



## SECTOR-BY-SECTOR APPROACHES

# Accelerating and Smoothing the Transition away from Coal

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Coal has been an essential fuel for American economic development since the 19<sup>th</sup> century. Even today, it is responsible for approximately 25 percent of U.S. electricity generation.<sup>1</sup> U.S. coal mines generate approximately 45,000 direct jobs<sup>2</sup> and approximately \$1 billion of tax revenues annually.<sup>3</sup> Every state in the country has a coal mine or coal-fired power plant, or is connected to an electric grid that transmits power derived from the combustion of coal. Despite continuing competition from natural gas, the U.S. Energy Information Agency (EIA) projects that coal combustion will still provide 700 billion kilowatt hours (kWh) in 2050 in direct electricity production, meaning that, under current trends, coal will still be a significant source of energy in this country for decades to come.<sup>4</sup>

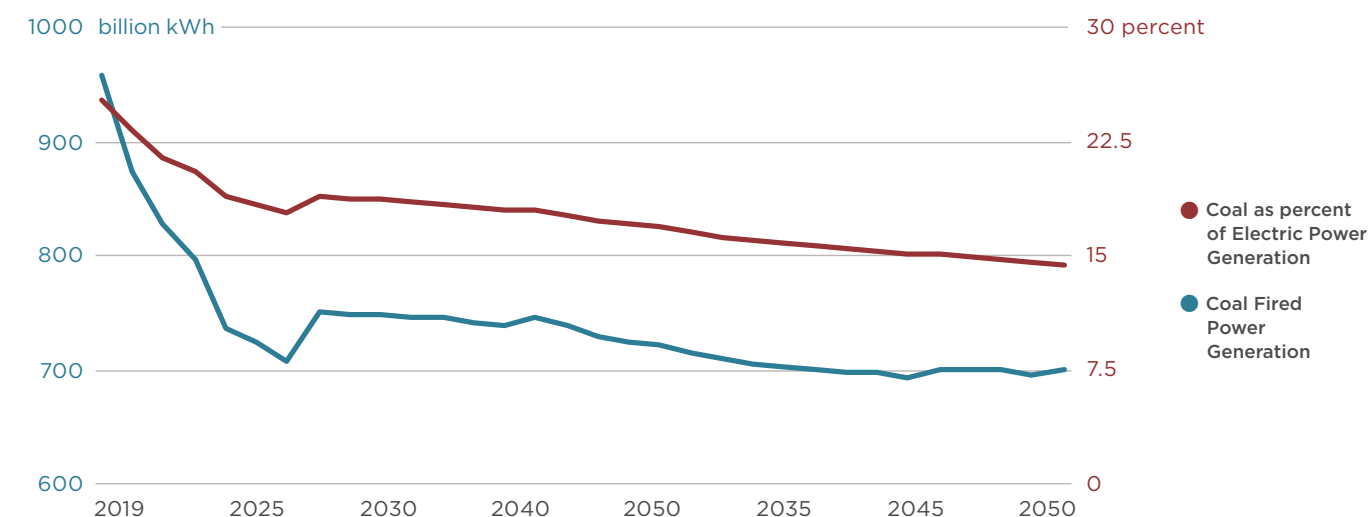
<sup>1</sup> U.S. EIA, *Annual Energy Outlook 2020*, Table 8.

<sup>2</sup> Federal Reserve Bank of St. Louis, “All Employees, Coal Mining.” For specific examples of the significance of coal tax revenues on individual communities, see Morris et al, “The Risk of Fiscal Collapse in Coal-Reliant Communities.”

<sup>3</sup> Headwaters Economics, “Coal Extraction,” Table 1.

<sup>4</sup> U.S. EIA estimated that coal will provide approximately 875 billion kWh of electric power in 2020 and approximately 700 billion KWh in 2050, an approximately 1 percent decline per year. *Annual Energy Outlook 2020*, Table 8.

FIGURE 1 - CHAPTER IN A CHART  
Coal Fired Electric Power



Source: U.S. Energy Information Administration, *Annual Energy Outlook 2020*.

However, the environmental, public health and economic damages from coal mining and coal combustion justify accelerating coal's exit.<sup>5</sup> To address the problems of climate change and other forms of air pollution, the Biden administration can apply the social costs of carbon, methane, particulate matter, and other air pollutants to inform decisions about how much federal land to lease for coal mining and the acceptable level of emissions from coal-fired power plants.

In addition, to protect the communities near existing mines, the Biden administration can revive protections for waters around mines and ensure that land surrounding retired mines is restored to a useful and safe condition. It can also promulgate regulations and create incentives to rectify both legacy land contamination and current threats to groundwater from coal combustion byproducts, commonly known as coal ash. Cleanup projects at former mines and current coal ash ponds can employ current and former workers in these industries to help smooth the financial transitions away from mining for them, their families, and their communities.

<sup>5</sup> See Hendryx & Ahern, “Relations Between Health Indicators,” 669. They find that “high levels of coal production were associated with worse adjusted health status and with higher rates of cardiopulmonary disease, chronic obstructive pulmonary disease, hypertension, lung disease, and kidney disease.”

## Heart of the Problem

Coal has been an essential source of energy for more than a century and, absent federal policy changes or changes in expected technology costs, the EIA projects that it is likely to continue to play an important role for the foreseeable future. In its 2020 *Annual Energy Outlook*, the EIA estimated that coal will provide approximately 875 billion kWh, or approximately 25 percent of total electric power, in 2020. Even as electricity production from natural gas and renewables grows, EIA projects that coal will decline at a rate of only about 1 percent per year over the next three decades, still providing approximately 700 billion KWh, or 15 percent of total electric power, in 2050.<sup>6</sup>

Historically, a substantial share of U.S. coal resources has been produced from mines on federal lands. In 2018, for example, approximately 311 million tons were mined on federal land<sup>7</sup> out of a total of 756 million tons,<sup>8</sup> or 41 percent, of total coal produced in the United States in that year.

The climate impacts of coal usage are severe. In its 2020 *Annual Energy Outlook*, EIA estimates that on current trends coal combustion for electricity in the United

<sup>6</sup> U.S. EIA, *Annual Energy Outlook 2020*, Table 8.

<sup>7</sup> U.S. Department of the Interior, Natural Resources Revenue Data.

<sup>8</sup> U.S. EIA, *Annual Coal Report 2019*, Table ES1.



Energy from burning coal has been a major U.S. power source, but it has come at a steep environmental price.

States will produce approximately 875 million metric tons (MMmt) of carbon dioxide emissions in 2020 (equal to about 58 percent of total U.S. electricity emissions), declining to a still-significant 661 MMmt by 2050.<sup>9</sup> Using estimates of the social cost of carbon from President Barack Obama's administration's Interagency Working Group, and applying a 3 percent discount rate, the total monetized damages from carbon emissions caused by coal to 2050 are more than \$966 billion—enough to fund the Environmental Protection Agency (EPA) at historical levels for more than a century.<sup>10</sup> (Read more about the IWG and the social cost of carbon in "Updating the United States Government's Social Cost of Carbon," page 20.)

Coal mining and combustion are significant sources of other air pollutants that cause public health and environmental problems as well. In 2017, for example, coal combustion for electric power generation was responsible for approximately 45 percent of emissions of sulfur dioxide<sup>11</sup> and nitrous oxide,<sup>12</sup> which cause acid rain and serious respiratory diseases. EPA estimated that the net present value<sup>13</sup> of reducing the emissions of toxics, particulate matter, sulfur dioxide, and hydrogen chloride due to the proposed Mercury and Air Toxics Standards (MATS) Rule was between \$33 and \$90 billion. The vast

majority of this total was due to the benefits of 4,200 to 11,000 fewer premature deaths in the United States from lower levels of particulate emissions.<sup>14</sup>

Coal pollution is not confined to the air. Burning coal leaves behind coal ash, which contains toxic materials and heavy metals including arsenic, lead, and mercury,<sup>15</sup> and which can pollute groundwater and surface waters when not disposed of properly.<sup>16</sup> Coal-fired power plants in the United States generate approximately 100 million tons of coal ash waste each year,<sup>17</sup> which is stored at more than 747 coal ash surface impoundments and 286 coal ash landfills in forty-seven states.<sup>18</sup> A survey published in 2019 found that more than 90 percent of coal plants had unsafe levels of one or more coal ash constituents in the groundwater beneath them and that the majority had unsafe levels of at least four toxics found in coal ash in their groundwater.<sup>19</sup> In more than a dozen cases, the contamination was so significant that companies were forced to provide alternative sources of drinking water, pay compensation, or both.<sup>20</sup> EPA itself "...has documented 157 sites in thirty-two states where coal ash mismanagement has caused damage to human health and the environment,"<sup>21</sup> and has

14 EPA, "Regulatory Impact Analysis," at ES-1. Emerging research argues that EPA underestimated these benefits. See Aldy et al., "Deep Flaws," 247-248.

15 See 75 Fed. Reg. 35,128; 35,138; 35,153; 35,168 (June 21, 2010).

16 Problems include lack of impermeable liners, insufficient groundwater monitoring systems, and improper construction and maintenance. See 80 Fed. Reg. at 21,326-28.

17 80 Fed. Reg. at 21,303 (Apr. 17, 2015).

18 *Id.*; Earthjustice et al., Comments on Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; A Holistic Approach to Closure, Part A: Deadline to Initiate Closure, Docket ID No. EPA-HQ-OLEM-2019-0172, at 2 (citing EPA, Regulatory Impact Analysis (RIA) for EPA's 2015 Coal Combustion Residuals (CCR) Final Rule, Docket ID No. EPA-HQ-RCRA-2009-0640-12034, at 2-1, 4-9) [hereinafter Earthjustice comment].

19 Environmental Integrity Project, "Coal's Poisonous Legacy," 4.

20 Environmental Integrity Project, "Coal's Poisonous Legacy," 44-46. (In a total of fifteen documented events, an alternate source of drinking water was provided in ten cases, the polluter modified or re-dug wells in two cases, compensation occurred in one case, and no remedial action was detailed in three cases.) See also *id.* at 6 ("Yet the Coal Ash Rule does not require the testing of drinking water wells near coal ash sites, so the scope of the threat is largely undefined").

21 Earthjustice comment at 3 (citing EPA, CCR Damage Cases Database, Docket ID No. EPA-HQ-RCRA-2009-0640-12123 and EPA, Damage Case Compendium EPA-HQ-RCRA-2009-0640-12118, -12119, -12120, -12121).

determined that, "contamination from coal ash in unlined impoundments results in unacceptable risks of developing cancer from exposure to arsenic and unacceptable risks of developing non-cancer illnesses from exposure to arsenic, lithium, molybdenum and thallium."<sup>22</sup>

Environmental damage from coal mining can also affect public health. Perhaps the most graphic example is mountaintop removal mining, in which miners dynamite the tops off mountains and move the top layer of rock into valleys below in order to recover the coal. In Central Appalachia alone, mountaintop removal has destroyed more than 500 mountains and 2,000 miles of stream channels—roughly the length of the entire Mississippi River.<sup>23</sup> According to the Congressional Research Service, the EPA has found that, "The cumulative effects of such surface coal mining operations include deforestation, which has been linked to harm in aquatic communities; accelerated sediment and nutrient transport; and increased algal production, as well as possible human health impacts."<sup>24</sup> Studies conducted in the Appalachian region show that health disparities, including higher cancer mortality rates, higher cardiovascular disease mortality rates, and higher rates of birth defects are concentrated in areas where mountaintop removal is practiced.<sup>25</sup>

Left un-reclaimed, coal mines cause lasting harm to air, water and land, and present environmental hazards. Air pollution occurs in the form of dust blown by wind<sup>26</sup> and emissions from spontaneous combustion<sup>27</sup> and mine fires.<sup>28</sup> Abandoned mines harm water resources by emitting acid drainage that affects water quality and wildlife. <sup>29</sup> Two decades ago, EPA named contaminated water seeping from abandoned coal mine areas, especially from acid mine drainage, as "the

22 Earthjustice comment at 4, citing 2014 Risk Assessment at 5-5 to 5-4, tbl. 5-3. For details on the negative health effects, see Earthjustice comment at 26 to 29, citing many U.S. EPA reports.

23 Appalachian Voices, "Mountaintop."

24 Copeland, "Mountaintop Mining," 1.

25 Hendryx, "Moving Beyond Case Studies," 203.

26 Bian et al, "Environmental Issues from Coal Mining," 218.

27 *Id.*

28 U.S. Fish and Wildlife Service, "Coal Mining."

29 U.S. Geological Survey, "Coal Extraction."

most severe water pollution problem in the coal fields of the Appalachian Mountains of the eastern United States."<sup>30</sup> A more recent study reports that acid mine drainage pollutes more than 9,000 miles of streams.<sup>31</sup> Drainage from abandoned coal mines can also contain other contaminants—including manganese, selenium and sediments—endangering rivers, especially in the northern Appalachian coal region.<sup>32</sup>

This is not just an eastern problem, however. A recent study of western states shows that of the total area mined for coal since 1977 in that region, 37 percent remains un-reclaimed.<sup>33</sup> While operators and the federal government state that land is still being mined or used for supporting operations,<sup>34</sup> some researchers contend that some of that land is actually available for reclamation, but the state governments are not forcing mining operators to begin the reclamation process.<sup>35</sup> Moreover, a recent spate of bankruptcies among top coal mining companies in the region has raised significant concerns as to whether sufficient funds will be available to reclaim these lands when operations cease at these sites.<sup>36</sup>

## How We Got Here

As noted above, coal is expected to remain an important power source in the United States until at least mid-century, in large part because it is a relatively cheap and abundant source of energy. It is cheap, however, because the market price of coal does not account for coal's full costs, measured in terms of the climate and health impacts of air and water pollution, ash disposal, and land reclamation. Failure to consider these social costs has also led the federal government to continue to lease coal from public lands when incorporating these costs would likely have led to ending—or at least significantly reducing—such leasing.

30 EPA, *A Citizen's Handbook*, 5.

31 Bian, et al, "Environmental Issues from Coal Mining," 217.

32 U.S. Geological Survey, "Coal Extraction."

33 Western Organization of Resource Councils, *Planning for Coal's Decline*, 11.

34 OSMRE records twenty percentage points, or approximately 82,000 acres, as "active mining area," and seventeen percentage points, or approximately 68,000 acres, as "long-term mining and reclamation facilities." *Id.* at 10-11.

35 *Id.* at 20-24.

36 *Id.* at 10, 15, 31.



## Air Pollution

When Barack Obama became president in 2009, he began working with Congress on a number of environmental initiatives. The legislation with the most direct relevance for coal was the comprehensive Waxman-Markey American Clean Energy and Security Act, which would have, among other things, imposed a price on carbon. Though it passed the House of Representatives—the first comprehensive climate policy to do so—it failed to pass the Senate.

Faced with the defeat of Waxman-Markey, the Obama administration focused on regulatory approaches instead. It convened an Interagency Working Group (IWG), to calculate the first government-wide social cost of carbon and provide guidance to federal agencies on its use (see "Updating the United States Government's Social Cost of Carbon," page 20). The social cost of carbon showed that the true costs of coal use were significantly higher than the sticker price of coal would suggest.

The Obama administration's furthest-reaching effort was a set of rules designed to limit carbon dioxide emissions from the power sector, which was then the largest contributor to U.S. greenhouse gas emissions. The Clean Power Plan drew on existing authority from the 1970 Clean Air Act<sup>37</sup> and the U.S. Supreme Court decision in *Massachusetts v. EPA*<sup>38</sup> to impose emissions limits on power plants. If enacted, carbon emissions from existing coal-fired power plants would have been 32 percent lower,<sup>39</sup> sulfur dioxide 90 percent lower, and nitrogen oxide emissions 72 percent lower than 2005 levels by 2030.<sup>40</sup> EPA calculated the discounted net present value of the benefits of the Clean Power Plan to be between \$25 billion and \$45 billion in 2030.<sup>41</sup> The proposed rules faced almost immediate legal challenge, however, and were still being debated in the courts when Donald Trump assumed the presidency in January 2017.

Donald Trump ran on a platform to support coal and other fossil fuels. Once in office, he issued a Presidential Executive Order on Promoting Energy Independence and Economic Growth, which disbanded the IWG and revoked its guidance to federal agencies. As a result, federal agencies in the past two years have taken positions that vary from arguing that they do not have a legal obligation to consider social costs<sup>42</sup> to using much lower social cost values than those of the IWG.<sup>43</sup>

In June 2019, the EPA replaced the Clean Power Plan with the Affordable Clean Energy (ACE) Rule,<sup>44</sup> which among other things changed how the social cost of carbon was calculated. It required the government to take into account only climate damages in the United States (rather than globally) and applied a much higher discount rate (the rate at which future costs are discounted when calculating present value).<sup>45</sup> Taken together, these changes dramatically reduced the official value of the social cost of carbon.

These changes depart from scientifically and economically appropriate methods for monetizing damages caused by CO<sub>2</sub> emissions. According to an amicus brief filed in litigation against the rule in the U.S. Court of Appeals for the D.C. Circuit, "EPA undervalued significantly the economic impacts caused by CO<sub>2</sub> emissions by applying inappropriately high discount rates that none of current market conditions, economic theory, or relevant government directives support."<sup>46</sup> In addition, by focusing solely on damages to the United States rather than the entire world, EPA "failed to account fully for impacts on U.S. citizens and businesses, misrepresented



Coal ash accidents have contaminated nearby land and waterways with arsenic, lead, and beryllium.

underlying climate models, failed to consider reciprocity benefits of using a global value, and was wrong as a matter of law."<sup>47</sup> These errors left "EPA well outside the bounds of mainstream economic methods for monetizing benefits from CO<sub>2</sub> emissions reductions."<sup>48</sup>

The net effect of the Trump administration's policies has been to reduce the compliance costs faced by coal-fired power plants, making the plants more economical and encouraging them to run more often or for longer than they would have otherwise. A 2019 study from Harvard University's Center for Climate, Health and the Global Environment documents the climate impacts of the "emissions rebound effect": while the ACE Rule reduces emission rates at individual coal plants, it is expected to increase the number of operating coal plants and coal-fired electricity generation, leading to overall higher CO<sub>2</sub> emissions compared to no policy. In the long term, longer lives for these coal plants will lead to more air pollution and higher environmental and public health damages than would have been the case otherwise.<sup>49</sup>

## Water

Beginning in 2009, the Obama administration launched an effort to update portions of the 1977 Surface Mining Control and Reclamation Act (SMCRA) to protect approximately 6,000 miles of streams and 52,000 acres of forests from mining waste dumped by coal companies in the process of mountaintop removal.<sup>50</sup> The Stream

Protection Rule, which the Department of Interior's Office of Surface Mining Reclamation and Enforcement (OSMRE) promulgated on December 19, 2016, placed new limits on the dumping of waste and debris by coal companies.<sup>51</sup> The Rule also required regulators and companies to complete baseline assessments of nearby ecosystems prior to mining, to monitor affected streams during mining, and to develop restoration plans for waterways in order to return them to their pre-mining state.<sup>52</sup>

Less than a month after President Trump's inauguration, the 116<sup>th</sup> Congress under the authority of the Congressional Review Act repudiated the Stream Protection Rule.<sup>53</sup> Now, coal mining companies need only comply with the less-stringent requirements that the Department of Interior established in 1983.<sup>54</sup> According to OSMRE's 2016 Final Regulatory Impact Analysis, just those annualized environmental and health benefits that could be quantified were worth approximately \$110 million in 2020,<sup>55</sup> compared to annual costs to industry of approximately \$81 million.<sup>56</sup>

37 See, e.g., Clean Air Act, 42 U.S.C. § 7602(h) (including "effects on ... weather ... and climate" in the definition of "public welfare").

38 *Massachusetts v. EPA*, 549 U.S. 497, 528 (2007) (holding that "Clean Air Act authorizes EPA to regulate greenhouse gas emissions from new motor vehicles in the event that it forms a "judgment" that such emissions contribute to climate change").

39 EPA, "Clean Power Plan Final Rule," Table ES-4. See also EPA, "Fact Sheet: Overview of the Clean Power Plan."

40 EPA, "Clean Power Plan Final Rule," Table ES-4.

41 Id.

42 U.S. Dep't of the Interior, Office of Surface Mining Reclamation and Enforcement, Bull Mountains Mine No. 1 Federal Mining Plan Modification Environmental Assessment, at D-7 to D-8 (2018).

43 Compare Interagency Working Group, Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12,866, 4 (Aug. 2016) with Repeal of the Clean Power Plan; Emission Guidelines for Greenhouse Gas Emissions From Existing Electric Utility Generating Units; Revisions to Emission Guidelines Implementing Regulations, 84 Fed. Reg. 32,520, 32,562 (July 8, 2019) [hereinafter Affordable Clean Energy Rule].

44 EPA, "Affordable Clean Energy Rule."

45 See Michael Greenstone, Brief of Professor Michael Greenstone as Amicus Curiae in Support of State and Municipal, Public Health and Environmental, Power Co., and Clean Energy Trade Ass'n Petitioners, American Lung Ass'n v. U.S. Env'tl. Prot. Agency, No. 19-1140 (D.C. Cir. Apr. 24, 2020), Doc. No. 1839719, at 3-4.

46 Id. at 3.

47 Id.

48 Id.

49 Lambert, et al, "Carbon Standards Re-Examined," 2. It shows that the final Regulatory Impact Analysis (RIA) for the ACE rule "underestimates the magnitude of state-level emissions rebound for CO<sub>2</sub>, SO<sub>2</sub>, and NO<sub>x</sub>;" by underestimating emissions rebound the final RIA also underestimates the potential adverse air quality and health effects of the ACE rule in some states."

50 Natter, "Trump Signs Measure."

51 Stream Protection Rule, 81 Fed. Reg. 93066 (Dec. 20, 2016).

52 Id.

53 U.S. Congress, Disapproving the Rule Submitted by the Department of the Interior Known as the Stream Protection Rule, Pub. L. No. 115-5, 131 Stat. 10 (2017).

54 OSMRE, "Stream Protection Rule," at 93070.

55 OSMRE, "Final Regulatory Impact Analysis," Exhibit 7-14a. But see also n. 335: "Of note, the first three years of our analysis experience the greatest reduction in coal production and, therefore, the greatest projected reduction in emissions. This benefit generally diminishes across the timeframe of our analysis. For context, the annualized benefit of reduced CO<sub>2</sub> emissions from fossil fuel combustion across the timeframe of the analysis (2020-2040) is \$57 million (assuming a 3 percent discount rate and average climate change projection from IWG 2016a). This information is provided for context as we note that significant uncertainty exists with respect to the baseline emissions profiles of the electricity sector over time."

56 OSMRE, "Final Regulatory Impact Analysis," ES-30. For context, this \$81 million would have made up "0.3 percent of estimated current total annual revenues for the coal industry."





Mining companies are required to set aside money for restoring the land around exhausted mines, but current law includes loopholes that have enabled companies to avoid that responsibility.

Land

The Abandoned Mine Land (AML) fund, established as part of the SMRCA, requires companies to pay into a government-run fund to clean up former mining sites. SMCRA requires “all operators of coal mining operations” to pay a reclamation fee to the AML fund based on the lesser of a fee per ton of coal mined or a fee on the value of the coal in the mine.<sup>57</sup> The AML disburses those funds to states to support protecting “public health, safety and property from...adverse effects of coal mining practices...[and restoring] land and water resources and the environment that have been degraded by the adverse effects of coal mining practices.”<sup>58</sup> However, the fund can pay only to address sites abandoned or un-reclaimed as of August 3, 1977, the date of SMCRA’s enactment,<sup>59</sup> and the fund has far less money than it needs even for those sites. As of 2019, the fund had \$2.3 billion in assets to cover an estimated \$10.7 billion in costs,<sup>60</sup> and it received only approximately \$150 million in new fees in fiscal year 2019.<sup>61</sup>

57 Surface Mining Control and Reclamation Act, 30 U.S.C. § 1232 (a) (2020) (“All operators of coal mining operations subject to the provisions of this chapter shall pay to the Secretary of the Interior, for deposit in the fund, a reclamation fee of 28 cents per ton of coal produced by surface coal mining and 12 cents per ton of coal produced by underground mining or 10 per centum of the value of the coal at the mine, as determined by the Secretary, whichever is less, except that the reclamation fee for lignite coal shall be at a rate of 2 per centum of the value of the coal at the mine, or 8 cents per ton, whichever is less.”)

58 *Id.* § 1233(a)(1)(A)-(B)(i) (2020).

59 Congressional Research Service, “The Abandoned Mine Reclamation Fund.”

60 *Id.*; see also, OSMRE, “Status of the Abandoned Mine Land Reclamation Fund.”

61 OSMRE, “Budget Justifications,” Table 8. Reports receipts as high as \$304 million in fiscal year 2007, falling consistently each year in the past decade to a projected \$138 million in fiscal year 2021.

For mines closed after SMRCA came into effect, the law requires coal mining companies to return mining sites to “a condition capable of supporting the uses which it was capable of supporting prior to any mining, or higher or better uses following mining.”<sup>62</sup> SMRCA mandates that companies pay to reclaim sites themselves, but it gives them significant flexibility in how they will pay for those reclamations. Under the law, companies are allowed to “self-bond” for their future reclamation responsibilities, meaning that they promise to cover those costs in the future based on their own credit rather than purchasing bonds up front to ensure sufficient financial resources to reclaim the site if the company does not do so itself.<sup>63</sup> GAO estimated in 2017 that a total of \$1.2 billion<sup>64</sup> of coal mining assurances were held as self-bonds, including \$425.9 million in Wyoming alone, accounting for 21 percent of the state’s total bonding.<sup>65</sup>

Often, however, companies attempt to shed financial responsibility for reclaiming their sites when they encounter financial difficulty, liquidating those financial obligations along with others.<sup>66</sup> As the coal industry has faced rising competition from natural gas in recent years, this has become more common. Over the past decade, more than fifty coal companies in the United States have declared bankruptcy;<sup>67</sup> in 2019 alone, eight coal companies filed for bankruptcy.<sup>68</sup>

The lack of sufficient bonding can put state regulators in impossible situations with perverse incentives: a choice between replacing self-bonds with more trusted financial backing, which would put the mine into bankruptcy, or allow the mine to continue operating

62 Surface Mining Control and Reclamation Act, 30 U.S.C. § 1265(b)(2) (1977). In order to receive a mining permit, operators must also submit a reclamation plan, including a proposal for how postmining land use will be achieved. *See id.* § 1258 (2010). This includes returning mines, as much as possible, to their original contour, restoring topsoil, revegetating the area, and isolating mine wastes. Permanent Program Performance Standards – Surface Mining Activities, 30 CFR 816.

63 *See*, Surface Mining Control and Reclamation Act, 30 U.S.C. § 1259(c) (2020).

64 Government Accountability Office, “Coal Mine Reclamation,” 10.

65 *Id.*, 12.

66 *See generally* Macey & Salovaara, “Bankruptcy as Bailout.”

67 Murray, “Charting a decade.”

68 Krauss, “Murray Energy is the 8th Coal Company.”

without valid financial assurance.<sup>69</sup> Many states attempted to solve the problem through creation of “bond pools” where the coal companies in the states insured each other. However, as more mining operations declare bankruptcy, these funds appear to be woefully insufficient to meet future reclamation needs.<sup>70</sup> For example, “Ohio’s bond pool guarantees about \$545 million in coal mine cleanup costs, according to a 2019 actuarial report, but is only worth \$22.2 million.”<sup>71</sup> States and communities face a looming crisis in which there are insufficient funds to address the legacy contamination at these sites.

Waste

Coal ash, a byproduct from burning coal, is one of the most common types of industrial waste in the United States. In 2008, a massive coal ash spill from a Duke Energy power plant in Kingston, Tennessee released 5.4 million cubic yards of wet coal ash, illustrating the potentially catastrophic risks of this waste. The spill flooded over 300 acres of nearby land,<sup>72</sup> led to an unprecedented fish kill in the Tennessee River and its tributaries,<sup>73</sup> contaminated local waterways with arsenic, lead, and beryllium, and endangered workers tasked with the massive cleanup effort.<sup>74</sup> In the aftermath of the disaster, under the authority of the 1976 Resource Conservation and Recovery Act<sup>75</sup> and 1970 Clean Water Act<sup>76</sup> President Obama’s EPA promulgated the Coal Ash Rule in 2015. The rule imposed obligations for groundwater monitoring of coal ash

69 Government Accountability Office, “Coal Mine Reclamation,” 21.

70 *See e.g.* Coren, “Coal’s Collapse,” stating that “the approximately \$115 million in bonds secured by [bankrupt coal mining company] ERP aren’t enough to clean up the mess from more than 100 mining permits ERP acquired in 2016 from the defunct Patriot Coal Corporation, West Virginia says in filings. The required clean-up costs would likely bankrupt not only the issuer of ERP’s bonds, the Indemnity National Insurance Company, but leave West Virginia’s own Special Reclamation Fund empty”); The Alliance for Appalachia, “Bonding Policy Recommendations,” 28.

71 Olalde, “Exposed: West Virginia.”

72 U.S. EPA, “EPA Response to Kingston.”

73 *Scientific American*, “The Lasting Damage.”

74 Bourne, Jr., “Coal’s Other Dark Side.”

75 Resource Conservation and Recovery Act (RCRA), 42 U.S.C § 6907(a)(3), 6912(a)(1), 6944, 6945(a) (2020).

76 Federal Water Pollution Control Act, 33 U.S.C. § 1345(d), (e) (2020).

landfills, required power companies to make that data available to the public, and required leaking, unlined impoundments to initiate closure and stop receiving waste.<sup>77</sup>

The 2015 Rule had some limitations, however. It designated coal ash as a non-hazardous waste,<sup>78</sup> despite data showing that coal ash contains significant amounts of toxic contaminants.<sup>79</sup> Importantly, this legal distinction took the bulk of regulatory oversight out of the hands of EPA, and rested it in, typically less stringent, state authority.<sup>80</sup> Moreover, it covered only those coal ash dumps that received waste after October 2015,<sup>81</sup> despite the fact that hundreds of older dumps also contaminate groundwater,<sup>82</sup> and despite an agency finding that, “facts indicate a high likelihood that in the absence of any regulatory action, such [aging] units will leak in the near future, or are currently leaking, undetected since groundwater monitoring is not installed at many of these older units.”<sup>83</sup> It also did not require closure of unlined impoundments that were not already known to be leaking,<sup>84</sup>

77 2015 Coal Ash Rule, 80 Fed. Reg. 21,301-21,501 (Apr. 17, 2015). <https://www.federalregister.gov/documents/2015/04/17/2015-00257/hazardous-and-solid-waste-management-system-disposal-of-coal-combustion-residuals-from-electric>

78 *Id.* at 21,319-21,327 (April 17, 2015) (electing to regulate coal combustion residuals under Subtitle D as a non-hazardous material and deferring more stringent regulation as a hazardous waste under Subtitle C).

79 75 Fed. Reg at 35,153 (June 21, 2010). The Rule relied on data that significantly underestimates the scope and severity of the issue. Whereas data from 2018 shows that more than 90 percent of unlined impoundments will contaminate groundwater in the next 100 years, EPA put this figure at only 57 percent. Current data also shows that there are more unlined impoundments than EPA originally estimated. Finally, analysis of the data demonstrates that the frequency of pollutants exceed safe levels by one or two orders of magnitude. *See* Earthjustice Comments at 7.

80 *See* Util. Solid Waste Activities Grp. v. EPA, 901 F.3d 414, 423-4 (D.C. Cir 2018).

81 2015 Coal Ash Rule, 80 Fed. Reg. at 21490 (§ 257.101(a)) (requiring that the owner or operator of an “existing unlined CCR surface impoundment” “must cease placing CCR and non-CCR wastestreams into such CCR surface impoundment and either retrofit or close the CCR unit” within six months after the owner or operator “determines in any sampling event that the concentrations of one or more [contaminants] . . . are detected at statistically significant levels above the groundwater protection standard.”)


82 80 Fed. Reg at 21,327. *See also* Environmental Integrity Project, “Coal’s Poisonous Legacy,” 5.

83 *Id.*

84 2015 Coal Ash Rule, 80 Fed. Reg. at 21490 (§ 257.101(a)).

FURTHER READING

A Future Without Coal




**Amicus Brief to American Lung Association et al v. U.S. EPA**  
*U.S. Court of Appeals for the DC Circuit*

States and environmental and public health advocates are challenging EPA's Affordable Clean Energy Rule, the agency's replacement to the Clean Power Plan, regulating CO<sub>2</sub> emissions from existing coal-fired power plants.



**Amicus Brief to Citizens for Clean Energy v. U.S. Department of Interior**  
*District Court for the District of Montana*

A number of environmental groups and a Native American tribe are challenging the decision of former Secretary of the Interior Ryan Zinke to remove the moratorium on new coal mine leases on federal lands.



**Bankruptcy as Bailout: Coal Company Insolvency and the Erosion of Federal Law**  
*71 Stanford Law Review*

Between 2012 and 2017, four of the largest coal companies in the United States succeeded in using the Bankruptcy Code to evade almost \$5.2 billion of congressionally imposed liability benefits to coal miners.

despite EPA's finding that unlined impoundments presented the “greatest risks to human health and the environment.”<sup>85</sup>

When environmentalists challenged the 2015 rule on the grounds that it was not sufficiently stringent, the U.S. Court of Appeals for the D.C. Circuit held that EPA had acted arbitrarily and capriciously in limiting the scope of regulations. It remanded the rule, finding the agency had not sufficiently addressed the risk of unlined coal ash impoundments and erroneously exempted “legacy ponds,” essentially older, inactive dumps, from regulation.<sup>86</sup> A 2018 Coal Ash Rule issued by the Trump administration, which rolled back regulatory oversights,<sup>87</sup> was likewise remanded by the D.C. Circuit in line with its opinion on the 2015 rule.<sup>88</sup>

Many of these sites may never be fully protected. In a recent report, Daniel Raimi of the University of Michigan and Resources for the Future observed, “A 2009 study estimates that closing all the nation's 155 ‘wet’ ash impoundments would cost roughly \$39 billion over ten years, and billions more will likely be needed for long-term monitoring and remediation.” Generally speaking, he continued, “no local, state, or federal policy ensures adequate funding for decommissioning. In these locations, plant owners may not be adequately saving for decommissioning, potentially exposing shareholders, ratepayers, and/or taxpayers to unanticipated costs in the coming years.”<sup>89</sup>

What To Do

The Biden administration, working in conjunction with Congress, can take several important steps to speed the transition away from coal and to address legacy environmental issues. Giving coal miners and coal-fired power plant workers priority for jobs generated by these activities would help to support the financial stability and independence of coal-mining communities during this transition.

85 80 Fed. Reg. at 21,451.

86 Util. Solid Waste Activities Grp. (USWAG) v. EPA, 901 F.3d 414, 430-32 (D.C. Cir. 2018)

87 Clements, “The Coal Ash Rule Trilogy,” 3.

88 Waterkeeper All., Inc. v. EPA, No. 18-1289, 2019 U.S. App. LEXIS 7443 (D.C. Cir. Mar 13, 2019).

89 Raimi, “Decommissioning U.S. Power Plants,” 2.

POLICY

To address the climate and other air emission impacts of coal combustion, the administration and Congress could:

- Review under what conditions, if any, to continue the leasing of federal lands for coal mining. The Department of Interior's Bureau of Land Management can conduct a new, full environmental review of the federal coal-leasing program to inform this decision. The programmatic environmental impact statement of the review would incorporate the full range of social costs, including the social costs of carbon and of other air pollutants. Calculations show that climate damages from coal mined from Powder River Basin, which accounts for nearly 90 percent of total annual federal coal production, are about six times greater than the market value of that coal.<sup>90</sup> In other words, one dollar of activity effectively creates six dollars of damages.<sup>91</sup> Incorporating these costs would likely justify curtailing significantly—or even entirely—federal coal leasing.
- Impose new regulations limiting greenhouse gas emissions from existing coal-fired power plants. Energy generation has changed since EPA promulgated the Clean Power Plan; there may be new opportunities for more cost-effective and more thorough reductions of carbon emissions from the electric power sector than previously. Working with other federal entities such as the Department of Energy and the Federal Energy Regulatory Commission, EPA can therefore develop a new version of the Clean Power Plan that reflects those changes, along with the full range of social costs of electricity generation. These figures, including the social costs of carbon and of other air pollutants, should be based on the best available science, incorporate global costs and benefits, and use discount rates that reflect current market conditions and the nature of the problem (e.g.,

90 Michael Greenstone, Amicus Brief on Behalf of Professor Michael Greenstone, *Citizens for Clean Energy et al. and the Northern Cheyenne Tribe v. U.S. Department of the Interior, et al. and State of Wyoming, et al. (lead consolidated case)* Case 4:17-cv-00030-BMM (Aug. 3, 2018) (Dkt. no. 119) (D. Mont.) at 14; Greenstone, “There's a Formula”; Gillingham, et al, “Reforming the U.S. Coal Leasing Program.”

91 *Id.*

intergenerational effects in the case of greenhouse gas emissions).

- Use the social cost of carbon and other social costs when making permitting, leasing and other decisions. The Obama administration's Interagency Working Group on the Social Cost of Carbon may have stated only that officials should consider the social cost of carbon in rulemakings, but the same logic applies to individual permitting and leasing decisions: government officials should understand the full costs of their decisions and incorporate those into their decision-making. Thus, if the programmatic review of federal coal leasing recommended above does not foreclose future leasing, the Biden administration could require officials to consider the full range of social costs when assessing whether to proceed with an individual lease. Officials can give significant weight to those cost-benefit analyses, approving those that are net beneficial and rejecting those that are net negative.

POLICY

To address problems related to water pollution and land contamination from coal mining and coal ash, the administration and legislators could:

- Protect waters from mountain top removal mining. While the Congressional Review Act forbids administrative agencies such as EPA from promulgating “substantially similar” rules to those that Congress has nullified under the Act, such as the Stream Protection Rule, EPA can promulgate a new regulation that uses other approaches to protecting mountain streams. Even better, if politically feasible, would be for the new administration to work with the new Congress to pass new legislation that achieves these objectives.
- Eliminate self-bonding. Rather than attempting to reform the self-bonding program, the administration could propose legislation to eliminate the self-bonding option. Under such a law, companies would still need to provide financial assurance, but the law would require them to do so through third-party instruments like bonds or insurance instruments. Financial markets would then use their skills and expertise to assess the potential liabilities and risks, charge





People in mining communities will need new jobs when mines close down. Prioritizing these workers for jobs in reclamation can help ease the economic effects of mine closures.

the companies appropriately, and provide the necessary funds for reclamation if a company failed to fulfill its obligations.

- Change the bankruptcy code to make shedding environmental liabilities more difficult. The Biden administration could promote legislation to make it more difficult for companies to shed their environmental liabilities in bankruptcy. The bankruptcy code could instead give priority to public interest claims—past and present—over those of unsecured creditors. Such a change would increase the amount of funds available for reclamation and coal ash cleanup, should mining or power generation companies go bankrupt.
- Provide more funds for reclamation of abandoned lands. To meet the billions of dollars of unmet need for both historical mines and mines that have just shuttered or are about to shutter, Congress should urgently consider shoring up the Abandoned Mine Land fund, and expanding the use of the Abandoned Mine Land fund to mines that shut down after August 3, 1977, the date of SMCRA's enactment. The Biden administration could work with Congress to increase the amount of funds available for cleaning up abandoned mines, which could be through increasing taxes on mined coal or increased general appropriations. At minimum, Congress should avoid treating the AML as a piggy bank for other causes and should find other funding sources for those needs.

- Establish stricter environmental requirements for coal-ash impoundments. EPA should reconsider whether it should regulate coal ash under the Resource Conservation and Recovery Act (RCRA) Subtitle C as a nonhazardous waste or under RCRA Subtitle D as a hazardous waste. If regulation continues under Subtitle C, EPA should monitor state implementation closely and take all necessary steps to ensure compliance with the federal regulations. Regulators should consider allowing for disposal of coal ash only at sites that have sufficient liners and other technologies to protect groundwater, and requiring the relocation of coal ash that is in unlined pits. EPA could also require more extensive and more frequent groundwater monitoring, characterization of groundwater flow, and assessments of actual and potential impacts to surface waters under various scenarios. The Biden administration could eliminate the loopholes that allow existing operations to seek exemptions to stay open and tighten disposal of associated hazardous wastes with coal ash. Finally, the Biden administration should consider developing a Superfund-type program to address legacy sites for which there are no financially responsible parties to cover the costs.
- To assist in a transition away from coal for coal-workers, the Biden administration and legislators should prioritize hiring coal workers for these cleanups. As the United States transitions away from coal mining and coal combustion, workers in those industries need jobs. There may be few other jobs in the near future in the communities in which these facilities reside, and many of these workers have a long and proud connection to the industry. The new administration could support tax credits for companies that hire and retrain current and unemployed former coal workers for these positions. According to a July 2020 report by the Western Organization of Resource Councils, surface mining reclamation could employ 4,800 full-time equivalent jobs per year, or 65 percent of the current surface mining workforce in the western coal mining region of Colorado, Montana, North Dakota and Wyoming.<sup>92</sup>

<sup>92</sup> Western Organization of Resource Councils, “New Report Shows Thousands of Jobs.”

## Closing Argument

On current trends, the EIA predicts that significant amounts of coal will continue to be mined from public and private lands in the years to come, and it will remain a major source of electric power in this country. Staying the course, though, will lead to billions of dollars of public health and environmental damages.

The Biden administration can help to accelerate the country’s transition away from coal mining and coal-fired power generation. Regulators should consider the full social costs of coal use when deciding whether to approve new coal mines on federal lands and how much pollution should be allowed from coal-fired power plants. Environmental officials should develop a new and improved approach for regulating emissions from existing coal-fired power plants. The Biden administration can act on its own—and in conjunction with Congress when necessary—to restore protections to mountain ecosystems, to ensure sufficient funds are available and are spent on reclaiming former mining sites, and to address water and land contamination from coal ash ponds. Those who have worked for years in these industries should have the opportunity to continue working in their communities.

The public health and environmental benefits of reducing CO<sub>2</sub> emissions and other air pollutants and of protecting our streams and lands outweigh the benefits of continuing the status quo. With the policy changes recommended above, mining companies and electric power generators companies would no longer be able to shift the burdens of their operations to the environment or people. The Biden administration has a great opportunity to build on technological innovations and market forces to ensure a strong, just and cost-effective transition to a clean energy economy.

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