem unaware of this ignoble era of exploitation that led to federally mandated reclamation standards and federal oversight of state regulators.

115. *House Report*, *supra* note 114, at 58-9. HISTORY OF OPPOSITION, *supra* note 104, at 3.

116. Rand Corp. Report, *supra* note 113, at 79 (citing Ian Frazier, *Coal Country*, ONEARTH, Spring 2003, <http://www.nrdc.org/onearth/03spr/coal1.asp> (last visited, June 5, 2012)).

117. BUFFALO CREEK DISASTER, *supra* note 87; see also Rand Corp. Report, *supra* note 113, at 79, (citing *Coal Country*, *supra* note 116) (illustrating that three and a half decades after the Buffalo Creek disaster, serious questions continue to be raised about coal waste impoundments' physical integrity in the near and long term.).

118. BUFFALO CREEK DISASTER, *supra* note 87, at 10. Pittston officials issued a statement claiming that “the break in the dam was caused by flooding—an Act of God.” West Virginia's state

engineered; rather, it was constructed by simply dumping an enormous quantity of solid and liquid coal refuse in a narrow valley flanked by high ridges and traversed by Buffalo Creek. Federal regulations at the time prohibited such dams.<sup>119</sup>

A state inspector's repeated warnings over several years and his suggestion that Pittston build an emergency spillway were ignored by company managers.<sup>120</sup> Terrified people living downstream from the dam unsuccessfully begged the company and state officials to act.<sup>121</sup>

On February 26, 1972, a towering flood wall created by a succession of huge waste impoundments collapsing upstream hurtled 132 million gallons of slurry down a narrow valley, killing 125 people and injuring thousands more. The flood totally destroyed 17 coal camp communities, leaving 4,000 homeless.<sup>122</sup> Appointed by the state's governor, the West Virginia Ad Hoc Commission of Inquiry into the Buffalo Creek Flood found that "Pittston[,] through its Officials, has shown flagrant disregard for the safety of residents of Buffalo Creek and other persons who live near coal-refuse impoundments."<sup>123</sup> Pittston was not alone in putting coalfield communities at risk. The Commission, staffed with experienced coal industry leaders, also found that "this attitude appears prevalent throughout much of the coal industry."<sup>124</sup>

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climatologist disagreed. "'Act of God' is a legal term. There are other legal terms—terms like 'involuntary manslaughter because of stupidity' and 'criminal negligence.'" *Id.*, quoting Robert Weedfall.

119. Gerald Stern described how the dump was "constructed:"

[T]rucks merely dumped coal refuse across [the Creek] until the refuse reached the other side. [After two dams positioned one above the other filled with silt] Dam 3 was started upstream . . . by the . . . time of the disaster its 534,000 cubic yards of refuse reached almost 500 feet up the hollow, and spanned 450 to 600 feet across the hollow. The water in this dam towered almost 250 feet above the town of Saunders . . . below.

*Id.* at 27 (bracketed words added).

120. *Id.* at 141–2.

121. *Id.* at 142–3. For example, one downstream resident wrote to West Virginia's Governor:

I'm writing to you about a big dam above us. The coal co. has dumped a big pile of slate about 4 or 5 hundred feet high. The water behind it is about 400 feet deep and it is like a river. It is endangering our homes & lives. Please send someone here to see the water and how dangerous it is. Every time it rains it scares me to death. We are all afraid we will be washed away & drowned. They just keep dumping slate and slush in the water and making it more dangerous everyday . . . for God's sake have the dump and water destroyed. Our lives are in danger.

*Id.*

122. *Id.*

123. *Id.* at 64.

124. *Id.*

The Buffalo Creek tragedy and the disdain many in the industry displayed for coalfield communities was an important catalyst finally leading to action.<sup>125</sup> After two decades of protests, the enormous harm caused by unregulated surface and underground coal mining throughout the Appalachian coalfields generated support for a national strip mining regulatory law.<sup>126</sup> After several years of debate and two presidential vetoes, Congress passed, and a new president, Jimmy Carter, signed the Federal Surface Mining Control and Reclamation Act of 1977 (“SMCRA”).<sup>127</sup> Professor Mark Squillace described the breadth of the damage that led to the enactment of the SMCRA:

Over the past twenty years, coal mining has disturbed almost two million acres of land; only half of that has been reclaimed even to minimum standards. More than 264,000 acres of cropland, 135,000 acres of pasture, and 127,800 acres of forest have been lost. In a 1977 report, Congress estimated the cost of rehabilitating these ravaged lands at nearly \$10 billion. . . . [M]ore than 11,000 miles of streams have been polluted by sediment or acid from surface and underground mining combined. Some 29,000 acres of reservoirs and impoundments have been seriously damaged by strip mining. Strip mining has created at least 3000 miles of landslides and left some 34,500 miles of

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125. *House Report, supra* note 114, at 56. (stating that “[o]ne example of exposure of the general public to dangerous conditions is the disastrous collapse of a mine waste impoundment on Buffalo Creek, West Virginia, in which 124 people were killed and 4,000 rendered homeless in 1972.”)

126. SHIRLEY STEWART BURNS, BRINGING DOWN THE MOUNTAINS 15–6 (W.Va. Un. Press 2007).

127. *See generally* P. McGinley, The Surface Mining Control And Reclamation Act of 1977: New Era of Federal-State Cooperation or Prologue to Future Controversy?, EASTERN MINERAL LAW FOUNDATION INSTITUTE 16, Chapter 11, (1997) (with E. Green, L. Price, D. Michael Miller and G. M. McCarthy). A primary author of SMCRA, Congressman Morris K. Udall (D-Ariz.) observed: “[the] Act was passed after years of struggle by people in the coal fields—people who have lived with the mutilated mountainsides, spoiled streams, landslides and destruction of their homes. The voices of those people were heard on that August day [when SMCRA was enacted].” Morris K. Udall, *foreword* to M. SQUILLACE, THE STRIP MINING HANDBOOK: A COALFIELD CITIZENS’ GUIDE TO FIGHT BACK AGAINST THE RAVAGES OF STRIP MINING AND UNDERGROUND MINING 1 (Environmental Policy Institute & Friends of the Earth 1990) [hereinafter COALFIELD CITIZENS’ GUIDE]. More recently, the National Research Council confirmed that “[a]dverse safety and environmental impacts of coal mining—even with regulation—are well documented and include mine drainage, mine fires, waste piles, ground movements (subsidence), and hydrological impacts.” NATIONAL RESEARCH COUNCIL, COAL: RESEARCH AND DEVELOPMENT TO SUPPORT NATIONAL ENERGY POLICY (2007), (emphasis added), available at <http://www.nap.edu/books/030911022X/html/>.

highwalls. [By 1977,] two-thirds of the land that had been mined for coal had been left unreclaimed.<sup>128</sup>

#### 4. New Technologies, Mining Methods, and Increasing Use of Coal Magnify Coal's Environmental Externalities

Coal mining technology advanced spectacularly in the decades after the 1977 enactment of the SMCRA.<sup>129</sup> Like the post World War II mining technology burst, new equipment and technology facilitated a quantum leap forward in worker efficiency and coal production capacity. As in the earlier post-war technology revolution, the number of coal miners again dropped precipitously.<sup>130</sup> With new surface mining and underground mining technologies and equipment came the potential for new and more extensive environmental damage than that caused by older mining methods.

The move to the use of large-scale mountaintop removal operations would make mining in Appalachia more efficient, productive, and—most important for coal operators—much less labor-intensive. Mechanization and concomitant massive job losses, attendant stripping operators' embrace of mountaintop removal, were paralleled by the underground operators' adoption of new deep mining technology.<sup>131</sup> Only a fraction of the miners required for conventional continuous miner operations in underground room and pillar mines are employed in longwall mining.<sup>132</sup>

The efficiencies of the new surface and underground mining technologies were reflected in the dramatic decline in coal mining jobs in Appalachia. In 1979, 58,565 miners produced 112.3 million tons of coal in

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128. COALFIELD CITIZENS' GUIDE, *supra* note 127, at 10–11. Squillace lamented: “[g]rossly underregulated coal mining in the 1960’s and 1970’s spawned one of the greatest abuses of the environment in the history of the United States. The statistics of strip mine abuse numb the mind and overwhelm the spirit.”

129. *See id.* at 1 (noting that “[o]verall [SMCRA] has produced a vast improvement in mining methods and reclamation compliance in much of the coalfields. Nevertheless, in some regions—too often the very regions which compelled the passage of the law—abuses continue at an alarming rate.”). Notwithstanding improvements in mining and enforcement, SMCRA has not proven a panacea. SMCRA’s strict regulatory regime has been muted by a combination of forces including industry lobbyists, state politicians inured to industry positions for political reasons, and government regulators who have been cowed by external pressures.

130. For example, in West Virginia, 55,256 coal miners were employed in 1975. By 2007 the number of working miners dropped by almost two thirds to 19,175. In contrast, coal production increased by more than fifty percent during 1975-2007—from 109,048, 898 to 160,043,930 tons.

131. Abramson, *supra* note 85, at 74.

132. Joel Darmstadter, *Innovation and Productivity in U.S. Coal Mining*, in Ralph David Simpson, ed., *Productivity in Natural Resource Industries: Improvement Through Innovation*, Chap. 2, at 48 (1999).

West Virginia; two decades later, 15,000 miners produced almost 170 million tons.<sup>133</sup>

Increased coal mine productivity coincided in the late 1970s with an oil shortage orchestrated by a Middle East oil cartel that significantly raised oil prices.<sup>134</sup> Electricity-generating power plants switched from burning oil to cheaper and more secure coal. An unintended consequence of this fuel switching was the creation of a new environmental externality—“acid rain.” Acid rain was caused primarily by emissions from electricity-generating plants that burned high-sulfur coal in the Ohio River Basin, extending from Missouri east to West Virginia and south to Georgia.<sup>135</sup> Scientists confirmed what hunters and anglers were reporting. Vast forested regions of the Northeastern United States as well as lakes and streams were experiencing serious adverse impacts of “acid precipitation,” or acid rain.<sup>136</sup>

As in the more recent climate change debate, late 1970s governmental inaction on acid rain became a significant environmental and political issue. The issue pitted Midwestern and Northern Appalachian high-sulfur coal producing states against conservationists and the downwind northeastern states whose forests and streams were suffering damage.<sup>137</sup> And, as with

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133. *Id.*

134. *See, e.g.*, ANTHONY H. CORDESMAN & KHALID R. AL-RODHAN, *THE CHANGING DYNAMICS OF ENERGY IN THE MIDDLE EAST* 104 (Centr. Strategic & Intn'l Stud. 2006).

135. The local impact of pollution-laden emissions from coal-fired power plants was avoided in many instances by the construction of very tall smoke stacks that served to transport the toxic brew higher into the atmosphere where prevailing winds transported it across state lines and dispersed it far from the source. *See, e.g.*, *Sierra Club v. EPA*, 719 F.2d 436, 439 (D.C. Cir. 1983). (“[s]ince taller stacks tend to disperse pollutants over a greater area, a utility or other source can lower the ambient pollution concentrations not only by reducing the amount of pollutants it emits into the air, but also by raising the height of its stack.”) The Clean Air Act regulates emissions based on the ground level concentrations of pollutants and EPA allowed sources to satisfy certain emission limitations by building taller smoke stacks (hence the term “dispersion techniques”). The high-sulfur coal burned in eastern power plants was produced in Northern Appalachia and the Mid-West coalfields of Ohio, Illinois and Indiana.

136. Acid precipitation occurs when sulfur dioxide and nitrogen oxides from coal-fired power plants and other sources of carbon fuel combustion react in the upper atmosphere with water, oxygen, and other chemicals to form sulfuric acid and nitric acid. The resulting acid-laced rain and snowfall damages forests and acidification of lakes limits their ability to support fish and other aquatic life. Acid precipitation damage has been most experienced in the northeastern United States and Canada where the forests and lakes are lightly buffered and thus more sensitive to acidic deposition. Byron Swift, *How Environmental Laws Work: An Analysis of the Utility Sector's Response to Regulation of Nitrogen Oxides and Sulfur Dioxide Under the Clean Air Act*, 14 TUL. ENVTL. L.J. 309, 314 (2001) (citing JAMES L. REGENS & ROBERT RYCROFT, *THE ACID RAIN CONTROVERSY* 35–58 (Univ. Pittsburgh Press 1989) REVESZ); NATIONAL ACID PRECIPITATION ASSESSMENT PROGRAM REPORT TO CONGRESS (2003). Richard L. Revesz, *Federalism and Interstate Environmental Externalities*, 144 U. PA. L. REV. 2341, 2351–52 (1996).

137. *Id.* (citing BRUCE A. ACKERMAN & WILLIAM T. HASSLER, *CLEAN COAL AND DIRTY AIR: OR HOW THE CLEAN AIR ACT BECAME A MULTIBILLION-DOLLAR BAILOUT FOR HIGH-SULFUR COAL*

climate change controversy, scientific findings were ignored or minimized by Big Coal and its political allies.<sup>138</sup> The acrimonious debate lasted for more than a decade until a Congressional stalemate was finally overcome by the enactment of Title IV of the Clean Air Act Amendments of 1990, which included an Acid Rain Program to address both sulfur dioxide (“SO<sub>2</sub>”) and nitrogen oxide (“NO<sub>x</sub>”) emissions from coal-fired power plants.<sup>139</sup>

### Longwall Mining Externalities

Underground, “longwall mines” cut vast swaths under the earth—often 1,500 feet wide and a mile or more long—through thick coal seams.<sup>140</sup> Longwall mining removes huge chunks of a coal seam that lies horizontally hundreds of feet beneath the earth’s surface.<sup>141</sup> A huge circular drum with cutting bits (the “shear”) cuts coal from the seam.<sup>142</sup> The longwall shear, related equipment, and the miners operating them are protected from roof cave-ins by overhead hydraulic shields (“roof supports”).<sup>143</sup> The roof supports move forward mechanically along the 1,000 to 1,500 foot wide longwall “face” as the shears cut into the coal.<sup>144</sup> As the mineral is cut by the shear bits, it drops onto a conveyer belt that runs parallel to the coal seam face.<sup>145</sup> The conveyor belt then carries the newly cut coal out of the mine to the surface for processing and transportation to market.<sup>146</sup> As the supports move forward, the strata they support cave in, causing overlying rock to subside.<sup>147</sup> Longwall mining subsidence under rural coalfield

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PRODUCERS (Yale Un. Press 1981)); RICHARD COHEN, WASHINGTON AT WORK, BACK ROOMS AND CLEAN AIR 152–66 (Longman 1990).

138. Swift, *supra* note 136, at 315.

139. Clean Air Act Amendments of 1990, Pub. L. No. 101-549, 104 Stat. 2399 (1990) (codified at 42 U.S.C. §§7401–7700 (1994)).

140. *See generally* S.S. PENG & H.S. CHIANG, LONGWALL MINING (John Wiley & Sons, Inc. 1984). For a brief explanation of longwall mining technology see McGinley, *supra* note 42, at 5556 n. 179, 180. *See also* BARLOW BURKE, JR. ET AL., MINERAL LAW: CASES AND MATERIALS 316 (West Publ’g. Co. 1994) [hereinafter BURKE].

141. BURKE, *supra* note 140, at 316.

142. *Id.*

143. *Id.*

144. *Id.*

145. *Id.*

146. *Id.*

147. *Id.*, at 316–17

communities has caused widespread, significant structural damage to homes and other structures.<sup>148</sup>

Similarly, longwall subsidence has triggered pervasive loss or contamination of rural domestic well and spring water supplies.<sup>149</sup> While some in the coal industry dispute the impact of longwall mining on water resources, evidence of such effect is pervasive.<sup>150</sup>

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148. In *Keystone Bituminous Coal Ass'n v. DeBenedictis*, 480 U.S. 470, 474 (1976), the Supreme Court of the United States defined "coal mine subsidence" as "the lowering of strata overlying a coal mine, including the land surface, caused by the extraction of underground coal."). The Court upheld a Pennsylvania law prohibiting underground longwall and room and pillar mining where the extraction of coal might harm important public interests. The Court summarized the harm that can accrue as a result of coal mining induced surface subsidence:

Coal mine subsidence is the lowering of strata overlying a coal mine, including the land surface, caused by the extraction of underground coal. This lowering of the strata can have devastating effects. It often causes substantial damage to foundations, walls, other structural members, and the integrity of houses and buildings. Subsidence frequently causes sinkholes or troughs in land which make the land difficult or impossible to develop. Its effect on farming has been well documented—many subsided areas cannot be plowed or properly prepared. Subsidence can also cause the loss of groundwater and surface ponds.

*Id.* at 474–5.

149. For a discussion of the externalities of longwall coal mining, *see generally* ENERGY INFORMATION ADMINISTRATION, LONGWALL MINING (Mar. 1995); SCHMID & COMPANY, INC., CONSULTING ECOLOGISTS, THE INCREASING DAMAGE FROM UNDERGROUND COAL MINING IN PENNSYLVANIA 25–31 (2011), *available at* <http://www.schmidco.com/17April2011SchmidAct54Analysis.pdf>; A. IANNACCHIONE I, S.J. TONSOR, M WITKOWSKI, J. BENNER, A. HALE, & MARTINE SHENDGE, THE EFFECTS OF SUBSIDENCE RESULTING FROM UNDERGROUND BITUMINOUS COAL MINING ON SURFACE STRUCTURES AND FEATURES AND ON WATER RESOURCES, 2003 TO 2008, at I\_9–I\_10 (Pa. Dept. Env. Prot. 2011), *available at* [http://www.dep.state.pa.us/dep/deputate/minres/bmr/act54\\_2008\\_report/cover.htm](http://www.dep.state.pa.us/dep/deputate/minres/bmr/act54_2008_report/cover.htm); *see also* B. M. STOUT III, IMPACT OF LONGWALL MINING ON HEADWATER STREAMS IN NORTHERN WEST VIRGINIA (W.Va. Water Research Inst. 2003), *available at* <http://water.usgs.gov/wri/02grants/prog-compl-reports/2002WV5B.pdf>; B. M. STOUT III, *DO HEADWATER STREAMS RECOVER FROM LONGWALL MINING IMPACTS IN NORTHERN WEST VIRGINIA?* (W.Va. Water Research Inst. 2004), *available at* <http://water.usgs.gov/wri/04grants/Progress%20Completion%20Reports/2002WV5B.pdf>; E. Perry, J. Kagel, C. Tibbott, & D. Densmore, *A Survey of Fish and Aquatic Habitat in Three Streams Affected by Longwall Mining in Southwestern Pennsylvania*, (U.S. Fish & Wildlife Serv. 2004), *available at* <http://www.publicintegrity.org/investigations/longwall/assets/pdf/Longwall2-Doc3.pdf>; Colin J. Booth, *Groundwater as a constraint of longwall mining*, RMZ-M&G, 2003, at 49, 49–52, *available at* [http://www.rmz-mg.com/letniki/rmz50/rmz50\\_0049-0052.pdf](http://www.rmz-mg.com/letniki/rmz50/rmz50_0049-0052.pdf); *see also* Letter from U.S. Fish & Wildlife Serv. to Wyona Coleman, Attaching Data on 131 W. Pa. Streams Evaluated for Impacts of Longwall (Jan. 4, 2001), *available at* <http://www.publicintegrity.org/investigations/longwall/assets/pdf/Longwall2-Doc1.pdf>.

150. *See, e.g.*, Statement of Katherine A. Fredriksen, U.S. HOUSE OF REP., ENERGY AND MINERAL RESOURCES SUBCOMMITTEE OF THE NATURAL RESOURCES COMMITTEE (Sept. 26, 2011), *available at* <http://naturalresources.house.gov/UploadedFiles/FredriksenTestimony09.26.11.pdf> (noting that "[t]o date over 172 square miles in PA and WV have been undermined by CONSOL's longwall operations with no material damage to the hydrological balance"). *But see*, D. Hopey, *Consol Energy Sued for \$58 Million to Fix Greene Co. Damage*, PITTSBURGH POST-GAZETTE (February 1, 2008).

Also, an additional little-noticed or commented-upon longwall mining coal externality is naturally occurring coalbed methane, a potent greenhouse gas. The methane is exhausted from mine ventilation shafts and degasification well bores into the ambient atmosphere during underground mining operations.<sup>151</sup> Longwall and other methods of underground mining release 13% of the methane gas emitted annually by industrial sources into the earth's atmosphere<sup>152</sup>. Two decades ago one commentator warned:

Approximately two-thirds of the wasted methane is intentionally "vented" as part of the coal mining process. Such venting not only wastes the energy present in this methane, but also significantly contributes to the problem of global warming, as methane is a powerful greenhouse gas with twenty-three times more "radiative effect" than carbon dioxide. Increased methane concentrations in the atmosphere are believed to be responsible for fifteen to twenty percent of the recent increase in global temperatures. Coal mine emissions account for approximately ten percent of worldwide methane emissions, and that number is expected to rise.<sup>153</sup>

20 years later, most coal mines continue to "vent" coalbed methane gas contributing to the accumulation of greenhouse gases in the earth's atmosphere.

#### Mountaintop Removal Mining Externalities

On the surface, strip miners using high explosives blasted apart mountain ridge tops in Kentucky, West Virginia, and Virginia.<sup>154</sup> The blasts, part of the new extraordinarily large-scale "mountaintop removal" ("MTR") mining method, allow coal to be scooped from the broken mountaintops by

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(discussing that the state sued coal company claiming it lied about risks of mining under Ryerson Station State Park Dam, necessitating draining of Duke Lake, a popular swimming, boating and fishing spot).

151. Longwall and other methods of underground mining release 13% of the methane gas emitted annually by industrial sources into the earth's atmosphere. See REDUCING COAL SUBSIDIES, *supra* note 42, citing World Resources Report 1996-1997 328, available at [http://pdf.wri.org/worldresources1996-97\\_bw.pdf](http://pdf.wri.org/worldresources1996-97_bw.pdf). See also Jeff L. Lewin et al., *Unlocking the Fire: A Proposal for Judicial or Legislative Determination of the Ownership of Coalbed Methane*, 94 W. VA. L. REV. 563, 584-87 (1992) [hereafter *Unlocking Fire*]. See also L. James Lyman, *Coalbed Methane: Crafting a Right to Sell From an Obligation To Vent*, 78 U. COLO. L. REV. 613, 615 (2007).

152. REDUCING COAL SUBSIDIES, *supra* note 42.

153. *Unlocking Fire*, *supra* note 151, at 584-87.

154. See, e.g., McGinley, *supra* note 42, at 54-57.

twenty story tall “draglines.”<sup>155</sup> Dragline booms may extend 300 feet or more and their buckets are big enough to hold five Jeep Cherokees or more at a time.<sup>156</sup> An enormous amount of rock and debris—the remains of what were high mountain ridges—are shoved into valleys burying headwater streams creating “valley fills.”<sup>157</sup> Valley fills both block and contaminate waterways. EPA has reported that “almost 2,000 miles of Appalachian headwater streams ha[d] been buried by mountaintop coal mining.”<sup>158</sup> At the same time, existing watersheds are negatively affected by the surface mining, water quality deteriorates as biodiversity diminishes, and a concentration of metals pollutes the soil and water.<sup>159</sup>

In the context of a citizen suit challenge to state agency permitting of mountaintop removal operations in West Virginia, a federal district court judge flew over all of the MTR mines in the state. In a subsequent opinion the judge related what he saw:

[The flight] revealed the extent and permanence of environmental degradation this type of mining produces. . . . [T]he ground was covered with light snow, and mined sites were visible from miles away. The sites stood out among the natural wooded ridges as huge white plateaus, and the valley fills appeared as massive, artificially landscaped stair steps. Some mine sites were twenty years old, yet tree growth was stunted or non-

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155. Abramson, *supra* note 85 (stating that “[t]he efficiency of [Appalachia’s] most productive mines pales beside that of mines in the West.”). Strip mining operations use draglines that take 200 cubic yard bites and dump coal or rock in to 400-ton trucks. *Id.*

156. See Ken Ward Jr., *Strip-Mining Battle Resurfaces in State*, SUNDAY GAZETTE-MAIL, Mar. 22, 1998, at 1A, available at <http://wvgazette.com/static/series/mining/MINE0322.html> [hereafter *Strip-Mining Battle Resurfaces*] (explaining that “valley fills” contain huge amounts of waste rock, “enough . . . to fill 1.1 million railroad cars, a train that would stretch from Charleston [W. Va.] to Myrtle Beach, S.C., and back a dozen times.”). See also Ken Ward Jr., *Industry, Critics Look for Mountaintop Removal Alternative: Is There Another Way?*, SUNDAY GAZETTE-MAIL, June 6, 1999, at 1A, available at <http://wvgazette.com/static/series/mining/mining0606.html> (noting that “mountaintop removal mines use 240-ton trucks. Valley fills sometimes measure 100 million cubic yards or more.”).

157. See *Bragg v. Robertson*, 72 F. Supp. 2d 642, 646 (S.D.W. Va. 1999) (describing mountaintop removal and the creation of valley fills), *rev’d sub nov. W. Va. Coal Ass’n*, 248 F.3d 275 (4th Cir. 2001). See also *Strip-Mining Battle Resurfaces*, *supra* note 156. (maintaining that “much of this rock and earth . . . is normally dumped into nearby hollows in piles called valley fills.”).

158. Press Release, U.S. Evtl. Prot. Agency, EPA Issues Comprehensive Guidance to Protect Appalachian Communities From Harmful Environmental Impacts of Mountain Top Mining (Apr. 1, 2010), available at [http://water.epa.gov/lawsregs/guidance/wetlands/upload/2010\\_04\\_10\\_wetlands\\_guidance\\_appalachian\\_mntop\\_mining\\_press\\_release.pdf](http://water.epa.gov/lawsregs/guidance/wetlands/upload/2010_04_10_wetlands_guidance_appalachian_mntop_mining_press_release.pdf).

159. M.A. Palmer et al., *Mountaintop Mining Consequences*, 327 SCIENCE 148, 148 (2010).

existent. Compared to the thick hardwoods of surrounding undisturbed hills, the mine sites appeared stark and barren and enormously different from the original topography.<sup>160</sup>

Chief Judge Haden continued:

If the forest canopy . . . is leveled, exposing the stream to extreme temperatures, and aquatic life is destroyed, these harms cannot be undone. If the forest wildlife are [sic] driven away by the blasting, the noise, and the lack of safe nesting and eating areas, they cannot be coaxed back. If the mountaintop is removed, even [coal company] engineers will affirm that it cannot be reclaimed to its exact original contour. Destruction of the unique topography of southern West Virginia, and of Pigeonroost Hollow in particular, cannot be regarded as anything but permanent and irreversible.<sup>161</sup>

EPA released a report in March 2011 on the impact of MTR and related valley fills on the aquatic ecosystems of the coalfields of Central Appalachia. The report was based on evidence gleaned from peer-reviewed literature and EPA's 2005 Programmatic Environmental Impact Statement on MTR. The report indicated that MTR and associated valley fills "lead directly to five principal alterations of stream ecosystems."<sup>162</sup> These direct impacts included:

(1) springs, and ephemeral, intermittent, and small perennial streams are permanently lost with the removal of

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160. *Bragg v. Robertson*, 54 F. Supp. 2d 635 646 (S.D. W.Va. 1999).

161. *Id.* (Haden, J., granting preliminary injunction) Chief Judge Haden's observations were an accurate depiction of the impact MTR has on vegetation and animal life. It has been estimated that as of 2007 MTR had destroyed over 300 square miles of Appalachian forest. Diana Kaneva, *Let's Face Fact, These Mountains Won't Grow Back: Reducing the Environmental Impact of Mountaintop Removal Coal Mining in Appalachia*, 35 WM. & MARY ENVTL. L. & POL'Y 931, 933. The deforestation that occurs during the MTR process affects the biodiversity of the region. *Id.* For example governmental studies reveal a decrease in species of forest birds and amphibians which require a mature forest habitat in MTR affected areas, while grassland birds and reptiles which do not typically thrive in wooded areas grow in numbers. U.S. ENVTL. PROT. AGENCY, MOUNTAINTOP MINING/VALLEY FILLS IN APPALACHIA: FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT (2005), available at [http://www.epa.gov/region03/mtntop/pdf/mtm-vf\\_fpeis\\_full-document.pdf](http://www.epa.gov/region03/mtntop/pdf/mtm-vf_fpeis_full-document.pdf) [hereafter FINAL PROGRAMMATIC EIS 2005].

162. U.S. ENVTL. PROT. AGENCY, THE EFFECTS OF MOUNTAINTOP MINES AND VALLEY FILLS ON AQUATIC ECOSYSTEMS OF THE CENTRAL APPALACHIAN COALFIELDS (EPA Rept. /600/R-09/138F) (2011), available at <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=225743#Download>.

the mountain and from burial under fill, (2) concentrations of major chemical ions are persistently elevated downstream, (3) degraded water quality reaches levels that are acutely lethal to standard laboratory test organisms, (4) selenium concentrations are elevated, reaching concentrations that have caused toxic effects in fish and birds and (5) macroinvertebrate and fish communities are consistently degraded<sup>163</sup>.

### Coal Waste Externalities

The newest generation of technology and mining methods on the front end of the coal fuel cycle has also magnified the scale of coal waste impoundments, which are bigger than ever and continue to pose threats to downstream communities. A 2002 National Academy of Sciences study reported that there were more than 700 federally-regulated waste impoundments in the United States, most of them located in Appalachia.<sup>164</sup> From 1981 through 2000, five coal waste impoundment failures released

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163. *Id.* See also FINAL PROGRAMMATIC EIS 2005, *supra* note 161; T. Ty Lindberg, et al, Cumulative Impacts of Mountaintop Mining on an Appalachian Watershed, Proceedings of the National Academy of Science, (December 12, 2011), *available at* <http://www.pnas.org/content/108/52/20929.short> (stating that “[i]ndividual mines profoundly impact stream water quality, community structure, and ecosystem functions immediately downstream of valley fills.”). It is very expensive to internalize the cost of mineral pollutants such as selenium discharged from MTR mines in violation of Clean Water Act water quality standards. Ken Ward Jr., *Alpha Agrees to \$50 Million for Selenium Treatment*, THE CHARLESTON GAZETTE (Coal Tattoo Blog, December 12, 2011), *available at* <http://blogs.wvgazette.com/coalattoo/2011/12/12/alpha-agrees-to-50-million-for-selenium-treatment/> (noting that the coal company agrees to begin construction of selenium treatment facilities with an estimated construction cost of over \$50 million and to pay civil penalties of \$4.5 million). See also *Ohio Valley Env’n’tl Council v. Independence Coal Co., et al.*, (Consent Order, Dec. 12, 2011), *available at* <http://wvgazette.com/static/coal%20attoo/AlphaSeleniumConsentDecree.pdf> (asserting that the company agrees to abate selenium discharges from mountaintop removal mines).

164. NATIONAL ACADEMY OF SCIENCES, COAL WASTE IMPOUNDMENTS: RISKS, RESPONSES, ALTERNATIVES 23–4 (National Academic Press 2002) [hereafter IMPOUNDMENTS]; see generally STANLEY J. MICHALEK ET AL., ACCIDENTAL RELEASES OF SLURRY AND WATER FROM COAL IMPOUNDMENTS THROUGH ABANDONED UNDERGROUND COAL MINES (Mine Safety & Health Admin.1996), *available at* <http://www.msha.gov/S&HINFO/TECHRPT/MINEWASTE/ASDSO2.pdf> (giving background information on impoundments). Thicker coal seams in the West contain less impurities and most coal from Western coalfields is shipped without extensive cleaning. *Id.* 23–24. More than a billion tons of coal is mined annually in the United States and more than 600 million tons are washed (processed) to some extent. Seventy to ninety million tons of slurry waste per year are disposed of in above-ground impoundments or injected underground as a water-coal slurry. *Id.*

more than 90 million gallons of this polluting “black water” into Appalachian streams<sup>165</sup>.

In 2000, an impoundment containing over a billion gallons of coal slurry waste in Eastern Kentucky was breached, allowing more than 300 hundred million gallons of the black water sludge to reach a nearby stream.<sup>166</sup> The waste travelled more than 100 miles downstream from Kentucky into West Virginia, burying and destroying stream life.<sup>167</sup>

On the back end of the coal fuel cycle, an enormous amount of inorganic coal combustion waste (“CCW”) is produced annually when coal is burned in electricity-generating power plants. According to a 2010 Congressional Research Service report,

The 1.05 billion tons of coal burned each year in the United States contain 109 tons of mercury, 7884 tons of arsenic, 1167 tons of beryllium, 750 tons of cadmium, 8810 tons of chromium, 9339 tons of nickel, and 2587 tons of selenium. On top of emitting 1.9 billion tons of carbon dioxide each year, coal-fired power plants in the United States also create 120 million tons of toxic waste. That means each of the nation's 500 coal-fired power plants produces an average 240,000 tons of toxic waste each year. A power

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165. IMPOUNDMENTS, *supra* note 164, at 27–31. “Black water” is a colloquial term for the liquid waste contained in or released untreated from coal waste impoundments. *See also* J. MICHALEK, *supra* note 164.

166. U.S. DEP’T OF LABOR, MINE SAFETY AND HEALTH ADMIN, INTERNAL REVIEW OF MSHA’S ACTIONS AT THE BIG BRANCH REFUSE IMPOUNDMENT, MARTIN COUNTY COAL CORPORATION, INEZ, MARTIN COUNTY, KENTUCKY 1, 3 (2003) [INTERNAL REVIEW], *available at* <http://www.msha.gov/MEDIA/PRESS/2003/Report20030113.pdf>; MINE SAFETY AND HEALTH ADMINISTRATION, REPORT OF INVESTIGATION (2000), *available at* <http://www.msha.gov/impoundments/martincounty/martincountytext.pdf>. To provide scale, the Exxon Valdez oil tanker spill of two decades ago, often called one of the worst environmental disasters in U.S. history, involved release of 11 million gallons of crude into a pristine aquatic ecosystem.

167. The impoundment collapse occurred on October 11, 2000. *See* INTERNAL REVIEW, *supra* note 166. *See also* Ky. Envntl. Quality Comm., Martin County Coal Slurry Spill: Three Years Later, <http://www.eqc.ky.gov/NR/rdonlyres/78642226-A465-4EDC-9D2C-8F673DCECC84/0/coalsslurrytour.pdf> (last visited June 3, 2012). Kentucky officials reported that 20 miles of streams and floodplains were buried in 8 feet of slurry. The sludge contaminated water supplies of riverside communities in Kentucky and West Virginia with measurable amounts of heavy metals including arsenic, mercury, lead, cadmium, copper, copper, and chromium. Four municipal drinking water intakes were shut down. All aquatic life was eliminated in Wolf and Coldwater creeks and severely damaged approximately 70 miles of streams. The cleanup cost was estimated to be at least \$58 million. *Id.*

plant that operates for 40 years will leave behind 9.6 million tons of toxic waste.<sup>168</sup>

Approximately 76 million tons of CCW is primarily disposed of annually, on-site at power plants in unlined wastewater water impoundments and landfills.<sup>169</sup> Of the more than 600 coal waste impoundments spread across the nation, one commentator estimates that 240 have been constructed in areas above abandoned underground mines, raising concerns of instability and possibility of structural collapse.<sup>170</sup>

In 2008, the contents of a Tennessee Valley Authority coal-fired power plant impoundment containing liquid coal combustion waste broke through a dam wall releasing 1.1 billion gallons of CCW slurry.<sup>171</sup> The cleanup cost has been estimated at \$1.2 billion.<sup>172</sup> The spill material included environmentally toxic levels of mercury, arsenic, and lead. It damaged a dozen homes and contaminated miles of a tributary of the Tennessee River.<sup>173</sup>

Coal and electric power industry lobbyists have successfully blocked federal regulation of CCW and coal processing waste, notwithstanding the risks attendant their disposal. In 1976, Congress enacted the Resource

168. *Bottom Ash*, SOURCE WATCH, [http://www.sourcewatch.org/index.php?title=Bottom\\_ash#cite\\_note-rachel-1](http://www.sourcewatch.org/index.php?title=Bottom_ash#cite_note-rachel-1) (last visited June 3, 2012); LINDA LUTHER, REGULATING COAL COMBUSTION WASTE DISPOSAL: ISSUES FOR CONGRESS 8 (Cong. Research Serv. 2010), available at <http://www.fas.org/sgp/crs/misc/R41341.pdf>. EPA estimates there are approximately 300 CCW landfills and 629 CCW surface impoundments or similar management units in use at roughly 495 coal-fired power plants. *Id.*; see also EPA, Office of Resource Conservation and Recovery, *Human and Ecological Risk Assessment of Coal Combustion Wastes* (Work Assignment No. 1-02, 2010).

169. Benjamin K. Sovacool & Kelly E. Sovacool, *Preventing National Electricity-Water Crisis Areas In The United States*, 34 COLUM. J. ENVTL. L. 333, 354 (2009).

170. *Id.* at 355.

171. Anne Paine & Colby Sledge, *Flood of Sludge Breaks TVA Dike: Collapse poses risk of toxic ash*, THE TENNESSEAN, Dec. 24, 2008, at A1, available at <http://www.commondreams.org/headline/2008/12/24-1>.

172. *Id.*

173. *Id.* (stating that “[m]illions of yards of ashy sludge broke through a dike at TVA’s Kingston coal-fired plant . . . covering hundreds of acres . . . [a]bout 2.6 million cubic yards of slurry—enough to fill 798 Olympic-size swimming pools.”). Inadequate regulation of coal combustion waste not only poses a threat to coalfield communities, it raises serious concerns of environmental racism. See, e.g., Mark Harrison Foster, Jr., *Ash Holes: The Failure to Classify Coal Combustion Residuals As a Hazardous Waste Under RCRA and The Burden Borne by a Minority Community in Alabama*, 12 Vt. J. Envtl. L. 735 (2011) (EPA approved disposal of TVA CCW from Tennessee impoundment collapse to predominately African American community in Alabama); Rebecca Tsosie, *Climate Change, Sustainability And Globalization: Charting The Future Of Indigenous Environmental Self-Determination*, 4 ENVTL. & ENERGY L. & POL’Y J. 188 (2009) (Coal-Fired Power plant CCW disposed of on Native American (Navajo) tribal lands).

Conservation and Recovery Act (“RCRA”) to strictly regulate generation, storage, and disposal of hazardous wastes.<sup>174</sup> In 1980, in response to intense lobbying by mining and related industries, Congress passed the Bevill Amendment exempting solid wastes from the “extraction, beneficiation and processing” of ores and minerals from RCRA while EPA conducted studies to determine how they should be regulated. 30 years after the adoption of the Bevill Amendment, the statute still exempts many mining wastes, including coal processing and coal combustion wastes from RCRA Subtitle C.<sup>175</sup> Regulatory responsibility for CCW has been left to the states until EPA decides to include it within the purview of RCRA.<sup>176</sup>

Thus, CCW is specifically exempted from regulation under RCRA, even though it is heavily laden with toxic material.<sup>177</sup> In the wake of the TVA CCW impoundment collapse, public demands for regulation grew, and EPA responded with a proposed regulation in 2010.<sup>178</sup> The agency is again

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174. 42 U.S.C. § 6902 (2009).

175. See generally Steven G. Barringer, *The RCRA Bevill Amendment: A Lasting Relief For Mining Wastes?*, 17 NAT. RESOURCES & ENV'T 155 (Winter 2003). See also JAMES T. O'REILLY & CAROLINE BROUN, *RCRA AND SUPERFUND: A PRACTICE GUIDE*, § 2:49 (3rd ed. 2011); Sovacool & Sovacool, *supra* note 169, at 333. *Environmental Defense Fund v. EPA*, 852 F.2d 1316, 1318–24 (D.C. Cir. 1988) (detailing statutory and regulatory history of mining exemption; ordering EPA to determine ore and mineral processing wastes that fall within Bevill Amendment “mining waste exclusion”).

176. The Congressional Research Service reports that EPA has finally grown impatient with state efforts to regulate CCW:

EPA again cites a lack of progress in state regulation of CCW disposal units. Primarily, after identifying risks associated with CCW disposal in unlined landfills and surface impoundments in 2000, states have still not adequately implemented CCW regulatory programs, according to EPA. In particular, according to recent survey data, with regard to CCW disposal units, 36% of responding states do not have minimum liner requirements for landfills, 67% do not have liner requirements for surface impoundments, 19% of the responding states do not have minimum groundwater monitoring for landfills, and 61% do not have minimum groundwater monitoring for surface impoundments. . . . EPA asserts that, while the states seem to be regulating landfills to a greater extent, given the significant risks associated with surface impoundments, survey results suggest that there continue to be significant gaps in state regulatory programs for the disposal of CCWs.

LUTHER, *supra* note 168, at 9.

177. *Id.* at 13.

178. Hazardous and Solid Waste Management System, 75 Fed. Reg. 35,128, 35,264 (proposed June 21, 2010) (to be codified as 40 C.F.R. pts. 257, 261, 264, 265, 268, 271, & 302). See also Matthew Pearl, *The Aftermath of the December 2008 Incident in East Tennessee Illuminates the Inadequate Regulation of Coal Ash Impoundments*, 16 U. BALT. J. ENVTL. L. 195, 199 (2009) (discussing legislation passed in response to the Tennessee Valley Authority CCW disaster).

under intense pressure from regulated entities and Big Coal's opposition makes promulgation of the proposed rule unlikely in the near future.<sup>179</sup>

As related above, much of the externalized environment and associated socio-economic costs of coal mining and burning have not been calculated or considered by public policy makers. Much of the harm of the past, however, could be mitigated or prevented in the future by responsible mining practices and strict government enforcement of the SMCRA, the Clean Water Act, the RCRA, and the Clean Air Act. One policy choice to be considered is continuing to use significant quantities of coal as a bridge to an energy future while renewable energy and infrastructure is developed. Some argue that technology is available to allow a smaller quantity of coal to be mined and burned at a profit with more limited environmental and related impacts than in the past. However, the history of lax enforcement and regulatory politicization does not engender confidence that coal's environmental externalities will be effectively minimized in the near future.<sup>180</sup>

### *C. Miner Safety and Public Health Impacts of Coal*

#### 1. A Century-Long Trail of Workplace Injuries and Deaths

Early on the morning of January 2, 2006, almost a century after the single worst industrial accident occurred in United States history in Monongah, West Virginia, an explosion ripped through the depths of a coal

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179. See Gabriel Nelson, *White House Gets an Earful on Power Plant Rule*, N.Y. TIMES, Mar. 14, 2011, <http://www.nytimes.com/gwire/2011/03/14/14greenwire-white-house-gets-an-earful-on-power-plant-rule-86449.html?scp=3&sq=coal%20ash&st=cse> (stating that the "rule has faced a backlash from companies that burn coal, or recycle the ash by using it . . . in cement and other products. EPA has not moved forward with a final rule since receiving tens of thousands of comments.).

180. Pervasive laxness in enforcement of the SMCRA in some coal producing states is well documented. In *W. Va. Highlands Conservancy v. Norton*, the Court stated that:

a climate of lawlessness [exists], which creates a pervasive impression that continued disregard for federal law and statutory requirements goes unpunished, or possibly unnoticed. Agency warnings have no more effect than a wink and a nod, a deadline is just an arbitrary date on the calendar and, once passed, not to be mentioned again. Financial benefits accrue to the owners and operators who were not required to incur the statutory burden and costs attendant to surface mining; political benefits accrue to the state executive and legislators who escape accountability while the mining industry gets a free pass. Why should the state actors do otherwise when the federal regulatory enforcers' findings, requirements, and warnings remain toothless and without effect?

161 F. Supp. 2d 676, 684 (S.D. W.Va. 2002) (commenting on two decades-long failure of federal and state regulators to enforce reclamation bonding requirements of the SMCRA).

mine in rural north-central West Virginia.<sup>181</sup> For 40 hours, an international television audience watched with growing trepidation as coal company officials and government regulators periodically reported on efforts to rescue 13 coal miners trapped deep in the Sago mine.<sup>182</sup> Ultimately, the truth was revealed as morning dawned on the third day after the explosion: one miner had died at the time of the blast and 11 others died hours later of asphyxiation when thick toxic fumes overwhelmed them as they lay barricaded deep in the mine. One miner, although overcome by fumes, was found lying among his comrades, unconscious, but alive.<sup>183</sup>

Four years later, on April 5, 2010, another mine explosion killed 29 coal miners at the Massey Energy Upper Big Branch Mine (“UBB”) located in southern West Virginia’s Raleigh County.<sup>184</sup> The UBB disaster was the worst since 78 miners were killed in 1968 in an explosion within Consolidation Coal’s Farmington No. 9 Mine near Fairmont, West Virginia.<sup>185</sup> Following an intensive investigation, including interviews of more than 250 UBB employees, an independent investigation panel found:

Ultimately, the responsibility for the explosion at the Upper Big Branch mine lies with the management of Massey

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181. The December 6, 1907, explosion at a coal mine in Monongah, West Virginia, is thought to have killed over 500 miners. Almost a century later, the Sago Mine disaster occurred a scant seventy miles from Monongah. For a definitive examination of the Monongah disaster, see Davitt J. McAteer, *MONONGAH: THE TRAGIC STORY OF THE 1907 MONONGAH MINE DISASTER, THE WORST INDUSTRIAL ACCIDENT IN US HISTORY* (W.VA. UNIV. PRESS, 2007).

182. For general information regarding the Sago mine explosion see: <http://www.msha.gov/sagomine/sagomine.asp>. See also Transcript of Jan. 4 edition of Anderson Cooper 360, CNN, <http://transcripts.cnn.com/TRANSCRIPTS/0601/04/acd.02.html> (last visited June 3, 2012). For a discussion of media coverage of the events at the Sago Mine, see, e.g., James Dao, Maria Newman, *False Report of 12 Survivors Was Result of Miscommunications*, N.Y. TIMES (Jan. 4, 2006) <http://www.nytimes.com/2006/01/04/national/04cnd-mine.html> (last visited June 3, 2012).

183. See Transcript of Jan. 4 edition of Anderson Cooper, *supra* note 182.

184. See, Emily Channell, *Coal Miner’s Slaughter*, 14 North American Dialogue 12, 13 (Apr. 3, 2011). During the previous two years MSHA had issued 639 safety violations to Massey Energy, the mine’s owner. *Id.* at 18. Although MSHA claimed it “used the tools we have available,” there was “a clear record of blatant disregard for the welfare and safety of Massey miners.” *Id.* (quoting Senator of West Virginia Robert Byrd). Today, a federal investigation continues in an effort to determine if criminal prosecutions under the Mine Act are warranted. MINE SAFETY & HEALTH ADMIN, STATEMENT BY SOLICITOR OF LABOR M. PATRICIA SMITH REGARDING ONGOING INVESTIGATION OF UPPER BIG BRANCH MINE EXPLOSION (Jan. 14, 2011) *available at* <http://www.msha.gov/MEDIA/PRESS/2011/NS110118.asp>.

185. The Farmington disaster triggered the enactment of the 1969 Federal Coal Mine Health and Safety Act—the first mine safety law with sufficient teeth to force coal operators to significantly improve conditions in the nation’s coal mines. For a comprehensive review of coal operator gross negligence and regulatory agency malfeasance, see, Bonnie E. Stewart, No.9: THE 1968 FARMINGTON MINE DISASTER (W.Va. Univ. Press, 2011).

Energy. The company broke faith with its workers by frequently and knowingly violating the law and blatantly disregarding known safety practices while creating a public perception that its operations exceeded industry safety standards.<sup>186</sup>

The Sago and UBB tragedies were neither unique nor the worst of our nation's coal mine disasters. They rank as but two of more than 600 mine disasters that have visited American coal mining communities over the last century.<sup>187</sup> For those familiar with coalfield history, Sago and UBB join a long list of names synonymous with death, injury, shattered families, and devastated communities stretching back to the 1800s.<sup>188</sup> Over the course of a century, more than 100,000 coalminers died from mine roof falls, cave-ins, fires, explosions, and other causes in American coal mines.<sup>189</sup> Several million miners suffered injuries, many of them serious and disabling.<sup>190</sup>

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186. GOVERNOR'S INDEPENDENT INVESTIGATION PANEL, REPORT TO THE GOVERNOR: UPPER BIG BRANCH 108 (May 2011) available at <http://www.nttc.edu/ubb/>. While most UBB miners willingly gave sworn testimony to government investigators, eighteen Massey Energy managers including Donald Blankenship the company Chairman and CEO and Chris Adkins the Executive Vice president asserted their fifth amendment privilege and refused to appear and answer questions. *Id.* at 5; see also, Industrial Homicide: The Report on the Upper Big Branch Disaster, (United Mine Workers of America, October 25, 2011), available at <http://www.umwa.org/files/documents/134334-Upper-Big-Branch.pdf>; Report Of Investigation, Fatal Underground Mine Explosion April 5, 2010, Upper Big Branch Mine-South, Performance Coal Company Montcoal, Raleigh County, West Virginia, Id No. 46-08436 (U.S. Dep't. Labor, December 6, 2011), available at <http://www.msha.gov/Fatals/2010/UBB/FTL10c0331.pdf> ; Report Of Investigation Into The Mine Explosion At The Upper Big Branch Mine April 5, 2010, (West Virginia Office of Miners' Health, Safety & Training, Feb. 23, 2012), available at <http://www.wvminesafety.org/Upper%20Big%20Branch%20Mine%20Accident%20Report.htm>.

187. Regulators and historians arbitrarily define a mine "disaster" as an incident involving at least five deaths. See, Center for Disease Control, *NIOSH Mining: Coal Mining Disasters*, <http://www.cdc.gov/niosh/mining/statistics/discoal.htm> (last visited June 3, 2012) (listing coal mining disasters with 5 or more fatalities dating back to 1829).

188. Among the disasters that gained the most public notoriety were: Monongah (500), Stag Canyon No. 9 (263), Cherry Mine (259), Mather (195), Centralia (111), Pond Creek No. 1 (91), Farmington (78), Willow Grove (72), Scotia (26), Finley Coal Nos. 15 & 16 (38), Wilberg (27), Jim Walter Resources No. 5 (13), No. 2, Dutch Creek No. 1 (15), Grundy Mining No. 21 (13), Robena No. 3 (37) and Blacksville No. 1 (9) (the numbers in the parentheticals represent the number of deaths reported).

189. MINE SAFETY AND HEALTH ADMINISTRATION, HISTORICAL DATA ON MINE DISASTERS IN THE UNITED STATES, available at <http://www.msha.gov/MSHAINFO/FactSheets/MSHAFCT8.HTM>.

190. Six-hundred and five mining disasters have occurred in American coal mines since 1876 (defined as accidents in which five or more workers were killed). *Id.* The MSHA website documents the history of the carnage in America's coal and other mines from 1936 through 2007:

“The deadliest year in the nation’s coal mining history was 1907, when 3,242 deaths were recorded.”<sup>191</sup> Coal mine deaths then declined from 1910 to the present.<sup>192</sup>

In the aftermath of the tragic events at the Sago and Upper Big Branch mines, as with virtually every other modern coal mine disaster in the United States, familiar pledges were made. Indeed, for a century, coal mine operators and government regulators have repeatedly asserted that they have “learned from” these disasters. Accompanying such assurances have been commitments that similar events would “never happen again” and solemn vows that miners have not “died in vain.”

Time after time, these pledges have rung hollow as coal miners, their families, and coalfield communities suffered from death and injuries in the nation’s mines. Following the deaths of 111 miners at the Centralia Illinois

Fatalities and Injuries for All Mining (Coal & Noncoal)

Years	Average Annual & Total Deaths for Period	Average Annual Injuries	Total Injuries During Period
1936-1940	1,546 / 7730	81,342	406,710
1941-1945	1592 / 7960	82,825	415,125
1946-1950	1,054 / 5270	63,367	316,835
1951-1955	690 / 3450	38,510	192,550
1956-1960	550 / 2750	28,805	144,025
1961-1965	449 / 2245	23,204	116,020
1966-1970	426 / 2130	22,435	112,175
1971-1975	322 / 1610	33,963	169,815
1976-1980	254 / 1270	41,220	206,100
1981-1985	174 / 870	24,290	121,450
1986-1990	122 / 610	27,524	137,620
1991-1995	99 / 495	24,201	121,005
1996-2000	86 / 430	17,500	87,500
2001-2005	62 / 310	12,952	64,625
2006-2007	69 / 138	11,800	23,600
	Total: 37,340		Total: 2,815,805

See MINE SAFETY AND HEALTH ADMINISTRATION, INJURY TRENDS IN MINING, <http://www.msha.gov/MSHAINFO/FactSheets/MSHAFACT2.HTM> [hereafter *Injury Trends in Mining*]. While these numbers include “metal and non-metal” mine statistics, the great majority reflect coal mine injuries and fatalities. It is fair to assume that for the period 1880 to 1935 for which there are not reliable statistics, far more deaths and injuries occurred than in the period from 1936 to the present. During 2008 through 2011 coal mining disabling and non-disabling injuries totaled 11,835 and 72 miners were killed. *Injury Experience in Coal Mining, 2008* at 13 (IR 1348, Mine Safety & Health Admin. 2011), available at <http://www.msha.gov/Stats/Part50/Yearly%20IR's/2009/Coal-2009-Annual-IR.pdf>; U.S. DEP’T OF LABOR, MINE SAFETY AND HEALTH ADMIN., MINE INJURY AND WORKTIME, QUARTERLY (2010) available at [http://www.msha.gov/Stats/Part50/WQ/MasterFiles/MIWQ%20Master\\_20105.pdf](http://www.msha.gov/Stats/Part50/WQ/MasterFiles/MIWQ%20Master_20105.pdf)

191. *Injury Trends in Mining*, *supra* note 190.

192. MINE SAFETY AND HEALTH ADMINISTRATION, *supra* note 189.

mine in 1947, legendary United Mine Workers Union President John L. Lewis captured the sense of *déjà vu* accompanying death and loss in America's coal field communities:

There is public sorrow at the moment, but we know from harsh experience that it is only a momentary feeling of pity on the part of the public, and this sacrifice, like others before, will soon be forgotten. Shortly after the mine workers bury their dead, the feeling of sorrow will remain only in the breasts of the loved ones who survived: and the mine workers can look forward to the next catastrophe.<sup>193</sup>

History documents a mine disaster leading to new laws followed by another disaster cause-and-effect cycle. In this repeating cycle, a coal mine disaster is followed by strengthening of mine safety laws and enforcement, a lax enforcement phase that includes industry resistance to regulation followed by another mine disaster, and so on. The causal connection between mine disasters involving multiple fatalities and enactment of mine safety laws should, however, not lead one to ignore the *far greater number of injuries and loss of lives suffered in isolated accidents* involving only one or two individuals.<sup>194</sup> Whether coal miner deaths occur in disasters or in ones and twos, the cost of these non-economic externalities are incalculable and the total economic costs have never been objectively calculated.

## 2. Mine Safety in The Twenty-First Century

The cause and effect cycle continues today, although more than a century passed between the 1906 Monongah and the 2006 Sago explosions. Following Sago, miners died needlessly in Massey Energy's Aracoma Mine in southern West Virginia and in the Darby Mine in eastern Kentucky in 2006.<sup>195</sup> In 2007, at a mine at Crandall Canyon, Utah, another drama

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193. *Text of Lewis Order Calling Stoppage*, THE NEW YORK TIMES (March 30, 1947), available at <http://select.nytimes.com/gst/abstract.html?res=F40E10F63B5F1A7A93C2AA1788D85F438485F9&sc p=1&sq=text+of+lewis+order+calling+stoppage&st=p>, [hereinafter *Text of Lewis Order*]. Lewis' letter to all United Mine workers members calling for a week's holiday in memorial to the victims of the Centralia mine disaster was printed in full in the *Times*.

194. See *Beyond Sago: One by One: Disasters Make Headlines, But Most Miners Killed on the Job Die Alone*, THE CHARLESTON GAZETTE Nov. 5, 2006, available at <http://wvgazette.com/News/Beyond+Sago/200611050006> (reporting that more miners die individually than as part of a large-scale accident). See also All Mining Fatalities by State, U.S. Dep't. of Labor Fact Sheet, <http://www.msha.gov/stats/charts/allstatesnew.asp>.

195. Steven Greenhouse, *Report Cites Mine-Safety Agency Failures*, N.Y. Times (Nov. 8, 2007).

unfolded before an international television audience and ended, like Sago, in unnecessary death and heartache.<sup>196</sup> Once again, Congress passed a new law in the wake of promises of “never again.”<sup>197</sup> The 2010 Upper Big Branch mine explosion was the worst disaster in the more than four decades since the 1969 Farmington explosion killed 78 men in 1968. Until UBB it was fair to say that every significant advance in coal mine safety has been written in the blood of coal miners.<sup>198</sup> Uncharacteristically, the UBB deaths did not spawn new safety legislation, although tough new amendments to the Mine Act were introduced in Congress.<sup>199</sup> These legislative proposals were shelved by both houses and are unlikely to be enacted—unless, of course, another coal mine tragedy reminds the public and politicians of the risks coal miners take every day to feed their families and in an effort to quench America’s thirst for electric power.

It is important, however, to recognize that enormous improvements in mine safety over the last 40 years have significantly reduced coal mine deaths and serious injuries over time. Records of the federal Mine Safety and Health Administration show that, in each decade of the 20th century, the number of mining deaths and serious injuries reported have slowly declined.<sup>200</sup> As the chart in footnote 187 indicates, annual coal mine

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196. See BURST ACCIDENTS AUGUST 6 AND 16, 2007 CRANDALL CANYON MINE (2007), available at <http://www.msha.gov/Fatals/2007/CrandallCanyon/FTL07CrandallCanyonNoAppendix.pdf>

197. Mine Improvement and New Emergency Response Act of 2006 (MINER ACT), P.L. 109-236, 120 Stat. 493 (2006);. See also Supplemental Mine Improvement and New Emergency Response Act of 2007 (S-MINER Act), H.R. 2768, 110th Cong. (2007) (the bill passed the House by a vote of 214-199, but died in the Senate due to industry and administration opposition).

198. *Text of Lewis Order*, *supra* note 193. “The American people must be aroused to the stark realities of the situation and the casualties of the coal industry. Coal is already saturated with the blood of too many brave men and drenched with the tears of too many surviving widows and orphans.” *Id.* The irony is emphasized by J. Davitt McAteer, lawyer, scholar, and former MSHA chief:

In 1940, mine explosions claimed 91 miners at Bartley, West Virginia; 72 miners at St. Clairsville, Ohio; and 63 miners at Portage Pennsylvania. Coal mine safety legislation was passed the next year. In 1951, 119 miners died in a West Frankfort, Illinois explosion, and 1952 brought a new law. In 1968, 78 coal miners were killed in Farmington, West Virginia. Congress acted in 1969. In 1972, 91 miners were killed at Kellogg, Idaho in a silver mine fire; and in 1976 26 miners died in back-to-back coal mine explosions in Scotia, Kentucky. The Mine [Federal Mine Safety and Health] Act was passed in 1977.

J. Davitt McAteer, *The Federal Mine Safety and Health Act of 1977: Preserving a Law that Works*, 98 W. VA. L. REV. 1105, 1113 (1996). See *Beyond Sago*, *supra* note 194 (explaining that the Coal Mine Health and Safety Act was passed in response to the fatal disaster at Farmington). See also, MINING FATALITIES BY STATE, U.S. DEP’T OF LABOR FACT SHEET, available at <http://www.msha.gov/stats/charts/allstatesnew.asp>.

199. H.R. 5663, 111<sup>th</sup> Cong. (2010).

200. MSHA’s averages are based upon measuring the numbers of miner injuries against hours worked. See MSHA Facts, *supra* note 189.

fatalities fell from more than 1,500 per year in the late 1930s to an average of about 450 in the 1950s. Average annual fatalities dropped to 140 in the 1970s. By the 2001–2005 period, the yearly average of coal miner deaths dipped to 30.<sup>201</sup> The safest year in American coal mining history occurred in 2005, when an all-time low of 23 coal mining deaths were recorded, lower than the previous low of 28 fatalities recorded in 2002. 33 miners died in 2007.<sup>202</sup> Even as the number of fatalities in U.S. mines dropped, MSHA loosened federal mine safety law enforcement in favor of giving “compliance assistance” to coal companies.<sup>203</sup> From 2008 through 2010, mining fatalities rose, with a total of 72 miners dying in that time span.<sup>204</sup> MSHA documented more than 170,000 miner injuries from 1995 to 2007.<sup>205</sup>

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201. *Id.* According to the MSHA website data, the coal miner death rate decreased from about .20 fatalities per 200,000 hours worked by miners (or one death per million production hours) in 1970 to about .07 fatalities in 1977 and dropped still lower to an average of .03 fatalities for the 2001–2005 period. *Id.*

202. *Id.*

203. CHRISTOPHER W. SHAW, UNDERMINING SAFETY: A REPORT ON COAL MINE SAFETY 25 (Center for The Study of Responsive Law, 2008), available at <http://www.csrl.org/reports/UnderminingSafety.pdf>. See generally Democratic Staff, COMMITTEE ON EDUCATION AND THE WORKFORCE, HOUSE OF REPRESENTATIVES, REVIEW OF FEDERAL MINE SAFETY AND HEALTH ADMINISTRATION’S PERFORMANCE FROM 2001 TO 2005 REVEALS CONSISTENT ABDICATION OF REGULATORY AND ENFORCEMENT RESPONSIBILITIES, (109th Congress, 2nd Sess., January 31, 2006), available at <http://edlabor.house.gov/publications/minesafetyreport.pdf>. While state and federal legislators have failed to act in the wake of the worst mine disaster in forty years, MSHA has stepped up federal enforcement “with industry and federal officials attributing the improvement to increased enforcement of regulations and better training by mining companies themselves.” Kris Maher, *Data Show Safety Levels Improving at Coal Mines*, WALL ST. J., Sept. 16, 2011, at A5, available at <http://online.wsj.com/article/SB10001424053111904491704576572831496880862.html>. Coal mine safety violations fell five percent per inspection hour through the first three quarters of 2011 compared with the 2010 violation rate. Serious violations in 2011 fell by 12% - strongly suggesting that coal miners lives can be saved if mine safety laws are properly enforced.

204. MINE SAFETY & HEALTH ADMIN, U.S. DEP’T LABOR, MSHA NEWS RELEASE: MINING DEATHS RISE IN 2010 (Jan. 13, 2011) available at <http://www.msha.gov/MEDIA/PRESS/2011/NR110113a.asp>.

205. *Id.* Emily Channell, *Coal Miner’s Slaughter*, 14 North American Dialogue 12, 13 (Apr. 3, 2011). During the previous two years MSHA had given Massey Energy Corporation, the mine’s owner company, 639 safety violation citations, which were ignored and not enforced. *Id.* at 18. Although MSHA claimed they “used the tools we have available,” there was “a clear record of blatant disregard for the welfare and safety of Massey miners.” *Id.* (quoting Senator of West Virginia Robert Byrd). Today, federal criminal investigation continues. MINE SAFETY & HEALTH ADMIN, STATEMENT BY SOLICITOR OF LABOR M. PATRICIA SMITH REGARDING ONGOING INVESTIGATION OF UPPER BIG BRANCH MINE EXPLOSION (Jan. 14, 2011) available at <http://www.msha.gov/MEDIA/PRESS/2011/NS110118.asp>.

Clearly, efforts to protect coal miners' health and safety have not stood still since 500 miners' lives were lost in the 1907 Monongah explosion.<sup>206</sup> Regulation, Union persistence, and more responsible coal mining management have greatly reduced the number of miners killed and maimed in American mines.

It is fair to say that extraordinary progress has been made over time in advancing mine safety and reducing coal miner deaths and injuries. Nevertheless, preventable deaths and injuries continue to externalize the costs of coal mining at an unacceptable rate. That tragic deaths in mine disasters are the primary, indeed the only, impetus for stimulating politicians to enact legislation to protect miners lives and health speaks volumes about the United States coal industry and the governments that regulate it. As with many other coal externalities, the American public is largely ignorant of the significant costs of coal mine injuries and fatalities except during the short windows of consciousness of the risks miners face which are highlighted by intense media reporting in the aftermath of mine disasters.

#### *D. Coal's Externalized Health-Related Costs: Black Lung Disease*

While a century of coal mine accidents and disasters have claimed thousands of lives and injured more than two million miners, an even more insidious and obscure health hazard has caused many more deaths and disabilities. Medically known as "coal workers' pneumoconiosis," "black lung" is the common name for lung disease developing from inhaling coal dust. The term "black lung" derives from the observation by pathologists that the lungs of diseased victims appear black instead of the natural pink color of the healthy organ.<sup>207</sup> The inhalation and accumulation of coal dust in the lungs increases the risk of developing emphysema and chronic bronchitis.<sup>208</sup> Coal dust can also enhance risk of chronic obstructive pulmonary disease or "COPD."<sup>209</sup> As explained below, accepted medical etiology of the disease was that black lung disease develops over a fairly long period of exposure—a view opened to question by the findings of an

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206. MONONGAH, *supra* note 181.

207. There are two forms of black lung: simple, which is known as coal workers' pneumoconiosis ("CWP"), and complicated, which is known as progressive massive fibrosis (PMF).

208. *See, e.g.*, WebMD, Black Lung Disease, *available at* <http://www.webmd.com/a-to-z-guides/black-lung-disease-topic-overview>.

209. *Id.*

independent government investigation panel examining the UBB explosion.<sup>210</sup>

Black lung disease was first identified in the mid-19th Century by doctors treating British coal miners.<sup>211</sup> For many years, the disease was called “miner’s asthma” or “miner’s consumption” and medically labeled “anthracosis.”<sup>212</sup> Miners’ symptoms include “progressive dyspnea, chest discomfort, and cough, sometimes dramatically accompanied by the expectoration of copious quantities of black, inky sputum.”<sup>213</sup> Black lung can be very debilitating and often fatal. Throughout the history of coal mining, miners have been exposed to and have contracted black lung disease. In the early days of coal mining, men and boys worked for a pittance in extraordinarily dusty places in mines where the process of contracting black lung would usually begin. Even today, modern coal mining technologies continue to expose miners to black lung disease, notwithstanding a federal regulatory regime intended to minimize such exposure.

It would surprise most Americans to learn that black lung disease has claimed “far more lives than do catastrophic cave-ins and explosions.”<sup>214</sup> “Perhaps even worse, . . . black lung condemn[s] thousands of miners to live out their days crippled by the devastating effects of progressive, chronic lung disease.”<sup>215</sup> The statistics of black lung’s costs are staggering.

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210. GOVERNOR’S INDEPENDENT INVESTIGATION PANEL, *supra* note 186; Facing South, Institute for Southern Studies, *As Black Lung Rises Among Appalachian Coal Miners, Industry and Regulators Block Action*, <http://www.southernstudies.org/2008/09/as-black-lung-rises-among-appalachian-coal-miners-industry-and-regulators-block-action.html> (last visited June 3, 2012).

211. See ALAN DERICKSON, *BLACK LUNG: ANATOMY OF A PUBLIC HEALTH DISASTER* 6 (Cornell Univ. Press 1998) [hereinafter *BLACK LUNG*]. Black lung was not officially recognized as a compensable occupational disease in Great Britain until 1937. See BARBARA ELLEN SMITH, *DIGGING OUR OWN GRAVES: COAL MINERS AND THE STRUGGLE OVER BLACK LUNG DISEASE* 4 (Temple Univ. Press 1987).

212. See FREDERIC GOMES CASSIDY, JOAN HOUSTON HALL, 3 *DICTIONARY OF AMERICAN REGIONAL ENGLISH* 607 (Belknap Press 1996), available at: [http://books.google.com/books?id=eEB0YFR2EowC&pg=PA607&lpg=PA607&dq=%22miner's+asthma%22+%22miner's+consumption%22&source=bl&ots=S7NGQy9u88&sig=UeiFWYW2BKdW\\_C0Ym\\_7FkzWpJD4&hl=en&sa=X&oi=book\\_result&resnum=2&ct=result](http://books.google.com/books?id=eEB0YFR2EowC&pg=PA607&lpg=PA607&dq=%22miner's+asthma%22+%22miner's+consumption%22&source=bl&ots=S7NGQy9u88&sig=UeiFWYW2BKdW_C0Ym_7FkzWpJD4&hl=en&sa=X&oi=book_result&resnum=2&ct=result).

213. Greg Wagner, Book Review, *Black Lung: Anatomy of a Public Health Disaster*, 340 *NEW ENGLAND J. OF MEDICINE* 1770 (June 3, 1999).

214. David C. Vladeck, *The Failed Promise of Workplace Health Regulation*, 11 *W. VA. L. REV.* 15, 19 (2008), [hereinafter *Failed Promise*] (citing an April, 1998, *LOUISVILLE COURIER JOURNAL* series focusing on the devastating impact of black lung disease on miners and their families). The series is available at <http://www.courier-journal.com/cjextra/dust/>. Articles in the series focusing on the victims of black lung can be found at <http://www.courier-journal.com/cjextra/blacklung/index.html>.

215. *Id.*

While 104,722 miners died in coal mine accidents from 1900 to 2010,<sup>216</sup> four times more miner deaths during the same period are attributable to black lung.<sup>217</sup> By 1969, at least 365,000 miners died of black lung disease; it has been estimated that another 123,000 miners died between 1969 and 2004.<sup>218</sup>

For a century in the United States, coal industry and governments generally refused to recognize the existence of the disease.<sup>219</sup> Bizarrely, some coal industry officials, politicians, and even medical doctors claimed that inhalation of coal dust posed no health threat.<sup>220</sup> A noted public health historian has observed that “it is clear in retrospect that denial of the dangers of mine dust shortened the lives of hundreds of thousands of anthracite and bituminous coal miners.”<sup>221</sup>

It was not until a grassroots uprising of miners’ widows forced a reluctant Congress and president to address the disease and its cause. The Federal Coal Mine Safety and Health Act of 1969 included limits on

216. *Id.* (citing Mine Safety and Health Administration, *Coal Fatalities for 1900 through 2010*, UNITED STATES DEPARTMENT OF LABOR, <http://www.msha.gov/stats/centurystats/coalstats.asp> (last visited June 3, 2012)).

217. *Id.*

218. See CHRISTOPHER W. SHAW, UNDERMINING SAFETY: A REPORT ON COAL MINE SAFETY 7–8, Center for the Study of Responsive Law, available at <http://www.csrl.org/reports/UnderminingSafety.pdf>; see also Brenda Wilson, *The Quiet Deaths Outside the Coal Mines*, NPR, (Apr. 16, 2010) <http://www.npr.org/templates/story/story.php?storyId=126021059>.

219. See Brian C. Murchison, *Due Process, Black Lung, And The Shaping Of Administrative Justice*, 54 ADMIN. L. REV. 1025, 1038–48 (2002) (illustrating the difficulties faced by former miners in receiving compensation for black lung).

220. *Id.* at 1040. Murchison explains:

By 1930, the “denial of coal workers’ respiratory difficulties had triumphed in the United States,” due to a host of factors that historians are still trying to understand. One factor was the stance of company physicians that inhaling coal mine dusts was harmless because the body was naturally equipped to expectorate “deposits of carbon” and thus purify itself. Another claim was that inhaling carbonaceous dusts was in fact *beneficial* to miners’ health because it caused fibrotic formations which supposedly prevented tubercular bacilli “from getting a foothold” in the lungs. A third industry position was that the only real danger posed by either anthracite or bituminous mining was inhalation of “silicious dusts associated with sandstone, slate, and other minerals that occurred with coal deposits.” According to industry doctors, miners with dust-induced lung disease must have inhaled dust containing rock dust, since inhaling particles of coal “posed no hazard at all.” This effort to equate all mine dust disease with silicosis became the conventional wisdom; the only conceded effect of inhaling coal particles without significant silica was anthracosis, which coal interests insisted was not a disease but a discoloration of the lung.

*Id.* at 1040–41 (citations omitted).

221. BLACK LUNG, *supra* note 211, at xii.

miners' workplace exposure to black lung-causing ambient coal dust.<sup>222</sup>  
One widow put the impact of black lung disease in perspective:

My father was killed by black lung. I lost four brothers to black lung. My first husband had black lung when he died, and my second husband died of black lung. . . . Women and children live in the coal fields, too, and they breathe coal dust just like the men do, and they end up with asthma.<sup>223</sup>

The 1969 federal legislation, however, did not end the nightmare experienced by black lung riddled coal miners and their families. For almost four decades coal operators and their lawyers have continued to challenge miners and widows' black lung claims in a tortuous U.S. Department of Labor administrative adjudicatory system.<sup>224</sup> A law professor who directs a black lung clinic representing coal miners in black lung administrative cases described the agency's scandalous black lung claims system in testimony before a Congressional subcommittee:

I have argued cases before the United States Supreme Court as well as the Supreme Courts of several states. I have also represented people before Justices of the Peace and Small Claims Court. And I can say without hesitation that the most unfair process I have ever run into is that which I found in the Federal black lung system. It defies

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222. Federal Mine Safety and Health Act of 1977, 30 U.S.C. § 842(b)(2) (2006) ("each [mine] operator shall continuously maintain the average concentration of respirable dust in the mine atmosphere during each shift to which each miner in the active workings of such mine is exposed at or below 2.0 milligrams of respirable dust per cubic meter of air.") Federal Law also requires miners and their widows/families to receive compensatory benefits if it can be proven that a miner contracted the disease while working in coal mines. Black Lung Benefits Act (BLBA), 83 Stat. 792 (2006) (codified as amended at 30 U.S.C. § 901).

223. W. Davis, *Out Of The Black Hole: Reclaiming The Crown Of King Coal*, 51 AM. U. L. REV. 905, 952 (2002) (citing RANDALL NORRIS & JEAN-PHILLIPE CYPRES, *WOMEN OF COAL* (Un. Press of Ky. 1996); CAROL A.B. GIESEN, *COAL MINER'S WIVES: PORTRAITS OF ENDURANCE* 56 (Un. Press of Ky. 1995)).

224. See generally Murchison, *supra* note 219 (describing coal operators' continuing challenges to former miners' black lung claims) (citing, Ron Nixon, *Benefits Claims Process is as Slow, Painful as the Disease, Miners Say*, ROANOAKE TIMES, Nov. 24, 2000). Ron Nixon, *A Coalfield Legacy: Black Lung—As Court Battles for Disability Benefits Drag On, Miners Slowly Suffocate*, ROANOAKE TIMES & WORLD NEWS, Nov. 24, 2000 at A1 (reporting black lung claims can last for decades); Ron Nixon, *Lawyers Are Few and Far Between for Black Lung Plaintiffs*, ROANOAKE TIMES, Nov. 25, 2000. Murchison recites the history of one shocking convoluted case, typical of numerous others, in which a coal miner suffering serious disability from black lung fought a circuitous route through hearing after hearing for more than a decade seeking benefits to which he was clearly entitled.

due process of law, it defies reason and it is just simply unreasonable.<sup>225</sup>

It is true that government mandated dust mitigation measures have resulted in a significant decline in the incidence of black lung since 1970.<sup>226</sup> However, while the prevalence of black lung disease among miners dropped substantially from the tragic numbers inflicted before government regulation, “the numbers are on the rise again”<sup>227</sup> and are affecting both young and seasoned miners.<sup>228</sup> In 1995, MSHA confirmed the increase in

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225. *Id.* at 1032. The problematic nature of the black lung benefit system and the injustice to severely diseased miners and their families is exacerbated by a system that makes it difficult for the afflicted to obtain competent legal counsel. *See generally* U.S. GOV'T ACCOUNTABILITY OFFICE, BLACK LUNG BENEFITS PROGRAM: ADMINISTRATIVE AND STRUCTURAL CHANGES COULD IMPROVE MINERS' ABILITY TO PURSUE CLAIMS, (Govt. Acct. Off. Rpt. GAO-10-7) (2009), available at <http://www.gao.gov/new.items/d107.pdf> (stating that the “GAO found that coal miners face a number of challenges pursuing federal black lung claims, including finding legal representation and developing sound medical evidence to support their claims. DOL officials identified miners’ lack of resources, the low probability of success, and high litigation costs for their cases as factors that contribute to the difficulties miners face in finding legal representatives. Miners also encounter challenges in developing sound medical evidence.”). A particularly outrageous example of a seriously ill black lung claimant’s *pro se* effort to obtain benefits occurred in West Virginia where a coal company lawyer tampered with evidence showing the claimant was entitled to benefits. The claimant died before he received benefits. The lawyer’s duplicity was discovered several years into the case when a lawyer was found who agreed to represent the client. Ultimately the lawyer was suspended from practice for one year for his actions. *See Lawyer’s Disciplinary Bd. v. Smoot*, \_\_\_ S.E.2d \_\_\_, 2010 WL 4679256 (W.Va.) ([The claimant] “was a seventy-four-year-old man with a limited education who was acting *pro se* at the time of Mr. Smoot’s misconduct. . . . Submitting an altered report to a tribunal is an affront to justice that simply cannot be tolerated”).

226. MD Attfield et al., *Changing Patterns of Pneumoconiosis Mortality—United States, 1968–2000*, CDC (July 23, 2004), <http://www.cdc.gov/MMWR/preview/mmwrhtml/mm5328a1.htm>.

227. Joby Warrick, *Into the Darkness*, WASHINGTON POST MAGAZINE, January 21, 2007, <http://www.washingtonpost.com/wpdyn/content/article/2007/01/16/AR2007011601066.html?nav=email> page. *See, Failed Promise*, *supra* note 214 at 17 (citing MSHA, *Controlling Respirable Coal Mine Dust In Underground Coal Mines: Introductory Remarks Slide 4*, (July 25, 2007), <http://www.msha.gov/s&hinfo/BlackLung/ControlDust2007/CTD2007.asp> (mortality chart showing miner deaths from black lung 1968-2004)). LOUISVILLE COURIER-JOURNAL reported in 1998:

Every year, black lung disease kills almost 1,500 people who have worked in the nation’s coal mines. It’s as if the Titanic sank every year, and no ships came to the rescue. While that long-ago disaster continues to fascinate the nation, the miners slip into cold, early graves almost unnoticed.

Dust, *Deception and Death: Why Black Lung Has Not Been Wiped Out*, LOUISVILLE COURIER-JOURNAL, at A1 (April 19, 1998), available at <http://courier-journal.com/cjextra/dust/>. The National Black Lung Association similarly estimates that black lung claims the lives of 1,500 coal miners each year. *See* MSHA News Release, *Nation’s Coal Miners Take Advantage of Labor Department’s Free Chest X-Rays* (June 9, 2009), <http://www.msha.gov/media/press/2000/nr000609.htm>.

228. Chris Hamby, *Autopsies of Massey Miners Reveal Black Lung*, HUFF POST GREEN (May 19, 2011), [http://www.huffingtonpost.com/the-center-for-public-integrity/autopsies-massey-miner-black-lung\\_b\\_864174.html](http://www.huffingtonpost.com/the-center-for-public-integrity/autopsies-massey-miner-black-lung_b_864174.html).

black lung and the need to tighten respirable dust standards. Government statistics showed that coal mines in the United States were logging more than 6,000 violations of ambient coal dust regulations annually over a five year period.<sup>229</sup> No action was taken on the agency findings for a decade and a half.<sup>230</sup>

Finally, on October 19, 2010, MSHA proposed a rule aimed at lowering miners' exposure to coal dust.<sup>231</sup> The rule is a part of MSHA's End Black Lung: ACT NOW campaign begun in 2009.<sup>232</sup> The new rule addresses many previously identified problems with existing federal mining regulations, including updating methods for measuring coal dust so that sampling will more accurately reflect working conditions. If implemented, the new rule would require miners to wear personal dust monitors if they work in high dust-concentration areas.<sup>233</sup> Dust levels will now be recorded using individual measurements instead of simply recording an average calculated over a time span of multiple shifts.<sup>234</sup> The goal of the rule is to give mine operators 24 months to phase in lower dust levels, from the present level of 2.0 mg/m<sup>3</sup> of air to 1.0 mg/m<sup>3</sup>. MSHA and coal mine operator data indicate that a majority of miners' exposures are presently at or below the limits in the proposed rule.<sup>235</sup>

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229. Ken Ward Jr., *Beyond Sago: Coal Dust Most Common Violation; Mines Averaging 6,000 Citations for it Each Year*, THE CHARLESTON GAZETTE (December 17, 2006).

230. U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, CRITERIA FOR A RECOMMENDED STANDARD, OCCUPATIONAL EXPOSURE TO RESPIRABLE COAL MINE DUST at iii (Nat'l. Inst. Occup. Safety & Health, NIOSH Pub. No. 95-106, 1995), available at <http://www.cdc.gov/niosh/pdfs/95-106a.pdf> (MSHA's "recommended exposure limit ('REL') does not insure that miners exposed at this concentration over a lifetime will have a zero risk of developing occupational respiratory diseases . . . NIOSH recommends additional measures to protect miners health . . . [by] keeping worker exposure low through . . . engineering controls and work practices . . . frequent monitoring of worker exposures, and . . . participation of miners in . . . medical screening and surveillance program."); see also NIOSH, A Review of Information Published Since 1995 on Coal Mine Dust Exposures and Associated Health Outcomes, (Draft Rept. 2010) available at <http://www.cdc.gov/niosh/review/peer/HISA/expandashealth-pr.html> (giving summary of reports since 1995).

231. Lowering Miners' Exposure to Respirable Coal Mine Dust, Including Continuous Personal Dust Monitors, 75 Fed. Reg. 64412, (proposed Oct. 19, 2010) (to be codified at 30 C.F.R. 70, 71, 72, 75, 90).

232. MINE SAFETY AND HEALTH ADMIN., END BLACK LUNG ACT NOW!, <http://www.msha.gov/S&HINFO/BlackLung/Homepage2009.asp> (last visited June 3, 2012).

233. Erica Peterson, *MSHA's Proposed Rules Cut Dust Limits, Require Personal Dust Monitors*, WEST VIRGINIA PUBLIC BROADCASTING (Oct. 15, 2010) <http://www.wvpubcast.org/newsarticle.aspx?id=17097>.

234. *Id.*

235. Respirable Coal Mine Dust, Including Continuous Personal Dust Monitors, 75 Fed. Reg. at 64419.

The coal industry has almost uniformly objected to the proposed rule on a number of grounds, which include the assertion that it will not reduce the incidence of black lung:

What evidence does MSHA have to show that the . . . standard that has been used to protect Part 90 miners for the past 40 years is no longer adequate? This appears to be a case of arbitrarily cutting the standard in half, since the proposed standard will be reduced by that amount? The rule also appears to include a variety of 30 C.F.R. Part 75 changes that bear no rational relationship whatsoever to preventing CWP.<sup>236</sup>

A coal industry executive criticized MSHA's black lung proposal in a more strident tone. Mr. Tom Mackall, President of East Fairfield Coal Company, testified:

Workers at businesses we supply will also see their jobs be destroyed if we don't stop the regulatory wave that's crushing the American economy. . . . MSHA has proposed a Respirable Dust Standard that is unachievable in underground mine settings, and continues to be unable to produce the relevant data that they claim creates the causation basis for their rule. Day to day, our company sees the impacts of how MSHA is being used as a tool to stop coal mining.<sup>237</sup>

Just as coal lobbyists were putting their aggressive campaign in opposition to the proposed rule in high gear, a report of the West Virginia Governor's Upper Independent Big Branch Investigation Panel added weight to demands for government action to curtail the return of the

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236. See, e.g., Pa. Coal Ass'n, *Testimony of George Ellis President Pennsylvania Coal Association*, (Feb. 8, 2011), <http://www.pacoalassn.com/news/21-pcas-testimony-given-at-msha-respirable-dust-hearing.html>.

237. Testimony of Tom Mackall, House Subcomm. on Reg. Affairs, Stimulus Oversight & Gov't. Spending, Comm. on Oversight & Govt. Reform, available at [http://oversight.house.gov/images/stories/Testimony/7-14-11\\_Mackall\\_RegAffairs\\_EPA\\_Testimony.pdf](http://oversight.house.gov/images/stories/Testimony/7-14-11_Mackall_RegAffairs_EPA_Testimony.pdf) (July 14, 2011); but see, Celeste Montforton, *No matter what mining industry reps say, MSHA's proposed rule to address black lung is easily achievable*, THE PUMP HANDLE BLOG (July 19, 2011), [http://scienceblogs.com/thepumphandle/2011/07/no\\_matter\\_what\\_mining\\_industry.php](http://scienceblogs.com/thepumphandle/2011/07/no_matter_what_mining_industry.php) ("Respirable dust concentrations at Mr. Mackall's underground coal mines are comparable to the situation nationwide. MSHA's enforcement data indicates that the vast majority of coal mine operators are already complying with the 1.0 milligram standard.").

scourge of black lung to coalfield communities. Autopsies revealed that of the 24 miners whose lungs could be examined, 17 (or 71 percent) had contracted the disease—more than 20 times higher than what was thought to be the average for all underground coal miners.<sup>238</sup>

Most troubling was the fact that, contrary to conventional government and coal industry reports, the disease was not limited to older UBB miners who had been exposed to coal dust during decades of working underground. The autopsies showed that some UBB miners with black lung were as young as 25, and five had been working in coal mines less than ten years.<sup>239</sup> The investigation panel observed that “the victims at UBB constitute a random sample of miners. The fact that 71 percent of them show evidence of CWP is an alarming finding given the ages and work history of these men.”<sup>240</sup>

The Comment period has been extended and MSHA has yet to publish the rule.<sup>241</sup> Notwithstanding the harm—10,000 black lung-related deaths in ten years—to coal miners, their families, and their communities, the coal industry and its supporters continue to successfully block more protective regulation of mining-generated respirable dust. Just in case MSHA decides to move forward with its 2010 regulatory proposal, the House of Representatives majority added a provision to block the agency’s use of appropriated funds to implement new black lung regulations to the 2012 appropriations bill.<sup>242</sup>

Unlike most of the externalized socio-economic and environmental costs of coal, it is possible to put a monetary price on coal mine operators’

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238. GOVERNOR’S INDEPENDENT INVESTIGATION PANEL, *supra* note 186. *See also*, Chris Hamby, *Autopsies of Massey Miners Reveal Black Lung*, HUFF POST GREEN (May 19, 2011), [http://www.huffingtonpost.com/the-center-for-public-integrity/autopsies-massey-miner-black-lung\\_b\\_864174.html](http://www.huffingtonpost.com/the-center-for-public-integrity/autopsies-massey-miner-black-lung_b_864174.html). (reporting that seventeen miners had black lung at “a rate more than 20 times higher than the average for all underground coal miners.”).

239. GOVERNOR’S INDEPENDENT INVESTIGATION PANEL, *supra* note 186.

240. *Id.* at 32.

241. MINE SAFETY & HEALTH ADMIN, PROPOSED RULE; EXTENSION OF COMMENT PERIOD (May 27, 2011), *available at* <http://www.msha.gov/REGS/FEDREG/PROPOSED/2011PROP/2011-13238.asp>.

242. In their FY 2012 appropriations bill, members of the majority party of the House Appropriations subcommittee with jurisdiction over the Labor Department would prohibit MSHA from using any funds to develop, promulgate, enforce or otherwise implement a new rule to protect miners from exposure to respirable coal dust. (See page 36 in the bill.) [http://appropriations.house.gov/UploadedFiles/FY\\_2012\\_Final\\_LHHSE.pdf](http://appropriations.house.gov/UploadedFiles/FY_2012_Final_LHHSE.pdf) (“SEC. 122. None of the funds made available by this Act may be used to continue the development of or to promulgate, administer, enforce, or otherwise implement the Lowering Miners’ Exposure to Coal Mine Dust, Including 22 Continuous Personal Dust Monitors regulation . . . being developed by the Mine Safety and Health Administration of the Department of Labor.”).

externalization of black lung costs. Since 1969, the federal government has administered a compensation program for victims of black lung paid in part by coal company fees.<sup>243</sup> In addition to the price paid by miners themselves, their families, and their communities, the American people have had to bear some of the costs. As Professor Vladeck emphasizes, mine “owners have managed to cap and partially off-load their liability for black lung disease on both the companies that buy coal and the American people.”<sup>244</sup> From 1969 through 2004, black lung benefits paid to almost one million miners have totaled more than \$41 billion.<sup>245</sup>

One commentator emphasizes the time lag in failing to act upon MSHA’s 1995 recommendations that the rising tide of black lung disability be addressed by aggressive action to protect miners’ health. Dr. Celeste Montforton reminds that:

For 15 years, the scientific evidence has been telling us that US coal miners are exposed to levels of respirable dust that cause disease, but under the current federal mine safety regulations, these exposure levels are legal. That needs to change. Not only is it ethically the right thing to do, but it is also the law of the land: “. . . to the greatest extent possible, the working conditions in each underground coal mine are sufficiently free of respirable dust concentrations in the mine atmosphere to permit each miner the opportunity to work underground during the period of his entire adult working life without incurring any disability from pneumoconiosis or any other occupation-related disease during or at the end of such period.”<sup>246</sup>

“In other words,” she writes, “U.S. coal miners should be able to have a long career in an occupation they enjoy, and when they retire, their lungs

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243. See *Usery v. Turner Elkhorn Mining Co.*, 428 U.S. 1 (1976) (highlighting the origins of the black lung program and the system it creates). See also, Donald T. DeCarlo, *The Federal Black Lung Experience*, 26 *How. L. J.* 1335 (1983).

244. Vladeck, *supra* note 214, at 40.

245. *Id.* at 41 (citing testimony of Anne-Marie Lasowski, Acting Director, Education, Workforce, and Income Security Issues, *Federal Compensation Programs: Perspective on Four Programs for Individuals Injured by Exposure to Harmful Substances, Comm. on Judiciary, U.S. House of Representatives*, available at [www.gao.gov/new.items/d08628t.pdf](http://www.gao.gov/new.items/d08628t.pdf)).

246. Celeste Montforton, *No matter what mining industry reps say, MSHA’s proposed rule to address black lung is easily achievable*, THE PUMP HANDLE BLOG (July 19, 2011), [http://scienceblogs.com/thepumphandle/2011/07/no\\_matter\\_what\\_mining\\_industry.php](http://scienceblogs.com/thepumphandle/2011/07/no_matter_what_mining_industry.php) (quoting the Federal Coal Mine Health and Safety Act of 1969, 30 U.S.C. § 841 (2006)).

should be healthy—not scarred and inelastic because of imbedded coal and silica dust.”<sup>247</sup>

The externalization of environmental harm, mine safety injuries and deaths, and the cumulative socio-economic damage attendant to coal mining and burning have long been obscured from public view. Misery and death of coal miners afflicted with black lung disease are other externalized costs that have similarly escaped public attention. In a just society, ten thousand deaths in a decade from a preventable occupational disease is abhorrent. A nation and its politicians properly exalt and honor the sacrifices of men and women in our armed forces; in contrast, they cast a blind eye upon the plight of coal miners who have subsidized the “cheap energy” provided by coal with their lungs and their lives.

#### IV. CLIMATE CHANGE AND COAL: AN HONEST DIALOGUE ABOUT COAL’S EXTERNALITIES AND ITS FUTURE

##### A. *Call For a New Paradigm*

For more than a century, electricity generated by coal combustion has fueled industrialization, improved living standards, and delivered historically unparalleled personal comfort and convenience to people of developed nations, and it promises the same for developing countries. Worldwide concern about climate change has awakened the public to one of the major externalities of coal—the fuel contributes 20% of global greenhouse gas emissions and 41% (11 billion metric tons) of global carbon dioxide emissions, the most common greenhouse gas.<sup>248</sup>

As the overwhelming consensus of climate change scientists revealed the threat of serious implications of continuing to pump greenhouse gas into the earth’s atmosphere, some supporters of Big Coal challenged the science, ridiculing it as a huge hoax. In a 2008 speech to the mining industry, Massey Energy’s former Chairman and CEO Donald Blankenship, a throwback to nineteenth-century coal barons, dismissed concerns about climate change: “They can say what they want about climate

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247. Celeste Montforton, *No matter what mining industry reps say, MSHA’s proposed rule to address black lung is easily achievable*, THE PUMP HANDLE BLOG (July 19, 2011), [http://scienceblogs.com/thepumphandle/2011/07/no\\_matter\\_what\\_mining\\_industry.php](http://scienceblogs.com/thepumphandle/2011/07/no_matter_what_mining_industry.php)

248. Larry Parker, Peter Folger, *Capturing CO2 from Coal-Fired Power Plants: Challenges for a Comprehensive Strategy*, CONGRESSIONAL RESEARCH SERVICE (April 15, 2010), at 1 <http://cnie.org/nle/crsreports/10may/RL34621.pdf>. The world meets 25% of its primary energy demand with coal and that figure is forecast to increase over the next several decades. *Id.*

change . . . But the only thing melting in this country that matters is our financial system and our economy.”<sup>249</sup> Blankenship warned that “[t]he greeniacs are taking over the world . . . and that . . . [i]f [U.S. House of Representatives Speaker] Pelosi thinks that decreasing CO<sub>2</sub> in this country is going to save the polar bears, she’s crazy.”<sup>250</sup> Blankenship concluded his talk with the confident observation that “if CO<sub>2</sub> emissions are going to kill the polar bears, it’s going to happen . . . [w]hat we do here [in the U.S.] is not going to do it.”<sup>251</sup>

In a Labor Day speech to Massey workers, Blankenship said, “we also endure a Mine Safety and Health Administration that seeks power over coal miners versus improving their safety and their health . . . Washington and state politicians have no idea how to improve miner safety. The very idea that they care more about coal miner safety than we do is as silly as global warming.”<sup>252</sup>

In yet another speech to coal industry officials a few months after the Upper Big Branch mine exploded, killing 29 Massey miners, Blankenship accused MSHA of lying and trying to cover up the agency’s culpability for the disaster.<sup>253</sup> Blankenship also generally denied coal’s other serious externalities.<sup>254</sup> He asserted that “coal is the most important thing to the

249. Julia R. Goad, *Coal CEO calls environmentalists crazy*, WILLIAMSON (WV) DAILY NEWS, Nov. 22, 2008 [hereinafter *Coal CEO*]. 10computer08, *The Big Lies of Coal: Don Blankenship Speaks*, YOUTUBE (Dec. 10, 2008), [http://www.youtube.com/watch?v=0M\\_XbeXDNnM](http://www.youtube.com/watch?v=0M_XbeXDNnM) (in the same speech, Blankenship also accused a newspaper editor of being a communist, and asserted that former Vice President Al Gore, U.S. House of Representatives Speaker Nancy Pelosi and U.S. Senate President Harry Reid are “totally wrong” and “absolutely crazy.”).

250. *Coal CEO*, *supra* note 249.

251. *Id.*

252. Joe Romm, *Don Blankenship Called Safety Regulators “As Silly as Global Warming”*, CLIMATE PROGRESS (Apr. 12, 2010, 4:14 PM), <http://thinkprogress.org/romm/2010/04/12/205795/don-blankenship-mine-safety-regulators-silly-global-warming/>.

253. Jessica Y. Lilly, *Blankenship Accuses MSHA of Lying about UBB Investigation*, W.VA. PUB. BROADCASTING (Sep. 22, 2010), <http://www.wvpubcast.org/newsarticle.aspx?id=16746> (“As the keynote speaker at [the 2010] Bluefield Coal Symposium . . . Don Blankenship criticized [MSHA] and its investigation into the Upper Big Branch Disaster. Blankenship compared MSHA’s actions to Watergate . . . [when] . . . President Richard Nixon [tried] to hide recordings of conversations in his office.”). *See also* Howard Berkes, *Mine CEO Points Fingers As He Details Explosion*, NAT’L PUB. RADIO (Nov. 20, 2010), <http://www.npr.org/2010/11/20/131465631/massey-head-points-fingers-as-he-details-explosion> (stating that “Blankenship blamed MSHA for the ventilation problems at Upper Big Branch before the fatal explosion in April . . . he said MSHA’s disaster investigators were essentially investigating themselves given the possibility that failed regulation may have contributed to the tragedy”).

254. A report of an investigation of the Massey UBB mine disaster commissioned by West Virginia’s Governor succinctly summarized the negative reputation Blankenship’s company had earned: Massey is . . . well known for causing incalculable damage to mountains, streams and air in the coalfields; creating health risks for coalfield residents by polluting

environment”<sup>255</sup> and scoffed at charges Massey mines did not put safety first.<sup>256</sup> Blankenship served on the Board of Directors of both the National Mining Association (“NMA”) and the United States Chamber of Commerce. Few among his colleagues spoke publically in support of the Massey Chairman’s views,<sup>257</sup> but neither NMA, the Chamber, nor any other

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streams, injecting slurry into the ground and failing to control coal waste dams and dust emissions from processing plants; using vast amounts of money to influence the political system; and battling government regulation regarding safety in the coal mines and environmental safeguards for communities.

J. Davitt McAteer, et al., *Upper Big Branch, The April 5, 2010 Explosion: A Failure of Basic Coal Mine Safety Practices*, REPORT TO THE GOVERNOR OF WEST VIRGINIA (May 2011), available at <http://www.nttc.edu/ubb>.

255. *Id.* (He stated, “I talk a lot about the total environment. Yes, we need to breathe clean air and have fresh water in the streams. We need to have trees and all that, but we need to be able to send out children to school. That’s a total environment. Most people wouldn’t believe that coal is the most important thing to the environment, but coal produces electricity . . . and that improves the quality of life.”).

256. An in-depth examination of Massey’s mine safety compliance record revealed that during the 10-year time period examined, Massey had been cited for 62,923 violations, including 25,612 considered “significant and substantial.” During that time, MSHA proposed \$49.9 million in fines against Massey, \$15 million more than any other company. Giovanni Russonello, *Massey Had Worst Mine Fatality Record Even Before April Disaster*, INVESTIGATIVE REPORTING WORKSHOP: AM. UNIV. SCHOOL OF COMM’N. (Nov. 23, 2010), <http://investigativereportingworkshop.org/investigations/coal-truth/story/massey-had-worst-mine-fatality-record-even-april-d/>. Admiral Bobby Inman assumed the position of Chairman of Massey Energy upon Blankenship’s retirement; Inman admitted that Blankenship’s claim that Massey always put miner’s safety first was not true:

I had been told by management for years that we had the best safety program in the coal business . . . What [wasn’t] convey[ed] to the board was behavior. The company asked employees, “Do you know the safety rules? Yes. Do you always abide by them?” The answer is no. As we got more deeply into examining our safety performance, we concluded we were not the best.

Joann S. Lublin, *Bobby Inman, A Year Later, Massey Chair Takes Stock*, WALL ST. J., March 28, 2011 [hereafter *Bobby Inman*], <http://online.wsj.com/article/SB10001424052748703410604576217063480492154.html>. See generally, Jeff Goodell, *The Dark Lord of Coal Country*, ROLLING STONE (Dec. 9, 2010, 12:00 PM), <http://www.rollingstone.com/politics/news/the-dark-lord-of-coal-country-20101129>. The independent investigation panel examining the UBB mine explosion found Massey responsible for “total and catastrophic systemic failures” that “can only be explained in the context of a culture in which wrongdoing became acceptable, where deviation became the norm.” GOVERNOR’S INDEPENDENT INVESTIGATION PANEL, *supra* note 186, at 101–02. The GIIP asserted that “the same culture allowed Massey Energy to use its resources to create a false public image to mislead the public, community leaders and investors—the perception that the company exceeded industry safety standards.” The GIIP report concluded that Massey’s corporate deviance from decades of acknowledged safe mining practices could be understood “only in the context of a culture bent on production at the expense of safety.” GOVERNOR’S INDEPENDENT INVESTIGATION PANEL, *supra* note 186.

257. See, e.g., Goodell, *supra* note 256, at 1 (“A hundred executives from the coal industry . . . gathered for a two-day conference on mine safety—a topic that has taken on added urgency since April, when 29 men were killed in an explosion at the Upper Big Branch . . . the worst mining

industry leaders disavowed Blankenship's provocative rhetoric. By the end of 2010, Blankenship's strident anti-regulation voice was silenced when he was forced to retire as Massey CEO and Chairman as a consequence of the impact the Upper Big Branch disaster and an attendant steep decline in the value of Massey shares.<sup>258</sup>

Senator Robert C. Byrd—Big Coal's most consistent champion in Congress for a half century—cautioned politicians and the industry's leaders against Blankenship-type scurrilous attacks. Byrd also urged them to reject the premise underlying Blankenship's brash attacks on environmental groups and government regulators. "When coal industry representatives stir up public anger toward federal regulatory agencies, it can damage the state's ability to work with those agencies to West Virginia's benefit," Byrd said in a public statement titled *Coal Must Embrace The Future*.<sup>259</sup> "This in turn," Byrd emphasized, "may create the perception of ineffectiveness within the industry, which can drive potential investors away."<sup>260</sup> In a statement pointedly directed at Big Coal and its political supporters, Senator Byrd suggested a new paradigm:

To be part of any solution, one must first acknowledge a problem. To deny the mounting science of climate change is to stick our heads in the sand and say "deal me out." West Virginia would be much smarter to stay at the table . . . The 20 coal-producing states together hold some powerful political cards. We can have a part in shaping energy policy, but we must be honest brokers if we have any prayer of influencing coal policy on looming issues important to the future of coal like hazardous air pollutants, climate change, and federal dollars for investments in clean coal technology.<sup>261</sup>

"The time has come," Byrd wrote, "to have an open and honest dialogue about coal's future."<sup>262</sup> Although Senator Byrd sounded a call for Big Coal to change its strategy in response to the new challenges of

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tragedy in 40 years . . . but nobody in the room seems to hold that against Blankenship . . . he is greeted by applause and whistles.")

258. See, *Bobby Inman*, *supra* note 256 (reviewing Blankenship's ouster in favor of Inman).

259. Senator Robert C. Byrd, *Coal Must Embrace The Future* (Dec. 3, 2010), available at <http://e360.yale.edu/images/digest/byrd-coal.pdf> [hereinafter *Embrace the Future*].

260. *Id.*

261. *Id.*

262. *Id.*



system.<sup>265</sup> Such legislation, if enacted, would impose significant costs on carbon emissions. It would, in turn, make alternative fuels more competitive while substantially reducing coal's energy market share.<sup>266</sup> The "war on coal" strategy frames its argument against limiting the externalized costs of coal mining and combustion by charging "elites" in government as "'job killers' who are out of touch with the struggle of the middle class to survive in a time of economic recession and high unemployment."<sup>267</sup>

One commentator who analyzed public relations campaign "framing" of issues found that "many environmental debates—clean coal, climate change, cap and trade, etc.—those against legislation or action to combat CO<sub>2</sub> emissions or change our energy sources in any way, use the threats to capitalism, the American way of life, and our economy to counter any positive/progressive action."<sup>268</sup> Another observer explains that, in the ongoing debate about climate change, opponents of regulation frame the issue as a:

[C]hoice between the earth and the economy, and making clear that the economy comes first. The notion that fixing

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265. Tom Eblen, a columnist covering Kentucky coalfield issues for the *Lexington Herald-Leader* reacted to Big Coal's War on Coal:

Did you hear we are at war? I don't mean the never-ending wars in Iraq and Afghanistan . . . or even the nebulous wars against terrorism and drugs. I mean the "War on Coal." All of Kentucky's politicians are talking about it—at least all of those who want campaign contributions and support from the coal industry. "They have declared war, war on Kentucky's coal industry," U.S. Sen. Mitch McConnell said of the U.S. Environmental Protection Agency in a speech to the Kentucky Coal Association . . . The U.S. Senate's Republican leader claimed the EPA wants to see the "coal industry driven out of business altogether."

Tom Eblen, 'War on Coal' Avoids the Real Challenge, Responsibility, THE BLUEGRASS AND BEYOND (June 12, 2011, 7:51 AM), <http://tomeblen.bloginky.com/2011/06/12/war-on-coal-avoids-the-real-challenge-responsibility/>. Eblen also quotes a Kentucky state legislator bemoaning an imagined assault on the coal industry: "[S]tate Rep. Jim Gooch . . . went even further [complaining] . . . about the EPA's efforts to make coal-fired power plants reduce their air and water pollution. "This is a war on Kentucky," Gooch exclaimed during a hearing, "because what we're talking about is totally destroying our economy." *Id.*

266. Melissa Powers, The Cost Of Coal: Climate Change And The End Of Coal As A Source Of 'Cheap' Electricity, 12 U. PA. J. BUS. L. 407, 409-10 (2010). See also, Energy Info. Admin., Energy Markets and Economic Impacts of H.R. 2454, The American Clean Energy and Security Act of 2009 at 26 (2009) (projecting dramatic reduction in coal production and consumption by 2030 under proposed cap-and-trade program).

267. Elizabeth D'Angel, *Analyzing The Framing Battle Over Coal As An Energy Source*, AGE OF ENGAGEMENT (Apr. 25, 2011), <http://bigthink.com/ideas/38072>. Frames help simplify complex issues. See Matthew C. Nisbet, Dietram A. Scheufele, *What's Next For Science Communication? Promising Directions and Lingering Distractions*, 96 AM. J. BOTANY 1767, 1770 (2009).

268. *Id.*

the climate necessarily means destroying the economy was to become the Big lie of the climate debate and the signature achievement of the opponents of action...Climate campaigners find themselves arguing in vain that the costs, “wouldn’t be as bad” as the opponents claim. *Not that bad* is not that good a strategy, and it [loses] every time.<sup>269</sup>

Identifying Big Coal’s strategy to maintain energy market share is not to suggest that there has been no push-back from environmental and other groups concerned about climate change. On the contrary, coal’s critics have spent tens of millions of dollars during the 2008–2011 period attempting to make the case for slashing the use of greenhouse gas-producing coal to generate electricity.<sup>270</sup> The largest and most effective counter-campaign responding to Big Coal’s strategy is “Reality Coalition,” an alliance of

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269. ERIC POOLEY, *THE CLIMATE WAR: TRUE BELIEVERS, POWER BROKERS, AND THE FIGHT TO SAVE THE EARTH* 91 (Hyperion 2010). There is a distinctly partisan political edge to Big Coal’s claims that the Obama Administration regulatory decisions signal an intent to destroy the coal industry. Prior to the 2010 elections, one political commentator reported that:

Republicans believe there are three words so powerful that they might reshape the political order in an economically beleaguered corner of the country: War on coal. With Democrats holding total control of the federal government and a cap-and-trade bill still looming, the GOP is fanning widespread coal country fears that the national Democratic Party is hostile to the coal mining industry, if not outright committed to its demise.

Jonathan Martin, *GOP Mines Coal-Country Anxieties*, POLITICO, (Feb. 15, 2010) <http://dyn.politico.com/printstory.cfm?uuid=D0FA7CF9-18FE-70B2-A8F0703457EB8629>. See also Julia A. Seymour, *Obama Backs EPA War on Coal, While Networks Ignore Harm to Industry Major utility announces proposal to retire power plants, layoff workers and spend billions to comply with 'pending' regulations* BUSINESS AND MEDIA INSTITUTE, (June 15, 2011), [http://www.mrc.org/bmi/articles/2011/Obama\\_Backs\\_EPA\\_War\\_on\\_Coal\\_While\\_Networks\\_Ignore\\_Harm\\_to\\_Industry.html](http://www.mrc.org/bmi/articles/2011/Obama_Backs_EPA_War_on_Coal_While_Networks_Ignore_Harm_to_Industry.html).

270. See generally MATTHEW C. NISBET, *CLIMATE SHIFT: CLEAR VISION FOR THE NEXT DECADE OF PUBLIC DEBATE* (Am. Univ. Sch. of Comm’n 2011) [hereafter *Climate Shift*], available at [http://climateshiftproject.org/wp-content/uploads/2011/08/ClimateShift\\_report\\_June2011.pdf](http://climateshiftproject.org/wp-content/uploads/2011/08/ClimateShift_report_June2011.pdf). Professor Nisbet identifies the spending of interest groups on climate change and energy-specific activities:

Overall, in 2009, the most recent year for which data is available, the major conservative think tanks, advocacy groups and industry associations . . . spent an estimated \$259 million specific to climate change and energy policy. In comparison, national environmental groups . . . spent an estimated \$394 million on climate change and energy-specific activities. Yet despite these sizable advantages in spending for environmental groups, only 19 percent of the spending by environmental groups specific to climate change and energy policy was unrestricted as part of a 501(c)(4) organization. In comparison, because of the 501(c)(6) tax status of the industry associations, approximately two-thirds of spending by the coalition of advocacy groups opposed to climate action was free to be applied in unlimited amounts to lobbying and direct grassroots mobilization.

*Id.* at iii.

environmental NGOs that promotes alternative forms of energy including wind, solar, and geothermal. The group engages in a campaign to explain the environmental impacts of coal while debunking the claim that clean coal technology is close to becoming a reality. Reality Coalition frames these issues using humor and sarcasm to discredit claims of “clean coal” technology.<sup>271</sup>

For Big Coal and its critics, framing the issues helps to simplify complex issues by lending greater weight to certain considerations and arguments over others and translating why an issue might be a problem, who or what might be responsible, and what should be done.<sup>272</sup> There is, however, a distinct difference between the way environmental and other groups frame issues and the manner in which Big Coal frames its’ “War on Coal” strategy. At bottom, Big Coal frames its strategy to demonize both government regulators who seek to enforce statutory mandates to abate air and water pollution and others who argue for the internalization of costs long borne by coalfield communities, coal miners, and the environment.<sup>273</sup>

Whatever the merits of the strategies of those who would limit the use of coal in our energy future, Big Coal’s assertion that there is a War on Coal seems the antithesis of the “open and honest dialogue about coal’s future” urged by Senator Byrd.<sup>274</sup> Byrd cautioned that “[w]e have our work cut out for us in finding a prudent and profitable middle ground—but we will not reach it by using fear mongering, grandstanding and outrage as a strategy.”<sup>275</sup>

Notwithstanding the fact that there is scientific consensus among experts in the field, some Big Coal interests continue to deny that climate

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271. See CLIMATE REALITY PROJECT, <http://climaterealityproject.org/> (last visited June 3, 2012). Reality Coalition members include Al Gore’s Alliance for Climate Protection, League of Conservation Voters, National Wildlife Federation, Natural Resources Defense Council, and the Sierra Club. Reality Coalition’s most widely discussed TV ad, “Clean Coal: This Is Real” shows a man walking into a “clean coal” power plant—only to find there is no power plant and he finds himself walking through an empty and quiet field. Reality Coalition uses this ad to show that there are no such thing as an operative clean coal facility.

272. See *Climate Shift*, *supra* note 270, at 4.

273. *Id.* Eblen asserts that what Big Coal refers to as a “war”—in reality is an effort to enforce existing law more aggressively than the G.W. Bush Administration (“EPA is enforcing the Clean Air Act by requiring industries to reduce carbon dioxide and other greenhouse-gas emissions that cause climate change. . . . The agency also is trying to curb destructive surface-mining practices and reduce water pollution.”)

274. *Embrace the Future*, *supra* note 259. It is beyond the scope of this essay to analyze and critique the methodology and tactics of those who argue for a major reduction of the use of coal or for a move to a future “carbon-free” energy future. Suffice it to say that “open and honest dialogue” regarding energy policy requires reciprocal candor and sincerity.

275. *Id.*

change is a result of human activity or that it is a credible threat.<sup>276</sup> In addition, while there are those among Big Coal that supported carbon capture and storage and other so-called “clean coal” technologies as essential to coal’s future, most Big Coal interests opposed enactment of cap and trade legislation.<sup>277</sup> Despite Big Coal opposition, the Waxman-Markey bill, containing a framework for a cap and trade system, passed the House loaded with \$60 billion to jump start carbon capture and storage and other “clean coal” initiatives. This enormous subsidy assuring coal’s market share for decades was insufficient to garner Big Coal’s support. The bill ultimately died in the Senate.<sup>278</sup>

Beyond opposing climate change legislation, Big Coal also has aggressively opposed legislative and regulatory proposals to reign in some of coal’s most harmful externalities including black lung, coal combustion waste disposal, mountaintop removal, water pollution, as well as carbon dioxide and other problematic emissions from coal-fired power plants. Set forth below is a sampling of industry leaders’ comments in response to efforts to enforce or strengthen laws to lessen the impact of coal’s externalities that incorporate the “War on Coal” strategy.

In testimony before a congressional committee, Mike Carey, President of the Ohio Coal Association, broadly attacked and derided efforts by EPA,

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276. See, *Statement of Peabody Energy CEO & Chairman Gregory H. Boyce* U.S. HOUSE REP., SELECT COMMITTEE FOR ENERGY INDEPENDENCE AND GLOBAL WARMING, Apr. 16, 2010 (“Peabody filed a detailed petition citing new information as a basis to urge EPA to reconsider its finding that greenhouse gases endanger human health.”); See also Rick Piltz, *Markey Presses Coal CEOs on Climate Change Denialism, Future of the Industry in a Low Carbon Economy*, CLIMATE SCIENCE WATCH Apr. 16, 2010, <http://www.climatesciencewatch.org/2010/04/16/markey-presses-coal-ceos-on-climate-change-denialism-future-of-the-industry-in-a-low-carbon-economy/>.

277. See, Matthew L. Wald, John M. Broder, *Utility Shelves Ambitious Plan to Limit Carbon*, N.Y. TIMES, July 13, 2011, [http://www.nytimes.com/2011/07/14/business/energy-environment/utility-shelves-plan-to-capture-carbon-dioxide.html?\\_r=1&pagewanted=print](http://www.nytimes.com/2011/07/14/business/energy-environment/utility-shelves-plan-to-capture-carbon-dioxide.html?_r=1&pagewanted=print) (according to “Representative Edward J. Markey, Democrat of Massachusetts, co-author of the House climate bill . . . [American Electric Power], the American coal industry and the Republicans who blocked help for this technology have done our economy and energy workers a disservice by likely ceding the development of carbon-capture technology to countries like China.”); See also, Tanya Snyder, *Big Coal Lobbies Cap-and-Trade*, CAPITAL NEWS CONNECTION (Nov. 4, 2009, 5:02 AM), <http://www.pri.org/stories/science/energy/coal-lobbies-cap-and-trade1709.html> (“Even though the bill was weakened, the National Mining Association said it’s not enough . . . ‘[w]e ended up having to oppose the bill,’ [NMA] spokeswoman Carol Raulston said.”).

278. See, *Statement of U.S. House of Representatives Committee on Energy & Commerce, House Passes Historic Waxman-Markey Clean Energy Bill*, June 28, 2009, <http://democrats.energycommerce.house.gov/index.php?q=news/house-passes-historic-waxman-markey-clean-energy-bill>; See also, Darrell Samuelsohn & Coral Davenport, *Democrats Pull Plug on Climate Bill*, POLITICO, July 22, 2010, <http://www.politico.com/news/stories/0710/40109.html>.

OSM, and MSHA to enforce the Clean Water, Clean Air, Surface Mining Control, and Reclamation and Resource Conservation and Recovery Acts:

The Obama Administration and its allies have declared war on coal across Appalachia. We are ground zero for the fundamental overreach of the Obama regulatory agenda. [T]he . . . Administration wants to shut down Eastern coal, forcing our power plants to be either redesigned or shut down[,] . . . lead[ing] to a massive increase in utility prices across the Midwest [and] . . . coal miners put out of work[;] . . . we are talking about thousands of more workers across the manufacturing sector losing their jobs, too. This will cause massive relocation of our citizens to other states with those left behind becoming totally dependent on the federal government.<sup>279</sup>

Under the general rubric of responding to the Obama Administration's "War on Coal," Carey attacked EPA for its regulatory initiatives under the Clean Air Act ("CAA") to strengthen standards for particulate matter, CO<sub>2</sub>, ozone, and Maximum Achievable Control Technology (MACT) emissions standards. EPA's intent in imposing those standards was to regulate greenhouse gases and other pollutants under the CAA and coal combustion wastes under RCRA. Carey also attacked the EPA and the Department of the Interior for its proposals to limit adverse impacts of mountaintop removal strip mining and MSHA's proposals to reduce respirable dust in underground mines that causes black lung.<sup>280</sup>

In April 2010, Greg Boyce Peabody Energy Chairman and CEO, testified before a subcommittee of the House of Representatives Select Committee on Energy Independence and Global Warming.<sup>281</sup> Boyce

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<sup>279</sup> *EPA Mining Policies: Assault on Appalachian Jobs Part II: Hearing Before the Subcomm. on Water Res. and Env't of the H. Comm. on Transp. and Infrastructure*, 112<sup>th</sup> Cong. 1-2 (2011) (Testimony of Mike Carey, President Ohio Coal Association) available at <http://Republicans.transportation.house.gov/Media/file/TestimonyWater/2011-05-11%20Carey.pdf>. Mr. Carey also has said: "We stand by our principals . . . as we always have and as we always will . . . You vote for cap and trade, you vote against coal—period, dot, end of story . . . The coal industry will continue to oppose misguided climate change legislation and costly regulations that hurt not just our own nation, but the rest of the world as well." See Martin, *supra* note 269. *But see*, Brad Woods, Jason Gordon, *Mountaintop Removal and Job Creation: Exploring the Relationship Using Spatial Regression*, 101 ANNALS OF ASS'N OF AM. GEOGRAPHERS 806 (2011) (researchers "found no supporting evidence suggesting [mountaintop removal mining] contributed positively to nearby communities' employment").

<sup>280</sup> *Id.*

<sup>281</sup> Patrick Reis, *Coal Executives Split on Carbon Caps*, *Climate Science*, N.Y. TIMES, Apr 15, 2010, available at <http://www.nytimes.com/gwire/2010/04/15/15greenwire-coal-executives-split-on->

asserted that “to move carbon capture technology forward, the federal government should assume responsibility for carbon storage and fund emissions reductions research.”<sup>282</sup> Boyce “blasted the House-passed energy and climate bill that would put a price on carbon emissions,” telling the committee that Congress should wait until carbon capture and storage technology is available before it regulates carbon.<sup>283</sup> The Peabody Energy Chairman also told the committee that his company wanted EPA to revisit its determination that carbon emissions endanger human health. When asked, he declined to say that human actions are causing global warming.<sup>284</sup>

With regard to coal combustion waste, the American Coal Council has argued that “the chemical make-up of coal ash is the same as what you would find in every day retail products and natural materials—like the soil in your back yard.”<sup>285</sup> The Council rejects “claims that CCPs are ‘toxic’” because those claims “ignore basic scientific facts.”<sup>286</sup> Kentucky Coal Association President, Bill Bissett, accused the EPA of “using public outrage over a recent and regrettable incident in Tennessee along with inaccurate science to further their political agenda and continue their war against coal.”<sup>287</sup> Bissett asserted: “Time and time again, the EPA has deemed coal ash to be non-hazardous waste[;] . . . EPA’s proposed rule is a continued pursuit of radical environmental policies by individuals who attack coal but do not offer any realistic alternatives.”<sup>288</sup>

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carbon-caps-climate-s-57111.html. Boyce’s testimony is available at <http://globalwarming.house.gov/files/HRG/041410futureCoal/Boyce.pdf>.

282. *Id.*

283. *Id.*

284. Reis, *supra* note 281.

285. American Coal Council, Coal Ash-Coal Combustion Products, available at <http://americancoalcouncil.org/displaycommon.cfm?an=1&subarticlenbr=129>. The American Coal Council’s board of directors includes executives of many major coal producers and power companies including The Southern Company, Arch Coal, Peabody Energy, American Electric Power, and Progress Energy. It is reasonable to ask how one can engage in an honest dialogue about the potential hazards of CCW while asserting that federal regulators and concerned citizens ignore basic scientific facts and the waste containing arsenic and other toxic components is like “soil in backyards.” Whether or not Big Coal’s position on CCW is ultimately borne out by objective science, its flat denial of any serious concern is evidence of the same tin-ear insensitivity to concerns of affected families and communities that has plagued Big Coal’s reputation for more than a century.

286. *Id.* See also, Federation for American Coal, Energy and Security, Rally Against EPA’s War on Coal in Louisville, Sept. 28, 2010, available at <http://www.facesofcoal.org/index.php?rally-against-epas-war-on-coal-in-louisville>.

287. Sheldon Compton, *Both Sides Rally Over Coal Ash*, FLOYD COUNTY TIMES, Sept. 28, 2010, [http://www.floydcountytimes.com/view/full\\_story/9730662/article-Both-sides-rally-over-coal-ash](http://www.floydcountytimes.com/view/full_story/9730662/article-Both-sides-rally-over-coal-ash).

288. *Id.* In contrast to Big Coal’s assertions, EPA has documented cases of damage relating to CCW disposal; CCW is referred to by EPA as “coal residual waste” but the meaning is the same. See, Hazardous and Solid Waste Management System; Identification and Listing of Special Wastes; Disposal

As discussed above, MSHA proposed a rule in 2010 to limit underground miners' exposure to coal dust in an effort to reduce the rising incidence of black lung that resulted in the deaths of 10,000 coal miners over a decade.<sup>289</sup> The proposal would cut the existing ambient respirable dust standard in half, require use of personal dust monitors providing instantaneous data, impose more strict dust sampling requirements, and increase medical monitoring of miners.<sup>290</sup>

The coal industry quickly rejected MSHA's black lung initiative.<sup>291</sup> George Ellis, president of the Pennsylvania Coal Association, said the current black lung dust standard was "more than adequate."<sup>292</sup> When asked why miners continue to be diagnosed with black lung he said: "There could be other issues besides [coal dust exposure]. It could be age or

of Coal Combustion Residuals from Electric Utilities, 75 F. Reg. 35128, 35143 (proposed Jun. 21, 2010) [hereafter "EPA Proposed CCW Regulations"] ("[i]n total, EPA has documented 27 cases of proven damages and 40 cases of potential damages resulting from the disposal of CCRs. Proven damage cases have been documented in 12 states, and potential damage cases--in 17 states"). An EPA draft risk assessment suggests that there are legitimate concerns that the toxic constituents (particularly arsenic and selenium) of CCW have the potential to harm public health and to contaminate surface and groundwater. See RTI, Human and Ecological Risk Assessment of Coal Combustion Wastes, 4-39-4-40, (Aug. 6, 2007) (Draft EPA document), available at [http://www.pineswater.org/EPA\\_ccw\\_risk.pdf](http://www.pineswater.org/EPA_ccw_risk.pdf). See also LINDA LUTHER, REGULATING COAL COMBUSTION WASTE DISPOSAL: ISSUES FOR CONGRESS 9 (Cong. Research Serv. 2010) available at <http://www.fas.org/sgp/crs/misc/R41341.pdf>. EPA has proposed rules that would strengthen requirements for CCW as solid waste under Title D of RCRA, or in the alternative to regulate it as a hazardous waste under Title C of RCRA. See EPA Proposed CCW Regulations. *Id.*

289. See Lowering Miner's Exposure to Respirable Coal Mine Dust, Including Continuous Personal Dust Monitors, 75 Fed. Reg. 64412, 64412 (proposed Oct. 19, 2010) (to be codified at 30 C.F.R. §§70, 71, 72, 75, 90); Laura Walter, *MSHA Issues Proposed Rule on Lowering Miners Exposure to Respirable Coal Dust*, EHS TODAY (Oct. 25, 2010, 1:42 PM), <http://ehstoday.com/standards/MSHA/msha-proposed-rule-respirable-coal-dust-3258/>.

290. Walter, *supra* note 289.

291. *Operators Give Coal Dust Proposal Chilly Reception*, RESOURCE FOR SAFETY, HEALTH, ENVIRONMENTAL LAW AND CRISIS MANAGEMENT NEWSLETTER (Patton Boggs LLC), July 2010, at 4, available at [http://www.pattonboggs.com/newsletters/insights/Release/insights\\_2011\\_07.htm#4](http://www.pattonboggs.com/newsletters/insights/Release/insights_2011_07.htm#4). The Patton Boggs law firm, which represents some major U.S. coal producers including Massey Energy and its' successor Alpha Natural Resources reported that:

during an extended comment period [in June 2011] coal operators and their allies objected to the proposal, calling it unnecessarily detailed and complex. Worse, they contended that it does not address the real problem, which they believe to be crystalline silica, not coal dust, and allege the proposal, if finalized, would cause major disruptions. They scoffed at MSHA's economic impact analysis and said the disruptions alone would far exceed MSHA's estimate of the annual cost of the proposal.

*Id.*

292. PA. COAL ASS'N, *Testimony of George Ellis President Pennsylvania Coal Association*, (Feb. 8, 2011), <http://www.pacoalassn.com/news/21-pcas-testimony-given-at-msha-respirable-dust-hearing.html>.

predisposition; maybe they're a smoker.”<sup>293</sup> Appearing at a hearing on the MSHA proposed black lung regulations, Chris Hamilton, senior vice president of the West Virginia Coal Association, said the companies he represents “strongly object to the proposal in its current form.” He added that the proposal was “fraught with technical and operational impracticalities, misapplication of dust control technologies,” and “relies on an inappropriate, convoluted or uneven enforcement scheme.”<sup>294</sup> Consistent with the “War on Coal” strategy of the many Big Coal interests, Hamilton asserted that the coal industry is “clearly under attack by the Obama administration.”<sup>295</sup>

From the above examples, several themes of Big Coal’s war strategy may be discerned: (1) obfuscation and denial of coal’s serious negative impacts, (2) orchestrated attacks on those who argue for internalization of costs of mining and burning coal, and (3) use of threats of economic doom for coalfield families and communities if the “War on Coal” is lost to “extremist” government regulators and environmentalists.

There are, however, some Big Coal leaders who recognize the value of a new paradigm and are open to honest and open dialogue about coal’s future. They agree that protecting the environment, communities, and miner health and safety constitutes good public policy. For example, CONSOL Energy President and CEO, Brett Harvey, has staked out a refreshingly enlightened position on coal mine safety, arguing to other industry leaders that zero injuries in U.S. coal mines is a realistic goal.<sup>296</sup> In a speech to the Utah Mining Association in August 2007, Brett Harvey stated:

We need to change the paradigm and we need to change it  
now . . . What industry must change is our incremental

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293. Chris Hamby, *Autopsies of Massey Miners Reveal Black Lung*, HUFF POST GREEN (May 19, 2011), [http://www.huffingtonpost.com/the-center-for-public-integrity/autopsies-massey-miner-black-lung\\_b\\_864174.html](http://www.huffingtonpost.com/the-center-for-public-integrity/autopsies-massey-miner-black-lung_b_864174.html).

294. Taylor Kuykendall, *MSHA holds hearing on mine dust rules*, REGISTER-HERALD Dec. 8, 2010, available at <http://www.register-herald.com/todaysfrontpage/x713545623/MSHA-holds-hearing-on-mine-dust-rules>.

295. *Id.* Hamilton told those attending the MSHA hearing on the proposed regulations that the industry is committed to reducing incidence of black lung by creating “lowest possible” concentrations of coal dust in the mines, but MSHA’s cost estimates were greatly “off the mark . . . and woefully understated,” Hamilton placed the expense of increased dust monitoring at more than \$75 million annually for underground operators as opposed to MSHA’s calculated cost of under \$40 million. He warned that the total cost of compliance would exceed \$1 billion. *Id.*

296. Consol ranked fifth among U.S. coal producers in 2009 according to the U.S. Energy Information Administration. U.S. ENERGY INFO. ADMIN., Major U.S. Coal Producers (2009), available at <http://www.eia.doe.gov/cneaf/coal/page/acr/table10.html>.

approach to safety improvement because it creates an unintended level of tolerance to accidents . . . . We will start with the premise that our normal state of operation is no accidents. An accident is an abnormality that is unacceptable. Accidents are an exception to our core values. Our approach means safety trumps everything else we do. It trumps production, it trumps profits, it trumps all other rules, policies or procedures . . . I firmly believe it is possible for CONSOL to achieve “zero-accidents” performance at every CONSOL facility and we intend to achieve those results within the next five years.<sup>297</sup>

Preston Chiaro, Group Executive of Rio Tinto, the largest diversified mining company in the United States, also testified at the April 2010 House Select Committee hearing. The Rio Tinto executive demonstrated a willingness to engage in honest dialogue and, in so doing, showed that Big Coal is not monolithic. Chiaro told the Select Committee that “[o]ur own experience as a company has been that constructive participation in the policy process can yield positive outcomes on the issues which are most important to us.”<sup>298</sup> He told those present that “Rio Tinto ha[d] recognized that human carbon emissions [had been] causing global warming since the mid-1990s.”<sup>299</sup>

In May 2011, EPA proposed Maximum Achievable Control Technology (“MACT”) rules pursuant to the Clean Air Act’s section 112(d) national emission standards for hazardous air pollutants (“NESHAP”) mandate. The proposed rule would require reduction of emissions by coal and oil-fired power plants of mercury, other metallic toxics, acid gases, and organic air toxics.<sup>300</sup>

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297. Brett Harvey, Keynote Address, Utah Mining Association 92nd Annual Meeting Park City, Utah (Aug. 23, 2007), *available at* <http://www.consolenergy.com/Newsroom/Speech5.aspx>.

298. Mr. Chiaro, Testimony *available at* <http://globalwarming.house.gov/files/HRG/041410futureCoal/Chiaro.pdf>.

299. *Id.*

300. 77 Fed. Reg. 9304 (Feb 16, 2012). (Final EPA Mercury and Air Toxics Standard). *See*, National Emission Standards for Hazardous Air Pollutants From Coal and Oil-Fired Electric Utility Steam Generating Units, 76 Fed. Reg. 24,976, 25,147 (proposed May 3, 2011) (to be codified as 40 C.F.R. pts. 60 & 63). Emissions from oil and coal-fired power plant include mercury and arsenic, acid gases, and particles, that can have adverse impacts on human health including neurological damage, cancer, lung damage, heart and respiratory disease. The benefits of garnered by the emissions reductions reducing mandated by the MACT rule amount to fifty nine to one hundred and sixty billion dollars per year according to EPA projections. The agency calculates that five to thirteen dollars of benefits will be derived for every dollar spent on pollution controls. BIPARTISAN POLICY CENTER, ASSESSMENT OF EPA’S UTILITY MACT PROPOSAL [hereafter *MACT Assessment*], *available at*

While most Big Coal entities opposed the rule, Exelon Corporation and The Clean Energy Group, which includes PG&E and other major utility companies, supported it.<sup>301</sup> In comments on the proposal, Exelon Corporation urged the agency “to implement the rule largely as proposed and to do so as quickly as possible.”<sup>302</sup> The MACT proposal would require reduction of emissions by coal and oil-fired power plants of mercury, other metallic toxics, acid gases, and organic air toxics.<sup>303</sup> Promising to “continue to work with U.S. EPA to support regulations to further improve regional air quality and modernize the nation’s power generation infrastructure,” Exelon comments stated that the “lack of a national standard for toxic emissions continues to be a barrier to investment in new, cleaner generation capacity.”<sup>304</sup> Explaining the Clean Energy Group’s support for the rulemaking, a consultant maintained that:

Complying with the two proposed rules will require significant planning, effort, and investments by the electric sector. However, given that the electric industry has made significant investments to reduce emissions in the past decade and that proven and commercially available control technologies exist, even companies with large coal fleets should be able to comply with the proposed rules in a timely and cost-effective manner. Evidence supports that the electric industry can maintain reliability while complying with EPA’s air rules.<sup>305</sup>

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<http://www.bipartisanpolicy.org/sites/default/files/Q&A%20Assessment%20of%20MACT%20Rule.pdf>. See also, Neela Banerjee, *EPA Issues Strong Limits on Mercury Emissions from Smokestacks*, (L.A. TIMES, Dec. 21, 2011), available at <http://articles.latimes.com/2011/dec/21/local/la-me-gs-epa-mercury-20111221>

301. THE CLEAN ENERGY GROUP MEMBER COMPANIES, <http://www.thecleanenergygroup.com/cegcompanies.asp> (last visited June 3, 2012) (providing a complete list of The Clean Energy Group’s member’s). The group describes itself as including “major electric generating and electric distribution companies with operations throughout the United States.” *Id.*

302. *Comments Of Exelon Corporation On Proposed Clean Air Transport Rule*, Docket ID No. EPA-HQ-OAR-2009-0491 (October 1, 2010), available at [http://www.exeloncorp.com/assets/performance/docs/comments\\_EXC\\_CrossStateAirPollution.pdf](http://www.exeloncorp.com/assets/performance/docs/comments_EXC_CrossStateAirPollution.pdf).

303. *MACT Assessment*, *supra* note 300. See, M. Houyoux, M. Strum, Memorandum: Emissions Overview: Hazardous Air Pollutants in Support of the Final Mercury and Air Toxics Standard, (EPA-454/R-11-014, November, 2011). available at <http://www.epa.gov/mats/pdfs/20111216EmissionsOverviewMemo.pdf>

304. *Comments Of Exelon Corporation*, *supra* note 302.

305. *Coal’s Path to Timely Compliance—Plenty of Proven Options*, XIV ENVIRONMENTAL ENERGY INSIGHTS (2011), at 4 [https://www.mjbradley.net/\\_sis/documents//EPTS/Control\\_Tech.pdf](https://www.mjbradley.net/_sis/documents//EPTS/Control_Tech.pdf).

There are major coal companies engaged in underground and surface mining that indicate a commitment to environmental compliance and stewardship. Among them is Alpha Natural Resources, which acquired corporate scofflaw Massey Energy in June 2011. With that acquisition, Alpha became the second biggest U.S. coal company by market capitalization and the leading producer of metallurgical coal. Alpha controls the second largest coal reserves (5.1 billion tons).<sup>306</sup> The management of Alpha Natural Resources promises leadership on environmental, mine safety, and other issues. Representative of this corporate policy is a statement prominently placed on its website:

Our commitment to environmental stewardship . . . extends across all facets of our mining operations. . . . Our highly trained team of environmental professionals perpetually measures the company's environmental compliance. We take pride in environmental awareness and repeatedly operate at a higher level of compliance than other mining companies in the Appalachian region. Alpha also has a zero tolerance for blackwater discharges and has established a release prevention program that exceeds regulatory requirements. All of our coal preparation plants and slurry handling and disposal facilities are required to utilize Best Management Practices that help us to prevent accidental discharges of coal slurry that could adversely impact the environment.<sup>307</sup>

Alpha Natural Resources, however, is a member of both the U.S. Chamber of Commerce and the National Mining Association, organizations closely tied to Big Coal's War strategy. In replacing Massey Energy's blighted management, Alpha has a unique opportunity to heed Senator Byrd's advice to move beyond the War on Coal rhetoric by choosing to be "an honest broker" by attempting to "influence coal policy on . . . issues important to the future of coal like hazardous air pollutants, climate change, and federal dollars for investments in clean coal technology."<sup>308</sup>

There is no doubt that there are enlightened leaders in the coal and power industries who recognize that there are alternatives to a war on coal

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306. Michael Erman, Ann Sapir, *Alpha Agrees to Buy Massey Energy for About 7.1 Billion*, REUTERS, Jan. 1, 2011, <http://www.reuters.com/article/2011/01/30/us-alpha-massey-idUSTRE70S0PC20110130>.

307. ALPHA NATURAL RESOURCES, COMMITMENT TO OUR ENVIRONMENT, <http://www.alphanr.com/environment/Pages/OurCommitment.aspx>, (last visited June 3, 2012).

308. *Embrace the Future*, *supra* note 259.

strategy of denial, obfuscation, and attack. Whether those leaders will emerge and push Big Coal in the direction of honest dialogue remains to be seen. No doubt the War on Coal strategy may, in the short term, prove successful in repelling legislative and regulatory initiatives intended to reduce Coal's many externalities. The entities comprising Big Coal will ignore the advice of Senator Byrd at their own peril. Indeed they need to look no further than the direction of the energy markets for a hint of what the future holds for an industry unwilling to engage in a truly honest and open dialogue about its future.

### *C. The Energy Markets*

While many Big Coal leaders and lobbyists rail against the so-called "War on Coal" allegedly being waged by EPA, MSHA, and environmental groups, the markets appear to be sorting out fact from fiction. The federal Energy Information Agency "reference case" outlook for 2011 through 2035 projects a relatively flat market for coal and a minimal drop in the mineral's market share:

Despite rapid growth in generation from natural gas and nonhydropower [sic] renewable energy sources, coal continues to account for the largest share of electricity generation. Assuming no additional constraints on CO<sub>2</sub> emissions, coal remains the largest source of electricity generation in the [American Energy Outlook 2011] Reference case because of continued reliance on existing coal-fired plants. EIA projects few new central-station coal-fired power plants, however, beyond those already under construction or supported by clean coal incentives. Generation from coal increases by 25 percent from 2009 to 2035, largely as a result of increased use of existing capacity; however, its share of the total generation mix falls from 45 percent to 43 percent as a result of more rapid increases in generation from natural gas and renewables over the same period.<sup>309</sup>

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309. *Outlook 2011*, *supra* note 99, at 3. The EIA reference case outlook also projected growth in the natural gas sector. *Id.* ("The role of natural gas grows due to low natural gas prices and relatively low capital construction costs that make it more attractive than coal. The share of generation from natural gas increases from 23 percent in 2009 to 25 percent in 2035"). Some commentators downplay the reliability of EIA energy forecasts. EIA's "reference case" projections, it is said, assume normal inventories, weather, as well as laws and regulations that won't change during the period of forecast.

Looking forward at the economics of energy over the next few decades, other commentators find coal's future clouded in differing degrees. For example, one power industry analyst opined that:

[C]oal looks solid for the next couple of years. But there is an eerie resemblance between the current coal project pipeline and what we saw in the late 1970s and 1980s with nuclear plants: It's a pipeline in the process of emptying. The EIA's Annual Energy Outlook also points to this phenomenon, showing a gradual but significant market share decline for coal-fired electricity by the middle of this decade, rebounding a bit by 2035. The EIA says, "With slow growth in electricity demand, little new coal-fired capacity is added, and the coal share falls from 48 percent in 2008 to 44 percent in 2035."<sup>310</sup>

More serious concerns have been expressed at the beginning of the second decade of the twenty-first century:

The headline news for the coal industry in 2010 was what didn't happen: Construction did not begin on a single new coal-fired power plant in the United States for the second straight year. This in a nation where a fleet of coal-fired plants generates nearly half the electricity used. But a combination of low natural gas prices, shale gas discoveries, the economic slowdown and litigation by environmental groups has stopped - at least for now - groundbreaking on new ones.<sup>311</sup>

The global head of asset management at Deutsche Bank was more blunt in his assessment of coal's future. The Bank's Kevin Barker asserted "Coal is a dead man walkin' . . . [b]anks won't finance them. Insurance companies

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Reference case forecasts, they argue, do not necessarily reflect EIA's view of the "most likely" market outcome. "In fact, the EIA does not assign probabilities to any of the forecasts it generates, so the "high economic growth case" forecast might be considered just as likely as the "reference case" or even "low economic growth case" forecast, for example." MARK BOLINGER & RYAN WISER, LAWRENCE BERKELEY NATIONAL LABORATORY, THE VALUE OF RENEWABLE ENERGY AS A HEDGE AGAINST FUEL PRICE RISK: ANALYTIC CONTRIBUTIONS FROM ECONOMIC AND FINANCE THEORY, at 8-9, available at <http://escholarship.org/uc/item/65g8f2t4>.

310. Kennedy Maize and Robert Peltier, *The U.S. Power Industry 2011: The Sequel*, POWER JAN 1, 2011, [http://www.powermag.com/gas/The-U-S-Power-Industry-2011-The-Sequel\\_3293.html](http://www.powermag.com/gas/The-U-S-Power-Industry-2011-The-Sequel_3293.html).

311. Steven Mufson, *Coal's Burnout: Have Investors Moved on to Cleaner Energy Sources?*, WASH. POST, Jan. 1, 2011, available at [http://www.washingtonpost.com/wp-dyn/content/article/2011/01/01/AR2011010102146\\_pf.html](http://www.washingtonpost.com/wp-dyn/content/article/2011/01/01/AR2011010102146_pf.html).

won't insure them. The EPA is coming after them. . . . And the economics to make it clean don't work."<sup>312</sup> In an October 2011 white paper, Bank analysts projected a very different scenario than did the Energy Information Agency. Deutsche Bank forecast that coal's U.S. market share of energy for production of electricity would drop from 45% in 2010 to 20% in 2030, while natural gas would capture 38% of the market by 2030, rising from a 24% share in 2010.<sup>313</sup>

On the positive side for the coal industry, the rapidly expanding demand for electricity in industrializing countries like China and India is viewed by Big Coal as creating significant new markets for North American steam and metallurgical coal.<sup>314</sup> However, the optimism over these new markets is tempered by analysts who see the U.S. coal industry's efforts to develop Asian markets as an indication that the domestic coal market is troubled.<sup>315</sup> A University of Wyoming coal expert explained:

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312. *Id. See*, Mark Fulton, et al., *Repowering America: Creating Jobs* (Deutsche Bank Rept., Oct., 2011), *citing*, Sierra Club list of 154 cancelled power plants in less than a decade, *available at* <http://www.sierraclub.org/environmentallaw/coal/plantlist.aspx>. Uncertainties over the cost of mandated CO<sub>2</sub> emission reduction, rising power plant construction costs, state and local decisions to move away from coal-fired power, environmental group litigation and growing public opposition to coal combustion as a favored fuel linked as competition from unconventional natural gas and renewables increased led to predictions that financing coal-fired power plants will become increasingly difficult over time. Those predictions have proven true, at least over the short term. *See*, Interfaith Center On Corporate Responsibility, *Don't Get Burned: The Risks Of Investing In New Coal-Fired Generating Facilities*, at 9 (2008). <http://www.synapse-energy.com/Downloads/SynapseReport.2008-02.GRACE.Don't-Get-Burned-Risks-of-New-Coal.07-014.pdf>. Union of Concerned Scientists, *A Risky Proposition: The Financial Hazards of New Investments in Coal Plants*, *available at* [http://www.ucsusa.org/clean\\_energy/technology\\_and\\_impacts/impacts/financial-hazards-of-coal-plant-investments.html](http://www.ucsusa.org/clean_energy/technology_and_impacts/impacts/financial-hazards-of-coal-plant-investments.html) *available at* [http://www.dbcca.com/dbcca/EN/\\_media/DB\\_Repowering\\_America\\_Creating\\_Jobs.pdf](http://www.dbcca.com/dbcca/EN/_media/DB_Repowering_America_Creating_Jobs.pdf).

313. The Bank's analysis also projected that nuclear's market share would drop from 19% to 17% by 2030, while intermittent (wind and solar) and baseload renewables (geothermal and hydro) would increase their market share from eleven percent in 2010 to 24% in 2030. The Bank's analysts acknowledged that "our low carbon fuel forecast is clearly not a consensus view when contrasted to the EIA's base case generation mix forecast for 2020 and 2030 . . . EIA expects coal to maintain share through 2030 at about 43%, whereas we are much more optimistic about growth in natural gas generation in particular but also growth in renewables." *Id. See also*, Henry D. Jacoby, et al., *The Influence of Shale Gas on U.S. Energy and Environmental Policy*, 1 *ECONOMICS OF ENERGY & ENVIRONMENTAL POLICY*, at 1 (2012), ("shale gas is shown both to benefit the national economy and to ease the task of emissions control. However, in treating the shale as a "bridge" to a low carbon future there are risks to the development of technologies, like capture and storage, needed to complete the task.") *available at* [http://globalchange.mit.edu/files/document/MITJPSPGC\\_Reprint\\_12-1.pdf](http://globalchange.mit.edu/files/document/MITJPSPGC_Reprint_12-1.pdf)

314. Dustin Bleirzeffer, *Coal Seeks Exports to Asia While U.S. Market Falters*, WYOFILE (Oct. 18, 2011), <http://wyofile.com/2011/01/coal-policy> ("In a prepared statement in October, Peabody chairman and CEO Gregory H. Boyce said, 'Peabody believes that the global coal industry is in the early stages of a long term supercycle, led by China and India.'")

315. *Id.*

[T]here's very little progress in the build-out of the coal-gasification and carbon sequestration technologies that are seen as essential to preserving Wyoming's coal industry in a future energy regime that forces nations to curb greenhouse gas emissions and become more energy independent. While it focuses on serving the burgeoning Asian market, the coal industry remains dead-set against implementing a cap-and-trade policy or any other market-driven carbon emission reduction policy in the U.S. 'It's evidence there's lack of confidence that the coal market for power generation in the U.S. will be vibrant for the future.'<sup>316</sup>

It is clear that the future of coal is in the process of being decided by market forces. It is axiomatic that the energy market is motivated by the profit/cost differentials. Coal's many externalities are, for the first time, being intensely examined as it seeks to compete with other fuels and sources for market share. Big Coal has reached the most significant crossroads in its history as a major fuel source. The positions and policies it advocates will be judged by economists and policy makers. Big Coal eschews objective discourse of its externalities at its peril.

#### CONCLUSION

As historian Barbara Freese asserted, coal may be seen by some as a gift from God that provides undeniable good and by others as an evil with extraordinary costs. She warns against "failing to recognize both sides of coal." The above discussion examines the history of coal in the United States focusing on recognition of its' many negative externalities that have largely been long obscured or ignored by a country hungry for cheap electricity.

Notwithstanding that history, the "War on Coal" campaign of the fuel's supporters embraces only coal's positive side while essentially ignoring the enormous costs that accompany coal mining and combustion. Big Coal leaders have adopted a strategy of continuing to obfuscate the fact of the industries' externalities while stridently attacking critics. In advancing its War on Coal meme, Big Coal has chosen to ignore Senator Byrd's warning that "using fear mongering, grandstanding and outrage as a strategy . . . can

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316. *Id.* (quoting, Mark Northam, director of the University of Wyoming's School of Energy Resources).

drive potential investors away.”<sup>317</sup> In the Twenty-First Century, it is unlikely that such a strategy will be successful in securing Coal’s future in America’s energy mix. There are simply too many competitors, too many critics, too many victims, and too many peer-reviewed studies and internet-accessible facts documenting Coal’s externalities.

Externalities and all, there is no doubt coal will be mined and burned both at home and abroad for decades to come. Metallurgical-grade Appalachian coal will be needed to make steel, and steam coal from Eastern and Western coalfields will continue to be used to generate electricity well into the future. The extent of coal’s contribution to that mix has yet to be determined. For the industries involved, the proportion of Big Coal’s market share is what is really at stake.<sup>318</sup> Some coal companies have hedged their bets, moving aggressively into shale gas and renewables.<sup>319</sup> Some power companies have begun to move aggressively into renewables and energy conservation.<sup>320</sup>

Arguments for the continued use of coal have appeal. There may be national security benefits of having coal provide a substantial part of a nation’s energy needs. Coal has the potential to reduce national reliance on oil whose market price-per-barrel spiked to stratospheric levels in 2008 and

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317. *Embrace the Future*, *supra* note 259.

318. See, Sonja Elmquist, *Appalachian Coal Fights for Survival on Shale Boom: Commodities*, (BLOOMBERG NEWS, Mar. 21, 2012) (“[c]oal mining in Appalachia . . . the latest threat is booming shale-gas production. U.S. power utilities are favoring natural gas, which is trading at its cheapest in a decade . . . [c]onsumption of coal to generate electricity will fall 5 percent in 2012 to less than 900 million tons, a 16-year low, according to the U.S. Energy Information Administration.”) available at <http://www.bloomberg.com/news/2012-03-21/appalachian-coal-fights-for-survival-on-shale-boom-commodities.html>

319. For example, leading coal producer Consol Energy has moved to greatly expand its natural gas reserves and production capacity, positioning itself as an energy industry leader among diversified energy companies with a balanced portfolio of both coal and natural gas. See Consol Energy, *News Release*, (Mar. 13, 2010), <http://phx.corporate-ir.net/phoenix.zhtml?c=66439&p=irol-newsArticle&ID=1402230&highlight=> (“In addition to bolstering our gas platform, this transaction will also result in a more balanced energy portfolio, improving the Company’s risk profile and positioning it to deliver sustainable long-term growth and increased value to shareholders . . . [a]s we expand our natural gas production, we remain fully committed to utilizing state-of-the-art exploration and production techniques, which enable us to operate efficiently, safely and compatibly with the environment.”).

320. See Jim Rogers, *Duke Energy Is Committed To Renewables - In The Right Way*, CHARLOTTE OBSERVER, Sept. 28, 2011 (describing Duke Energy’s large investment in renewable energy). See also, Marc Roca, *Clean-Energy Investment Rises Annual 16% in Quarter, BNEF Says*, BLOOMBERG (Oct. 13, 2011, 8:31 AM), <http://www.bloomberg.com/news/2011-10-13/clean-energy-investment-rises-annual-16-in-quarter-bnef-says.html>. (stating how “New investment in clean energy rose 16 percent in the third quarter to \$45.4 billion, aided by a surge in wind and solar plant financing as low equipment costs drive installations . . . [a]sset financing of utility-scale renewable-energy projects jumped to a record \$41.8 billion in the [third] quarter [of 2011]”).

again in the spring of 2012. The United States coal reserves are among the largest in the world and Coal's proponents assert that security of supply and economics provide significant incentives for continuing use of the fuel. Under various scenarios, it may be argued that coal is cheaper and more readily available than other sources—at least if all of coal's previously obscure externalities are not included in the calculation. While there are certainly arguments in support of coal in the new energy future, they cannot be made in a vacuum without reference to externalities.

The nexus of the threat of catastrophic climate change and competition from shale gas, renewable energy technologies, and demands for greater energy efficiency call into question coal's role in America's energy future. In less than five years, plans for construction of scores of new coal-fired power plants have been put on hold or abandoned, and the percentage of electric power fueled by coal has dropped from fifty percent to less than forty percent.

Coal's longtime champion Senator Robert C. Byrd saw the handwriting on the wall, so to speak, when he warned: “[c]hange has been a constant throughout the history of our coal industry[;] . . . [we] can choose to anticipate change and adapt to it, or resist and be overrun by it. One thing is clear. The time has arrived . . . to think long and hard about which course . . . to choose.”<sup>321</sup>

If coal is to play an important role in the energy future, pragmatism and demands of rational decision-making should lead to an inclusion of a full calculation of all of Coal's costs, not just its benefits. Efforts to conceal the huge demonstrable price extracted from miners and their families, coalfield communities, taxpayers and the environment are no longer a viable option.

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321. *Embrace the Future*, *supra* note 259.