

# CHAPTERS

## CLIMATE CHANGE AND THE PSD PROGRAM: USING BACT TO COMBAT THE INCUMBENCY OF FOSSIL FUELS

BY

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*Climate change and its impacts are steadily worsening. Stubborn reliance on fossil fuels for electricity and the associated greenhouse gas emissions are largely to blame for exacerbating those impacts. The Prevention of Significant Deterioration (PSD) program under the Clean Air Act establishes one of the mechanisms for monitoring and controlling such air pollution. The United States Environmental Protection Agency and other permitting authorities implement the PSD program, primarily requiring that major stationary sources of air pollution seek a permit to ensure compliance with the Best Available Control Technology (BACT) standard. However, the “redefining the source” doctrine affords polluters and regulators great discretion under the standard, allowing many polluting facilities to elude more stringent regulation. This dynamic undermines the regulatory scheme, and courts, including the Ninth Circuit in *Helping Hand Tools v. U.S. Environmental Protection Agency*, have been complicit in allowing broad application of the doctrine.*

*This Chapter explores the incumbency of fossil fuels in the U.S. electricity sector and the environmental need for regulatory change. It then analyzes the “redefining the source” doctrine and how the doctrine has been applied in permitting disputes. Finally, this Chapter*

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*proposes to remedy the doctrinal loophole by either restricting its application or, alternatively, by abolishing the doctrine altogether.*

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## I. INTRODUCTION

As a result of anthropogenic climate change, negative environmental impacts are a growing threat to the health and welfare of the global population.<sup>1</sup> In the last century, average global temperatures have risen to dangerous heights, and this pattern is only predicted to continue.<sup>2</sup> Glaciers

<sup>1</sup> CHRIS WOLD ET AL., CLIMATE CHANGE AND THE LAW 12–15 (2d ed. 2013).

<sup>2</sup> See INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2014: SYNTHESIS REPORT 58–60 & fig.2.1 (Rajendra K. Pachauri et al. eds., 2015), <https://perma.cc/MSM4-QQQ6> [hereinafter IPCC SYNTHESIS REPORT] (summarizing annual findings of the ICPP related to climate change); *Global Temperature*, NAT’L AERONAUTICS & SPACE ADMIN., <https://perma.cc/U26A-MB7C> (last updated Nov. 7, 2017).

are melting, sea level is rising, the ocean is acidifying, and natural disasters are intensifying.<sup>3</sup>

Since the Industrial Revolution, as more and more nations have implemented energy-intensive technology, humans have been generating pollution faster than the Earth's natural processes can absorb it, thus increasing atmospheric concentrations of greenhouse gases (GHGs).<sup>4</sup> Unfortunately, when generating the electricity necessary to support a developing industry and society, the most popular, potent, and reliable methods of energy production also produce the most pollution.<sup>5</sup> Rising atmospheric concentrations of GHGs are primarily responsible for the observed surges in global temperatures.<sup>6</sup> Although there are countless sources of GHG emissions, this Chapter will focus primarily on the U.S. electricity sector.

According to the United States Environmental Protection Agency (EPA), the electricity sector was the leading source of GHG emissions in 2014, totaling 30% of U.S. GHG emissions.<sup>7</sup> Emissions from the electricity sector are predominantly comprised of carbon dioxide (CO<sub>2</sub>).<sup>8</sup> In turn, fossil fuel combustion is “[t]he predominant source of anthropogenic CO<sub>2</sub> emissions.”<sup>9</sup> The electricity sector largely depends on the burning of fossil fuels to quickly and reliably produce power to meet energy demand.<sup>10</sup> Due in part to generous government subsidies, this fossil fuel incumbency has dominated U.S. energy markets for over a century.<sup>11</sup> Unfortunately, despite

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<sup>3</sup> See discussion *infra* Part II.A.

<sup>4</sup> See WOLD ET AL., *supra* note 1, at 6.

<sup>5</sup> See *id.* at 816.

<sup>6</sup> See IPCC SYNTHESIS REPORT, *supra* note 2, at 5 (“It is extremely likely that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in GHG concentrations and other anthropogenic forcings together.” (emphasis omitted)).

<sup>7</sup> See *Sources of Greenhouse Gas Emissions*, U.S. ENVTL. PROTECTION AGENCY, <https://perma.cc/A9WS-8497> (last updated Oct. 6, 2016). The major GHGs include: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), sulfur hexafluoride (SF<sub>6</sub>), nitrogen trifluoride (NF<sub>3</sub>), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and chlorofluorocarbons (CFCs). WOLD ET AL., *supra* note 1, at 6.

<sup>8</sup> *Sources of Greenhouse Gas Emissions*, *supra* note 7 (under the “Electricity” tab).

<sup>9</sup> U.S. ENVTL. PROT. AGENCY, EPA 430-P-17-001, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990–2015, at 1-5 (2017), <https://perma.cc/J34S-DQJC> [hereinafter EPA U.S. GHG INVENTORY].

<sup>10</sup> See WOLD ET AL., *supra* note 1, at 816 (discussing the prominence of fossil fuel use to power the electricity grid).

<sup>11</sup> See SALVATORE LAZZARI, IB 10054, CRS ISSUE BRIEF FOR CONGRESS: ENERGY TAX POLICY, at CRS-1 (2000) (“Historically, federal energy tax policy was focused on increasing domestic oil and gas reserves and production.”); WOLD ET AL., *supra* note 1, at 816–17 (discussing the economic factors behind the dominance of fossil fuels); *U.S. Energy Facts Explained*, U.S. ENERGY INFO. ADMIN., <https://perma.cc/9TL7-KWR9> (last updated May 19, 2017).

the reduced external costs to society,<sup>12</sup> renewable energy has seen only a fraction of the subsidies provided to the fossil fuel industry.<sup>13</sup>

In the United States, the primary legislative tool used by EPA to regulate emissions of air pollutants, like GHGs, is the Clean Air Act<sup>14</sup> (CAA).<sup>15</sup> In 1990, sensitive to the substantial need for better air pollution protections, Congress amended the CAA,<sup>16</sup> creating several programs designed to further the goals of achieving “the prevention and control of air pollution,” and protecting “public health and welfare.”<sup>17</sup> Although the CAA is not explicitly designed to prevent climate change, it serves to prevent its biggest causes by establishing air quality standards and imposing technology-based controls that apply to certain stationary sources of air pollution.<sup>18</sup> One of the programs established by the 1990 amendments, called Prevention of Significant Deterioration (PSD), imposes a preconstruction permit requirement on new or modified “major” stationary sources of air pollution.<sup>19</sup> The permit assures a facility’s compliance with PSD’s technology-based pollution control requirements.<sup>20</sup> For each major facility—i.e., those emitting regulated pollutants in “major” quantities—PSD requires that the facility satisfy the “best available control technology” (BACT) standard.<sup>21</sup>

To implement the BACT standard, EPA uses a five-step, top-down approach to determine what pollution control technologies must be installed by a particular major facility.<sup>22</sup> At step one, the list of pollution controls from which BACT is selected is meant to be expansive and comprehensive in order to ensure that all viable pollution control options are adequately considered.<sup>23</sup> However, to some degree, EPA and states have discretion to exclude from step-one BACT consideration pollution controls that would effectively “redefine the source” by disrupting the facility’s basic project purpose.<sup>24</sup> Unfortunately, polluters reap the benefit of this EPA-created

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<sup>12</sup> Steven Ferrey, *Exit Strategy: State Legal Discretion to Environmentally Sculpt the Deregulating Electric Environment*, 26 HARV. ENVTL. L. REV. 109, 128 & tbl. (2002).

<sup>13</sup> See ENVTL. LAW INST., ESTIMATING U.S. GOVERNMENT SUBSIDIES TO ENERGY SOURCES: 2002–2008, at 3 (2009), <https://perma.cc/A7Q6-6CEE> (discussing subsidies for differing types of energy sources).

<sup>14</sup> 42 U.S.C. §§ 7401–7671q (2012).

<sup>15</sup> See *id.* §§ 7401(b), 7601(a)(1), 7602(a).

<sup>16</sup> Clean Air Act Amendments of 1990, Pub. L. No. 101–549, 104 Stat. 2399.

<sup>17</sup> 42 U.S.C. § 7401(b)(1)–(2); see also CRAIG N. JOHNSTON & MELISSA POWERS, PRINCIPLES OF ENVIRONMENTAL LAW 51 (2016).

<sup>18</sup> *Summary of the Clean Air Act*, U.S. ENVTL. PROTECTION AGENCY, <https://perma.cc/HD7G-86UX> (last updated Aug. 24, 2017).

<sup>19</sup> JOHNSTON & POWERS, *supra* note 17, at 73.

<sup>20</sup> *Id.* at 72–73.

<sup>21</sup> See 42 U.S.C. § 7475(a); 40 C.F.R. § 52.21(b)(12) (2016); JOHNSTON & POWERS, *supra* note 17, at 73–75.

<sup>22</sup> See U.S. ENVTL. PROT. AGENCY, DRAFT: NEW SOURCE REVIEW WORKSHOP MANUAL, at B.5–B.9 (1990), <https://perma.cc/H8K4-FBNS> [hereinafter NSR MANUAL].

<sup>23</sup> *Id.* at B.5–B.7.

<sup>24</sup> *Id.* at B.13; see also U.S. ENVTL. PROT. AGENCY, PSD AND TITLE V PERMITTING GUIDANCE FOR GREENHOUSE GASES 26–28 (2011), <https://perma.cc/827T-KUL4> [hereinafter GHG BACT].

loophole by narrowly defining their facilities' stated purposes and specific design configurations.<sup>25</sup> The result is that power-generating facilities, when bringing new facilities online or making major modifications to an existing facility, typically never have to consider using alternative—e.g., cleaner or zero-emission—fuels, as opposed to fossil fuels.<sup>26</sup>

The general test to determine whether a potential pollution control might “redefine the source” begins with an initial attempt by the PSD applicant to define the basic purpose and design of its proposed facility.<sup>27</sup> The permitting authority is then tasked with deciding which design elements are inherent and which elements may be changed to achieve desired emissions reductions without disrupting that inherent design.<sup>28</sup> According to EPA guidance, however, the CAA does not actually prohibit BACT consideration of pollution controls that “redefine the source.”<sup>29</sup> Thus, permitting authorities ultimately have the discretion to require PSD applicants to consider a redesign, such as changes to the facility's primary fuel type.<sup>30</sup> Exempting cleaner fuel technology from BACT consideration means that the emissions standards imposed will be less stringent than they could or should be, arguably undermining the goals of the CAA and PSD program.<sup>31</sup> This Chapter argues that in order to best serve the purpose of preserving air quality and protecting public health and welfare, fossil fuel reliance should be curtailed by imposing stricter regulations on the worst GHG emitters: fossil fuel facilities.

Several cases illustrate courts' general tendency to defer to EPA when assessing how the “redefining the source” test is used to permit a PSD

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GUIDANCE] (“The ‘redefining the source’ issue is ultimately a question of degree that is within the discretion of the permitting authority.”).

<sup>25</sup> See Gregory B. Foote, *Considering Alternatives: The Case for Limiting CO<sub>2</sub> Emissions from New Power Plants Through New Source Review*, [2004] 34 *Envtl. L. Rep.* (Envtl. Law Inst.) 10,642, 10,651 (“Despite the clarity of the statutory language requiring consideration of alternatives, some permitting authorities have limited the scope of NSR proceedings to the specific configuration of fuel and production process presented by the applicant.”).

<sup>26</sup> See GHG BACT GUIDANCE, *supra* note 24, at 27 (“The CAA includes ‘clean fuels’ in the definition of BACT. Thus, clean fuels which would reduce GHG emissions should be considered, but EPA has recognized that the initial list of control options for a BACT analysis does not need to include ‘clean fuel’ options that would fundamentally redefine the source. Such options include those that would require a permit applicant to switch to a primary fuel type (i.e., coal, natural gas, or biomass) other than the type of fuel that an applicant proposes to use for its primary combustion process.” (citation omitted)).

<sup>27</sup> See *Desert Rock Energy Co.*, 14 E.A.D. 484, 530 (EAB 2009).

<sup>28</sup> *Id.*

<sup>29</sup> GHG BACT GUIDANCE, *supra* note 24, at 26–27.

<sup>30</sup> *Id.* at 27–28.

<sup>31</sup> See CAA, 42 U.S.C. § 7401(b)(1)–(2) (2012) (declaring that the purpose of the CAA, in part, is to “protect and enhance” air quality and “to achieve prevention and control of air pollution”); see also Foote, *supra* note 25, at 10,646 (“The control technology provisions of NSR require minimization of emissions from new sources of pollution. BACT . . . [is] “technology-forcing,” intended to stimulate the development of improved methods for reducing air pollution.”).

applicant and limit its pool of potential pollution controls under BACT step one. For example, in *Sierra Club v. U.S. Environmental Protection Agency*<sup>32</sup> and *Helping Hand Tools v. U.S. Environmental Protection Agency*,<sup>33</sup> the United States Court of Appeals for the Seventh and Ninth Circuits, respectively, attempted to address the “redefining the source” issue.<sup>34</sup> Both courts ultimately agreed that it was not clear where to “draw the line” with respect to when a pollution control constitutes a redefinition of the source, and each court deferred that determination to the discretion of EPA.<sup>35</sup>

In *Sierra Club*, the Seventh Circuit held that the permitting authority did not err in finding that the use of a more efficient fuel alternative—low-sulfur coal as opposed to high-sulfur coal—would constitute a redefinition of the source.<sup>36</sup> The court found that decision reasonable in light of the applicant’s basic project purpose, which was to use a high-sulfur coal mine as a fuel source to operate a “mine-mouth” plant—a plant that mines for its fuel on-site as opposed to having its fuel shipped from a distance.<sup>37</sup> In *Helping Hand Tools*, the Ninth Circuit used similar reasoning in holding that EPA did not err when it found that the use of solar energy, as opposed to wood-waste biomass accumulated on site, would redefine the source.<sup>38</sup> The court further sided with EPA in finding that, despite the facility’s planned fuel usage of natural gas for limited purposes, requiring consideration of a higher natural gas mix as its primary fuel nevertheless constituted redefining the source.<sup>39</sup> In both cases, the “redefining the source” justification precluded inherently lower-emitting pollution controls—i.e., cleaner fuel alternatives—from BACT consideration.<sup>40</sup>

However, even in cases where courts rejected the redefining the source argument, the lower-polluting controls of which the court required consideration under BACT consisted only of other fossil fuel options.<sup>41</sup> There does not appear to be a single instance of any court requiring BACT consideration of a renewable fuel source, despite express EPA authorization

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<sup>32</sup> 499 F.3d 653 (7th Cir. 2007) (Posner, J.).

<sup>33</sup> 836 F.3d 999 (9th Cir. 2016), *amended by and reh’g denied*, 848 F.3d 1185 (9th Cir. 2016).

<sup>34</sup> See *Sierra Club*, 499 F.3d at 655 (“But this opens the . . . crucial question where control technology ends and a redesign of the ‘proposed facility’ begins.”); *Helping Hand Tools*, 836 F.3d at 1001 (“This is the first time we have reviewed EPA’s doctrine of ‘redefining the source.’”).

<sup>35</sup> *Sierra Club*, 499 F.3d at 655; *Helping Hand Tools*, 836 F.3d at 1010, 1012–13.

<sup>36</sup> *Sierra Club*, 499 F.3d at 657.

<sup>37</sup> *Id.* at 654, 657.

<sup>38</sup> *Helping Hand Tools*, 836 F.3d at 1010.

<sup>39</sup> *Id.* at 1009.

<sup>40</sup> *Sierra Club*, 499 F.3d at 657–58; *Helping Hand Tools*, 836 F.3d at 1009.

<sup>41</sup> See *infra* notes 165–171 and accompanying text (requiring BACT consideration of Integrated Gasification Combined Cycle (IGCC) coal technology); *infra* notes 173–177 and accompanying text (requiring BACT consideration of natural gas); see also *infra* note 76 and accompanying text (explaining that the major fossil fuels consist of petroleum, natural gas, and coal).

to do so.<sup>42</sup> The court in *Helping Hand Tools* even specifically rejected the plaintiffs' argument that EPA's BACT assessment should have considered the use of solar energy as a fuel source.<sup>43</sup>

This Chapter argues that courts and agencies have demonstrated a pattern of relying on the overly subjective nature of the "redefining the source" doctrine to read out of the CAA the "clean fuels" requirement.<sup>44</sup> This treatment allows new GHG-emitting sources to come online when potentially viable carbon-free renewable energy sources could be constructed in their stead, thereby perpetuating the overcapitalization of fossil fuel resources.<sup>45</sup> In desperate need of solutions to mitigate the worst effects of climate change, agencies, legislators, and courts should operate to ensure that the goals of the CAA are not dwarfed by fossil fuel interests heavily resistant to policy reform.

Part II of this Chapter addresses the global impacts of climate change and explains the relation between climate change and GHG emissions as a product of the incumbency of the fossil fuel industry in the United States. Part III outlines the statutory and regulatory framework of the PSD program and the application of BACT under the CAA. It also discusses the "redefining the source" doctrine and outlines the test relied on by courts when examining the use of the doctrine in practice. Part IV surveys how various authorities have actually applied their discretion under the "redefining the source" test in PSD permitting disputes. Part V suggests potential solutions that either curb the discretionary power courts and agencies are afforded under the "redefining the source" doctrine or simply eliminate the doctrine altogether. In Part VI, the Chapter concludes that in future practice BACT should be construed as strictly as possible, eliminating or at least limiting the reach of the "redefining the source" doctrine, to facilitate a technological shift toward clean, renewable energy in order to: 1) achieve the goals of the CAA; 2) dissolve the polluted incumbency of fossil fuels; and 3) mitigate the worsening impacts of climate change on the environment.

## II. PRESSING CLIMATE CONCERNS AND THE FOSSIL FUEL INCUMBENCY

The world is experiencing unprecedented levels of CO<sub>2</sub> concentrations in the atmosphere.<sup>46</sup> Although GHGs only account for 3% of Earth's atmosphere, even small increases in atmospheric GHG concentrations are altering the climate system, resulting in countless negative environmental

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<sup>42</sup> GHG BACT GUIDANCE, *supra* note 24, at 26 ("EPA does not interpret the CAA to prohibit fundamentally redefining the source.").

<sup>43</sup> *Helping Hand Tools*, 836 F.3d at 1005.

<sup>44</sup> See CAA, 42 U.S.C. § 7479(3) (2012).

<sup>45</sup> See Shi-Ling Hsu, *Capital Rigidities, Latent Externalities*, 51 HOUS. L. REV. 719, 737–38 (2014) (describing how the overcapitalization of coal has locked in a "fossil fuel-centered way of doing things").

<sup>46</sup> See *Climate Change Indicators: Atmospheric Concentrations of Greenhouse Gases*, U.S. ENVTL. PROTECTION AGENCY, <https://perma.cc/G2PW-4QBM> (last updated Jan. 23, 2017).

and socio-economic impacts.<sup>47</sup> Although it is imperative that we reduce our reliance on fossil fuels in hopes of decelerating the rate of climate change, such an undertaking is easier said than done. Spurred by government support, the dynasty of fossil fuels is deeply rooted in the U.S. economy. However, the CAA could act as a catalyst for a transition away from that pollution-centric dynamic.<sup>48</sup>

### A. Climate Change and Its Impacts

The Arctic sea ice wintertime extent is declining at a rate of 13.3% per decade, and in 2016, for the second consecutive year, the ice reached a record low.<sup>49</sup> Since 1993, sea level has risen at an average of 3.4 millimeters per year.<sup>50</sup> This rise “has been larger than the mean rate during the previous two millennia.”<sup>51</sup> As a result, coastal areas “will increasingly experience adverse impacts such as submergence, coastal flooding, and coastal erosion due to relative sea level rise.”<sup>52</sup> Land loss and coastal flooding due to rising sea levels will cause hundreds of millions of people to be displaced by 2100 unless adaptation measures are put in place.<sup>53</sup>

Oceans serve as sinks and reservoirs that soak up and store GHGs from the atmosphere.<sup>54</sup> Thus, high CO<sub>2</sub> levels in the atmosphere have led to the escalation of CO<sub>2</sub> levels in the ocean.<sup>55</sup> This causes the oceans to become more acidic, which, in combination with ocean warming, has devastating effects on marine ecology.<sup>56</sup> Additionally, rising ocean temperatures will cause “irreversible shifts in the spatial distribution of species and seasonal timing of their activities (feeding, growth, development, behaviors, and

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<sup>47</sup> See WOLD ET AL., *supra* note 1, at 6.

<sup>48</sup> *Summary of the Clean Air Act*, *supra* note 18; see also *infra* notes 76–77 and accompanying text.

<sup>49</sup> The rate of decline was measured relative to the 1981–2010 average. *Arctic Sea Ice Minimum*, NAT'L AERONAUTICS & SPACE ADMIN., <https://perma.cc/W4YY-CHL5> (last updated Nov. 7, 2017); *2016 Arctic Sea Ice Wintertime Extent Hits Another Record Low*, NAT'L AERONAUTICS & SPACE ADMIN. (Mar. 28, 2016), <https://perma.cc/L7NU-62XD>.

<sup>50</sup> *Sea Level*, NAT'L AERONAUTICS & SPACE ADMIN., <https://perma.cc/ADF9-NSZ8> (last updated Nov. 7, 2017).

<sup>51</sup> IPCC SYNTHESIS REPORT, *supra* note 2, at 42.

<sup>52</sup> INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE: WORKING GRP. II, CLIMATE CHANGE 2014: IMPACTS, ADAPTATION, AND VULNERABILITY 364 (Christopher B. Field et al. eds., 2014) [hereinafter IPCC WGII].

<sup>53</sup> *Id.*

<sup>54</sup> WOLD ET AL., *supra* note 1, at 6, 10.

<sup>55</sup> *Climate Change Indicators: Ocean Acidity*, U.S. ENVTL. PROTECTION AGENCY, <https://perma.cc/6FNC-9U2H> (last updated Dec. 17, 2016). CO<sub>2</sub> “compos[es] over 70% of all anthropogenic GHGs.” WOLD ET AL., *supra* note 1, at 6.

<sup>56</sup> IPCC WGII, *supra* note 52, at 436, 451; WOLD ET AL., *supra* note 1, at 26–27. Oceans have a large capacity to absorb and store heat from the atmosphere, and this heat absorption impacts ocean currents and the Earth's climate system overall. *Climate Change Indicators: Ocean Heat*, U.S. ENVTL. PROTECTION AGENCY, <https://perma.cc/V9JS-JAPH> (last updated Dec. 17, 2016) (under the “Background” tab).

productivity).<sup>57</sup> Ocean warming and acidity decrease the productivity and viability of plankton, shellfish, and coral reef builders, and result in mass coral bleaching and habitat loss.<sup>58</sup> Plankton, krill, and marine snails form the base of the ocean food chain, and “[r]eductions in their productivity will affect populations of everything from whales to salmon.”<sup>59</sup> Climate impacts stretch from surface marine ecosystems down to the “deepest benthic communities.”<sup>60</sup>

Anthropogenic climate change also results in intensified weather events (such as droughts, floods, and hurricanes), declining forests, and desertification.<sup>61</sup> The predicted socio-economic impacts of climate change are distressing.<sup>62</sup> In addition to mass population displacement, global food security is threatened by heightened drought conditions and shortened growing seasons for agriculture, which have reduced food productivity in countries all over the world.<sup>63</sup> In part, other threats to general public health include: greater risk of illness and deaths from heat waves and air pollution; greater risk of many food, water, and insect-borne diseases; worsened malnutrition from diminished food production; and a general reduction in labor productivity among vulnerable populations.<sup>64</sup> Tragically, those who are least equipped to adapt—e.g., developing nations and poorer populations around the globe—disproportionately suffer many of the worst impacts of climate change.<sup>65</sup>

Since 1880, global average surface temperatures have increased by 0.99°C.<sup>66</sup> There is much agreement in the scientific community that the temperature increase must be limited to 2°C in order to avoid the most significant negative impacts from climate change.<sup>67</sup> The *2014 Fifth Assessment Report* prepared by an international panel of scientists—the Intergovernmental Panel on Climate Change (IPCC)—asserted that “[i]t is extremely likely that more than half of the observed increase in global

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<sup>57</sup> IPCC WGII, *supra* note 52, at 414.

<sup>58</sup> *Id.* at 414, 436, 448, 451, 462 tbl.6 (discussing habitat loss, acidification, coral bleaching, and warming).

<sup>59</sup> WOLD ET AL., *supra* note 1, at 26 (citing JOAN A. KLEYPAS ET AL., *IMPACTS OF OCEAN ACIDIFICATION ON CORAL REEFS AND OTHER MARINE CALCIFIERS: A GUIDE FOR FUTURE RESEARCH* (2006)).

<sup>60</sup> IPCC WGII, *supra* note 52, at 424 (“The ocean’s primary production is inextricably linked with benthic (sea floor) communities . . . [C]limate impacts on surface marine ecosystems will impact even the deepest benthic communities, even if direct changes to their physical habitat do not occur.”).

<sup>61</sup> *See* WOLD ET AL., *supra* note 1, at 27–32.

<sup>62</sup> *See* IPCC WGII, *supra* note 52, at 713; WOLD ET AL., *supra* note 1, at 37 (“[C]rop yields and changes in productivity could vary considerably across regions and among localities. Severe hardships could occur in specific regions, unless agricultural methodologies and distribution chains adapt successfully to relatively rapid and unpredicted changes in climate patterns.”).

<sup>63</sup> *See* IPCC WGII, *supra* note 52, at 713; WOLD ET AL., *supra* note 1, at 38–39.

<sup>64</sup> *See* IPCC WGII, *supra* note 52, at 713; WOLD ET AL., *supra* note 1, at 39.

<sup>65</sup> *See* IPCC WGII, *supra* note 52, at 19–20.

<sup>66</sup> *See also Global Temperature, supra* note 2.

<sup>67</sup> *See, e.g.,* WOLD ET AL., *supra* note 1, at 56.

average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in GHG concentrations and other anthropogenic forcings together.”<sup>68</sup> The report also concluded that “[a] mitigation of GHG emissions in *absolute terms* is only possible through policies/measures that either reduce the amount of fossil fuel carbon oxidized and/or that capture and permanently remove GHGs from fossil fuel extraction, processing, and use from the atmosphere.”<sup>69</sup> In other words, curbing the longstanding reliance on fossil fuels or fundamentally altering the processes by which we harvest their energy is essential to permanently mitigating GHG emissions.

### *B. A Fossil Fuel Dynasty*

In 2014, the electricity sector accounted for 30% of total U.S. GHG emissions.<sup>70</sup> As previously discussed, CO<sub>2</sub> constitutes a large majority of GHGs emitted by the electricity sector.<sup>71</sup> The electricity sector is staunchly reliant on fossil fuels, which are the “predominant source of anthropogenic CO<sub>2</sub> emissions.”<sup>72</sup> Although some methods of renewable energy production, such as solar and wind, are experiencing tremendous growth and are less costly now than they have ever been, there is far more infrastructure in place for burning fossil fuels for energy, which provide a more potent and reliable source of power.<sup>73</sup> Worldwide, renewables and fossil fuels have historically operated on “an uneven playing field, tilted in favor of long-established, deeply entrenched [fossil fuel] incumbents.”<sup>74</sup> This imbalance is equally ingrained into the fabric of U.S. energy production, beginning in the early stages of the fossil fuel industry’s development.<sup>75</sup>

The major fossil fuels—petroleum, natural gas, and coal—have maintained their dominant position over U.S. energy markets for more than a hundred years and still account for most of the nation’s energy production.<sup>76</sup> From the inception of the fossil fuel industry, one unequivocal advantage exploited by the industry has been the exorbitant subsidization by

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<sup>68</sup> IPCC SYNTHESIS REPORT, *supra* note 2, at 5 (emphasis omitted).

<sup>69</sup> INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE: WORKING GRP. III, CLIMATE CHANGE 2014: MITIGATION OF CLIMATE CHANGE 566 (Ottmar Edenhofer et al. eds., 2014), <https://perma.cc/8725-7XCN> [hereinafter IPCC WGIII].

<sup>70</sup> *Sources of Greenhouse Gas Emissions*, *supra* note 7 (providing percentage measurements of each economic sector: electricity, transportation, industry, commercial and residential, and agriculture).

<sup>71</sup> See *supra* note 8 and accompanying text.

<sup>72</sup> EPA U.S. GHG INVENTORY, *supra* note 9, at 1-5; see also Hsu, *supra* note 45, at 738.

<sup>73</sup> See WOLD ET AL., *supra* note 1, at 816, 837-38, 842.

<sup>74</sup> Felix Mormann, *Requirements for a Renewables Revolution*, 38 ECOLOGY L.Q. 903, 919 (2011).

<sup>75</sup> Mona Hymel, *The United States’ Experience with Energy-Based Tax Incentives: The Evidence Supporting Tax Incentives for Renewable Energy*, 38 LOY. U. CHI. L.J. 43, 47 (2006).

<sup>76</sup> See LAZZARI, *supra* note 11, at CRS-1 (“Oil and gas production increased from 16% of total U.S. energy production in 1920 to 71.1% of total energy production in 1970 . . .”); *U.S. Energy Facts Explained*, *supra* note 11.

the federal government in the form of tax incentives.<sup>77</sup> The government's rationalization for the incentives was to support a fledgling industry, "designed to defer tax liability and to encourage oil and gas prospecting and drilling along with the development of U.S. petroleum reserves."<sup>78</sup> However, by the 1970s—when the domestic supply of oil was fixed yet American demand for oil continued to rise—the government's new justification became price support for the increasing fuel demand.<sup>79</sup>

The tax incentives to encourage exploration and production in the petroleum industry have been much greater than the tax incentives for other capital investments. For example, between 2002 and 2008, U.S. federal subsidies for fossil fuels totaled roughly \$72 billion, while subsidies for renewable fuels totaled just \$29 billion over the same period.<sup>80</sup> Worldwide in 2013, subsidies for fossil fuels reached an estimated \$548 billion, while subsidies for renewable energy were estimated at \$121 billion.<sup>81</sup> Further indicative of the inequity, the largest fossil fuel subsidies in the United States were written as permanent provisions of the U.S. Tax Code, while most subsidies for renewables were finite initiatives with expiration dates that limited their usefulness.<sup>82</sup> The subsidies amplified profitability, which "increased investments in petroleum exploration, accelerat[ing] oil and gas extraction."<sup>83</sup> A consequent reduction of oil production costs and prices led to higher petroleum consumption, all of which had the effect of inhibiting investment in energy efficiency and renewable energy technologies.<sup>84</sup> The resulting overcapitalization of the fossil fuel industry spawned an empire heavily resistant to U.S. policy reform.<sup>85</sup>

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<sup>77</sup> Hymel, *supra* note 75, at 47–48.

<sup>78</sup> *Id.* at 65.

<sup>79</sup> *Id.* at 47–48.

<sup>80</sup> ENVTL. LAW INST., *supra* note 13, at 3. Almost half of the subsidies for renewables went to corn-based ethanol—a fuel whose effect on the climate is still debated by scientists. *Id.*; see WOLD ET AL., *supra* note 1, at 912 (discussing GHG emissions from corn-based ethanol).

<sup>81</sup> RICHARD BRIDLE & LUCY KITSON, GLOB. SUBSIDIES INITIATIVE ET AL., THE IMPACT OF FOSSIL-FUEL SUBSIDIES ON RENEWABLE ELECTRICITY GENERATION 1 (2014).

<sup>82</sup> ENVTL. LAW INST., *supra* note 13, at 3; see OIL CHANGE INT'L, DIRTY ENERGY DOMINANCE: DEPENDENT ON DENIAL 12, 17–18 (2017) (explaining the permanence of the larger fossil fuel subsidies compared to typically impermanent renewable subsidies, and then providing general examples of the largest fossil fuel tax deductions, exemptions, and credits); see also, e.g., I.R.C. § 263(c) (2012) (providing for the establishment of regulations to allow a federal tax deduction for intangible drilling and development costs for oil and gas wells); 26 C.F.R. § 1.612-4 (2016) (establishing the actual regulation, with no expiration, that provides for the intangible drilling and development costs tax deduction for oil and gas wells).

<sup>83</sup> Hymel, *supra* note 75, at 67.

<sup>84</sup> *Id.*; see also Mormann, *supra* note 74, at 920; Karsten Neuhoff, *Large-Scale Deployment of Renewables for Electricity Generation*, 21 OXFORD REV. ECON. POL'Y 88, 93 (2005). "In addition, inefficiently low pricing of externalities (e.g., environmental and social costs of electricity production) in the energy supply sector introduces a bias against the development of many forms of low-carbon technologies." IPCC WGIII, *supra* note 69, at 566.

<sup>85</sup> See Hsu, *supra* note 45, at 743 ("Laws that promote the formation of capital create policy inertia indirectly because they lower the cost of capital and induce larger investments than would otherwise occur. Capital-friendly rules thus enlarge capital stock and therefore increase

In theory, the CAA includes an important program, PSD, to eliminate or reduce the incumbency dynamic and enable a transition away from fossil fuels.<sup>86</sup> However, as the next Part explains, the “redefining the source” doctrine has undermined PSD’s transformational potential.

### III. PSD, BACT, AND THE TEST FOR “REDEFINING THE SOURCE”

Under PSD, Congress intended BACT to serve a “technology-forcing” purpose.<sup>87</sup> Namely, PSD was designed to combat incumbency by ensuring that, in addition to new facilities, existing facilities will eventually have to satisfy stringent technology-based requirements when they make major modifications.<sup>88</sup> The “redefining the source” doctrine, however, undermines PSD by affording polluters too much deference in their development decisions, allowing them to avoid stricter regulation.

#### *A. Prevention of Significant Deterioration*

The Clean Air Act mandates state compliance with federally set national ambient air quality standards (NAAQS).<sup>89</sup> For regions that are in “attainment” with the NAAQS, the CAA imposes a preconstruction review process, called Prevention of Significant Deterioration, on qualifying sources of air pollution.<sup>90</sup> The PSD program—one of two New Source Review (NSR) programs under the CAA—regulates new “major” sources of air pollution, imposing technology-based emissions limitations.<sup>91</sup> To ensure compliance with these limitations, PSD requires any “stationary source” that qualifies as “major” to obtain a permit from EPA or an authorized state *before* beginning construction on a new facility or modification of an existing facility.<sup>92</sup>

To qualify as “major” under the CAA, a source included within twenty-eight specified categories must actually emit or have the potential to emit

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the incentives to resist reform. In short, capital-friendly rules impede policy reform by increasing the private costs of policy reform.” (citation omitted)).

<sup>86</sup> See *Ala. Power Co. v. Costle*, 636 F.2d 323, 400 (D.C. Cir. 1979); Foote, *supra* note 25, at 10,646 (noting BACT’s “technology-forcing” purpose).

<sup>87</sup> Foote, *supra* note 25, at 10,646.

<sup>88</sup> See *infra* note 98 and accompanying text.

<sup>89</sup> See CAA, 42 U.S.C. § 7409(a)(1) (2012); see also *id.* § 7410(a)(1) (requiring every state to submit a plan that illustrates their compliance with a “national primary air quality standard”).

<sup>90</sup> See *id.* § 7407(d)(1)(A)(ii) (“[A]ttainment [is] any area . . . that meets the national primary or secondary ambient air quality standard for the pollutant.”); *id.* § 7475 (explaining when Governors of each state must submit a list of all “attainment” areas and the subsequent preconstruction requirements of said facilities).

<sup>91</sup> *Id.* § 7475(a). The technology-based limitations are set on a case-by-case basis. JOHNSTON & POWERS, *supra* note 17, at 72–73. The other NSR program established by the CAA is Nonattainment New Source Review (NNSR), which applies to new and modified major stationary sources specifically in “nonattainment” areas. 42 U.S.C. § 7502(c)(5); JOHNSTON & POWERS, *supra* note 17, at 80.

<sup>92</sup> 42 U.S.C. § 7475(a); JOHNSTON & POWERS, *supra* note 17, at 73.

100 tons per year or more of any CAA-regulated air pollutant.<sup>93</sup> Alternatively, a source that is not included within those specified categories will be considered “major” if it actually emits or has the potential to emit 250 tons per year of any CAA-regulated pollutant.<sup>94</sup> “Major” status is based on total facility-wide emissions.<sup>95</sup> Additionally, although the PSD program applies to all regulated pollutants, GHG emissions are currently treated uniquely in that they cannot alone qualify a facility as “major” for purposes of triggering PSD.<sup>96</sup> However, GHG emissions may be subject to regulation if the source is an “anyway” source—a source which is already “major” under PSD for emissions of a non-GHG pollutant.<sup>97</sup>

The PSD program provides a relief valve for existing major sources of air pollution because they can escape regulation unless and until they make a regulated modification: “[t]he statutory scheme intends to ‘grandfather’ existing industries; but the provisions concerning modifications indicate that this is not to constitute a perpetual immunity from all standards under the PSD program.”<sup>98</sup> In other words, grandfathered existing sources should eventually become regulated. Congress thus appears to have intended for the PSD requirements to reach most, if not all, major stationary sources of air pollution.

An existing facility must meet two requirements to satisfy the definition of “modification” under the CAA: 1) there must be a “physical change . . . or change in the method of operation”; and 2) that change must result in any new or increased emissions.<sup>99</sup> Despite the purpose of regulating modifications, EPA, permitting agencies, and the courts have all enabled many sources to avoid PSD entirely through a set of regulatory exemptions and interpretations that have little basis in the statute.<sup>100</sup> For example, EPA

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<sup>93</sup> 42 U.S.C. § 7479(1).

<sup>94</sup> *Id.*

<sup>95</sup> EPA interprets the definition of “stationary source” broadly to permit “bubbling”—assessing emissions on a plant-wide basis as opposed to a per-unit basis—such that a facility may increase emissions in one area while reducing them in another without triggering PSD, so long as the net emissions of the entire facility, or “bubble,” do not exceed the statutory or regulatory thresholds. *See Chevron U.S.A. Inc. v. Nat’l Res. Def. Council Inc.*, 467 U.S. 837, 840, 845 (1984) (holding that EPA’s policy of assessing emissions to permit “bubbling” a reasonable policy choice). Although PSD permits “bubbling” when calculating emissions, not all CAA programs do. *See CRAIG N. JOHNSTON, WILLIAM F. FUNK & VICTOR B. FLATT, LEGAL PROTECTION OF THE ENVIRONMENT* 351 (3d ed. 2010) (“[B]ubbling is unavailable under the [New Source Performance Standards].”).

<sup>96</sup> 42 U.S.C. § 7475(a)(4) (applying to each pollutant “subject to regulation”); 40 C.F.R. § 52.21(b)(49)–(50) (2016); *Utility Air Regulatory Grp. v. Env’tl. Prot. Agency*, 134 S. Ct. 2427, 2447 (2014) (“EPA overstepped its statutory authority when it decided that a source could become subject to PSD . . . by reason of its [GHG] emissions.”).

<sup>97</sup> *See Utility Air Regulatory Grp.*, 134 S. Ct. at 2449.

<sup>98</sup> *Ala. Power Co.*, 636 F.2d 323, 400 (D.C. Cir. 1979); *see* 40 C.F.R. § 51.166(a)(7)(ii), (b)(2)(i); *see also id.* § 52.2(a)(2)(ii), (b)(2)(i).

<sup>99</sup> *See* 42 U.S.C. § 7411(a)(4).

<sup>100</sup> *See* 40 C.F.R. § 60.14(e); *see also* JOHNSTON & POWERS, *supra* note 17, at 84–85 (discussing regulatory exemptions from PSD).

regulations exempt “routine maintenance, repair and replacement” (RMRR) from constituting a “physical change” under the first part of the definition of “modification.”<sup>101</sup> Further, the regulations establish rules that govern what constitutes “increased emissions” under the second part of the definition of “modification.”<sup>102</sup> Only a “major modification” triggers the application of PSD.<sup>103</sup> A “major modification” is “any physical change in or change in the method of operation of a major stationary source that would result in: a *significant emissions increase* . . . of a regulated NSR pollutant . . . and a significant *net* emissions increase of that pollutant from the major stationary source.”<sup>104</sup> More precisely, a modification is “major” if, first, a regulated physical change results in an emissions increase in any quantity above what is called the Significant Emissions Rate (SER) for a given pollutant.<sup>105</sup> The relevant SER for each pollutant is set by EPA regulation.<sup>106</sup> Second, the significant emissions increase must also result in a significant *net* emissions increase to constitute a “major modification.”<sup>107</sup> This allows a facility to factor in any “contemporaneous” emissions increases or decreases when comparing the net emissions change to the relevant SER.<sup>108</sup> Thus, if a facility wants to make a regulated physical change that will result in an emissions increase above the relevant SER, but also recently made a physical change that reduced its actual emissions, that facility may subtract the reduced actual emissions from the projected increased emissions and avoid PSD regulation if the resulting net emissions do not exceed the SER.<sup>109</sup>

Although the grandfathering mechanism is not designed to grant a facility “perpetual immunity” from PSD regulation, these regulatory exemptions invite facilities to game the system in attempts to avoid

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<sup>101</sup> 42 U.S.C. § 7411(a)(4); 40 C.F.R. § 60.14(e)(1). In addition to RMRR, other “modification” exemptions include: 1) “an increase in production rate, if . . . accomplished without a capital expenditure”; 2) “[a]n increase in the hours of operation”; 3) the added use of an alternative fuel or raw material if the existing facility is designed to accommodate that use; 4) the addition of a pollution control system or device (unless it is “less environmentally beneficial”); and 5) “[t]he relocation or change in ownership of an existing facility.” 40 C.F.R. § 60.14(e)(2)–(6).

<sup>102</sup> *Id.* §§ 51.166(b)(2)(i), 52.21(b)(2)(i).

<sup>103</sup> *Id.* §§ 51.166(a)(7)(ii), 52.21(a)(2)(ii).

<sup>104</sup> *Id.* §§ 51.166(b)(2)(i), 52.21(b)(2)(i) (emphasis added).

<sup>105</sup> JOHNSTON & POWERS, *supra* note 17, at 85.

<sup>106</sup> 40 C.F.R. §§ 51.166(b)(23)(i), 52.21(b)(23)(i). The SER for any pollutant not specifically listed the regulations is zero, meaning that *any* emissions of an unlisted pollutant would constitute a “major modification.” *Id.* §§ 51.166(b)(23)(ii), 52.21(b)(23)(ii).

<sup>107</sup> *Id.* §§ 51.166(b)(2)(i), 52.21(b)(2)(i).

<sup>108</sup> *Id.* §§ 51.166(b)(3)(i)(b), 52.21(b)(3)(i)(b). “An increase or decrease in actual emissions is *contemporaneous* with the increase from the particular change only if it occurs between: (a) The date five years before construction on the particular change commences; and (b) The date that the increase from the particular change occurs.” *Id.* § 52.21(b)(3)(ii) (emphasis added).

<sup>109</sup> *Id.* §§ 51.166(b)(3)(i), 52.21(b)(3)(i) (“Net emissions increase means . . . the amount by which the sum of the following exceeds zero: (a) The increase in emissions from a particular physical change . . . ; and (b) Any other increases and decreases in actual emissions at the major stationary source that are contemporaneous with the particular change and are otherwise creditable.”).

regulation.<sup>110</sup> However, that is not the only means of dodging regulation. A statute of limitations issue has arisen in courts where facilities that were actually required to obtain a PSD permit, but failed to do so, nevertheless escaped culpability.<sup>111</sup> In considering whether lawsuits over PSD violations were time-barred by the statute of limitations, circuits have split on when exactly these claims accrue—i.e., when the relevant statute of limitations begins to run—and whether or not particular PSD violations are considered to be “ongoing.”<sup>112</sup> Thus, even facilities that have made “major modifications,” but ignored PSD requirements, can ultimately and successfully evade PSD regulation and, in turn, avoid the BACT analysis.<sup>113</sup>

### *B. Best Available Control Technology*

Facilities subject to PSD must achieve BACT for each pollutant emitted in “significant” amounts.<sup>114</sup> BACT is a site-specific determination resulting in selection of an appropriate emission limitation based on application of a carefully chosen control technology. The CAA defines BACT as:

[A]n emission limitation based on the maximum degree of reduction of each pollutant subject to regulation under this chapter emitted from or which results from any major emitting facility, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and

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<sup>110</sup> JOHNSTON & POWERS, *supra* note 17, at 86; *see also supra* note 98 and accompanying text.

<sup>111</sup> In *National Parks Conservation Ass’n, Inc. v. Tennessee Valley Authority*, 502 F.3d 1316 (11th Cir. 2007), the United States Courts of Appeals for the Eleventh Circuit concluded that a lawsuit against a facility that had failed to comply with PSD was time-barred by the five-year statute of limitations. *Id.* at 1318. The court held that, in Alabama, BACT did not require ongoing compliance, and thus, the violation occurred only at the time construction commenced without a permit. *Id.* at 1325. Similarly, in *Sierra Club v. Oklahoma Gas & Electric Co.*, 816 F.3d 666 (10th Cir. 2016), the Tenth Circuit also concluded that a lawsuit alleging PSD violations was time-barred by the five-year statute of limitations because, again, the claim accrued once the facility commenced construction. *Id.* at 669. The dissent, however, rejected the argument that “operation of an unpermitted source is not a continuing violation.” *Id.* at 677 (Briscoe, J., dissenting). Conversely, in *National Parks Conservation Ass’n, Inc. v. Tennessee Valley Authority*, 480 F.3d 410 (6th Cir. 2007), the Sixth Circuit concluded that a lawsuit against a facility in violation of PSD was not time-barred by the statute of limitations. *Id.* at 411. The court held that the BACT violation “manifests itself anew each day a plant operates without BACT limits on emissions.” *Id.* at 419.

<sup>112</sup> Compare *National Parks Conservation Ass’n, Inc.*, 502 F.3d at 1325, and *Sierra Club*, 816 F.3d at 669, with *National Parks Conservation Ass’n, Inc.*, 480 F.3d at 411.

<sup>113</sup> *See, e.g., National Parks Conservation Ass’n, Inc.*, 502 F.3d at 1318; *Sierra Club*, 816 F.3d at 669.

<sup>114</sup> 40 C.F.R. § 52.21(j)(2). “Significant” emissions refers to emissions in excess of the SER. *See id.* § 51.21(b)(23)(i); *see also supra* notes 105–106 and accompanying text.

techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each such pollutant.<sup>115</sup>

Notably, despite EPA's acknowledgment of "its present practice . . . that clean fuels are an available means of reducing emissions to be considered . . . in identifying BACT level controls,"<sup>116</sup> EPA's regulatory definition of BACT curiously leaves out the words "clean fuels."<sup>117</sup>

EPA uses a five-step, top-down approach in implementing this standard.<sup>118</sup> Step one involves identifying the potential control technologies available to the source that it must consider in its BACT analysis.<sup>119</sup> In step two, technically infeasible options are eliminated from consideration.<sup>120</sup> Step three entails ranking the list of remaining control technologies by their effectiveness.<sup>121</sup> In step four, beginning from the top of the list, each option is evaluated, giving consideration to energy, environmental, and economic impacts.<sup>122</sup> If the first option is not selected as BACT, the next option on the list is evaluated giving weight to the same three factors.<sup>123</sup> Step five entails selection of the appropriate BACT standard to be implemented.<sup>124</sup> A quintessential EPA guidance document, the *New Source Review Workshop Manual* (NSR Manual), in part interpreted the BACT requirement, and provided the substantive and procedural framework for the above five-step approach.<sup>125</sup>

Of particular relevance in the "redefining the source" context is step one of the BACT top-down approach. In this step, the permit applicant identifies—irrespective of cost, which factors into the BACT analysis at later steps—all available control technologies that may apply to the source and

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<sup>115</sup> CAA, 42 U.S.C. § 7479 (2012).

<sup>116</sup> Letter from William G. Rosenberg, Assistant Adm'r for Air & Radiation, to Henry A. Waxman, Chairman, Subcomm. on Health & Env't, House Comm. on Energy and Commerce (Oct. 17, 1990), *reprinted in* 136 CONG. REC. S16916–17 (daily ed. Oct. 27, 1990).

<sup>117</sup> See 40 C.F.R. § 52.21(b)(12) (listing possible means of emissions reduction, "including fuel cleaning or treatment or innovative fuel combustion techniques").

<sup>118</sup> See NSR MANUAL, *supra* note 22, at B.6.

<sup>119</sup> *Id.* at B.5.

<sup>120</sup> *Id.* Technical infeasibility involves showing, "based on physical, chemical, and engineering principles, that technical difficulties would preclude the successful use of the control option on the emissions unit under review." *Id.* at B.7.

<sup>121</sup> *Id.* at B.6. In ranking technologies, factors to consider "[s]hould include: control effectiveness (percent pollutant removed); expected emission rate (tons per year); energy impacts (BTU, kWh); environmental impacts (other media and the emissions of toxic and hazardous air emissions); and economic impacts (total cost effectiveness, incremental cost effectiveness)." *Id.*

<sup>122</sup> *Id.* at B.8–B.9.

<sup>123</sup> *Id.* at B.6.

<sup>124</sup> *Id.*

<sup>125</sup> See generally *id.* EPA suggests that a BACT determination for GHG emissions "should be conducted in the same manner as it is for any other PSD regulated pollutant." GHG BACT GUIDANCE, *supra* note 24, at 17.

pollutant being evaluated.<sup>126</sup> EPA suggests this list of available control technologies should consider alternatives from each of three categories: 1) inherently lower-emitting processes and practices, 2) add-on controls, and 3) combinations of the previous two.<sup>127</sup> Inherently lower-emitting processes and practices include “the use of materials and production processes and work practices that prevent emissions and result in lower ‘production-specific’ emissions.”<sup>128</sup> Add-on controls include “scrubbers, fabric filters, thermal oxidizers and other devices that control and reduce emissions after they are produced.”<sup>129</sup> Step one is meant to be comprehensive to ensure that all viable technology options are considered.<sup>130</sup>

EPA’s NSR Manual implicitly facilitates expansion of the scope of the step-one BACT analysis. First, it addresses which sources an applicant should look to in compiling its list of “demonstrated and transferable technologies.”<sup>131</sup> Some of the suggested sources include: 1) EPA’s BACT and Lowest Achievable Emissions Rate (LAER) Clearinghouse, a database of past control technologies implemented at different facilities for different pollutants under different CAA standards;<sup>132</sup> 2) control technology vendors; 3) federal, state, and local NSR permits and associated performance test reports; 4) environmental consultants; and 5) technical journals, reports, and newsletters.<sup>133</sup> Furthermore, EPA suggests that applicants look to technologies implemented outside of the United States “to the extent that the technologies have been successfully demonstrated in practice on full scale operations.”<sup>134</sup> Second, EPA’s NSR Manual suggests that an applicant may propose and evaluate “innovative technologies” under BACT step one.<sup>135</sup> This encourages facilities to consider pollution controls that “achieve a[n even] more stringent emissions level than otherwise would constitute BACT.”<sup>136</sup>

EPA has not established the five-step BACT approach as binding regulation. However, permitting authorities that choose not to follow this five-step framework must still satisfy the statutory and regulatory BACT criteria subject to EPA oversight.<sup>137</sup> Despite a definitive emphasis on an

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<sup>126</sup> See NSR MANUAL, *supra* note 22, at B.10.

<sup>127</sup> *Id.*

<sup>128</sup> *Id.*

<sup>129</sup> *Id.*

<sup>130</sup> See *id.* at B.11.

<sup>131</sup> See *id.*

<sup>132</sup> *Technology Transfer Network Clean Air Technology Center - RACT/BACT/LAER Clearinghouse*, U.S. ENVTL. PROTECTION AGENCY, <https://perma.cc/NTW3-Q565> (last updated Nov. 11, 2017).

<sup>133</sup> NSR MANUAL, *supra* note 22, at B.11.

<sup>134</sup> *Id.*

<sup>135</sup> *Id.* at B.12–B.13.

<sup>136</sup> See *id.* at B.13.

<sup>137</sup> GHG BACT GUIDANCE, *supra* note 24, at 19.

expansive analysis, EPA nevertheless established a doctrine used today that limits the scope of step one: “redefining the source.”<sup>138</sup>

### C. “Redefining the Source” Doctrine

The test for “redefining the source”—sometimes called “redesigning” the source—puts discretionary power in the hands of both the permitting agency as well as the PSD applicant.<sup>139</sup> With little statutory support, EPA created a loophole and developed a test to examine the application of that discretionary power in practice.<sup>140</sup> Though it is not entirely certain if the loophole should exist at all, or how exactly it should apply if it should, the following Sections demonstrate how regulators afford polluters too much deference in their development decisions. Because many sources already dodge PSD regulation, only a very limited interpretation of the “redefining the source” doctrine is appropriate, if even appropriate at all.<sup>141</sup> For the limited number of sources that do trigger PSD regulation, it should serve a meaningful purpose, particularly because it is unlikely that they will trigger it again for many years.<sup>142</sup>

#### 1. The Test for “Redefining”

EPA’s long-standing position is that step one in the BACT determination does not require sources to consider pollution controls whose implementation would effectively redesign the plant as proposed by the permit applicant.<sup>143</sup> EPA and its Environmental Appeals Board (EAB) have articulated a general test for determining whether a proposed BACT alternative “would so substantially alter the purpose or basic design of [the] proposed facility that it should be considered a redefinition of the source.”<sup>144</sup> First, the permit applicant “defines the proposed facility’s end, object, aim, or purpose—that is the facility’s basic design.”<sup>145</sup> Next:

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<sup>138</sup> See NSR MANUAL, *supra* note 22, at B.13.

<sup>139</sup> JOHNSTON & POWERS, *supra* note 17, at 74.

<sup>140</sup> See *infra* note 148 and accompanying text.

<sup>141</sup> Deepa Varadarajan, *Billboards and Big Utilities: Borrowing Land-Use Concepts to Regulate “Nonconforming” Sources Under the Clean Air Act*, 112 YALE L.J. 2553, 2562–63 (2002); see also JOHNSTON & POWERS, *supra* note 17, at 86 (concluding that the NSR programs, including PSD, invite facilities to game the regulations to avoid pollution control requirements).

<sup>142</sup> Foote, *supra* note 25, at 10,666 & n.194.

<sup>143</sup> See NSR MANUAL, *supra* note 22, at B.13 (“For example, applicants proposing to construct a coal-fired electric generator, have not been required by EPA as part of a BACT analysis to consider building a natural gas-fired electric turbine although the turbine may be inherently less polluting . . .”).

<sup>144</sup> Desert Rock Energy Co., 14 E.A.D. 484, 529–30 (EAB 2009). “The [EAB] is the final decision maker on administrative appeals under all major environmental statutes that EPA administers.” *Environmental Appeals Board*, U.S. ENVTL. PROTECTION AGENCY, <https://perma.cc/RSH9-ETSL> (last updated Nov. 11, 2017).

<sup>145</sup> Prairie State Generating Co., 13 E.A.D. 1, 22, 23 n.23 (EAB 2006).

[t]he permit issuer... should take a “hard look” at the applicant’s determination in order to discern which design elements are inherent for the applicant’s purpose and which design elements “may be changed to achieve pollutant emissions reductions without disrupting the applicant’s basic business purpose for the proposed facility.”<sup>146</sup>

In short, the test involves a two-step process where a PSD applicant defines its facility’s design, and the permit issuer then determines, based on that design, whether the applicant sufficiently identified and considered pollution controls in step one of BACT that would achieve emissions reductions without also redefining the source.

## *2. Discretionary Power Under the Clean Air Act*

Despite EPA’s doctrine, it acknowledges in a more recent guidance document that the “redefining the source” test does not facially stem from the CAA:

EPA does not interpret the CAA to prohibit fundamentally redefining the source and has recognized that permitting authorities have the discretion to conduct a broader BACT analysis if they desire. The “redefining the source” issue is ultimately a question of degree that is within the discretion of the permitting authority. However, any decision to exclude an option on “redefining the source” grounds must be explained and documented in the permit record, especially where such an option has been identified as significant in public comments.<sup>147</sup>

The question therefore only becomes whether the authority chooses to exercise its discretion to exclude a particular technology from BACT consideration. But, it seems that even in applying its “redefining the source” test, EPA still recognizes that step one under BACT should be broad:

The CAA includes “clean fuels” in the definition of BACT. Thus, clean fuels which would reduce GHG emissions should be considered, but EPA has recognized that the initial list of control options for a BACT analysis does not need to include “clean fuel” options that would fundamentally redefine the source. . . . EPA does not classify the option of using a cleaner form of the same type of fuel that a permit applicant proposes to use as a change in primary fuel, so these types of options should be assessed in a top-down BACT analysis in most cases. For example, a permitting authority may consider that some types of coal can have lower emissions of GHG than other forms of coal, and they may insist that the lower emitting coal be evaluated in the BACT review. Furthermore, when a permit applicant has incorporated a particular fuel into one aspect of the project design (such as startup or auxiliary

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<sup>146</sup> Desert Rock Energy Co., 14 E.A.D. at 530 (quoting Prairie State Generating Co., 13 E.A.D. at 23).

<sup>147</sup> GHG BACT GUIDANCE, *supra* note 24, at 27.

applications), this suggests that a fuel is “available” to a permit applicant. In such circumstances, greater utilization of a fuel that the applicant is already proposing to use in some aspect of the project design should be listed as an option in Step 1 unless it can be demonstrated that such an option would disrupt the applicant’s basic business purpose for the proposed facility.<sup>148</sup>

Because the CAA’s statutory definition of BACT includes “clean fuels” but the “redefining the source” doctrine grants to permitting authorities the power to essentially ignore it, EPA’s sanctioned discretion essentially only serves to facilitate leniency toward emitters.

Former Assistant General Counsel to EPA, Gregory Foote, even asserted that limiting the scope of NSR proceedings “to the specific configuration of fuel and production process presented by the applicant” runs contrary to the weight of EAB permit appeal decisions as well as the legislative purposes of the CAA.<sup>149</sup> In other words, he argued, states have an “initial obligation to address statutorily mandated factors,” regardless of how the applicant defines his or her facility, and “the permitting agency must have authority to consider redefining the source.”<sup>150</sup>

A stronger case can be made for power plants in particular, Foote argued. “[T]he function of any single plant typically is to add to a common pool of electricity supply,” and “[c]oal-fired plants in particular merit extra scrutiny because of their tremendous size, longevity, capital and operating costs, demands on fuel suppliers and transmissions lines, and adverse environmental impacts.”<sup>151</sup> Thus, extremely careful consideration of these public policy concerns is warranted early in the PSD process. Foote concluded that these “concerns are best addressed by reading the CAA as providing no vested right to build a coal-fired plant in any form.”<sup>152</sup>

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<sup>148</sup> *Id.* at 27–28 (citations omitted).

<sup>149</sup> *See* Foote, *supra* note 25, at 10,651–52 (“It seems inappropriate for NSR purposes to consider the goal of the permit applicant—a municipality—to be construction of a waste combustor. A municipality has no proper intrinsic purpose to undertake a particular method of waste disposal. Rather, its governmental function is to dispose of waste in an appropriate way at minimum cost.”).

<sup>150</sup> *Id.* This language from a 2003 EAB decision is supportive of Foote’s position:

We have previously noted that the Agency’s PSD regulations governing permit conditions do not require that a permitting authority consider “redefining the source” as a means of reducing emissions. . . . However, “although it is not EPA’s policy to require a source to employ a different design, redefinition of the source is not always prohibited. This is a matter for the permitting authority’s discretion.” In order to obtain review of a permit issuer’s decision not to conduct a broader BACT analysis that would include redefinition of the source, a petitioner must show a good reason in the circumstances of the case for curtailing the permit issuer’s discretion or that the permit issuer abused this discretion.

*Id.* at 10,652 (omission in original) (citations omitted) (quoting Kendall New Century Dev., 11 E.A.D. 40, 52 n.14 (EAB 2003)).

<sup>151</sup> *See* Foote, *supra* note 25, at 10,657.

<sup>152</sup> *Id.*

As applied, requiring BACT consideration of an alternative primary fuel source has been considered a redefinition of the source.<sup>153</sup> In some instances, even requiring consideration of a cleaner version of the same inherent fuel type has been deemed a redefinition of the source.<sup>154</sup> Affording polluters the discretion to narrowly define their facilities' purposes and designs has hindered the "technology-forcing" scheme of the PSD program.<sup>155</sup> Despite a permitting agency's authority to require a redefinition of the source, it seems that authority is rarely, if ever, exercised, which runs contrary to Foote's argument that "the CAA did not intend that PSD . . . permit applicants should be entitled to dictate the design parameters" of their facilities. However, the cases discussed in Part IV exemplify the common practice of doing just that.<sup>156</sup>

#### IV. APPLICATION OF THE "REDEFINING THE SOURCE" DOCTRINE

As discussed, the "redefining the source" doctrine is exceedingly subjective and enables fossil fuel sources to define a facility's design such that it precludes even the consideration of using lower-emitting fuels. The doctrine undercuts the CAA by allowing permitting authorities to read "clean fuels" out of the statute.<sup>157</sup> Courts sanction this behavior by affording regulators undue deference in their permitting determinations.

##### A. *Sierra Club v. U.S. Environmental Protection Agency*

In *Sierra Club*, exercising authority delegated by EPA, an Illinois agency granted Prairie State Generating Co. (Prairie) a PSD permit to build a 1,500-megawatt coal-fired electric-generating plant.<sup>158</sup> Because it was EPA exercising its authority, the environmental petitioners sued EPA, alleging that the issued permit did not comply with BACT.<sup>159</sup> The petitioners initially sought review from the EAB, but the EAB refused to reverse the issuance of the permit.<sup>160</sup> The petitioners then took their appeal to the Seventh Circuit, arguing that EPA improperly excluded from the BACT analysis low-sulfur coal as a potential fuel option for controlling emissions of sulfur dioxide.<sup>161</sup>

Prairie initially defined its facility as a "mine-mouth" plant—i.e., a plant situated strategically adjacent to a coal seam—that would supply its fuel needs for an estimated thirty years.<sup>162</sup> Judge Posner, writing for the Seventh

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<sup>153</sup> See *supra* note 26 and accompanying text.

<sup>154</sup> See discussion *infra* Part IV.A.

<sup>155</sup> See Foote, *supra* note 25, at 10,646 (discussing BACT's "technology-forcing" purpose).

<sup>156</sup> *Id.* at 10,657.

<sup>157</sup> See *infra* notes 180–183 and accompanying text.

<sup>158</sup> *Sierra Club*, 499 F.3d 653, 654 (7th Cir. 2007).

<sup>159</sup> *Id.*

<sup>160</sup> *Id.*

<sup>161</sup> *Id.*

<sup>162</sup> *Id.*

Circuit, ultimately found that using low-sulfur coal from a distant mine, as opposed to high-sulfur coal from the co-located mine, would require the company to reconfigure and redesign the plant.<sup>163</sup> Thus, consistent with EPA guidance, the court upheld the permit issuance and found that EPA properly excluded the low-sulfur coal alternative from step one of BACT.<sup>164</sup>

### B. Desert Rock Energy Co.

In *Desert Rock Energy Co.*, EPA issued a PSD permit to Desert Rock Energy Company to construct a 1,500-megawatt coal-fired electric-generating facility in New Mexico.<sup>165</sup> In an irregular turn of events, EPA filed its own “Motion for Voluntary Remand” of the permit, which was adjudicated by the EAB.<sup>166</sup> EPA thus challenged its own failure to consider Integrated Gasification Combined Cycle (IGCC) as an available control technology in step one of the BACT analysis.<sup>167</sup> After EPA initially precluded IGCC from consideration at step one of BACT, the EAB agreed with EPA that the agency abused its own discretion when it first concluded that IGCC redefined the source.<sup>168</sup>

The EAB first found EPA did not take the requisite “hard look” at the permit applicant’s project purpose when excluding IGCC from consideration, relying principally on the fact that the applicant itself had included IGCC as a control technology that could be considered at step one for a coal-fueled power plant.<sup>169</sup> EPA previously had required two other PSD permit applicants with similar coal-fired facilities to consider IGCC in their BACT analyses, one of which resulted in IGCC being selected as BACT.<sup>170</sup> Unable to distinguish the two other cases, the EAB then determined that EPA failed to provide any explanation as to why IGCC would constitute “redefining the source” in this instance but not in the others.<sup>171</sup>

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<sup>163</sup> *Id.* at 657.

<sup>164</sup> *Id.*

<sup>165</sup> *Desert Rock Energy Co.*, 14 E.A.D. 484, 486 (EAB 2009).

<sup>166</sup> *Id.* at 485.

<sup>167</sup> *Id.* at 498. IGCC is a technology which converts the coal into “syngas.” OLA MAURSTAD, LAB. FOR ENERGY & THE ENV’T, AN OVERVIEW OF COAL BASED INTEGRATED GASIFICATION COMBINED CYCLE (IGCC) TECHNOLOGY 1 (2005). The syngas is then fed into turbines to generate electricity. *Id.* Heat is recovered from this process and then used to produce additional power. *Id.* The syngas is also cleaned of various pollutants and impurities, some of which can even be recaptured and reused. *Id.* at 3. Overall, the advantage of IGCC is better environmental performance. *See id.* at 5.

<sup>168</sup> *Desert Rock Energy Co.*, 14 E.A.D. at 539.

<sup>169</sup> *Id.* at 533.

<sup>170</sup> *Id.* at 533–34.

<sup>171</sup> *Id.* at 534.

*C. Cash Creek Generation, LLC*

In *Cash Creek Generation, LLC*,<sup>172</sup> the Kentucky Division for Air Quality (KDAQ), the state agency serving as the PSD permitting authority in Kentucky, issued a PSD permit to Cash Creek Generation, LLC to construct a new 770-megawatt electric-generating facility using IGCC coal technology.<sup>173</sup> Environmental petitioners filed petitions with EPA requesting that EPA object to the issuance of the permit for numerous reasons.<sup>174</sup> Among those reasons, the petitioners claimed that KDAQ improperly excluded natural gas as a primary fuel consideration when setting BACT emissions limits for the Cash Creek Generation facility.<sup>175</sup>

Lisa Jackson, the EPA Administrator, recognized EPA's "redefining the source" doctrine, but she determined that KDAQ failed to provide any reasoned explanation as to why powering the facility exclusively with natural gas was not an "available" option under the BACT analysis.<sup>176</sup> She reasoned that the facility had access to a natural gas supply, and because the facility intended to use that supply initially for six months and then as a back-up source of fuel after that, it was improper for the KDAQ to refuse to consider the use of natural gas as the facility's exclusive fuel source in the BACT analysis.<sup>177</sup>

*D. Helping Hand Tools v. U.S. Environmental Protection Agency*

In *Helping Hand Tools*, EPA issued a PSD permit to Sierra Pacific Industries for the construction of a biomass-burning cogeneration unit at its lumber mill in California.<sup>178</sup> Following two appeals to the EAB, Helping Hand Tools and the Center for Biological Diversity (collectively, plaintiffs) challenged the issuance of the permit in the Ninth Circuit.<sup>179</sup> Plaintiffs argued that EPA was required to "consider solar power and a greater natural gas mix as clean fuel control technologies in the BACT analysis."<sup>180</sup> They further argued that EPA's deferral to Sierra Pacific's stated design purpose effectively read the "clean fuels" statutory language out of the CAA.<sup>181</sup> The

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<sup>172</sup> 2009 EPA CAA Title V LEXIS 4 (EPA Dec. 15, 2009).

<sup>173</sup> *Id.* at \*1–2.

<sup>174</sup> *Id.* at \*2.

<sup>175</sup> *Id.* at \*15–16.

<sup>176</sup> *Id.* at \*18.

<sup>177</sup> *Id.* at \*18–19.

<sup>178</sup> *Helping Hand Tools*, 836 F.3d 999, 1001 (9th Cir. 2016), *amended by and reh'g denied*, 848 F.3d 1185 (9th Cir. 2016). "Cogeneration units produce both electrical power and heat." *Id.* at 1001 n.1. "Used interchangeably with the terms 'bioenergy' and 'biogenic,' biomass fuels include wood waste such as chips and bark from sawmill operations, forest residue, agricultural residue, crops, grasses, standing trees, and waste from landfills or water treatment." *Id.* at 1001 n.2.

<sup>179</sup> *Id.* at 1004–05.

<sup>180</sup> *Id.* at 1005.

<sup>181</sup> *Id.* at 1008.

new power unit's stated design purpose was to burn biomass fuels—primarily wood waste produced from the lumber mill's own processes—in order to produce a small amount of electricity for the lumber mill, as well as to heat existing lumber dry kilns.<sup>182</sup>

The Ninth Circuit, however, ultimately held that EPA did not err when it excluded both solar power and a greater natural gas mix from BACT consideration because they would “redefine the source.”<sup>183</sup> The court acknowledged that it was the first time it had considered EPA's “redefining the source” doctrine, but its holding was explicitly guided by the EAB's decision in *Desert Rock Energy Co.* and the Seventh Circuit's decision in *Sierra Club*.<sup>184</sup>

The Ninth Circuit first reasoned that when co-location with the fuel source is an inherent aspect of the design, EPA need not consider in the BACT analysis “fuel sources that are not readily available, because it would ‘redefine the source.’”<sup>185</sup> As such, the Ninth Circuit held that EPA properly dismissed solar power from the BACT analysis because its “hard look” at the record reasonably resulted in the determination that use of the co-located fuel—wood waste—“was an inherent part of the facility's design.”<sup>186</sup>

The court next examined whether EPA should have required the facility to consider a greater mix of natural gas as a primary fuel source in its BACT analysis.<sup>187</sup> The Ninth Circuit distinguished the facts from those in *Cash Creek*, asserting:

[U]nlike the facilit[y] in . . . *Cash Creek*, Sierra Pacific does not propose to use natural gas as a “secondary” or backup fuel source but only for strictly limited purposes. And unlike the facilit[y] in . . . *Cash Creek*, Sierra Pacific gave valid reasons for imposing a 10% cap: that its purpose was to burn as much of its own biomass waste as possible, and that it expected to burn much less than 10% natural gas because it was being used for such a limited purpose.<sup>188</sup>

Sierra Pacific proposed to use natural gas “only for the limited purposes of startup, shutdown, and flame stabilization,” to be capped at 10% of its annual fuel usage.<sup>189</sup> The court held that “[b]urning natural gas is therefore incidental to Sierra Pacific's business purpose of using its on-site source of biomass as fuel for the new facility. Declining to consider greater use of an incidental fuel is not arbitrary, capricious, or an abuse of discretion.”<sup>190</sup>

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<sup>182</sup> *Id.* at 1001.

<sup>183</sup> *Id.* at 1005. After a petition to the Ninth Circuit for a rehearing en banc, the Ninth Circuit made only minor amendments to its initial opinion and then denied the petition for rehearing. See *Helping Hand Tools v. U.S. Env't Prot. Agency*, 848 F.3d 1185, 1188–89 (9th Cir. 2016).

<sup>184</sup> *Helping Hand Tools*, 836 F.3d at 1001, 1005–06.

<sup>185</sup> *Id.* at 1006.

<sup>186</sup> *Id.* at 1009.

<sup>187</sup> *Id.*

<sup>188</sup> *Id.*

<sup>189</sup> *Id.* at 1008.

<sup>190</sup> *Id.* at 1009.

*E. An Overview: How “Redefining” Undermines PSD*

Prominently, the cases above demonstrate a pattern of keen focus on facilities’ specific design requirements in applying the test for redesigning or redefining the source.<sup>191</sup> In *Helping Hand Tools* and *Sierra Club*, both the courts and EPA took as a given the permit applicants’ purpose of being co-located with their fuel sources.<sup>192</sup> Both courts held that it would be a redefinition of the source to require the facility to consider another fuel source that was not similarly co-located.<sup>193</sup> However, in *Sierra Club*, the Seventh Circuit explicitly asserted that absent the purpose of co-location with the fuel source, it would have impermissibly read “clean fuels” out of the CAA if the permit applicant were not required to otherwise consider low-sulfur coal over the high-sulfur option, even if “[s]ome adjustment in the design of the plant would be necessary.”<sup>194</sup> That is to say, merely because a PSD permit applicant would have to make changes to its facility to meet the BACT standard does not automatically constitute a redefinition of the source.

Several years after *Sierra Club* was decided, EPA’s actions in *Desert Rock Energy Co.* and *Cash Creek* seemed to support the “technology-forcing” purpose of PSD. In *Desert Rock Energy Co.*, EPA filed a motion to voluntarily remand its own permit issuance, essentially acknowledging that it erred when it failed to consider IGCC as an available option.<sup>195</sup> Then, in a petition to EPA itself, *Cash Creek* similarly resulted in the rejection of a permit due, at least in part, to a state agency’s impermissible exercise of discretion when excluding natural gas from BACT as an available fuel option.<sup>196</sup> The state agency failed to provide any explanation to support its reasoning that natural gas would “redefine the source.”<sup>197</sup> Yet in *Helping Hand Tools*, the Ninth Circuit did not require Sierra Pacific to consider natural gas as an available primary fuel option in the BACT analysis, even

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<sup>191</sup> See *id.* at 1006 (“When a fuel source is co-located with a facility, EPA need not consider in the BACT analysis fuel sources that are not readily available, because it would redefine the source.”); see also *Sierra Club*, 499 F.3d 653, 657 (7th Cir. 2007) (“[T]he Board . . . granted the permit not because it thinks that *burning* low-sulfur coal would require the redesign of Prairie State’s plant (it would not), but because *receiving* coal from a distant mine would require Prairie State to reconfigure the plant as one that is not co-located with a mine, and this reconfiguration would constitute a redesign. So the Board’s ruling on the BACT issue must be upheld . . .”).

<sup>192</sup> See *Helping Hand Tools*, 836 F.3d at 1001; *Sierra Club*, 499 F.3d at 654.

<sup>193</sup> See *Helping Hand Tools*, 836 F.3d at 1006 (“When a fuel source is co-located with a facility, EPA need not consider in the BACT analysis fuel sources that are not readily available, because it would redefine the source.”); *Sierra Club*, 499 F.3d at 657.

<sup>194</sup> *Sierra Club*, 499 F.3d at 656.

<sup>195</sup> *Desert Rock Energy Co.*, 14 E.A.D. 484, 485 (EAB 2009).

<sup>196</sup> *Cash Creek Generation, LLC*, 2009 EPA CAA Title V LEXIS 4, at \*22–23 (EPA Dec. 15, 2009).

<sup>197</sup> *Id.*

though the facility already intended to use natural gas for limited purposes.<sup>198</sup> EPA's own guidance suggests:

when a permit applicant has incorporated a particular fuel into one aspect of the project design (such as startup or auxiliary applications), this suggests that a fuel is "available" to a permit applicant. In such circumstances, greater utilization of a fuel that the applicant is already proposing to use in some aspect of the project design should be listed as an option in Step 1 unless it can be demonstrated that such an option would disrupt the applicant's basic business purpose for the proposed facility.<sup>199</sup>

As noted above, the Ninth Circuit attempted to distinguish the facts from those in *Cash Creek*, albeit unpersuasively. The court placed a distinction between using natural gas as a "backup" and using natural gas for "limited purposes."<sup>200</sup> This distinction was artificial, overly subjective, and placed too much discretion in the hands of the PSD permit applicant. Further relying on Sierra Pacific's chosen purpose, in very few words, the court refused to entertain the plaintiffs' argument for considering solar power: "Sierra Pacific and EPA are not required to take on the 'Sisyphean' task of considering every possible clean fuel alternative."<sup>201</sup>

The deference provided to agencies by courts to make these subjective determinations facilitates gaming the system to elude consideration of cleaner fuel options.<sup>202</sup> For example, if a PSD permit applicant desires to construct a coal facility, the cases seem to support that the applicant need only pick a location for its facility such that it is co-located with its desired fuel source. If so, the applicant will likely avoid having to consider cleaner fuel options under BACT because considering *any* other fuel would constitute a "redefinition of the source." Keeping in line with the "technology-forcing" purpose of the PSD program, courts should exercise caution when applying the "redefining the source" doctrine to prevent reading "clean fuels" out of the CAA.

## V. REMEDIES

To better achieve the goals of the CAA and PSD, regulators, courts, and legislators should step in and amend the principles that guide the application of BACT in practice. Although BACT is applied on a case-by-case basis, it should operate to ensure consistency, and the "redefining the source" doctrine should not enable subversion of the PSD program. PSD was designed in part to bring all sources of pollution into compliance with

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<sup>198</sup> *Helping Hand Tools*, 836 F.3d at 1009.

<sup>199</sup> GHG BACT GUIDANCE, *supra* note 24, at 28.

<sup>200</sup> *Helping Hand Tools*, 836 F.3d at 1009.

<sup>201</sup> *Id.*

<sup>202</sup> See JOHNSTON & POWERS, *supra* note 17, at 86.

modern pollution control technology.<sup>203</sup> Several steps can be taken to support that design. First, at a minimum, the redefining doctrine should be given definitive parameters as applied to any particular type of source to ensure that BACT application is objective and consistent. Second, the redefining test should be altered to preclude PSD applicants from defining a facility's purpose so narrowly as to avoid stricter PSD regulation. Finally, the more rigid alternative would be to eliminate the doctrine altogether.

#### *A. Clarifying Doctrinal Principles*

Placing decisive boundaries on the BACT analysis would mitigate uncertainty in its application and allow PSD permit applicants to know exactly what to expect should they desire to bring a fossil fuel source online. As seen above, courts are keen on carving out distinct categories of sources that may escape stricter regulation based on their defined purpose. Most notably, in *Sierra Club* and *Helping Hand Tools* the Seventh and Ninth Circuits, respectively, focused on the facility's co-location with its desired fuel source.<sup>204</sup> In *Helping Hand Tools*, the Ninth Circuit identified an additional purpose: the applicant's cogeneration unit also served to produce heat for existing lumber dry kilns.<sup>205</sup> Specific facility characteristics such as these—e.g., co-location with a fuel source or having multiple functional purposes—that are afforded regulatory leniency should be expressly provided for in the CAA regulations to ensure consistent doctrinal application. It is important for permit issuers to know not only what constitutes redefining the source, but more importantly, what should not constitute redefining the source.

For example, it should be explicit that the “redefining the source” test should not prevent sources from having to consider cleaner primary fuel options if fuel choice is the only reason the facility provides as justification. Having one's first choice of fuels should never *alone* be dispositive under the “redefining the source” test at step one, because that would effectively read “clean fuels” out of the CAA's definition of BACT. This idea was exemplified in practice in *Desert Rock Energy Co.*, where EPA itself sought to remand a permit that it had issued.<sup>206</sup> The EAB agreed with EPA, finding a failure to meet the “hard look” requirement when EPA precluded IGCC from consideration under BACT step one without any reason beyond its “unavailability.”<sup>207</sup> It should be incumbent upon courts and regulators to set more conclusive parameters defining exactly how BACT must apply in a particular circumstance. It should only be the rare outlier where less objective discretion must be applied.

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<sup>203</sup> *Id.* at 72–73.

<sup>204</sup> *See supra* notes 192–193 and accompanying text.

<sup>205</sup> *Helping Hand Tools*, 836 F.3d at 1001.

<sup>206</sup> *See* *Desert Rock Energy Co.*, 14 E.A.D. 484, 531 (EAB 2009).

<sup>207</sup> *Id.*

*B. Curbing the Test for “Redefining the Source”*

EPA, EAB, and courts should also further temper the overly broad application of the “redefining the source” test. One way to do this would be to afford permit applicants less discretion in setting the parameters of a particular facility’s basic purpose. Arguably,

[the CAA] and its legislative purposes already provide . . . that permitting authorities cannot lawfully accept the design or location of a proposed source as a *fait accompli*. Rather, the proposal is subject to public debate, and permitting authorities must justify on the record of the permit proceeding any decision to reject reasonable alternatives to the proposed source.<sup>208</sup>

That is to say, merely having been provided the permit applicant’s desired purpose does not sanction the permitting authority’s blind acceptance of whatever the applicant puts before it. Foote seems to argue that, from its inception, the test was never meant to be applied in that manner. In fact, Foote’s later reasoning seems entirely at odds with the decisions in *Sierra Club* and *Helping Hand Tools*:

This aspect of considering alternative fuels in turn raises the issue of choice of fuel source, and related siting issues. In particular, an applicant may intend to construct a “mine-mouth” power plant to eliminate transportation costs, or a state may desire to use coals mined within the state, to provide jobs and promote economic growth. These certainly are legitimate reasons to prefer a particular choice of fuels in a permit application, but they cannot legitimately prevent consideration of different fuel choices.<sup>209</sup>

This suggests that even the above courts’ strongest arguments for technologies that “redefine the source”—fuel co-location—should fail to preclude step one BACT consideration of a particular fuel choice.

Through regulation, EPA could place distinct limitations on how a facility’s purpose may be determined. For example, after the permit applicant defines its facility’s objective, the permit issuer should be imbued with the authority to base its “hard look” on the broadest possible interpretation of that defined objective. Thus, in line with how the test was meant to be applied, the permitting authority would not simply have to “accept the design or location of a proposed source as a *fait accompli*.”<sup>210</sup>

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<sup>208</sup> See Foote, *supra* note 25, at 10,651.

<sup>209</sup> *Id.* at 10,659 (citation omitted).

<sup>210</sup> See Foote, *supra* note 25, at 10,651. Foote provided an example to illustrate this concept:

It seems inappropriate for NSR purposes to consider the goal of the permit applicant—a municipality—to be construction of a waste combustor. A municipality has no proper intrinsic purpose to undertake a particular method of waste disposal. Rather, its governmental function is to dispose of waste in an appropriate way at minimum cost.

*Id.* at 10,652.

The more broadly a facility's design is defined, the fewer control technologies are likely to constitute a redefinition of the source. Putting the power to broadly interpret a proposed facility's purpose in the hands of the permitting authority would serve to appropriately expand the scope of the BACT step one analysis and allow fewer sources to elude more stringent PSD regulation.

### *C. Abolishing the Test*

Finally, EPA could implement a drastic policy shift and do away with the "redefining the source" test altogether, closing the loophole. Given the various existing channels by which polluters can avoid PSD and BACT consideration, the need for the test is not precisely clear.<sup>211</sup>

As demonstrated above, regulatory exemptions and statute of limitations issues offer refuge for polluters hoping to avoid PSD regulation altogether.<sup>212</sup> Further, the five-step BACT analysis includes multiple avenues through which a pollution control could be eliminated from consideration.<sup>213</sup> Most notably, at step two, "technically infeasible options" are eliminated.<sup>214</sup> After the remaining options are ranked according to their effectiveness at step three, then, at step four, each technically feasible option is evaluated to determine its 1) energy impacts, 2) environmental impacts, and 3) economic impacts.<sup>215</sup> It would seem apparent that both step two and step four provide adequate avenues to eliminate options that are either not technologically feasible or that impose undue burdens upon the applicant.

The major distinction between eliminating pollution control measures under the "redefining the source" doctrine at step one and eliminating it under any other step is the degree of scrutiny and public participation involved.<sup>216</sup> As noted above, PSD is one of two NSR programs under the CAA, and to ensure that sources are complying with the requirements that apply to them, all NSR permits are subject to an opportunity for the public to submit comments and request a public hearing.<sup>217</sup> But, if a regulator agrees that a given technology would amount to a redefinition, it is not afforded any consideration at all past step one, and the public never learns anything else about what that technology can do. If, however, the technology is included as part of the five-step process, public scrutiny will apply and the technology

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<sup>211</sup> See JOHNSTON & POWERS, *supra* note 17, at 84–85.

<sup>212</sup> See *supra* notes 100–113 and accompanying text.

<sup>213</sup> See NSR MANUAL, *supra* note 22, at B.6–B.8.

<sup>214</sup> *Id.* at B.6–B.7.

<sup>215</sup> *Id.* at B.6, B.8.

<sup>216</sup> See *Participating in the Permitting Process*, U.S. ENVTL. PROTECTION AGENCY, <https://perma.cc/KGW9-NUGF> (last updated Mar. 15, 2017) (explaining the opportunity for the public to comment on NSR permits).

<sup>217</sup> *Id.*

will be more intimately evaluated.<sup>218</sup> Nevertheless, absent application of the “redefining the source” doctrine, sources will still not be required to do the impossible.

#### *D. Remedies: Why They’re Important*

The fundamental idea, consistent with the purpose of PSD and CAA, is that if heavily emitting pollution sources—like those that use fossil fuels and emit GHGs—could instead feasibly operate using a renewable source of fuel and could generate power for reasonably similar costs but with a substantially reduced environmental impact, then BACT should be applied stringently so as to require selection of the viable renewable fuel option. The “redefining the source” doctrine undermines that ideal, perpetuating the fossil fuel incumbency.<sup>219</sup>

Delineating clearer principles in applying the “redefining the source” test should foster regulatory certainty as well as less subjective BACT determinations. Tempering the broad discretion afforded to permit applicants to prevent them from advantageously defining their facilities’ purposes should allow fewer sources to strategically avoid stricter PSD regulation. At a minimum, fuel choice should not, on its own, be the dispositive factor in applying the doctrine because that effectively reads “clean fuels” out of the statutory definition of BACT. Each remedy is warranted, in part, because many sources already escape PSD regulation.<sup>220</sup>

The reach of PSD regulation is measurably reduced pursuant to numerous express regulatory exemptions and statute of limitations issues.<sup>221</sup> Further, the BACT analysis itself already provides, for various reasons, other means of excluding pollution control options.<sup>222</sup> For the sources that do trigger PSD, it should have significance—a sizeable impact on that facility’s potential to pollute.<sup>223</sup> This is especially true since it is unlikely that the source will trigger PSD regulation again for many years.<sup>224</sup> Therefore, it would not be unreasonable to simply abolish the “redefining the source” test altogether. BACT is designed to be “technology-forcing,” and thus, the PSD program should serve to dissolve the deeply entrenched fossil fuel

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<sup>218</sup> See NSR MANUAL, *supra* note 22, at B.7–B.8 (“In the event that the top candidate is shown to be inappropriate, due to energy, environmental, or economic impacts, the rationale for this finding should be documented for the public record. Then the next most stringent alternative in the listing becomes the new control candidate and is similarly evaluated.”).

<sup>219</sup> See discussion *supra* Part IV.E.

<sup>220</sup> See 40 C.F.R. § 60.14(e) (2016); JOHNSTON & POWERS, *supra* note 17, at 84–86.

<sup>221</sup> JOHNSTON & POWERS, *supra* note 17, at 84–86; see also *supra* notes 111–113 and accompanying text.

<sup>222</sup> See NSR MANUAL, *supra* note 22, at B.6–B.9.

<sup>223</sup> JOHNSTON & POWERS, *supra* note 17, at 78–79.

<sup>224</sup> Foote, *supra* note 25, at 10,666 & n.194.

incumbency and ultimately facilitate the integration of clean and renewable fuel technologies.<sup>225</sup>

## VI. CONCLUSION

The global impacts of climate change pose a serious and immediate threat to public health and welfare. Much of the temperature increase observed over the past century is attributable to anthropogenic increases in GHG emissions. The only way to mitigate GHG emissions in absolute terms is to reduce fossil fuel reliance or capture and permanently remove fossil fuel-related GHG emissions from the atmosphere. However, the overcapitalization of the fossil fuel industry has made it heavily resistant to policy reform.

The PSD program is designed to mitigate that incumbency dynamic by integrating stricter pollution control technologies—e.g., lower-emitting or renewable fuels—into the electricity sector. However, the “redefining the source” doctrine, as applied by courts and regulators, undermines those efforts by allowing polluters to evade a more stringent BACT analysis. Thus, it is incumbent upon courts, agencies, or perhaps Congress, to step in and ensure that the goals of the CAA and PSD are met. Polluters should be compelled to internalize the negative external costs they impose on society through diminished air quality and exacerbated environmental and socio-economic impacts. Notwithstanding staunch opposition to tougher regulations, the stability of our climate and the safety of worldwide populations are past the point of “wait and see” policymaking.<sup>226</sup>

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<sup>225</sup> *Id.* at 10,646.

<sup>226</sup> See John D. Sterman & Linda B. Sweeney, *Understanding Public Complacency About Climate Change: Adults' Mental Models of Climate Change Violate Conservation of Matter*, 80 CLIMATIC CHANGE 213, 214 (2007) (explaining that federal policymakers rationalize a “wait and see” approach to climate change policy by arguing that “it is prudent to determine whether anthropogenic climate change will cause substantial harm before reducing GHG emissions”).