

## FIXING NET ZERO LEAKAGE

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*In the context of climate policy, carbon leakage refers to an increase in greenhouse gas emissions in one jurisdiction resulting from actions intended to reduce emissions in another jurisdiction. Corporate net zero pledges, in which companies promise to balance their carbon emissions with removals of equivalent amounts of carbon from the atmosphere, are also susceptible to leakage. Net zero leakage reflects the potential for companies' actions under net zero pledges to displace rather than reduce carbon emissions. Just as carbon regulation in one jurisdiction can lead to carbon leakage, action by a private actor under a net zero pledge can result in greater emissions by another actor. Overall emissions may even increase. Net zero leakage presents more than a problem of greenwashing, however, as it poses a widespread and serious threat to climate change mitigation efforts.*

*This Article explores strategies to prevent or limit net zero leakage. These strategies include: extending net zero pledges to cover more activities and entities, amending carbon accounting rules to account for actual carbon impacts, incorporating safeguards against leakage into asset sales agreements, and establishing investment vehicles aimed at purchasing and retiring fossil fuel assets.*

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#### INTRODUCTION

Thousands of businesses have pledged to achieve net zero greenhouse gas (“GHG”) emissions in the coming decades.<sup>1</sup> Some companies are reducing GHG emissions associated with their operations by adopting energy efficiency measures or switching from fossil fuels to renewable energy.<sup>2</sup> Others are selling off oil and gas reserves or halting support for new fossil fuel development projects.<sup>3</sup>

Not all of these measures will decrease total GHG emissions, however. Net zero pledges and the actions taken to achieve them are subject to leakage. Net zero leakage occurs when emissions-reducing actions taken by one company under a net zero pledge result in

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1. FREDERIC HANS ET AL., NEW CLIMATE INST., NET ZERO STOCKTAKE 2022 4 (2022).

2. *Id.* at 31.

3. JES ANDREWS & REMCO FISCHER, UNITED NATIONS ENVIRONMENT PROGRAMME FINANCE INITIATIVE, HIGH-LEVEL RECOMMENDATIONS FOR CREDIBLE NET-ZERO COMMITMENTS FROM FINANCIAL INSTITUTIONS 10 (2021).

greater emissions by other entities.<sup>4</sup> The company acting to reduce its emissions essentially transfers those emissions elsewhere—either by transferring ownership or control over a GHG-emitting asset or by making way for someone else to support GHG-emitting activities.<sup>5</sup> Thus, sales of reserves by major oil and gas companies offer little or no climate benefit if the new owners intend to develop those reserves. Likewise, financial institutions' divestment from carbon-intensive companies has minimal impact if other sources step in to provide financial support.<sup>6</sup> In the wake of such moves, overall GHG emissions may decline by less than the claimed amount, remain the same, or even increase.

Net zero leakage may constitute a form of greenwashing, as companies' claims to more sustainable practices are belied by a thorough accounting of net carbon emissions.<sup>7</sup> In general, greenwashing is deceptive, undermines other companies' legitimate efforts to reduce emissions, and weakens support for regulation.<sup>8</sup> The same is true for net zero commitments that are susceptible to leakage. Even worse, net zero leakage can exacerbate the climate crisis if carbon-intensive assets wind up in the hands of companies that are less subject to public scrutiny and more likely to run dirty operations.<sup>9</sup>

Fixing net zero leakage is critical to combating climate change. Part I of this Article offers background information on net zero pledges and GHG emissions accounting and reporting systems. Part II defines net zero leakage and identifies different categories of leakage. Net zero leakage can arise from asset transfers, including sales or transfers of fossil fuel reserves, coal-fired power plants, and gas-powered vehicles. Leakage can also occur when banks avoid project finance loans for fossil fuel projects, equity owners divest from coal companies, and insurers withhold coverage for fossil fuel activities. Part III explores strategies for fixing net zero leakage. Extending net zero coverage to more activities within a company and to a broader range of companies can promote accurate accounting of carbon impacts even as assets are transferred. Provisions in asset sales agreements can similarly safeguard against leakage. Carbon

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4. Michael A. Mehling et al., *Designing Border Carbon Adjustments for Enhanced Climate Action*, 113 AM. J. INT'L L. 433, 434–35 (2019).

5. GABRIEL MALEK, ENV'T DEF. FUND, TRANSFERRED EMISSIONS: HOW RISKS IN OIL AND GAS M&A COULD HAMPER THE ENERGY TRANSITION 6 (2022).

6. ANDREWS & FISCHER, *supra* note 3, at 9.

7. Albert C. Lin, *Fig Leaves, Pipe Dreams, and Myopia: Too-Easy Solutions in Environmental Law*, 93 U. COLO. L. REV. 727, 732–33 (2022).

8. Miriam A. Cherry, *The Law and Economics of Corporate Social Responsibility and Greenwashing*, 14 U.C. DAVIS BUS. L.J. 281, 299–302 (2014) (discussing harms of greenwashing).

9. Anili Raval, *A \$140bn Asset Sale: The Investors Cashing in on Big Oil's Push to Net Zero*, FIN. TIMES (July 6, 2021), <https://www.ft.com/content/4dee7080-3a1b-479f-a50c-c3641c82c142>.

accounting rules can be amended to plug loopholes that allow companies to take credit for activities that offer little or no climate benefit. Managed transition vehicles and similar instruments can facilitate early retirement of fossil fuel assets, reducing leakage from asset transfers. Stakeholder engagement with companies involved in carbon-intensive activities also can counter leakage, especially when divestment is unlikely to have a direct impact.

These strategies alone will not bring about complete decarbonization, but they can help net zero pledges fulfill their potential to complement emission standards, carbon taxes, and other government policies to stop climate change.

## I. BACKGROUND

### A. *Net Zero*

Net zero pledges are an increasingly popular mechanism for governments and private actors to articulate their goals and future actions on climate change.<sup>10</sup> Defined narrowly, a net zero pledge represents a commitment to balance GHG emissions with removal of GHGs from the atmosphere by a specified date.<sup>11</sup> More broadly, net zero pledges also include—or should include—interim targets, emissions reduction strategies, and other details that specify how an entity expects to achieve its goals.<sup>12</sup> Private net zero pledges by companies, banks, investors, and other entities represent both an encouraging and challenging development because of their voluntary nature.

Many companies have announced their intent to achieve net zero on a companywide basis.<sup>13</sup> Nonetheless, there is considerable variation in how companies define net zero and in the substance of their commitments.<sup>14</sup> Some pledges encompass only those emissions arising within a company's operations (commonly referred to as "Scope 1 emissions").<sup>15</sup> Other pledges include—in addition to Scope 1 emissions—emissions relating to the company's use of grid-supplied energy ("Scope 2 emissions"), as well as emissions generated by the company's supply chain and the transport, use, and disposal of the company's products ("Scope 3 emissions").<sup>16</sup> Net zero targets also

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10. HANS ET AL., *supra* note 1, at 16 (reporting a rise in net zero target announcements by governments and private entities).

11. ANDREWS & FISCHER, *supra* note 3, at 7.

12. HANS ET AL., *supra* note 1, at 13 (listing expected minimum procedural steps for actors committing to net zero).

13. *Id.* at 4.

14. *Id.* at 28–31; THOMAS DAY ET AL., NEW CLIMATE INSTITUTE, CORPORATE CLIMATE RESPONSIBILITY MONITOR 2022 21 (2022).

15. ANDREWS & FISCHER, *supra* note 3, at 7.

16. *See* HANS ET AL., *supra* note 1, at 30 (reporting that of 700 companies studied, "virtually all . . . claim that their net zero targets cover full [S]cope 1 and

vary in other ways, such as anticipated target dates, types of activities and GHGs covered, and expected reliance on carbon credits generated by other actors.<sup>17</sup> In light of these variations, transparency is essential to understanding net zero targets, holding entities accountable, and making meaningful progress in addressing climate change.<sup>18</sup>

Observers have raised several concerns about net zero pledges. Companies might use net zero to greenwash, taking credit for pledges that appear socially beneficial but have little positive impact.<sup>19</sup> Indeed, net zero pledges are easy to make and hard to enforce.<sup>20</sup> In the absence of uniform standards, companies may report their emissions in varied and self-serving ways, complicating comparisons between companies and analyses of actual carbon impacts.<sup>21</sup> At the same time, multiple factors confound the enforcement of net zero pledges. Net zero targets are voluntary, reflect long-term objectives, and often are unsupported by concrete plans for achieving those objectives.<sup>22</sup> Compounding these concerns, net zero pledges may rely on still-developing technologies or carbon credits of dubious real-world impact.<sup>23</sup> And as recent research warns, the net zero framing

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2 emissions” but only 38 percent include all Scope 3 emissions as well); THOMAS DAY ET AL., NEWCLIMATE INSTITUTE & DATA-DRIVEN ENVIROLAB, NAVIGATING THE NUANCES OF NET-ZERO TARGETS 9 tbl. 1 (2020); WORLD ECON. F., NET-ZERO CHALLENGE: THE SUPPLY CHAIN OPPORTUNITY 7 (2021).

17. See HANS ET AL., *supra* note 1, at 28–31; INT’L ENERGY AGENCY, NET ZERO BY 2050: A ROADMAP FOR THE GLOBAL ENERGY SECTOR 34 (2021); DAY ET AL., *supra* note 16, at 47.

18. See DAY ET AL., *supra* note 16, at 57.

19. Shelley Welton, *Neutralizing the Atmosphere*, 132 YALE L.J. 171, 195–96 (2022); DAY ET AL., *supra* note 16, at 5 (analyzing twenty-five companies’ net zero pledges and finding that twelve failed to make any specific emission reduction commitment for their target year and the other thirteen committed to reduce their full value chain emissions by only 40 percent on average).

20. Cf. Albert C. Lin, *Making Net Zero Matter*, 79 WASH. & LEE L. REV. 679, 719–30 (2022) (exploring potential avenues for enforcing private net zero targets).

21. Simon Dietz et al., *How Ambitious Are Oil and Gas Companies’ Climate Goals?*, 374 SCI. 405, 405 (2021); Lin, *supra* note 20, at 707; see also Jack Arnold & Perrine Toledano, *Corporate Net-Zero Pledges: The Bad and the Ugly*, COLUMBIA CENTER ON SUSTAINABLE INV. (Dec. 1, 2021), <https://ccsi.columbia.edu/news/corporate-net-zero-pledges-bad-and-ugly###top> (noting that emissions-intensity-based GHG reduction targets do not guarantee absolute emissions reductions, many targets are not aligned with science-based targets for achieving global climate goals, and many pledges omit Scope 3 emissions).

22. Lin, *supra* note 20, at 702, 707–08.

23. Welton, *supra* note 19, at 199–200 (discussing concerns of “self-serving optimism” and fungibility); Zack Colman & Lorraine Woellert, *A \$130T Climate Promise Is Greeted with Suspicion*, POLITICO (Nov. 3, 2021, 6:14 PM), <https://www.politico.com/news/2021/11/03/banks-climate-promises-519176> (discussing concerns regarding reliance on offsets).

ignores concerns of equity and racial justice and mistakenly assumes the effectiveness of strategies that cannot be achieved collectively at scale.<sup>24</sup>

The foregoing concerns, while serious, are not the primary subject of this Article. This Article focuses instead on net zero leakage, which has attracted far less attention. Net zero leakage refers to action taken by a private actor under a net zero pledge or GHG emission reduction commitment that results in an increase in emissions by another actor.<sup>25</sup> This problem, defined further below, threatens to drastically undermine private sector efforts to reduce carbon emissions.

### B. GHG Accounting and Reporting

Accurate GHG accounting is essential to the integrity of net zero pledges. A brief overview of corporate GHG accounting is thus helpful in understanding the problem of net zero leakage.

GHG emissions accounting encompasses “the processes required to consistently measure the amount of GHGs generated, avoided, or removed by an entity, allowing it to track and report th[ose] emissions over time.”<sup>26</sup> Typically, a company tracks its emissions against its base-year emissions and reports its progress at regular intervals.<sup>27</sup>

Corporate GHG accounting relies heavily on nongovernmental, voluntary standards that are designed by climate specialists and stakeholders and are sometimes crafted for specific industry sectors.<sup>28</sup> Of the numerous standards that have proliferated over the years, the most prominent include: the Greenhouse Gas Protocol Corporate Accounting and Reporting Standard (“GHG Protocol”); the corporate disclosure recommendations of the Task Force on Climate-related Financial Disclosures (“TCFD”); the Science Based Targets Initiative’s (“SBTi”) Net-Zero Standard; and the Global GHG Accounting and Reporting Standard for the Financial Industry (“Financial Industry Reporting Standard”).<sup>29</sup>

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24. Welton, *supra* note 19, at 176.

25. See *infra* Subpart II.A; Lin, *supra* note 20, at 708.

26. P’ship for Carbon Acct. Fins. (PCAF), *The Global GHG Accounting & Reporting Standard for the Financial Industry* 19 (1st ed. 2020), [hereinafter PCAF] <https://carbonaccountingfinancials.com/files/downloads/PCAF-Global-GHG-Standard.pdf>.

27. Base-year emissions should be recalculated upon transfer of ownership or control of emissions-generating activities or operations to or from another company. THE GREENHOUSE GAS PROTOCOL, A CORPORATE ACCOUNTING AND REPORTING STANDARD, REVISED EDITION 35–37 (2004) [hereinafter GHG Protocol], <https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf>.

28. *Id.* at 20, 76, 78.

29. *Id.* at 2; Lin, *supra* note 20, at 713; SCI. BASED TARGETS, FINANCIAL SECTOR SCIENCE-BASED TARGETS GUIDANCE (Version 1.1) 6, 16 (2022) <https://sciencebasedtargets.org/resources/files/Financial-Sector-Science-Based-Targets-Guidance.pdf>; PCAF, *supra* note 26, at 8, 12.

The GHG Protocol—crafted through a partnership of businesses, nongovernmental organizations (“NGOs”), governments, and other stakeholders—is the dominant reporting standard.<sup>30</sup> The GHG Protocol established the system of categorizing reportable emissions in terms of Scope 1, 2, and 3 emissions.<sup>31</sup> Scope 1 emissions arise from a company’s generation of electricity, heat, or steam; physical or chemical processing; transportation of materials, products, waste, or employees; or direct release of GHGs.<sup>32</sup> Scope 2 emissions come “from the generation of purchased electricity consumed by the company.”<sup>33</sup> Finally, “Scope 3 emissions are a consequence of the activities of the company, but occur from sources not owned or controlled by the company.”<sup>34</sup>

Scope 3 emissions often comprise the bulk of a company’s total GHG emissions.<sup>35</sup> This is true for oil companies, where Scope 3 emissions include emissions generated from gasoline consumption.<sup>36</sup> For financial institutions, Scope 3 emissions include emissions associated with an institution’s investments—including equity investments, debt investments, project finance, and managed investments and client services.<sup>37</sup>

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30. GHG Protocol, *supra* note 27, at 41; Lynn M. LoPucki, *Corporate Greenhouse Gas Disclosures*, 56 U.C. DAVIS L. REV. (forthcoming 2022) (manuscript at 9–10) (on file with author). The GHG Protocol “provides the accounting platform for virtually every corporate GHG reporting program in the world.” *About Us*, GREENHOUSE GAS PROTOCOL, <https://ghgprotocol.org/about-us> (last visited Jan. 31, 2023).

31. LoPucki, *supra* note 30, at 10.

32. GHG Protocol, *supra* note 27, at 27.

33. *Id.* at 25.

34. *Id.*

35. *See, e.g.*, PCAF, *supra* note 26, at 20 (noting that for a financial institution, financed emissions “are often the most significant part of its GHG emissions inventory”).

36. GREENHOUSE GAS PROTOCOL, TECHNICAL GUIDANCE FOR CALCULATING SCOPE 3 EMISSIONS 52 (2013) [hereinafter *Scope 3 Technical Guidance*], [https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporting-Standard\\_041613\\_2.pdf](https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporting-Standard_041613_2.pdf).

37. GREENHOUSE GAS PROTOCOL, CORPORATE VALUE CHAIN (SCOPE 3) ACCOUNTING AND REPORTING STANDARD: SUPPLEMENT TO GHG PROTOCOL CORPORATE ACCOUNTING AND REPORTING STANDARD 51 (2011) [hereinafter *GHG Protocol Scope 3 Standard*], [https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporting-Standard\\_041613\\_2.pdf](https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporting-Standard_041613_2.pdf). For asset managers, Scope 3 emissions may include emissions from equity investments managed on behalf of clients. *Scope 3 Technical Guidance*, *supra* note 36, at 141. A company’s Scope 3 emissions from the use of its products include the Scope 1 and Scope 2 emissions of consumers. *GHG Protocol Scope 3 Standard*, *supra* note 37, at 48. Individual consumers generally are not subject to net zero standards.

The GHG Protocol Scope 3 Standard provides further guidance for reporting Scope 3 emissions.<sup>38</sup> Under the Scope 3 Standard, a company should report “the total expected lifetime emissions from all relevant products sold in the reporting year across the company’s product portfolio.”<sup>39</sup> An automaker, for example, should report in 2022 the projected lifetime emissions of all the cars it sold in 2022.<sup>40</sup> Similarly, when an institution finances a project (such as a coal-fired power plant), the institution should report the total projected lifetime emissions from that project in the initial year the project is financed.<sup>41</sup> Reported emissions should also include significant *indirect* emissions from financed projects. For example, an institution that finances a light bulb manufacturing facility should report direct emissions from the facility as well as emissions from consumer use of the light bulbs produced.<sup>42</sup>

Other major voluntary frameworks and standards build on the GHG Protocol and its distinction between Scope 1, 2, and 3 emissions. The TCFD’s corporate disclosure recommendations aim to promote more informed investment, lending, and insurance underwriting decisions.<sup>43</sup> These recommendations carry special weight, as the TCFD was established by the Financial Stability Board at the direction of the G20 Finance Ministers and Central Bank Governors.<sup>44</sup> As an initial matter, the TCFD recommends that organizations calculate their GHG emissions in line with the GHG Protocol.<sup>45</sup> All organizations should disclose Scope 1 and 2 emissions and “if appropriate, Scope 3 GHG emissions.”<sup>46</sup> Specifically, the TCFD “strongly encourages all organizations to disclose Scope 3 GHG emissions,” in light of “whether such emissions are a significant

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38. *Id.* at 4. The Scope 3 Standard states that it is intended to facilitate “comparisons of a company’s GHG emissions over time” and “not . . . to support comparisons between companies based on their Scope 3 emissions.” *Id.* at 6 (explaining that valid comparisons across companies would require consistency in methodology, reporting, and data used).

39. *Id.* at 48.

40. *Id.* at 49.

41. *Id.* at 32–33, 53.

42. *Id.* at 53.

43. TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURES, FINAL REPORT: RECOMMENDATIONS OF THE TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES iii (June 2017) [hereinafter TCFD Final Report], <https://assets.bbhub.io/company/sites/60/2021/10/FINAL-2017-TCFD-Report.pdf>.

44. LoPucki, *supra* note 30, at 15.

45. TCFD Final Report, *supra* note 43, at 2; TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURES, IMPLEMENTING THE RECOMMENDATIONS OF THE TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES 21 (2021) [hereinafter TCFD 2021 Update], [https://assets.bbhub.io/company/sites/60/2021/07/2021-TCFD-Implementing\\_Guidance.pdf](https://assets.bbhub.io/company/sites/60/2021/07/2021-TCFD-Implementing_Guidance.pdf).

46. TCFD 2021 Update, *supra* note 45, at 21.



portion of their total GHG emissions.”<sup>47</sup> Organizations also should describe targets related to GHG emissions, timeframes for applying climate-related targets, and indicators for assessing progress against targets.<sup>48</sup>

The SBTi’s Net-Zero Standard offers guidance, criteria, and recommendations for large corporations in setting net zero targets.<sup>49</sup> Incorporating the accounting methodologies of the GHG Protocol, the SBTi’s Net-Zero Standard defines corporate net zero to mean “[r]educing Scope 1, 2, and 3 emissions to zero or to a residual level that is consistent with reaching net-zero emissions . . . in eligible 1.5°C-aligned pathways” and “[n]eutralizing any residual emissions at the net zero target year” and beyond.<sup>50</sup> Under this standard, corporate net zero targets should include five-to-ten-year emissions reduction targets in line with 1.5°C pathways, targets to reduce emissions to a residual level by 2050, and actions beyond companies’ value chains to mitigate emissions or remove carbon.<sup>51</sup>

Some voluntary standards are sector specific. The Financial Industry Reporting Standard offers guidance to facilitate financial institutions’ measuring and reporting of financed emissions.<sup>52</sup> The standard, for example, provides that a lender who finances the construction of a gas-fired power plant should report the total projected lifetime GHG emissions of the plant in the year of

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47. *Id.* at 21 nn.32–33; *see also* TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURES, GUIDANCE ON METRICS, TARGETS, AND TRANSITION PLANS 54 (2021) [hereinafter TCFD 2021 Guidance], <https://www.fsb.org/wp-content/uploads/P141021-2.pdf> (further discussing the importance of including Scope 3 emissions).

48. TCFD Final Report, *supra* note 43, at 14, 22–23; TCFD 2021 Update, *supra* note 45, at 21–22.

49. SCI. BASED TARGETS INITIATIVE (SBTi), SBTi CORPORATE NET ZERO STANDARD VERSION 1.0 4 (2021).

50. *Id.* at 8. The reference to 1.5°C pathways is based on the Paris Agreement’s ambition of “pursuing efforts to limit the temperature increase to 1.5C above pre-industrial levels.” Conference of the Parties, *Adoption of the Paris Agreement*, prml., U.N. Doc. FCCC/CP/2015/L.9 [hereinafter Paris Agreement].

51. SBTi, *supra* note 49, at 9. Net zero targets may be submitted to SBTi for validation. *See* SBTi, TARGET VALIDATION PROTOCOL FOR NEAR-TERM TARGETS VERSION 3.0 (2021). Other mechanisms for assessing corporate net zero targets include the Climate Corporate Responsibility Monitor and the Climate Action 100+ Net Zero Company Benchmarks. *See* FREDERIC HANS ET AL., NET ZERO TRACKER, NET ZERO STOCKTAKE 33–37 (2022).

52. PCAF, *supra* note 26, at 8. The guidelines found in this standard are consistent with the GHG Protocol Scope 3 Standard and can be used to set targets in accordance with methods developed by the SBTi. *Id.* at 8–9. Specifically, financial institutions can perform GHG accounting to focus their target-setting efforts, determine baseline emissions, and track progress against their emission-based targets. *Id.* at 30.

contracting.<sup>53</sup> The SBTi also has issued guidance for the financial sector to assist in science-based net zero target setting.<sup>54</sup> The SBTi recognizes financial institutions' targets that meet specific criteria, including a requirement that their targets encompass specified activities. These activities include stockholdings, bond holdings, electricity-generation project finance, and corporate loans for commercial real estate, electricity generation, and other long-term debt.<sup>55</sup>

All the GHG reporting standards just discussed are voluntary, but mandatory standards are currently under consideration. The Securities and Exchange Commission ("SEC") has proposed requiring public companies to make disclosures with respect to climate-related risks, GHG emissions, and climate-related targets and goals.<sup>56</sup> Disclosure requirements would apply to Scope 3 emissions if material or if the registrant "has set a GHG emissions reduction target or goal that includes its Scope 3 emissions."<sup>57</sup> Disclosure requirements also may extend to net zero targets. Under the proposed rules, a public company that has announced climate-related targets would have to provide information about the scope of activities and emissions included in the target, interim targets, plans for meeting climate-related targets, and data on whether the company is making progress toward meeting its targets.<sup>58</sup>

## II. NET ZERO LEAKAGE

With this background on GHG accounting and reporting, we can turn to defining net zero leakage and exploring its manifestations.

### A. Definition

The more general problem of carbon leakage arises when policies aimed at reducing GHG emissions in one place result in increased emissions in another place.<sup>59</sup> This may occur when carbon regulation

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53. *Id.* at 75, 100. GHG accounting generally considers only those emissions that occur in a reporting year. *Id.* at 37.

54. SBTi, FINANCIAL SECTOR SCIENCE-BASED TARGETS GUIDANCE VERSION 1.1 6 (2022).

55. *Id.* at 26, 31, 55–57 tbl.5.2.

56. The Enhancement and Standardization of Climate-Related Disclosures for Investors, 87 Fed. Reg. 21334, 21347 (proposed Apr. 11, 2022).

57. *Id.* at 21468.

58. *Id.* at 21471.

59. See Mehling et al., *supra* note 4, at 434–35; Intergovernmental Panel on Climate Change, *Fourth Assessment Report: Climate Change 2007*, § 11.7.2, [https://archive.ipcc.ch/publications\\_and\\_data/ar4/wg3/en/ch11s11-7-2.html](https://archive.ipcc.ch/publications_and_data/ar4/wg3/en/ch11s11-7-2.html) ("Carbon leakage is defined as the increase in CO<sub>2</sub> emissions outside the countries taking domestic mitigation action divided by the reduction in the emissions of these countries."); Michael Jakob, *Why Carbon Leakage Matters and What Can Be Done Against It*, 4 ONE EARTH 609, 609 (2021); Carolyn Fischer,

drives carbon-intensive industries to relocate to jurisdictions with less stringent or nonexistent regulation.<sup>60</sup> Carbon regulation in one jurisdiction also may tempt other jurisdictions to free ride—reaping the benefits of cleaner air—and reduce or delay regulations of their own as a result.<sup>61</sup> In addition, the expansion of renewable energy may reduce demand for fossil fuels, lowering their prices and prompting some actors to consume more fossil fuels.<sup>62</sup>

These various forms of carbon leakage have received substantial attention. Creative solutions to the problem, while not the focus of this Article, are illustrative. As a general matter, widespread adoption of carbon mitigation measures reduces opportunities for leakage.<sup>63</sup> Where domestic producers face higher regulatory burdens than foreign competitors, border carbon adjustments can ameliorate the competitive disadvantages of carbon regulation by imposing a carbon tax on imports.<sup>64</sup> Similarly, output-based rebates for carbon-intensive sectors, when coupled with carbon taxes, preserve incentives for carbon-efficient production and disincentivize consumers from substituting domestic products with imports.<sup>65</sup> Sectoral agreements, in which trading partners negotiate common measures for reducing emissions within specific industrial sectors, also can address competitiveness concerns.<sup>66</sup> Finally, tradeable permit systems can allocate emission allowances according to output to counter leakage.<sup>67</sup>

The related concept of net zero leakage has received far less attention and problem-solving energy than carbon leakage. Net zero leakage recognizes the potential for private actors under net zero pledges to displace rather than reduce carbon emissions.<sup>68</sup> Just as carbon regulation in one jurisdiction can lead to carbon leakage, action taken by a private actor under a net zero pledge or GHG emission reduction commitment can result in an increase in emissions by another actor. In net zero leakage, an actor essentially transfers its GHG emissions to another entity—either by transferring ownership or control over a GHG-emitting asset or by making way for

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*Options for Avoiding Carbon Leakage, in TOWARDS A WORKABLE AND EFFECTIVE CLIMATE REGIME* 297, 299 (S. Barrett, C. Carraro, & J. de Melo eds., 2015).

60. Jakob, *supra* note 59, at 609; Fischer, *supra* note 59, at 299.

61. Jakob, *supra* note 59, at 609.

62. *Id.*; Fischer, *supra* note 59, at 298.

63. Jakob, *supra* note 59, at 612 (“[C]arbon leakage becomes less of an issue if mitigation costs are level across regions.”); Daniel A. Farber, *Carbon Leakage Versus Policy Diffusion: The Perils and Promise of Subglobal Climate Action*, 13 *CHI. J. INT’L L.* 359, 372 (2013) (“Expanding the economic size of the coalition engaged in abatement also decreases leakage.”).

64. Jakob, *supra* note 59, at 611–12; Fischer, *supra* note 59, at 304–05.

65. Fischer, *supra* note 59, at 303.

66. *Id.* at 306.

67. Jakob, *supra* note 59, at 611.

68. Lin, *supra* note 20, at 708.

another actor to support GHG-emitting activities.<sup>69</sup> Overall, GHG emissions may decline by less than the claimed amount, remain the same, or even increase.

As a result of net zero leakage, actual carbon emissions reductions are likely to fall short of the claimed carbon reduction benefits of private net zero pledges. Deliberately misleading or not, leaky net zero pledges can deceive stakeholders and the public and undermine legitimate net zero efforts by other companies. While net zero leakage may facilitate greenwashing, the problem is not just a matter of misleading public relations.<sup>70</sup> As the next section illustrates, net zero leakage poses a widespread and serious threat to climate change mitigation and may even result in increased carbon emissions. The transfer of fossil fuel reserves offers the most prominent example. But the transfer of other carbon-intensive assets also can result in net zero leakage, as can the divestment efforts of banks, investors, and insurers.

### B. *Net Zero Leakage from Asset Transfers*

By itself, a change in ownership of carbon-intensive assets offers no climate benefits. Companies nevertheless may claim progress toward achieving net zero goals when they transfer such assets. The resulting net zero leakage, which reflects the discrepancy between claimed and actual climate benefits, is sometimes referred to as the “transferred emissions” problem.<sup>71</sup>

#### 1. *Transfer of Carbon-Intensive Permanent Assets: Sales*

The sale of fossil fuel assets to purchasers who intend to develop them offers a prime example of net zero leakage.<sup>72</sup> Such transactions have occurred with growing frequency as the world’s largest companies come under increasing pressure to reduce carbon emissions.<sup>73</sup> Even fossil fuel companies—whose existence rests on selling products that generate massive carbon emissions—have made

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69. *Id.*

70. *Cf.* Lin, *supra* note 7, at 732–33 (discussing greenwashing). Although greenwashing typically involves an element of deliberate deception, net zero leakage may occur regardless of any intent to deceive.

71. MALEK, *supra* note 5, at 6.

72. Cyrus Taraporevala, *CEO’s Letter on Our 2022 Proxy Voting Agenda*, STATE ST. GLOB. ADVISORS (Jan. 12, 2022), <https://www.ft.com/content/c586e4cd-9fb7-47a3-8b43-3839e668fe3a> (referring to the practice of “brown-spinning” as “public companies selling off their highest-emitting assets to private equity or other actors at a discount”); Alperen A. Gözlügöl & Wolf-Georg Ringe, *Private Companies: The Missing Link on the Path to Net Zero* 10–11 (European Corp. Governance Inst. L. Working Paper No. 635/2022), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4065115](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4065115).

73. Hans ET AL., *supra* note 10, at 9–10, 26.

net zero pledges.<sup>74</sup> Because the vast bulk of fossil fuel companies' emissions arise from the products they sell, shifting away from coal, oil, and natural gas has become a central component of many of their net zero strategies.<sup>75</sup>

Major mining companies have made net zero pledges, notwithstanding their extensive history of mining coal.<sup>76</sup> In response to investor pressure, many of these companies have sold off coal assets or are in the process of doing so.<sup>77</sup> BHP, the world's largest mining company by market value, is selling off its thermal coal assets to concentrate on metallurgical coal used in steelmaking.<sup>78</sup> Rio Tinto, the world's second-largest mining company by market value,<sup>79</sup> began to sell off its coal assets in 2013 and completed its exit from coal in 2018.<sup>80</sup> The world's third-largest mining company by market value, Anglo American, plans to end production of thermal coal in 2024.<sup>81</sup>

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74. Lin, *supra* note 20, at 701.

75. Dietz et al., *supra* note 21, at 407. Companies may transfer fossil fuel assets not only to reduce their GHG emissions but also to consolidate operations or raise money for debt repayment, dividend payouts, and share buybacks. MALEK, *supra* note 71, at 10.

76. Zandi Shabalala & Clara Denina, *World's Largest Miners Pledge Net Zero Carbon Emissions by 2050*, REUTERS (Oct. 6, 2021, 9:43 AM), <https://www.reuters.com/business/sustainable-business/worlds-largest-miners-pledge-net-zero-carbon-emissions-by-2050-2021-10-05/>. Most of these pledges are yet to encompass Scope 3 emissions. Neil Hume, *Miners Face Up to Climate Challenge*, FIN. TIMES (Jan. 7, 2021), <https://www.ft.com/content/8469ef8b-86a1-4260-a280-2a18ed19b2ef>.

77. Alistair MacDonald, *Glencore Faces Call from Activist to Sell Coal Assets*, WALL ST. J. (Nov. 30, 2021, 8:37 AM), <https://www.wsj.com/articles/glencore-faces-call-from-activist-to-sell-coal-assets-11638273033>.

78. David Winning, *BHP Posts 4% Profit Drop, Wants to Stop Mining Thermal Coal*, WALL ST. J. (Aug. 17, 2020, 7:54 PM), <https://www.wsj.com/articles/bhp-posts-4-profit-drop-wants-to-stop-mining-thermal-coal-11597708449>. Thermal coal is used to generate electricity, whereas metallurgical coal is used to create coke for iron and steel production. See Paula Baker, *The Coal Facts: Thermal Coal vs. Metallurgical Coal*, GLOB. NEWS (June 10, 2013, 1:05 PM), <https://globalnews.ca/news/627069/the-coal-facts-thermal-coal-vs-metallurgical-coal/>.

79. *Leading Mining Companies Worldwide Based on Market Capitalization in 2021*, STATISTA, <https://www.statista.com/statistics/272706/top-10-mining-companies-worldwide-based-on-market-value/> (last visited Jan. 31, 2023).

80. Eric Reguly, *DirtyCo to CleanCo: How Environmental Pressure Is Shaking Up the Mining Industry – and Will Soon Reshape It*, GLOBE & MAIL (Feb. 8, 2021), <https://www.theglobeandmail.com/business/article-dirtyco-to-cleanco-how-environmental-pressure-is-shaking-up-the-mining/>; *Rio Tinto Exits Coal with \$2.25 Billion Kestrel Sale*, REUTERS (Mar. 28, 2018, 12:11 AM), <https://www.reuters.com/article/rio-tinto-plc-coal-divestiture-idINKBN1H40EG>.

81. Joe Wallace & Rhiannon Hoyle, *Coal Is a Gold Mine for Producers After Blistering Rally*, WALL ST. J. (Aug. 5, 2021, 4:51 PM), <https://www.wsj.com/articles/coal-is-gold-mine-for-producers-after-blistering-rally-11628159504>; Greg Roxburgh, *Glencore to Buy out Anglo American and*

Interestingly, Glencore—the one major mining company that has committed to achieving net zero inclusive of Scope 3 emissions—has deepened its involvement in coal just as its peers are getting out.<sup>82</sup> Glencore plans to deplete its coal mines in the coming years and wind down its coal operations by 2050.<sup>83</sup> Defending its decision to buy out BHP's and Anglo American's interests in a major Colombian coal mine, Glencore stated that the decision was “in line with [its] commitment to a responsible managed decline of [its] coal portfolio.”<sup>84</sup> Glencore explained that allowing other parties to join the project would risk “extending production beyond the current mining concessions” and that divestment “would not be consistent with . . . a responsible managed decline of [the company's] coal portfolio.”<sup>85</sup> Indeed, the company expressed doubts that a sell-off of coal assets would reduce absolute GHG emissions.<sup>86</sup> However, it is unclear whether the company is merely accelerating its emissions now so that it can subsequently claim net zero emissions in 2050—an approach that would involve *intertemporal* net zero leakage.<sup>87</sup> Increased emissions during one time period, motivated by a desire to achieve net zero goals, represent a unique threat to the purposes of international agreements, large-scale climate objectives, and environmental justice communities (who may suffer increased

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*BHP at Coal Mine*, MORNINGSTAR (June 28, 2021, 8:26 AM), [https://www.morningstar.co.uk/uk/news/AN\\_1624868782798022900/top-news-glencore-to-buy-out-anglo-american-and-bhp-at-coal-mine.aspx](https://www.morningstar.co.uk/uk/news/AN_1624868782798022900/top-news-glencore-to-buy-out-anglo-american-and-bhp-at-coal-mine.aspx).

82. Wallace & Hoyle, *supra* note 81; Reguly, *supra* note 80.

83. Wallace & Hoyle, *supra* note 81; Reguly, *supra* note 80.

84. GLENCORE, PATHWAY TO NET ZERO 2021 PROGRESS REPORT 22 (2021), <https://www.glencore.com/dam/jcr:ad341247-c81e-45b4-899d-a7f32a9d69a0/2021-Climate-Change-Report-.pdf>. Comments by Glencore's CEO make clear, however, that this position is not etched in stone and the company could spin off its coal assets in response to shareholder demand. Jael Holzman, *Mining Giant's Goal: Coal—and Net Zero*, E&E NEWS (Dec. 2, 2021, 1:41 PM), <https://www.eenews.net/articles/mining-giants-goal-coal-and-net-zero/>.

85. GLENCORE, *supra* note 84, at 22.

86. *Id.*; see also MacDonald, *supra* note 77 (“Some fund managers have questioned the policy of large miners exiting coal for environmental reasons, given their assets sometimes end up in the hands of companies that want to expand production.”).

87. *Cf.* Jakob, *supra* note 59, at 609 (“The mere anticipation of stringent climate policies could provide an incentive for fossil fuel owners to accelerate their extraction, which would result in so-called intertemporal leakage.”). Indeed, environmentalists have filed a complaint with Australian financial regulators alleging that Glencore's net zero claims are misleading. Cecilia Keating, *Misuse of Climate Science: Legal Complaint Lodged over Glencore's Emissions Claims*, BUSINESSGREEN (Sept. 8, 2022), <https://www.businessgreen.com/news/4056009/misuse-climate-science-legal-complaint-lodged-glencores-emissions-claims-australia-net-zero-commodities-hub>.

exposure to pollutants from increased fossil fuel production and consumption).<sup>88</sup>

Major oil and gas companies, too, have been selling off fossil fuel deposits.<sup>89</sup> Expressed motives for the sales include transitioning to a lower-carbon business model and shoring up company finances.<sup>90</sup> BP sold all its Alaskan assets to Hilcorp for \$5.6 billion, enabling BP to claim a 16 percent drop in Scope 1 and 2 emissions in 2020.<sup>91</sup> Responding to a Dutch court order that the company reduce its emissions 45 percent by 2030,<sup>92</sup> Royal Dutch Shell sold all its assets in the Permian Basin—a region responsible for 40 percent of United States’ oil production—to ConocoPhillips for \$9.5 billion in September 2021.<sup>93</sup> ExxonMobil, Chevron, Royal Dutch Shell, Total, and Eni sold over \$28 billion in assets between 2018 and mid-2021.<sup>94</sup> A Norwegian energy consulting firm predicts even more substantial asset sales by leading oil companies in coming years—68 billion barrels of oil and natural gas equivalent—an amount representing two years of global oil demand and valued at \$111 billion.<sup>95</sup>

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88. Jakob, *supra* note 59, at 609–10; Emily Pontecorvo, *Why Developing Countries Say Net-Zero Is ‘Against Climate Justice,’* GRIST (Oct. 25, 2022), <https://grist.org/cop26/ahead-of-cop26-developing-countries-say-net-zero-is-against-climate-justice/>.

89. Raval, *supra* note 9.

90. *Id.*

91. Rachel Adams-Heard, *What Happens When an Oil Giant Walks Away*, BLOOMBERG (Apr. 15, 2021), <https://www.bloomberg.com/graphics/2021-tracking-carbon-emissions-BP-hilcorp/>.

92. Ktg. Den Haag 26 mei 2021, JOR 2021, 208 m.nt. Biesmans, SJM (Vereniging Milieudefensie/Royal Dutch Shell) (4.4.1, 5.3) (Neth.).

93. David French & Jessica Resnick-ault, *Shell Exits Permian with \$9.5 Bln Texas Shale Sale to ConocoPhillips*, REUTERS (Sept. 21, 2021, 12:07 PM), <https://www.reuters.com/business/shell-nears-deal-sell-texas-shale-assets-conocophillips-95-bln-wsj-2021-09-20/>. ConocoPhillips contended that the acquisition would decrease the carbon intensity of its production, even as the company’s overall emissions would rise. Jean Eaglesham, *Climate Promises by Businesses Face New Scrutiny*, WALL ST. J. (Nov. 6, 2021, 5:30 AM), <https://www.wsj.com/articles/climate-promises-by-businesses-face-new-scrutiny-11636104600>.

94. Raval, *supra* note 9.

95. *Energy Transition Could Push Oil Majors To Sell or Swap Oil and Gas Assets of More Than \$100 Billion*, ENERGY N. PERSP. (Sept. 23, 2020), <https://energynorthern.com/2020/09/23/energy-transition-could-push-oil-majors-to-sell-or-swap-oil-and-gas-assets-of-more-than-usd-100-billion/> (Rystad Energy Research’s press release reposted by Energy Northern Perspective); *cf. Who Buys the Dirty Energy Assets Public Companies no Longer Want?*, ECONOMIST (Feb. 12, 2022), [hereinafter *Who Buys Dirty Energy Assets?*] <https://www.economist.com/finance-and-economics/who-buys-the-dirty-energy-assets-public-companies-no-longer-want/21807594> (reporting that “the West’s six biggest oil companies have shed \$44bn of mostly fossil-fuel assets since the start

Canada's tar sands have witnessed an especially dramatic exodus of major oil companies. Oil production from tar sands requires large amounts of freshwater, destroys forests and other ecosystems, and generates significantly more carbon emissions than conventional oil production.<sup>96</sup> Citing climate and financial concerns, Royal Dutch Shell, ConocoPhillips, and Total have sold or expressed an intent to sell tar sands assets.<sup>97</sup> Oil production from Alberta's tar sands nevertheless has continued to rise and is not expected to decline for at least another decade.<sup>98</sup> This is largely a result of the transfer of tar sands assets to privately held small companies.<sup>99</sup> The chief executive of one such firm explained that his company has greater leeway to boost production because "it doesn't have to answer to public shareholders."<sup>100</sup>

Transactions aimed at reducing companies' carbon profile have involved not only fossil fuel deposits but also supporting infrastructure. Utility companies have sold coal and natural gas plants, oil pipelines, and storage terminals to buyers who continue to operate them.<sup>101</sup> For example, New Jersey's largest investor-owned utility, Public Service Enterprise Group, sold off its fossil fuel power plants to a private equity firm in 2021 as part of its net zero strategy

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of 2018" and quoting estimate by consultant Wood Mackenzie that "[t]he industry is eyeing total disposals worth \$128bn in the coming years").

96. Alex D. Charpentier et al., *Understanding the Canadian Oil Sands Industry's Greenhouse Gas Emissions*, 4 ENV'T RES. LETTERS 014005 (2009); Lorenzo Rosa et al., *Environmental Consequences of Oil Production from Oil Sands*, 5 EARTH'S FUTURE 158 (2017); Vipal Monga, *One of the World's Dirtiest Oil Patches Is Pumping More than Ever*, WALL ST. J. (Jan. 13, 2022), <https://www.wsj.com/articles/oil-sands-canada-dirty-carbon-environment-11642085980>.

97. Monga, *supra* note 96; see also Michael Amon & Sarah Kent, *Shell to Sell Canadian Oil-Sands Businesses for \$7.25 Billion*, WALL ST. J. (Mar. 9, 2017), <https://www.wsj.com/articles/shell-to-sell-canadian-oil-sands-business-for-7-25-billion-1489045655>.

98. CAN. ENERGY REGUL., CANADA'S ENERGY FUTURES 2020 SUPPLEMENT: OIL SANDS (2020), <https://www.cer-rec.gc.ca/en/data-analysis/canada-energy-future/2020oilsands/index.html> (projecting production from oil sands to peak in 2039); Nia Williams & Rod Nickel, *Canada's Oil Sands Tiptoe to Record Output, But Keep a Lid on Spending*, REUTERS (Nov. 8, 2021), <https://www.reuters.com/business/energy/canadas-oil-sands-tiptoe-record-output-keep-lid-spending-2021-11-08/>.

99. Monga, *supra* note 96.

100. *Id.*

101. Catherine Boudreau, *When Companies Go Green, the Planet Doesn't Always Win*, POLITICO (Mar. 30, 2021), <https://www.politico.com/news/2021/03/30/companies-green-planet-doesnt-always-win-478460>; Nina Chestney, *Factbox: Getting Out of Gas—the Sold and Scrapped Projects*, REUTERS (May 13, 2021), <https://www.reuters.com/business/energy/getting-out-gas-sold-scrapped-projects-2021-05-14/> (listing sales of gas-fired power plants in Europe).



of shifting to nuclear and offshore wind.<sup>102</sup> Similarly, American Electric Power—one of the largest generators of electricity in the United States—sold off its Kentucky power operations, which run on coal and natural gas, in its efforts to achieve 50 percent renewable electricity generation by 2030.<sup>103</sup> Private equity-owned power plants, which include over 200 natural gas plants, now account for one-seventh of GHG emissions from United States’ power plants.<sup>104</sup>

In general, buyers of fossil fuel assets have been small public companies, private players, independent operators backed by private equity, energy traders, and state oil companies.<sup>105</sup> Buyers of coal assets have included private equity firms as well as companies looking to profit from rising coal prices and increased demand.<sup>106</sup> Buyer interest in oil and gas has been fueled by growing demand in developing countries, combined with high commodity prices resulting from the global economic recovery and the Russian invasion of Ukraine.<sup>107</sup> However, finding buyers for fossil fuel assets is not

102. Scott Van Voorhis, *PSEG Unloads Fossil Fuel Plants for \$1.9B in Push Toward Decarbonization*, UTUIL. DIVE (Aug. 13, 2021), <https://www.utilitydive.com/news/pseg-unloads-fossil-fuel-plants-for-19b-in-push-toward-decarbonization/604946/>; *Trillions in Assets May Be Left Stranded as Companies Address Climate Change*, WALL ST. J. (Nov. 20, 2021), <https://www.wsj.com/articles/trillions-in-assets-may-be-left-stranded-as-companies-address-climate-change-11637416980>.

103. Mark Williams, *AEP to Sell Kentucky Operations as It Continues Move Toward More Renewable Energy*, COLUMBUS DISPATCH (Oct. 27, 2021), <https://www.dispatch.com/story/business/2021/10/27/aep-selling-its-kentucky-operations-canadian-company/8559240002/>.

104. OSCAR VALDÉS VIERA ET AL., AMS. FOR FIN. REFORM EDUC. FUND, PRIVATE EQUITY OWNERSHIP OF U.S. POWER PLANTS: A HIDDEN CLIMATE THREAT 6 (2022).

105. Raval, *supra* note 9; *Upstream M&A Deals Reached a Three-Year High of \$181 Billion in 2021, Returning to Pre-Covid Levels*, AM. J. TRANSP. (Jan. 21, 2022), <https://ajot.com/news/upstream-ma-deals-reached-a-three-year-high-of-181-billion-in-2021-returning-to-pre-covid-levels>; MALEK, *supra* note 5, at 7 (concluding that oil and gas assets “are flowing from public to private markets at a significant rate”).

106. Wallace & Hoyle, *supra* note 81; James Attwood, *Private Equity Lines Up for Coal “Bonanza” Left by Public Miners*, BLOOMBERG (Jan. 3, 2022), <https://www.bloomberg.com/news/articles/2022-01-03/private-equity-lines-up-for-coal-bonanza-left-by-public-miners>.

107. Luis Garcia, *Higher Prices Spark Fresh Investor Interest in Oil and Gas*, WALL ST. J. (Mar. 28, 2022), <https://www.wsj.com/articles/higher-prices-spark-fresh-investor-interest-in-oil-and-gas-11648465202>; SUSTAINABLE FITCH, SHIFTING OWNERSHIP PATTERNS OF FOSSIL FUEL ASSETS AND DECARBONISATION 6 (May 25, 2021) (predicting that “investments in conventional oil and gas assets to continue for private equity firms, because fundamental demand drivers remain strong, particularly in the Asia-Pacific region”); David Hodari, *Energy Giants Ditch Oil and Coal Projects. Smaller Rivals Want Them.*, WALL ST. J. (Apr. 21, 2021), <https://www.wsj.com/articles/energy-giants-ditch-oil-and-coal-projects-smaller-rivals-want-them-11618997401> (noting “there is no shortage in buyers of oil, gas and coal assets”).

guaranteed, thanks to the volume of assets for sale, a relatively shallow pool of buyers, and limited financing.<sup>108</sup>

When major companies sell off fossil fuel assets—ostensibly making progress toward net zero goals—the climate and environment may be worse off. As an initial matter, sellers are often shedding dirty and inefficient assets that they might never have developed.<sup>109</sup> Compared to the former owners, the new owners are less likely to leave reserves in the ground or curb production.<sup>110</sup> The new owners are also less likely to have made net zero commitments.<sup>111</sup> Typically, the buyers are privately held firms, which have acquired \$60 billion of oil, gas, and coal assets over the last two years.<sup>112</sup> Such firms not only are exempt from most SEC disclosure rules but also operate free from investor pressure to follow Environmental, Social, and Governance (“ESG”) principles.<sup>113</sup> Indeed, private equity owners often structure acquisitions in ways that limit potential liability, hinder transparency, and reduce available resources for improving

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108. Raval, *supra* note 9; SUSTAINABLE FITCH, *supra* note 107, at 4–5 (noting that divestment of thermal coal assets “is becoming challenging . . . particularly due to falling asset prices” and the rising cost of loans).

109. Hiroko Tabuchi, *Private Equity Funds, Sensing Profit in Tumult, Are Propping Up Oil*, N.Y. TIMES (Oct. 13, 2021), [https://www.nytimes.com/2021/10/13/climate/private-equity-funds-oil-gas-fossil-fuels.html#:~:text=the%20main%20story-.Private%20Equity%20Funds%2C%20Sensing%20Profit%20in%20Tumult%2C%20Are%20Propping%20Up,lifelines%20to%20coal%20power%20plants.](https://www.nytimes.com/2021/10/13/climate/private-equity-funds-oil-gas-fossil-fuels.html#:~:text=the%20main%20story-.Private%20Equity%20Funds%2C%20Sensing%20Profit%20in%20Tumult%2C%20Are%20Propping%20Up,lifelines%20to%20coal%20power%20plants.;); Hodari, *supra* note 107 (reporting consulting firm analyst’s view that oil fields being sold are “mature assets with high operating expenditure that typically have high emissions”).

110. James Mackintosh, *Why the Sustainable Investment Craze Is Flawed*, WALL ST. J. (Jan. 23, 2022), <https://www.wsj.com/articles/why-the-sustainable-investment-craze-is-flawed-11642865789>; see also Joyeeta Gupta et al., *Access and Allocation: the Role of Large Shareholders and Investors in Leaving Fossil Fuels Underground*, 20 INT’L ENV’T AGREEMENTS 303, 315–16 (2020) (worrying that pension funds’ sale of fossil fuel assets to climate-indifferent investors may shift fossil fuel assets, as well as risk of financial losses from stranded assets, to developing countries).

111. MALEK, *supra* note 5, at 7 (noting that from 2018 to 2021, “more than twice as many deals moved [oil and gas] assets away from operators with net zero commitments than the reverse”).

112. *Who Buys Dirty Energy Assets?*, *supra* note 95. Private companies have similarly acquired fossil fuel assets from public companies in Europe. See Gözlügöl & Ringe, *supra* note 72, at 12.

113. John C. Coffee, Jr., *Climate-Risk Disclosures and “Dirty Energy” Transfers: “Progress” Through Evasion*, COLUM. BLUE SKY BLOG (Jan. 25, 2022), <https://clsbluesky.law.columbia.edu/2022/01/25/climate-risk-disclosures-and-dirty-energy-transfers-progress-through-evasion/>; Gözlügöl & Ringe, *supra* note 72, at 18, 20 (noting that institutional investors’ investments in private companies “seem to involve a small number of companies” and that controlling shareholders of private companies typically mitigate any influence of institutional investors).

operations.<sup>114</sup> Subject to little or no public and stakeholder scrutiny, new owners of fossil fuel assets are likely to generate higher carbon emissions as they pump out more fossil fuels and follow less environmentally protective practices.<sup>115</sup>

Take, for example, Hilcorp, a private company backed by the Carlyle Group, one of the world's largest private equity firms.<sup>116</sup> Hilcorp has become the United States' largest known emitter of methane (a powerful GHG generated during oil and gas production) even though it produces far less oil and gas than the oil majors.<sup>117</sup> In recent years, Hilcorp purchased fossil fuel assets from ConocoPhillips and BP, boosting Hilcorp's production while at the same time enabling these two major oil companies to claim significantly lower carbon emissions.<sup>118</sup> Indicative of this are the assets that BP sold in Alaska, which had double the Scope 1 and 2 emissions of the company's overall portfolio.<sup>119</sup> Hilcorp has since increased production from those assets, and it has also announced plans for further exploration.<sup>120</sup> Hilcorp has had frequent environmental and safety violations and spills, and its acquired Alaska operations have generated GHG emissions at a higher rate than BP's prior operations.<sup>121</sup>

The net effect of asset sales on the climate depends in part on what sellers do with the proceeds. Investments in renewables and

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114. VIERA ET AL., *supra* note 104, at 12 (describing financial engineering used by private equity owners in extracting value from companies and fossil fuel plants they purchase).

115. Raval, *supra* note 9 (noting that some energy analysts believe that asset sales by major oil companies "may only boost emissions as production likely shifts to players that operate in the shadows, answer to private shareholders and make few environmental disclosures"); DELOITTE, *THE 2030 DECARBONIZATION CHALLENGE: THE PATH TO THE FUTURE OF ENERGY 10* (2020) (raising possibility of a "race to the bottom, with the least socially responsible companies the only ones willing to take [carbon-intensive] assets on, potentially creating new risks"); *see also* MALEK, *supra* note 5, at 16–17, 24 (noting the number of transactions in which oil and gas assets were transferred from companies with commitments to reduce emissions and methane flaring to companies without such commitments).

116. Gözlügöl & Ringe, *supra* note 72, at 11.

117. Tabuchi, *supra* note 109. Private companies constitute half of the top ten emitters of methane in the United States. *See* Gözlügöl & Ringe, *supra* note 72, at 9.

118. *Id.* at 11–12.

119. *Id.*

120. *Id.*

121. *Id.*; David Hasemeyer, *Concerns Linger Over a Secretive Texas Company That Owns the Largest Share of the Trans-Alaska Pipeline*, *INSIDE CLIMATE NEWS* (Nov. 22, 2021), <https://insideclimatenews.org/news/22112021/hilcorp-trans-alaska-pipeline/#:~:text=Environmental%20organizations%20and%20pipeline%20expe,rt,threatened%20the%20massive%20oil%20conduit> (discussing Hilcorp's history of regulatory noncompliance and safety and environmental incidents).

other low-carbon energy technologies could eventually reduce GHG emissions and counter the harms associated with net zero leakage.<sup>122</sup> Energy transition investments by fossil fuel companies with net zero pledges have risen significantly, but they constitute a small fraction of corporate budgets.<sup>123</sup> Indeed, sellers need not spend proceeds from asset sales on such investments at all. For instance, Shell used the proceeds from selling its Permian Basin assets to make distributions to shareholders and pay down debts.<sup>124</sup> All in all, the majority of an estimated \$198 billion in asset sales by the world's largest oil companies between 2015 and 2020 was dedicated to new fossil fuel investment, reducing debt, and paying dividends.<sup>125</sup> Less than one-quarter of that amount was invested in clean energy technologies, undermining claims that these asset sales are facilitating a clean energy transition.<sup>126</sup>

## 2. *Transfer of Carbon-Intensive Permanent Assets: Spinoffs*

Companies seeking to please ESG investors are also using corporate reorganizations, in addition to asset sales, to get carbon-intensive assets off their books. Under one scenario, companies combine their fossil fuel reserves into a separate entity that can be spun off or sold to another company.<sup>127</sup> Such transactions are already starting to occur, and mining industry leaders predict “an unprecedented wave of sales and mergers” aimed at removing coal, oil, and iron from their portfolios.<sup>128</sup> In 2021, Anglo American spun off its South African coal business into a separate company, Thungela.<sup>129</sup> Mitsubishi, Japan's largest chemical company, announced plans to spin off its petrochemical and carbon operations by 2023.<sup>130</sup> Major oil and gas companies are contemplating similar

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122. Raval, *supra* note 9.

123. Benjamin Storrow, *Oil Is Soaring, Will the Majors Stick with Net Zero?*, E&E NEWS (May 2, 2022, 6:41 AM), <https://www.eenews.net/articles/oil-is-soaring-will-the-majors-stick-with-net-zero/>.

124. French & Resnick-ault, *supra* note 93.

125. *Big Oil's \$198B Divestment Windfall Outpaces Green Spend*, BLOOMBERGNEF (Aug. 11, 2021), <https://about.bnef.com/blog/big-oils-198b-divestment-windfall-outpaces-green-spend/>.

126. *Id.* (reporting that the company invested \$45 billion in clean energy technologies).

127. Reguly, *supra* note 80 (recounting mining executives' use of the term “ShitCo” to describe the new company and “CleanCo” or “GoodCo” to describe the existing companies).

128. *Id.*

129. *S. Africa Coal Miner Thungela Valued at \$253 Mln After Anglo Spin-Off*, REUTERS (June 7, 2021, 9:03 AM), <https://www.reuters.com/business/energy/safrica-coal-miner-thungela-valued-253-mln-after-anglo-spin-off-2021-06-07/>.

130. Sakura Murakami, *Japan's Mitsubishi Chemical to Spin Off Petrochemical and Carbon Operations*, REUTERS (Dec. 1, 2021, 1:18 AM),

transactions to boost their green bona fides and their attractiveness to investors.<sup>131</sup>

Ultimately, the focus on major fossil fuel companies' permanent asset transfers may prove distracting, as these companies account for a small fraction of global reserves, production, and emissions.<sup>132</sup> State-controlled companies, such as Saudi Arabia's Aramco and Russia's Rosneft and Gazprom, dominate global oil and gas.<sup>133</sup> These companies have largely avoided making meaningful net zero pledges.<sup>134</sup> Compared to publicly listed companies, state-owned companies "are much less responsive to activist pressure and less dependent on financing from financial institutions that are."<sup>135</sup> As fossil fuel majors exit the business, state-owned companies could benefit from heightened demand. Nonetheless, ongoing European sanctions on Russian oil and gas suggest potential sources of leverage against state-owned producers.<sup>136</sup> The sanctions cover the fossil fuels themselves as well as software services and other technologies that

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<https://www.reuters.com/business/sustainable-business/japans-mitsubishi-chemical-spin-off-petrochemical-carbon-operations-2021-12-01/>; Katsumori Matsuoka, *Mitsubishi Seeks Petrochemical Consolidation in Japan*, CHEM. & ENG'G NEWS (Dec. 9, 2021), <https://cen.acs.org/business/petrochemicals/Mitsubishi-seeks-petrochemical-consolidation-Japan/99/web/2021/12>. The company denied that the spinoff is a component of its emissions reduction plans. *See id.*

131. Raval, *supra* note 9.

132. INT'L ENERGY AGENCY, *THE OIL AND GAS INDUSTRY IN ENERGY TRANSITIONS 6* (2020) (noting that seven large integrated oil and gas companies account for just 12 percent of oil and gas reserves, 15 percent of production, and 10 percent of emissions from industry operations).

133. Raval, *supra* note 9; *see* SILVANA TORDO, NATIONAL OIL COMPANIES AND VALUE CREATION xi (2011) (estimating that national oil companies control 90 percent of oil reserves and 75 percent of oil production); *The Uses and Abuses of Green Finance*, ECONOMIST (Nov. 4, 2021), <https://www.economist.com/leaders/the-uses-and-abuses-of-green-finance/21806111> (estimating that only 14–32 percent of world's emissions are not state controlled). Gazprom is publicly traded but is majority owned by the Russian state. *How Gazprom Helps the Kremlin Put the Squeeze on Europe*, ECONOMIST (Feb. 26, 2022), <https://www.economist.com/business/how-gazprom-helps-the-kremlin-put-the-squeeze-on-europe/21807841>.

134. Raval, *supra* note 9. Saudi Aramco's net zero pledge covers only its Scope 1 and Scope 2 emissions. *Aramco Expands Climate Goals, Stating Ambition to Reach Operational Net-Zero Emissions by 2050*, ARAMCO (Oct. 23, 2021), <https://www.aramco.com/en/news-media/news/2021/ambition-to-reach-operational-net-zero-emissions-by-2050>.

135. Jason Bordoff, *Why Shaking Up Big Oil Could be a Pyrrhic Victory*, FOREIGN POL'Y (June 3, 2021, 9:17 AM), <https://foreignpolicy.com/2021/06/03/big-oil-shell- Exxon-Chevron-emissions-climate-change-production-supply-demand-cuts-risks/>.

136. *See* Tom Wilson & Nastassia Astrasheuskaya, *Russian Oil and Gas: Headed for Long-Term Decline?*, FIN. TIMES (June 6, 2022), <https://www.ft.com/content/9dd4df75-48ee-4dcd-aaf5-0ecb05eaade4>.

support oil and gas development.<sup>137</sup> In at least some instances, sanctions on these supporting technologies are predicted to undermine future oil and gas development.<sup>138</sup> Net zero pledges by providers of such technologies could have a similar effect.

### 3. *Transfer of Carbon-Intensive Nonpermanent Assets*

The sale of assets that are not permanent or long-lived also can result in net zero leakage. Cumulatively, the emissions associated with these assets may be substantial.

Fossil fuel powered vehicles offer a prominent example. Ramping up sales of electric vehicles is essential to reducing GHG emissions.<sup>139</sup> However, overall climate impacts will also depend on the fate of the gasoline- and diesel-powered vehicles being replaced. If used gasoline and diesel vehicles were simply scrapped, the GHG emissions benefits would be clear. However, reselling used vehicles is often more economically attractive than scrapping them.<sup>140</sup> Millions of used vehicles are exported annually, mostly to developing countries, in a largely unregulated trade.<sup>141</sup> The used-vehicle trade does improve mobility and livelihoods in importing countries, many of which are relatively poor.<sup>142</sup> However, the continued operation of used fossil fuel powered vehicles may increase overall GHG emissions as relatively inexpensive used vehicles boost global car ownership.<sup>143</sup>

Small off-road engines—gasoline-powered lawn mowers, leaf blowers, chainsaws, and golf carts—offer another example of short-term capital assets contributing to net zero leakage. Concerned by the significant amounts of smog-causing pollution and GHG emissions these engines generate, California banned the sale of new gasoline-powered units, effective as early as 2024.<sup>144</sup> Whether the

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137. *See id.*

138. *See id.*

139. U.N. ENV'T PROGRAMME, USED VEHICLES AND THE ENVIRONMENT 12 (2020).

140. *Id.* at 25.

141. *Id.* at 3–4, 35 (noting that some countries restrict vehicle imports through age limits, emissions or safety standards, or other measures, but many do not). Used heavy-duty vehicles, such as trucks and buses, are exported as well. *Id.* at 31.

142. *Id.* at 11–13.

143. *Id.* at 5 (concluding that used vehicle exports “contribute to affordable access to vehicles” but also “are a major contributor to air pollution and climate emissions in recipient countries”).

144. Phil Willon, *California Moves Toward Ban on Gas Lawn Mowers and Leaf Blowers*, L.A. TIMES (Oct. 9, 2021, 6:32 PM), <https://www.latimes.com/california/story/2021-10-09/california-moves-toward-ban-on-gas-lawnmowers-and-leaf-blowers>; Air Pollution: Small Off-Road Engines, Assem. Bill 1346, 2021-2022 Sess. (Cal. 2021); Press Release, California Air Res. Bd., CARB Approves Updated Regulations Requiring Most New Small Off-Road Engines Be Zero Emissions by 2024 (Dec. 9, 2021),

replaced equipment is destroyed or resold will strongly shape actual emission impacts.<sup>145</sup> While landscaping companies or golf clubs may not necessarily adopt net zero targets,<sup>146</sup> many cities, universities, and other entities responsible for significant acreage have done so—and their efforts may be susceptible to net zero leakage from the resale of landscaping equipment.<sup>147</sup>

### C. Divestment

Financial institutions increasingly have made net zero pledges and commitments to reduce or eliminate their support for carbon-intensive activities. The Glasgow Financial Alliance for Net Zero (“GFANZ”) consists of 450 banks, insurers, and asset managers—controlling \$130 trillion in assets—who have pledged to achieve net zero in their loans and investments by 2050.<sup>148</sup> These efforts, too, are subject to net zero leakage.

As the Paris Agreement recognizes, financial institutions have a tremendous influence on GHG emissions.<sup>149</sup> Financial support can

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<https://ww2.arb.ca.gov/news/carb-approves-updated-regulations-requiring-most-new-small-road-engines-be-zero-emission-2024> (announcing regulations to implement zero emission requirements).

145. The California law does not regulate the resale market. See Willon, *supra* note 144.

146. But see Pippa Neill, *Landscaping Team to Deliver Net-Zero Services to Cities*, ENV'T J. (Aug. 7, 2020), <https://environmentjournal.online/articles/landscaping-service-to-deliver-sustainable-services-to-cities/> (discussing landscaping service company that uses only electric vehicles and battery-powered equipment).

147. Willon, *supra* note 144 (reporting legislative sponsor’s comments that cities and universities are moving to zero-emission landscaping equipment).

148. Liz Alderman & Eshe Nelson, *Global Finance Industry Says It Has \$130 Trillion to Invest in Efforts to Tackle Climate Change*, N.Y. TIMES (Nov. 6, 2021), <https://www.nytimes.com/2021/11/03/world/europe/cop26-climate-change-finance-industry.html>. Moreover, the co-chairs of the GFANZ issued a statement expressing their personal support for a June 2022 UN Race to Zero requirement that members avoid support for new coal projects and phase out existing coal assets. Bloomberg et al., *Statement on “No New Coal”*, [https://assets.bbhub.io/company/sites/63/2022/08/Statement-on-No-New-Coal\\_August-2022.pdf](https://assets.bbhub.io/company/sites/63/2022/08/Statement-on-No-New-Coal_August-2022.pdf). GFANZ is comprised of several financial subsector initiatives: the Net-Zero Banking Alliance, the Net Zero Asset Managers initiative, the Net-Zero Asset Owner Alliance, the Paris Aligned Investment Initiative, the Net-Zero Insurance Alliance, the Net Zero Financial Service Providers Alliance, and the Net Zero Investment Consultants Initiative. See *Our Members*, GFANZ, <https://www.gfanzero.com/membership/> (last visited Jan. 31, 2023).

149. Paris Agreement, *supra* note 50, art. 2.1(c) (stating importance of “[m]aking finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development”). See also UNEP FINANCE INITIATIVE, HIGH-LEVEL RECOMMENDATIONS FOR CREDIBLE NET-ZERO COMMITMENTS FROM FINANCIAL INSTITUTIONS 6 (Oct. 2021) [hereinafter UNEP

take various forms, including loans, investments, underwriting, and financial guarantees.<sup>150</sup> Such support is critical to a wide range of fossil fuel activities, including exploration, extraction, construction of pipelines, rail lines, and other transport infrastructure, construction of power plants, and electricity transmission and distribution.<sup>151</sup> Scope 3 emissions—which include activities financed by an entity—constitute an estimated 97 percent of financial institutions’ total GHG emissions.<sup>152</sup>

Divesting from fossil fuel companies and the utility sector offers a relatively quick and easy way for banks and investors to move toward net zero goals.<sup>153</sup> Recognizing finance’s critical role in enabling fossil fuel activities, divestment campaigns aim to reduce carbon emissions by choking off funding for these activities.<sup>154</sup> In theory, restricting access to funding will increase the cost of capital and make fossil fuel projects financially unviable.<sup>155</sup> Net zero leakage nonetheless threatens to undermine such efforts as “rapid and blanket divestment” paves the way for “a less environmentally-conscious investor, insurer or loan provider [to] step in to provide financing.”<sup>156</sup>

The following discussion considers leakage from net zero commitments by lenders, shareholders and asset managers, and insurers. To guard against leakage, carbon accounting should be accurate and cover the full spectrum of financial institutions’ activities.

### 1. *Lenders*

Debt financing is generally cheaper than equity financing and provides most of the financial capital for significant infrastructure

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Finance Initiative] (“Financial institutions . . . produce a miniscule amount of emissions in their own operations yet they finance many of the world’s largest emitters as well as enable the transition through provision of their financing.”).

150. See HAN CHEN ET AL., NRDC, *SWEPT UNDER THE RUG: HOW G7 NATIONS CONCEAL PUBLIC FINANCING FOR COAL AROUND THE WORLD* 11–12 (May 2016) (discussing forms of international public financial support for coal); PAUL BARUYA, *INTERNATIONAL FINANCE FOR COAL-FIRED POWER PLANTS* 15–19 (2017) (discussing elements of project finance).

151. CHEN ET AL., *supra* note 150, at 11.

152. UNEP Finance Initiative, *supra* note 149, at 7.

153. JAMES VACCARO, CLIMATE SAFE LENDING NETWORK, *THE GOOD TRANSITION PLAN 22* (2021) [hereinafter VACCARO 2021].

154. *Id.* at 39–41.

155. JAMES VACCARO, CLIMATE SAFE LENDING NETWORK, *TAKING THE CARBON OUT OF CREDIT* 18 (2020) [hereinafter VACCARO 2020]; Maximilian Horster, *Failed Theories of Change: Misperceptions About ESG Investment and Investment Efforts to Combat Climate Change*, in *THEORIES OF CHANGE* 51, 55 (Karen Wendt et al. eds., 2021).

156. UNEP Finance Initiative, *supra* note 149, at 9.



projects such as large power plants.<sup>157</sup> Bank financing can be especially important for private companies, which are unable to access public capital markets.<sup>158</sup> Through banks, private equity has been able to finance energy deals at interest rates of 4 to 5 percent—approximately half the cost that major fossil fuel companies face in financing deals through equity financing.<sup>159</sup>

Lender net zero efforts gained momentum in 2020 as several major banks vowed to achieve net zero from their financed emissions.<sup>160</sup> The Net Zero Banking Alliance (“NZBA”), formed in April 2021 and representing over 43 percent of global banking assets, now has over one hundred members committed to achieving net zero by 2050.<sup>161</sup> These pledges cover investment and lending but not securities “held for client facilitation and market-making purposes”—i.e., underwriting.<sup>162</sup> NZBA members promise to periodically review their progress toward achieving net zero, and a body established by the alliance will set climate disclosure standards.<sup>163</sup>

Lenders can reduce portfolio emissions most obviously by withholding loans from high emitters. They can also require transition plans from borrowers, incorporate conditions into loan agreements, and offer incentives to borrowers to reduce carbon pollution.<sup>164</sup> If banks withhold loans from carbon-intensive industries and redirect those assets to support clean energy technologies, net zero calculations may not necessarily reflect the full carbon

157. BARUYA, *supra* note 150, at 15.

158. Gözlügöl & Ringe, *supra* note 72, at 37 (“Banks are the conventional financing source for private companies.”).

159. *Who Buys Dirty Energy Assets?*, *supra* note 95.

160. RAINFOREST ACTION NETWORK, BANKING ON CLIMATE CHAOS 11 (2021) [hereinafter Climate Chaos 2021]; VACCARO 2020, *supra* note 155, at 15; *see also* Sarah E. Light & Christina P. Skinner, *Banks and Climate Governance*, 121 COLUM. L. REV. 1895, 1934–36 (2021) (discussing major US banks’ commitments not to offer credit for certain kinds of fossil fuel projects).

161. *Net Zero Banking Alliance Passes the 100-Member Mark*, UNEP (Jan. 19, 2022), <https://www.unepfi.org/news/industries/banking/net-zero-banking-alliance-passes-the-100-member-mark/>. Notwithstanding their net zero promises, banks provided billions of dollars in financing to support oil and gas expansion in 2021. *See* RAINFOREST ACTION NETWORK, BANKING ON CLIMATE CHAOS 2022 16–17 (2022) [hereinafter Climate Chaos 2022].

162. *Frequently Asked Questions*, NZBA 10 (Oct. 20, 2021), <https://www.unepfi.org/wordpress/wp-content/uploads/2021/10/NZBA-Frequently-Asked-Questions.pdf>. The NZBA plans to review underwriting activities for inclusion in future member guidelines. UNEP, GUIDELINES FOR CLIMATE TARGET SETTING FOR BANKS 6–7 (2021).

163. ALDERMAN & NELSON, *supra* note 148.

164. VACCARO 2021, *supra* note 153, at 40–41; VACCARO 2020, *supra* note 155, at 16; Catherine Clifford, *These Are the World’s Largest Banks that Are Increasing and Decreasing Their Fossil Fuel Financing*, CNBC (Apr. 22, 2021); Light & Skinner, *supra* note 160, at 1920 (discussing use of debt covenants to control borrower behavior after loan is made).

benefits.<sup>165</sup> Once a loan is made, however, lenders have little leverage over borrowers to impose conditions that might reduce emissions.<sup>166</sup>

Commercial lending aside, public finance also serves as a critical source of funding for fossil fuel activities, particularly in developing countries.<sup>167</sup> Export credit agencies provide approximately half of this funding, offering government-backed loans, guarantees, and insurance to domestic corporations for constructing, operating, and maintaining fossil fuel infrastructure abroad.<sup>168</sup> Multilateral development banks provide longer-term financing and guarantees than commercial banks and investors are typically willing to offer.<sup>169</sup> National development banks and aid agencies also help to fund fossil fuel projects in developing countries.<sup>170</sup> Ultimately, public finance can offer below-market rates and decrease financial risks, and its availability can determine whether a project goes forward.<sup>171</sup> By the end of 2021, all major international public finance institutions had promised to stop financing new coal power.<sup>172</sup> The United States and several other nations, along with several development banks, also have made a broader pledge to halt new public financing for fossil fuel projects.<sup>173</sup>

The overall effect of lenders' net zero pledges on actual emissions will depend on whether carbon emitters can tap alternative financing sources.<sup>174</sup> Lending markets are generally less liquid than other potential sources of funds such as public equity markets.<sup>175</sup> As a result, banks' decisions to divest are more likely to impact a targeted

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165. *Uses and Abuses*, *supra* note 133; KATHARINA LÜTKEHERMÖLLER ET AL., UNPACKING THE FINANCE SECTOR'S CLIMATE-RELATED INVESTMENT COMMITMENTS 14 (2020) (discussing "positive impact investments" that "may lead to GHG emission reduction").

166. UNEP Finance Initiative, *supra* note 149, at 8.

167. URGEWALD, FIVE YEARS LOST: HOW FINANCE IS BLOWING THE PARIS CARBON BUDGET 21 (2020).

168. *Id.*; BROWNE TUCKER & KATE DEANGELIS, PAST LAST CALL: G20 PUBLIC FINANCE INSTITUTIONS ARE STILL BANKROLLING FOSSIL FUELS 17 (2021).

169. URGEWALD, *supra* note 167, at 23.

170. TUCKER & DEANGELIS, *supra* note 168, at 9, 19.

171. *Id.* at 3.

172. REBECCA RAY ET AL., LIGHTS ON: THE STATE OF INTERNATIONAL DEVELOPMENT FINANCE, COAL AND GREEN ENERGY 2–6, 8 (2021); *see also* TUCKER & DEANGELIS, *supra* note 168, at 25; Sara Schonhardt, *U.S. Agrees to End Fossil Fuel Financing Abroad*, E&E NEWS (Nov. 4, 2021), <https://www.eenews.net/articles/u-s-agrees-to-end-fossil-fuel-financing-abroad/>.

173. *See* Schonhardt, *supra* note 172 (however, several of the biggest financiers, including Japan, South Korea, and China, did not make the pledge).

174. LÜTKEHERMÖLLER ET AL., *supra* note 165, at 17.

175. *Id.*; *see also* Theodor Cojoianu et al., *Does the Fossil Fuel Divestment Movement Impact New Oil and Gas Fundraising?*, 21 J. ECON. GEOGRAPHY 141, 159 (2021) (finding that the divestment movement reduced new capital flows into the oil and gas sector in countries with more stringent environmental regulation but banks in such countries increased finance to oil and gas companies abroad).

company's activity than other types of financial institution divestment. Nonetheless, net zero leakage may occur if targeted companies find alternative funding sources, and fossil fuel loans may become more profitable for those still willing to lend.<sup>176</sup>

Another form of net zero leakage may arise within individual financial institutions. Project finance loans are made to a standalone business entity or special purpose vehicle, formed by a sponsoring company for the purpose of developing the project and bearing its risks.<sup>177</sup> These loans constitute a small fraction of banks' fossil fuel financing efforts.<sup>178</sup> Unfortunately, net zero pledges are sometimes limited only to project finance loans. Such pledges do nothing to prevent fossil fuel projects from going forward if a bank's loans for general corporate activity indirectly facilitate those same projects.<sup>179</sup> In other words, a company can borrow money directly, offer its own balance sheets as security, and use the borrowed funds for fossil fuel projects.<sup>180</sup>

Bank pledges to no longer support oil and gas drilling projects in the Arctic illustrate the ease with which banks can circumvent pledges limited to project finance.<sup>181</sup> General corporate loans have enabled Arctic oil exploration to proceed notwithstanding these pledges.<sup>182</sup> Similarly, while many of the world's largest commercial and investment banks are now avoiding project finance for coal-fired power plants, Citigroup, Barclays, and other major banks have continued to offer financing to project sponsors and other companies engaged in the coal industry.<sup>183</sup>

A further source of net zero leakage at banks, increasingly reflected in the practice of international financing institutions,

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176. VACCARO 2021, *supra* note 153, at 22.

177. BARUYA, *supra* note 150, at 15, 17.

178. Climate Chaos 2022, *supra* note 161, at 19; JEANNE MARTIN ET AL., SHAREACTION, OIL & GAS EXPANSION: A LOSE-LOSE BET FOR BANKS AND THEIR INVESTORS 34 (2022) (estimating that 92 percent of European banks' financing to top fifty upstream oil and gas expanders between 2016 and 2021 came in the form of general-purpose corporate finance as opposed to project finance or dedicated financing).

179. Simon Clark, *Some Investors Say Bank Pledges to Cut Funding for Arctic Drilling Contain Loopholes*, WALL ST. J. (Oct. 17, 2021), <https://www.wsj.com/articles/banks-promised-to-cut-funding-for-arctic-oil-drilling-money-flowed-anyway-11634468580>.

180. BARUYA, *supra* note 150, at 15.

181. Clark, *supra* note 179.

182. *Id.*

183. SUSTAINABLE ENERGY FOR ALL, COAL POWER FINANCE IN HIGH-IMPACT COUNTRIES 11 (2021); Sam Meredith, *Banks Haven't Quit Coal. Study Says Commercial Lenders Have Channeled \$1.5 Trillion to the Industry Since 2019*, CNBC (Feb. 15, 2022), <https://www.cnbc.com/2022/02/15/climate-research-shows-how-banks-investors-finance-the-coal-industry.html>.

involves financial intermediaries.<sup>184</sup> Under this practice, the Export-Import Bank or a similar institution lends money to a local bank, private equity fund, or special government-managed fund.<sup>185</sup> The borrower in turn uses the funding to finance another entity's fossil fuel projects.<sup>186</sup> The original lender then reports that its loan generated no direct carbon emissions.<sup>187</sup>

Additionally, the fact that banks' net zero pledges generally do not cover underwriting gives rise to yet another type of net zero leakage. Underwriting, also known as investment banking, refers to the process by which banks raise investment capital by issuing bonds or shares on other companies' behalf and selling them to pension funds, mutual funds, and other investors.<sup>188</sup> Between 2019 and 2021, commercial banks helped the coal industry raise \$1.2 trillion through underwriting, more than triple the \$363 billion they loaned to the industry.<sup>189</sup> European banks' support for expanding upstream oil and gas operations likewise has come primarily in the form of underwriting rather than lending.<sup>190</sup> In recent years, bank underwriting of fossil fuels has risen even as lending for fossil fuels has dropped.<sup>191</sup>

Bank divestment efforts thus far have had limited measurable impact on fossil fuel activity. In 2020, as the first net zero pledges were being made, fossil fuel financing by large banks in China and the European Union actually increased.<sup>192</sup> In 2021, as major banks widely adopted net zero pledges, bank fossil fuel financing continued at prior levels.<sup>193</sup> Although most of the leading lenders to the coal industry are members of the NZBA, only some forms of coal finance have begun to decline.<sup>194</sup> American, European, Japanese, and South Korean banks have stopped funding coal-fueled power plants in developing Asian countries.<sup>195</sup> Coal projects in developing countries

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184. CHEN ET AL., *supra* note 150, at 12.

185. *Id.*

186. *Id.*

187. *Id.*

188. Press Release, Urgewald, Who Is Still Financing the Global Coal Industry? (Feb. 15, 2022), <https://urgewald.org/en/medien/who-still-financing-global-coal-industry>.

189. *Id.*

190. MARTIN ET AL., *supra* note 178, at 34; *see also* Climate Chaos 2022, *supra* note 161, at 19 (noting that the majority of banks' fossil fuel financing in recent years has come in the form of bond and equity underwriting rather than lending).

191. Climate Chaos 2021, *supra* note 160, at 21.

192. *Id.* at 19.

193. Climate Chaos 2022, *supra* note 161, at 6.

194. URGEWALD, *supra* note 167, at 71.

195. Phred Dvorak et al., *Coal Projects in Asia Face Dwindling Financing as Climate Pressure Mounts*, WALL ST. J. (Aug. 2, 2021, 5:30 AM), <https://www.wsj.com/articles/coal-projects-in-asia-face-dwindling-financing-as-climate-pressure-mounts-11627896602>; Quirin Schiermeier, *China's Pledge on*

are generally facing more limited funding availability as state lenders and multilateral development banks have moved to end funding for overseas coal projects.<sup>196</sup> Coal projects in China and India nevertheless continue to have ample access to domestic funding.<sup>197</sup> These two countries, which account for two-thirds of global coal consumption, are expected to increase coal-fired power generation through 2024.<sup>198</sup>

## 2. Shareholders and Asset Managers

Initially focused on institutions of higher education, the fossil fuel divestment movement has since broadened its attention to financial institutions worldwide.<sup>199</sup> Major shareholder divestment initiatives today include DivestInvest and the Net Zero Asset Owner Alliance (“NZAOA”).<sup>200</sup> Proponents contend that divestment campaigns draw attention to climate change, align investment decisions with investor values, spur changes in social preferences, reduce systemic and portfolio financial risks, and pressure fossil fuel companies to change their practices.<sup>201</sup> However, divestment appears unlikely to effectively restrict the capital available to fossil fuel

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*Overseas Coal—by the Numbers*, 598 NATURE 20, 20 (2021) (noting that China’s pledge to stop financing new coal-fired plants abroad would have a tiny impact compared to continued emissions from coal-fired plants in China).

196. Alexandra Wexler & Gabriele Steinhauser, *South Africa Can’t Afford to Quit Coal. Will Rich Countries Pay for the Transition?*, WALL ST. J. (Nov. 11, 2021, 10:08 AM), <https://www.wsj.com/articles/south-africa-cant-afford-to-quit-coal-will-rich-countries-pay-for-the-transition-11636643299>; see also SUSTAINABLE ENERGY FOR ALL, *supra* note 183, at 9, 11 (finding that “[f]inance for the global coal industry is increasingly drying up as many funders pull out” but that commercial lenders continue to make financing available indirectly).

197. Dvorak et al., *supra* note 195.

198. Sha Hua, *Global Coal Power Expected to Hit Record Despite Climate Fight*, WALL ST. J. (Dec. 17, 2021, 5:35 AM), <https://www.wsj.com/articles/global-coal-power-expected-to-hit-record-despite-climate-fight-11639737307>.

199. Julie Ayling & Neil Gunningham, *Non-State Governance and Climate Policy: the Fossil Fuel Divestment Movement*, 17 CLIMATE POL’Y 131, 134 (2017); LÜTKEHERMÖLLER ET AL., *supra* note 165, at 12.

200. Sarah Murray, *Divestment: Are There Better Ways to Clean Up ‘Dirty’ Companies?*, FIN. TIMES (Jun. 6, 2022), <https://www.ft.com/content/79851eeed9e6-4ceb-be16-e9cf8b8c4ddf>.

201. Sibylle Braungardt et al., *Fossil Fuel Divestment and Climate Change: Reviewing Contested Arguments*, 50 ENERGY RSCH. & SOC. SCI. 191, 192–94 (2019); Eleonora Broccardo et al., *Exit vs. Voice* 35–36 (Nat’l Bureau of Econ. Rsch., Working Paper No. 27710, 2020), <http://www.nber.org/papers/w27710> (explaining how divestment efforts can alter social preferences and apply pressure to behave socially); Paul Brest et al., *How Investors Can (and Can’t) Create Social Value*, 44 J. CORP. L. 205, 206 (2018); Ayling & Gunningham, *supra* note 199, at 136 (explaining that divestment aims to influence fossil fuel companies through reputational damage and stigmatization).

companies. Indeed, net zero leakage seems probable: As some investors divest, other investors will step in to offer capital.

Some 1,485 institutions have committed to fossil fuel divestment under the DivestInvest movement.<sup>202</sup> The nature and degree of divestment varies, although many institutions have pledged not to invest in at least the 200 largest fossil fuel companies.<sup>203</sup> DivestInvest focuses on investment decisions; in addition to avoiding investments in fossil fuel companies, participants also pledge to invest in companies that exhibit positive ESG metrics or engage in climate solutions.<sup>204</sup>

Participants in another initiative, NZAOA, commit “to transitioning their investment portfolios to net-zero GHG emissions by 2050 consistent with a maximum temperature rise of 1.5C.”<sup>205</sup> NZAOA members also are expected to avoid supporting new thermal coal projects.<sup>206</sup> Under the NZAOA’s protocol for net zero target setting, members should set portfolio emission targets for their holdings’ Scope 3 emissions “as soon as possible.”<sup>207</sup>

Screening out or selling off stocks that do not meet sustainability criteria can pressure companies to improve their practices.<sup>208</sup> Nonetheless, divestment is unlikely to actually restrict the capital available to fossil fuel companies.<sup>209</sup> As explained below, divestment

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202. INVEST-DIVEST 2021: A DECADE OF PROGRESS TOWARDS A JUST CLIMATE FUTURE 4, 8 (2021).

203. TOM HARRISON, DIVESTINVEST, HOW TO DIVEST INVEST: A GUIDE FOR INSTITUTIONAL INVESTORS 22 (2018); see LÜTKEHERMÖLLER ET AL., *supra* note 165, at 5 (discussing varying commitments by participants in DivestInvest). As DivestInvest does not require 100 percent divestment, some of the \$39 trillion in assets managed by DivestInvest participants are invested in fossil fuels. *Id.*

204. HARRISON, *supra* note 203, at 22.

205. NET-ZERO ASSET OWNER ALL. (NZAOA), TARGET SETTING PROTOCOL 18 (2d ed. 2022). Convened by the UNEP Finance Initiative, the Alliance counted sixty-nine institutional investor members representing \$10.4 trillion in assets under management as of January 25, 2022. *Id.* at 12.

206. NET ZERO ASSET MANAGERS INITIATIVE, NET ZERO ASSET MANAGERS INITIATIVE: NETWORK PARTNERS’ EXPECTATION OF SIGNATORIES WITH REGARD TO FOSSIL FUEL INVESTMENT POLICY 2 (2021), <https://www.netzeroassetmanagers.com/NZAM-Network-Partners-Fossil-Fuel-Position.pdf>.

207. NZAOA, *supra* note 205, at 33.

208. Julian F. Kölbl et al., *Can Sustainable Investing Save the World? Reviewing the Mechanisms of Investor Impact*, 33 *ORG. & ENV’T* 554, 560–64 (2020).

209. Braungardt et al., *supra* note 201, at 198; see also Tyler Hansen & Robert Pollin, *Economics and Climate Justice Activism: Assessing the Financial Impact of the Fossil Fuel Divestment Movement*, 80 *REV. SOC. ECON.* 424, 425 (2020) (“divestment campaigns have not been successful in inflicting significant economic damage on fossil fuel corporations and are not likely to do so in the future”); Jonathan M. Gilligan, *Carrots and Sticks in Private Climate Governance*, 6 *TEX. A&M L. REV.* 179, 190 (2018) (noting analyses finding “no

will not affect stock prices so long as enough profit-seeking investors are willing to purchase assets from divesting entities.<sup>210</sup> Moreover, a drop in a company's stock market value has no immediate effect on the company's cost of capital.<sup>211</sup> Ultimately, the widespread availability of capital makes net zero leakage almost inevitable in the divestment context.

As an initial matter, the proportion of sustainability investors necessary to influence asset prices is potentially large.<sup>212</sup> To date, divestment has had "no measurable impact" on oil and gas company share prices.<sup>213</sup> Even the coal industry, which has experienced higher levels of divestment, has witnessed "relatively weak and mixed" effects on share prices.<sup>214</sup> Indeed, divestment proponents themselves concede the minimal direct effect of their efforts on fossil fuel company valuations.<sup>215</sup>

Furthermore, whether changes in asset prices lead to reduced GHG emissions or meaningful changes in ESG practices is questionable.<sup>216</sup> In contrast to a refusal to bid on an initial stock offering<sup>217</sup> or a bank's refusal to lend, selling a stock to another investor on secondary capital markets does not immediately impact the company itself.<sup>218</sup> For the most part, the company's cost of capital

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important impact" of divestment on share prices of fossil fuel companies and other analyses suggesting no significant impact on share prices unless a significant fraction of the international investment market divests); Jonathan B. Berk & Jules H. van Binsbergen, *The Impact of Impact Investing 2* (Stan. Graduate Sch. Bus., Working Paper No. 3981, 2022), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3909166](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3909166) (estimating that "to effect a more than 1% change in the cost of capital, impact investors would need to make up more than 80% of all investable wealth"); Kenneth P. Pucker, *The Trillion-Dollar Fantasy*, INSTITUTIONAL INV. (Sept. 13, 2021), <https://www.institutionalinvestor.com/article/b1tkr826880fy2/The-Trillion-Dollar-Fantasy> (predicting that as renewable energy costs decline, demand for fossil fuels may erode before a shortage of capital undermines their supply).

210. Hansen & Pollin, *supra* note 209, at 6.

211. Brest et al., *supra* note 201, at 218.

212. Kölbel et al., *supra* note 208, at 561.

213. Hansen & Pollin, *supra* note 209, at 27.

214. *Id.*

215. Ayling & Gunningham, *supra* note 199, at 135.

216. Kölbel et al., *supra* note 208, at 561; LÜTKEHERMÖLLER ET AL., *supra* note 165, at 13.

217. Horster, *supra* note 155, at 56 ("[P]rimary market investments include taking stakes through direct private equity or real asset investments as well as participation in initial public offerings").

218. Horster, *supra* note 155, at 53; LÜTKEHERMÖLLER ET AL., *supra* note 165, at 9; Brest et al., *supra* note 201, at 218 ("One person's purchase of shares is another person's sale. Unless the company raises fresh capital in the primary markets, the scale of its activities is largely unaffected by secondary market transactions.").

remains the same.<sup>219</sup> Why bother to divest, then? Perhaps investors are unaware of the limited impact on a company's share price or cost of capital. More likely, investors pursue a divestment strategy notwithstanding net zero leakage in order to reduce portfolio risks, signal virtue, or greenwash.<sup>220</sup>

The flip side of divestment is that it reduces opportunities for climate-oriented investors to engage with companies. An engagement strategy requires more work than divestment but presents little risk of net zero leakage. Recognizing the limitations of divestment, the NZAOA prioritizes engagement as a critical mechanism for climate progress and characterizes divestment “as an escalation tactic and a last resort.”<sup>221</sup> NZAOA members are expected to engage portfolio companies in the process of transitioning to low-carbon and net-zero business strategies and are required to set engagement targets.<sup>222</sup> Members must also report on financing to support the transition to a net zero economy.<sup>223</sup> Because large institutional investors own a significant share of many of the largest carbon emitters, their engagement efforts could be influential.<sup>224</sup>

The Net Zero Asset Managers (“NZAM”) initiative features similar commitments by 273 asset managers responsible for over \$60 trillion in assets.<sup>225</sup> Notwithstanding asset managers' limited role as non-investors, NZAM describes “commitment, engagement, and stewardship” as “key levers” for accomplishing actual emissions reductions.<sup>226</sup> Participants—which include Vanguard, BlackRock, and Fidelity—have committed to work with client owners on

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219. Divestment is more likely to increase the cost of capital for small, startup companies in illiquid or private markets as opposed to large, publicly listed companies that have greater access to external financing. Kölbel et al., *supra* note 208, at 564; LÜTKEHERMÖLLER ET AL., *supra* note 165, at 12; Brest et al., *supra* note 201, at 219–20 (explaining potential effect of socially conscious investments in private markets).

220. Berk & van Binsbergen, *supra* note 209, at 5.

221. NZAOA, *supra* note 205, at 21, 61 (describing engagement as “perhaps the most important mechanism asset owners have to contribute to net-zero transformation”).

222. *Id.* at 15, 61–63.

223. *Id.* at 16, 67.

224. *Hotting Up: How Much Can Financiers Do about Climate Change?*, ECONOMIST (June 20, 2020), <https://www.economist.com/briefing/2020/06/20/how-much-can-financiers-do-about-climate-change>. Institutional investors' holdings in the coal industry total over \$1.2 trillion with BlackRock and Vanguard each holding over \$100 billion in share and bond holdings. Urgewald, *supra* note 188.

225. THE NET ZERO ASSET MANAGERS INITIATIVE, <https://www.netzeroassetmanagers.org/> (last visited Jan. 31, 2023); NET ZERO ASSET MANAGERS INITIATIVE, PROGRESS REPORT 2 (2021) [hereinafter NZAM PROGRESS REPORT].

226. FAQ, THE NET ZERO ASSET MANAGERS INITIATIVE, <https://www.netzeroassetmanagers.org/faq/> (last visited Jan. 31, 2023).



decarbonization goals and to set interim net zero targets for the assets they manage.<sup>227</sup>

Is engagement likely to be effective? Investors, particularly large institutional investors, plausibly may exert a greater impact on a company's emissions by engaging with its directors and supporting climate-related shareholder resolutions than by divesting.<sup>228</sup> Engagement may be more effective for investors than banks. Investors gain leverage over a company's operations only after allocating capital to a company.<sup>229</sup> But once investors acquire a stake in a company, they can exert more ongoing control than lenders, who occupy a relatively passive role once a loan is made.<sup>230</sup>

Engagement efforts aside, net zero leakage could be sizable, notwithstanding increasingly common net zero pledges by public equity investors and managers. As the former chief investment officer for sustainable investing at BlackRock observed, fossil fuel divestment is akin to "playing whack-a-mole against trillions of dollars sloshing around global financial markets."<sup>231</sup> The growing role of private equity will likely exacerbate such leakage. Between 2010 and 2021, private equity firms invested over \$1 trillion in the energy sector, the vast majority of that in fossil fuels.<sup>232</sup> The rise in private equity funding has helped to make up for the decline in bank funding for these investments.<sup>233</sup> Although private equity participation in traditional energy investment has dropped below historic levels, rising demand for oil and gas has continued to attract private investment.<sup>234</sup> Compared to public equity, private equity

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227. NZAM PROGRESS REPORT, *supra* note 225, at 3; *Commitment*, THE NET ZERO ASSET MANAGERS INITIATIVE, <https://www.netzeroassetmanagers.org/commitment/> (last visited Jan. 31, 2023); *Signatories*, THE NET ZERO ASSET MANAGERS INITIATIVE, <https://www.netzeroassetmanagers.org/signatories/> (last visited Jan. 31, 2023).

228. Horster, *supra* note 155, at 57–61.

229. UNEP Finance Initiative, *supra* note 149, at 8.

230. Light & Skinner, *supra* note 160, at 1950.

231. Tariq Fancy, *The Future of Climate Activism: Tariq Fancy on the Failure of Green Investing and the Need for State Action*, ECONOMIST (Nov. 4, 2021), <https://www.economist.com/by-invitation/2021/11/04/tariq-fancy-on-the-failure-of-green-investing-and-the-need-for-state-action>. See also James Mackintosh, *Why the Sustainable Investment Craze Is Flawed*, WALL ST. J. (Jan. 23, 2022), <https://www.wsj.com/articles/why-the-sustainable-investment-craze-is-flawed-11642865789> ("In practice, there has been a very weak link between the cost of capital and overall corporate investment for at least a couple of decades.").

232. Tabuchi, *supra* note 109; PRIV. EQUITY STAKEHOLDER PROJECT (PESP), PRIVATE EQUITY PROPELS THE CLIMATE CRISIS 4, 6 (2021).

233. Tabuchi, *supra* note 109.

234. Gregory Zuckerman, *Investor Shift from Fossil Fuels Leaves Surging Market to Smaller Players*, WALL ST. J. (Oct. 13, 2021), <https://www.wsj.com/articles/investor-shift-from-fossil-fuels-leaves-surging-market-to-smaller-players-11634117402> (noting that private equity firms have not fully made up for the drop in public equity support for fossil fuels).

firms are relatively insulated from ESG concerns.<sup>235</sup> In addition, state-owned firms and sovereign funds are acquiring fossil fuel assets in some countries, further muting the effect of divestment efforts.<sup>236</sup>

### 3. Insurers

Historically, insurers have supported fossil fuel operations by underwriting insurance coverage and investing in fossil fuel companies.<sup>237</sup> Insurance for fossil fuel projects may cover “project finance, credit, contractor risks, property and equipment damage, fire and special perils risk, and political risk.”<sup>238</sup>

For insurers, climate change poses risks of asset devaluation and increased claims.<sup>239</sup> Some insurers, particularly in Europe, have moved away from coal by divesting from coal companies and limiting or halting new insurance policies for coal.<sup>240</sup> Thirty-five insurers,

235. SUSTAINABLE FITCH, *supra* note 107, at 2–3 (noting that 431 private equity firms have signed UN Principles for Responsible Investment but only half of these use ESG principles in monitoring portfolio companies). Private equity firms invest money from pension funds, mutual funds, and other ultimate investors that may express sustainability preferences, but evidence of private equity decarbonization efforts is limited. Gözlügöl & Ringe, *supra* note 72, at 23.

236. *Who Buys Dirty Energy Assets?*, *supra* note 95 (reporting Saudi Aramco’s acquisition of 30 percent stake in a refinery in Poland and purchase of offshore oil assets by an Angolan group); Philippe Le Billon & Gerit Kristoffersen, *Just Cuts for Fossil Fuels? Supply-Side Carbon Constraints and Energy Transition*, 52 ENV’T & PLAN. A: ECON. & SPACE 1072, 1079 (2020) (observing that state-owned companies are “relatively insulated from external financial leverage”).

237. Alexander Sammon, *The Oil Merchant in the Gray Flannel Suit*, AM. PROSPECT (Sept. 29, 2021), <https://prospect.org/environment/oil-merchant-in-the-gray-flannel-suit/> (“[O]utside of the fossil fuel industry itself, there may be no industry more actively and intimately tied to the climate crisis than the insurance industry.”).

238. INSURE OUR FUTURE, TOOLKIT: HOW CAN YOU IDENTIFY THE COMPANIES INSURING A FOSSIL FUEL PROJECT? 1, [https://static1.squarespace.com/static/5b7c9307f79392b49031d551/t/5fbdde826457125654fd5e50/1606278791914/FossilFuel\\_InsuranceToolkit\\_ELC.pdf](https://static1.squarespace.com/static/5b7c9307f79392b49031d551/t/5fbdde826457125654fd5e50/1606278791914/FossilFuel_InsuranceToolkit_ELC.pdf).

239. Bridget Pals & Michael Panfil, *Climate Change Comes to Insurance*, THE HILL (Dec. 3, 2021, 12:30 PM), <https://thehill.com/opinion/energy-environment/584240-climate-change-comes-to-insurance/>.

240. Nick Holmes, *IEEFA: COP26—AXA Leads by Example, Accelerating its Exit from Oil and Gas to Battle Climate Change*, IEEFA (Nov. 3, 2021), [https://ieefa.org/ieefa-cop26-axa-leads-by-example-accelerating-its-exit-from-oil-and-gas-to-battle-climate-change/?utm\\_source=rss&utm\\_medium=rss&utm\\_campaign=ieefa-cop26-axa-leads-by-example-accelerating-its-exit-from-oil-and-gas-to-battle-climate-change&utm\\_source=Weekly+IEEFA+Newsletter&utm\\_campaign=43f50f2248-IEEFA\\_WeeklyDigest&utm\\_medium=email&utm\\_term=0\\_30c2b8506b-43f50f2248-128742461](https://ieefa.org/ieefa-cop26-axa-leads-by-example-accelerating-its-exit-from-oil-and-gas-to-battle-climate-change/?utm_source=rss&utm_medium=rss&utm_campaign=ieefa-cop26-axa-leads-by-example-accelerating-its-exit-from-oil-and-gas-to-battle-climate-change&utm_source=Weekly+IEEFA+Newsletter&utm_campaign=43f50f2248-IEEFA_WeeklyDigest&utm_medium=email&utm_term=0_30c2b8506b-43f50f2248-128742461). American insurers remain heavily invested in fossil fuel stocks and bonds. Sammon, *supra* note 237; Liam Phelan et al., *Insurance and Climate Change*, in ROUTLEDGE INT’L HANDBOOK OF GREEN CRIMINOLOGY 449, 455–56 (Nigel South et al. eds., 2d ed. 2020).

amounting to over half of the global reinsurance market, have ended or limited coverage for coal projects.<sup>241</sup> Many of these insurers have joined the Net Zero Insurance Alliance (“NZIA”), whose members agree to achieve net zero GHG emissions in their insurance and reinsurance underwriting portfolios by 2050.<sup>242</sup> The NZIA collaborated in establishing a standard for measuring and disclosing insured GHG emissions and recently issued a net zero target-setting protocol for insurers.<sup>243</sup>

Net zero efforts in underwriting could have a greater impact than similar efforts in other areas, thanks to the essential role of insurance in enabling fossil fuel projects and the concentrated structure of insurance markets. In the oil and gas insurance market, the top ten insurers account for more than 70 percent of coverage.<sup>244</sup> Relatively few firms have the size and expertise to provide coverage for major coal, oil, or natural gas projects.<sup>245</sup> Net zero commitments by these firms are less susceptible to leakage and could affect the availability and cost of coverage. Indeed, insurers’ decarbonization efforts are already affecting some fossil fuel sectors. Insurance premiums for coal projects have risen significantly, and coal companies report that reduced insurance availability has adversely affected their

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241. HARRIET REUTER HAPGOOD & PETER BOSSHARD, *INSURE OUR FUTURE, 2021 SCORECARD ON INSURANCE, FOSSIL FUELS, AND CLIMATE CHANGE* 5, 14 (David Mason ed., 2021) (noting that thirty-five major insurers no longer insure new coal projects and that some insurers are also phasing out coverage for existing coal projects).

242. *Statement of Commitment by Signatory Companies*, U.N. ENV’T PROGRAMME, <https://www.unepfi.org/psi/wp-content/uploads/2021/07/NZIA-Commitment.pdf> (last visited March 5, 2023).

243. NZIA, *Target-Setting Protocol Version 1.0* (2023); *World-Leading Insurers and United Nations Launch Pioneering Target-Setting Protocol to Accelerate Transition to Net-Zero Economy*, UN ENV’T PROGRAMME FIN. INITIATIVE (Jan. 17, 2023), <https://www.unepfi.org/industries/insurance/launch-of-nzia-target-setting-protocol-version-1-0/>.

244. HAPGOOD & BOSSHARD, *supra* note 241, at 17.

245. Lauren Hirsch, *Large Insurers Are Hatching a Plan to Take Down Coal*, N.Y. TIMES (Nov. 23, 2021), <https://www.nytimes.com/2021/11/23/business/dealbook/insurance-companies-coal.html> (quoting chief executive of a French insurance company AXA stating that only twelve to fifteen companies offer insurance for coal projects); Scott Carpenter, *Axa’s Vow To Stop Insuring Coal Hits at Industry’s Soft Underbelly*, FORBES (Nov. 30, 2019), <https://www.forbes.com/sites/scottcarpenter/2019/11/30/axas-vow-to-stop-insuring-coal-hits-at-industrys-soft-underbelly/?sh=4055dc6c1a70> (noting that “fewer than 20 global insurance companies [are] active in the energy sector” and that only some of these companies “can provide the expertise necessary for many projects”); Steven Mufson, *What Could Finally Stop New Coal Plants? Pulling the Plug on Their Insurance*, WASH. POST (Oct. 26, 2021, 1:03 PM), <https://www.washingtonpost.com/climate-environment/2021/10/26/climate-change-insurance-coal/>.

operations.<sup>246</sup> Tar sands operations have also faced higher insurance costs and limitations on coverage.<sup>247</sup>

Still, net zero leakage is possible. Smaller specialty insurers may step in as large insurers retreat.<sup>248</sup> In a global reinsurance market, Indian, Chinese, and Russian companies may replace European underwriters.<sup>249</sup> Fossil fuel companies also may turn to governments for insurance.<sup>250</sup> In response to an alleged doubling of insurance premiums, the state of North Dakota directed its insurance commissioner to explore the establishment of publicly funded insurance for the coal industry.<sup>251</sup> Self-insurance also may be a viable option, especially in the short term.<sup>252</sup> In-house insurers, or captives, serve as a form of self-insurance for some large coal mining companies.<sup>253</sup>

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246. Patrick Springer, *Wall Street's Climate Concerns Create Cloud of Financial Uncertainty for North Dakota Coal Country*, DICKINSON PRESS (Jan. 15, 2021, 4:01 AM), <https://www.thedickinsonpress.com/business/wall-streets-climate-concerns-create-cloud-of-financial-uncertainty-for-north-dakota-coal-country> (reporting industry official's estimate that insurance premiums have risen 20 to 100 percent and that only five to ten major insurance companies are willing to offer coverage); Fred Pearce, *As Investors and Insurers Back Away, the Economics of Coal Turn Toxic*, YALE ENVIRONMENT360 (Mar. 10, 2020), <https://e360.yale.edu/features/as-investors-and-insurers-back-away-the-economics-of-coal-turn-toxic>; LÜTKEHERMÖLLER ET AL., *supra* note 165, at 13; Corbin Hiar, *Coal, Oil Sands Companies Feel Growing Insurance Squeeze*, E&E NEWS: CLIMATEWIRE (Sept. 20, 2021, 6:50 AM), <https://www.eenews.net/articles/coal-oil-sands-companies-feel-growing-insurance-squeeze/>.

247. Hiar, *supra* note 246.

248. HAPGOOD & BOSSHARD, *supra* note 241, at 5.

249. Ian Smith, *Insurance Industry Feels the Heat on Cover for Fossil Fuels*, FIN. TIMES: CLIMATE CAPITAL (July 1, 2021), <https://www.ft.com/content/3b0b8f5f-7e7c-4de3-b9c0-4b8a12eb531a>.

250. Hiar, *supra* note 246.

251. Taylor Kuykendall, *North Dakota Studying Coal Sector's Insurance Challenges*, S&P GLOB. MKT. INTEL. (Mar. 17, 2021), <https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/north-dakota-studying-coal-sector-s-insurance-challenges-63206895>; S. Bill No. 2287, 66th Legis. Assemb. of N.D., Reg. Sess. (N.D. 2021), <https://www.legis.nd.gov/assembly/67-2021/documents/21-0978-02000.pdf>. The resulting report concluded that “hard market conditions were the primary driver of insurance rate increases” and that “ESG-related pressures are a secondary factor driving insurance rate increases.” GUIDEHOUSE, NORTH DAKOTA INSURANCE RESERVE FUND INSURANCE STUDY 3 (2022). The report also stated that “only two major insurance companies still provide coverage for the majority of the lignite coal sector[,] limit[ing] competition in the market and creat[ing] upward pricing pressure on policies[.]” *Id.* at 18.

252. Hiar, *supra* note 246 (quoting London School of Economics professor Swenja Surminski).

253. Carpenter, *supra* note 245.

Overall, concrete progress in decarbonizing insurance has been modest. Limits on underwriting oil and gas are uncommon, even among NZIA members.<sup>254</sup> Insurance for coal projects has become less widely available, but concerns about potential antitrust violations led the NZIA to scrap a proposed requirement that members avoid coal insurance.<sup>255</sup> Antitrust concerns also prompted the NZIA to caution that its Target Setting Protocol only “propose[s] general measures and best practices on how to set and pursue individual targets” but does not require its members to adopt or agree on specific measures.<sup>256</sup>

### III. FIXING THE LEAKS

Net zero pledges alone will not bring about decarbonization. However, if made and carried out with integrity, they can effectively complement emission standards, carbon taxes, and other government climate policies.<sup>257</sup> Fixing net zero leakage is essential to achieving net zero pledges’ potential.

The related challenge of ensuring that claimed emissions reductions from carbon offset projects are “real” offers insight relevant to fixing net zero leakage. While some ambiguity surrounds the term, “real” is generally used to indicate that accounting of carbon impacts must be complete and accurate.<sup>258</sup> For example, California’s cap-and-trade program defines “real” to mean “that GHG reductions . . . are quantified using appropriate, accurate, and conservative methodologies that account for all GHG emissions sources, GHG sinks, and GHG reservoirs within the offset project boundary and account for uncertainty and the potential for activity-

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254. HAPGOOD & BOSSHARD, *supra* note 241, at 5; Sammon, *supra* note 237 (explaining insurers’ reluctance to move away from oil and gas).

255. Alastair Marsh, *Net-Zero Insurers Uncover New Climate Adversary Antitrust Law*, BLOOMBERG: GREEN (Jan. 19, 2022, 4:40 AM), <https://www.bloomberg.com/news/articles/2022-01-19/net-zero-insurance-coal-exit-plans-impeded-by-antitrust-laws>. Concerns of potential antitrust liability are not unfounded: Arizona’s attorney general is exploring whether organized efforts by banks and money managers to limit fossil fuel investments constitute unlawful market manipulation. Mark Brnovich, *ESG May Be an Antitrust Violation*, WALL ST. J. (Mar. 6, 2022, 4:40 PM), <https://www.wsj.com/articles/esg-may-be-an-antitrust-violation-climate-activism-energy-prices-401k-retirement-investment-political-agenda-coordinated-influence-11646594807>.

256. NZIA, *supra* note 243, at 3.

257. Kolbel et al., *supra* note 208, at 568.

258. Michael Gillenwater, *What Is Wrong with ‘Real’ Carbon Offsets?*, 2 GREENHOUSE GAS MEASUREMENT & MGMT. 167, 167–69 (2012). *See, e.g.*, GREENHOUSE GAS PROTOCOL, MITIGATION GOAL STANDARD 47 (2014), [https://ghgprotocol.org/sites/default/files/standards/Mitigation\\_Goal\\_Standard.pdf](https://ghgprotocol.org/sites/default/files/standards/Mitigation_Goal_Standard.pdf) (defining real as “Emission reductions or removals represent actual emission reductions and are not artifacts of inaccurate or incomplete accounting”).

shifting leakage and market-shifting leakage.”<sup>259</sup> In other words, carbon accounting should reflect only those changes in carbon emissions that take place in the real world, once one considers all effects—direct and indirect—of the analyzed activity.

This principle holds true for fixing net zero leakage as well. Ensuring that carbon accounting rules reflect actual carbon impacts will be critical. Other important strategies for promoting real emissions reductions in the net zero context include universalizing net zero, deploying financial mechanisms that account for leakage or address the problem of stranded assets, incorporating engagement, and adopting regulatory approaches.

#### A. *Accounting Options*

Net zero pledges will be effective only if backed by transparent and accurate carbon reporting.<sup>260</sup> Transparent reporting, based on common standards, promotes accountability by enabling stakeholders and the public to track a company’s adherence to climate commitments.<sup>261</sup> Oversight of net zero compliance by certifiers, NGOs, or other actors also can help.<sup>262</sup> Carbon accounting must also accurately reflect net carbon impacts. Specifically, carbon accounting rules should account for the effects of corporate activity on GHG emissions as fully as possible and require incorporation of science-based targets.<sup>263</sup>

##### 1. *Extending Transparency*

As an initial matter, broader application of transparency standards can counter leakage associated with divestment efforts. Federal law requires companies with more than 2,000 shareholders—whether publicly traded or not—to register with the SEC and disclose key information.<sup>264</sup> Concern over the growth of private capital markets not subject to these transparency requirements has prompted the SEC to consider expanding their scope.<sup>265</sup> Moreover,

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259. CAL. CODE REGS. tit. 17 § 95802(a) (2019).

260. Lin, *supra* note 20, at 712.

261. *Id.*

262. Welton, *supra* note 19, at 237–38 (advocating enhanced net zero standard setting and monitoring to “help ensure high-quality net zero pledges”).

263. Pucker, *supra* note 209 (criticizing failure to evaluate ESG funds based on actual impacts).

264. 15 U.S.C. § 78l(g); Tom Zanki, *SEC Could Pull More “Unicorns” into Public Reporting Regime*, LAW360 (Jan. 28, 2022, 9:14 PM), <https://www.law360.com/articles/1459446>.

265. Paul Kiernan, *SEC Pushes for More Transparency from Private Companies*, WALL ST. J. (Jan. 10, 2022, 6:00 PM), <https://www.wsj.com/articles/sec-pushes-for-more-transparency-from-private-companies-11641752489>; *Revisions to the Definition of Securities Held of Record*, SEC (2021),

some companies avoid disclosure by counting an individual investment vehicle, which often has multiple shareholders, as a single shareholder.<sup>266</sup>

Applying disclosure obligations—including proposed climate-related disclosure requirements—to private companies would counter the temptation to acquire dirty assets.<sup>267</sup> One proposal would extend disclosure requirements to more private companies by counting shareholders based on the number of participants in an investment vehicle.<sup>268</sup> This proposal would merely require the SEC to promulgate a new rule changing its interpretation of “shareholder.”<sup>269</sup> Another option would apply emissions disclosure requirements based on company size or total GHG emissions rather than the number of shareholders.<sup>270</sup> This approach could better tailor disclosure requirements but would likely require Congressional action.<sup>271</sup>

Outside the United States, climate reporting requirements are already being applied to private companies. The United Kingdom requires large private companies to report GHG emissions associated with energy use and to make climate-related financial disclosures.<sup>272</sup> The European Union’s Corporate Sustainability Reporting Directive (“CSRD”), finalized in 2022, would impose sustainability reporting standards on all large companies—public or private—while also bringing small and medium-sized enterprises under its purview.<sup>273</sup> Companies will have to report adverse impacts associated with company operations and plans for ensuring a business strategy consistent with the Paris Agreement’s 1.5°C goal and achieving carbon neutrality by 2050.<sup>274</sup>

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<https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=202110&RIN=3235-AN05>.

266. Kiernan, *supra* note 265; Zanki, *supra* note 264.

267. Gözlügöl & Ringe, *supra* note 72, at 35–36; Taraporevala, *supra* note 72 (contending that “universal disclosure requirement for all companies of a certain size” would help avoid “brown-spinning”).

268. Kiernan, *supra* note 265; Zanki, *supra* note 264.

269. Zanki, *supra* note 264.

270. Gözlügöl & Ringe, *supra* note 72, at 42–45.

271. Coffee, *supra* note 113 (“Attempts to force private companies to become ‘reporting companies’ seem more Quixotic than realistic.”); Gözlügöl & Ringe, *supra* note 72, at 30 n.142 (concluding that Congressional action will be required to mandate climate-related disclosures by private companies in United States).

272. Gözlügöl & Ringe, *supra* note 72, at 31.

273. *Id.* at 29. See also Council Directive 2022/2464, art. 15, 2022 O.J. (L322) 1.

274. Gözlügöl & Ringe, *supra* note 72, at 29 n.132; Proposal for a Directive of the European Parliament and of the Council 2021/0104(COD), <https://www.consilium.europa.eu/media/57644/st10835-xx22.pdf>; Kolja Stehl et al., *EU Corporate Sustainability Reporting Directive—What Do Companies Need to Know*, HARV. L. SCH. F. ON CORP. GOV. (Aug. 23, 2022),

Disclosure by private equity funds that often invest in private companies also can combat leakage. Mutual funds, pension funds, insurance companies, and other institutional investors behind these funds should pressure private equity funds not only to disclose carbon emissions and fossil fuel holdings but also to enter into net zero commitments.<sup>275</sup> Along these lines, the NZAOA encourages its members to “evaluate the strength of asset managers’ systematic stewardship efforts related to climate and integrate that evaluation into their ongoing selection, appointment, and monitoring processes.”<sup>276</sup>

For banks, greater transparency and granularity in implementing net zero pledges can help to distinguish loans that support clean energy projects from those that support fossil fuels.<sup>277</sup> Transparency should extend to “look throughs” that reveal carbon-related activities of intermediaries or subsidiaries, as well as off-balance sheet activities where a bank underwrites or otherwise facilitates transactions that lead to significant GHG emissions.<sup>278</sup> More generally, fine-grained information about specific net zero strategies can help lenders, investors, and other actors distinguish between climate leaders and laggards in different sectors.<sup>279</sup> Transparency on green investments and the use of proceeds from the sale of fossil fuel reserves also can facilitate more accurate assessments of companies’ environmental performance.<sup>280</sup>

## 2. *Fine-Tuning Carbon Accounting Standards*

Adherence to the GHG Protocol enables the direct tracking of historic and current carbon emissions.<sup>281</sup> However, the Protocol’s

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<https://corpgov.law.harvard.edu/2022/08/23/eu-corporate-sustainability-reporting-directive-what-do-companies-need-to-know/>.

275. PESP, *supra* note 232, at 5, 13–14.

276. UN-CONVENED NET-ZERO ASSET OWNER ALL., *THE FUTURE OF INVESTOR ENGAGEMENT* 27 (2022).

277. Clifford, *supra* note 16464.

278. VACCARO 2021, *supra* note 153, at 22, 27.

279. See Felix Mormann, *Why the Divestment Movement Is Missing the Mark*, 10 *NATURE CLIMATE CHANGE* 1067, 1068 (2020) (calling for such differentiation within the fossil fuel divestment movement).

280. *Sustainable Finance Is Rife with Greenwash. Time for More Disclosure*, *ECONOMIST* (May 22, 2021), <https://www.economist.com/leaders/2021/05/22/sustainable-finance-is-rife-with-greenwash-time-for-more-disclosure> (calling for requirements that “force companies to reveal their full carbon footprint” so that “an investor could work out how much pollution their portfolio is responsible for today and how it might look tomorrow”); VACCARO 2021, *supra* note 153, at 23.

281. STEPHEN RUSSELL, WORLD RES. INST., *A RECOMMENDED METHODOLOGY FOR ESTIMATING AND REPORTING THE POTENTIAL GREENHOUSE GAS EMISSIONS FROM FOSSIL FUEL RESERVES* 1 (2016),



standards generally do not account adequately for future emissions that are embedded in a fossil fuel company's reserves.<sup>282</sup> A new category of "Scope 4" emissions could be added to track these projected emissions.<sup>283</sup> Alternatively, estimated future emissions could be based on disclosures of fossil fuel reserves under United States' securities law. Publicly listed oil and gas companies already must report proven reserves, and publicly listed coal companies must report proven and probable reserves.<sup>284</sup> These reports focus on reserve size and do not disclose all reserves a company might own,<sup>285</sup> but the reported information can be a starting point for estimating potential carbon emissions.<sup>286</sup> However, such disclosures alone will not address net zero leakage because a company's reported reserves will decrease equally upon a sale of reserves or a decision to leave them in the ground.<sup>287</sup>

One common way to measure progress in reducing emissions is to compare current or projected emissions against emissions in an earlier base year.<sup>288</sup> When a company retires a high-emitting asset, such as a coal-fired plant, it may include the resulting decrease in emissions in calculating its progress toward net zero.<sup>289</sup> When a company sells such an asset, the GHG Protocol calls for recalculating

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<http://www.wri.org/publication/methodology-calculating-potential-emissions-fossil-fuel-reserves>.

282. Jan Bebbington et al., *Fossil Fuel Reserves and Resources Reporting and Unburnable Carbon: Investigating Conflicting Accounts*, 66 CRITICAL PERSPS. ON ACCT. 1, 16 (2020).

283. *Id.*

284. 17 C.F.R. § 229.1202(a)(2) (2022) (oil and gas); 17 C.F.R. § 229.1303(b)(3) (2022) (mineral). SEC regulations define "reserves" in terms of the quantities of substances that can be economically extracted. 17 C.F.R. § 210.4-10(a)(26) (2022); 17 C.F.R. § 229.1300 (2022).

285. Some oil and gas reserves are not required to be reported at all, depending on the characterization and classification of the reserve—including the degree of certainty that the reserve will be drilled, whether it has been developed at all, and whether the company has made a "final investment decision." 17 C.F.R. § 229.1202(a)(2) (2022) (detailing disclosure requirements for oil and gas reserves); 17 C.F.R. § 210.4-10(a) (2022) (defining different types of reserves); *Oil and Gas Rules*, SEC, at Question 131.04, <https://www.sec.gov/divisions/corpfin/guidance/oilandgas-interp.htm> (last visited Jan. 31, 2023).

286. RUSSELL, *supra* note 281, at 1 (proposing a methodology for reporting potential emissions from reserves).

287. SEC regulations require a company to disclose material changes in proved undeveloped reserves of oil and gas, which may include a decision to keep such reserves in the ground. 17 C.F.R. § 229.1203(b) (2022). SEC regulations also require mining operations to report on their proposed program of exploration or development, which presumably would account for a decision to leave coal reserves in the ground. 17 C.F.R. § 229.1304(b)(2)(i) (2022).

288. GHG Protocol, *supra* note 27, at 35.

289. SBTi, *supra* note 49, at 55 (defining abatement).

base-year emissions to account for the transfer of ownership.<sup>290</sup> Actions that may trigger base-year recalculations include mergers, acquisitions, and divestments, as well as the outsourcing and insourcing of emitting activities.<sup>291</sup> “[Such] [s]tructural changes trigger recalculation because they merely transfer emissions from one company to another without any change of emissions released to the atmosphere[.]”<sup>292</sup> Recalculating base-year emissions helps to counter some forms of net zero leakage—such as leakage that results from the transfer of ongoing operations.<sup>293</sup> But it does not account for changes in a company’s undeveloped fossil fuel reserves because the existence of these reserves is not reflected in base-year emissions.<sup>294</sup>

To remedy this gap, companies’ net zero plans should reveal fossil fuel reserves. These plans already should incorporate the emissions anticipated from exploiting reserves within emissions projections and planned net zero pathways.<sup>295</sup> However, under existing reporting standards, a company’s projected emissions decline equally whether the company sells off its fossil fuel reserves or decides to leave them in the ground.<sup>296</sup> From a climate perspective, the sale of reserves to a purchaser who intends to develop them is far worse. To address this problem, incentives should “support retirement, not divestment.”<sup>297</sup> Carbon accounting rules should not allow companies to take credit for simply moving high-carbon assets off their books. Similarly, a parent company should not be able to claim progress in reducing emissions when it merely transfers high-carbon assets to a dirty subsidiary.<sup>298</sup> A company’s emissions disclosure report should include emissions associated with the company as well as its subsidiaries.<sup>299</sup> Furthermore, carbon accounting rules should not only mandate disclosure of fossil fuel reserves but also require that a

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290. GHG Protocol, *supra* note 27, at 35 (requiring recalculation for activities “that have a significant impact on the company’s base-year emissions”).

291. *Id.*

292. *Id.* at 37.

293. Clara Ferreira Marques & Clive Cook, *What to Do with the Dirty Stuff*, BLOOMBERG (Oct. 7, 2021), <https://www.bloomberg.com/opinion/articles/2021-10-07/oil-and-gas-asset-sales-amount-to-climate-arbitrage> (urging that “emissions goals be rebased when a significant sale is made”); GHG Protocol, *supra* note 27, at 35 (discussing recalculation of base-year emissions when a company divests a subsidiary).

294. GHG Protocol, *supra* note 27, at 38.

295. The SEC’s proposed rules on climate change disclosure would require detailed disclosures of targets related to reducing GHG emissions, including interim targets and plans for meeting targets. 87 Fed. Reg. 21471 (proposed Apr. 11, 2022).

296. GHG Protocol, *supra* note 27, at 76.

297. SIERRA CLUB, DESIGNING COAL RETIREMENT MECHANISMS FOR EQUITY AND IMPACT 7 (2021).

298. Reguly, *supra* note 80.

299. DAY ET AL., *supra* note 14, at 17.

seller of carbon-intensive assets continue to carry those assets on its books unless there is a reasonable assurance that those assets will not be developed.

*B. Universalizing Net Zero*

Extending carbon regulation to a wider range of activities is one strategy used to address carbon leakage.<sup>300</sup> Analogously, establishing more comprehensive coverage by net zero pledges can address net zero leakage. A company's net zero pledge should cover all its activities, and all members of an industry sector should make net zero commitments.

*1. Within a Company*

Under existing standards—which are voluntary—entities have broad discretion over the activities they include within their net zero pledges. Some net zero leakage results from a pledge's coverage of only some of an entity's activities. For example, a bank may stop financing oil and gas projects but continue to make general loans to oil and gas companies.<sup>301</sup> Or a bank's pledge may encompass loans to some borrowers but not others.<sup>302</sup> In each instance, a company may assert publicly—and accurately—its intent to achieve net zero but has limited its ambition to a subset of its activities.

For banks, the Financial Industry Reporting Standard has begun to address these concerns by requiring financial institutions' GHG disclosures to include Scope 3 emissions of borrowers and investees in the energy and mining industry.<sup>303</sup> Furthermore, institutions must report Scope 3 emissions of all borrowers and investees beginning in 2026.<sup>304</sup> The Financial Industry Reporting Standard applies to carbon accounting and disclosure but does not establish standards for net zero target setting.<sup>305</sup> The SBTi's Net Zero Standard does address target setting and offers guidance specific to the financial sector.<sup>306</sup> Under this guidance, financial institutions' pledges must encompass Scope 3 emissions associated with general corporate loans for fossil fuel companies, electricity generation, and other specified activities.<sup>307</sup> A more comprehensive approach would require net zero

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300. *See supra* text accompanying note 49.

301. *See supra* text accompanying notes 152, 154, and 157.

302. *See supra* note 180.

303. PCAF, *supra* note 26, at 49, 60.

304. *Id.*

305. *Id.*

306. SBTi, *supra* note 49.

307. *Id.* at 53–57. The guidance also recommends phaseout of financial support for thermal coal by 2030, which means immediately ceasing support to coal companies that are building new infrastructure or investing in new or additional thermal coal activities. *Id.* at 33–34. A leading example of a net zero pathway validated by SBTi is that of France's La Banque Postale, which has

pledges to cover debt and equity underwriting as well as other activities deemed optional or excluded under the SBTi's guidance.<sup>308</sup> The point is not to halt all financial support for energy companies, however. These companies increasingly engage in both fossil fuel and renewable energy activities, and financial institutions should be encouraged to expand support for the latter.

Under appropriate circumstances, net zero pledges also should extend beyond Scope 3 emissions. Those circumstances include situations when a company facilitates activities by its customers that in turn generate significant carbon emissions. For example, Microsoft sells to fossil fuel companies software and services that assist in exploring and extracting fossil fuels.<sup>309</sup> Although Microsoft's net zero pledge covers Scope 3 emissions—including emissions associated with energy use of Microsoft devices<sup>310</sup>—it does not extend to the emissions resulting from the burning of fossil fuels produced by Microsoft's customers.<sup>311</sup> Microsoft *is* demanding that those customers have public commitments to net zero targets covering Scope 1 and Scope 2 emissions.<sup>312</sup> However, it is not requiring those commitments to include Scope 3 emissions—most notably, the emissions associated

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committed to “refrain[] from financing oil and gas energy projects,” to cease providing loans and other financial services to oil and gas companies beyond 2030, and to divest from such businesses by 2030. *La Banque Postale Is Stepping Up Its Decarbonisation Strategy*, LA BANQUE POSTALE (Oct. 13, 2021), <https://www.lapostegroupe.com/en/news/la-banque-postale-is-stepping-up-its-decarbonisation-strategy>; Alexandre Rajbhandari, *La Banque Postale Unveils Plan to Exit Oil and Gas by 2030*, BLOOMBERG (Oct. 14, 2021), <https://www.bloomberg.com/news/articles/2021-10-14/la-banque-postale-receives-sbti-backing-for-its-climate-strategy>.

308. SBTi, *supra* note 49, at 114.

309. Corbin Hiar, *Microsoft to Continue Helping Most Oil Drillers*, E&E NEWS (Mar. 15, 2022), <https://subscriber.politicopro.com/article/eenews/2022/03/15/microsoft-to-continue-helping-most-oil-drillers-00017095..>

310. Peter Eavis, *Microsoft's Pursuit of Climate Goals Runs into Headwinds*, N.Y. TIMES (Mar. 10, 2022), <https://www.nytimes.com/2022/03/10/business/microsoft-climate-carbon-emissions.html#:~:text=The%20company%20aims%20to%20be,the%20most%20recent%20year%20measured.&text=As%20a%20subscriber%2C%20you%20have,articles%20to%20give%20each%20month>.

311. Tim Donaghy et al., *Oil in the Cloud: How Tech Companies are Helping Big Oil Profit from Climate Destruction*, GREENPEACE: REPS. (May 19, 2020), <https://www.greenpeace.org/usa/reports/oil-in-the-cloud/> (noting that emissions associated with Microsoft's cloud technology contracts “are excluded from Microsoft's carbon footprint and the company has explicitly stated its carbon negative plans will not include cancelling these contracts”).

312. Darryl Willis & Lucas Joppa, *Working Toward a Net Zero Future: Evolving Our Work with Energy Companies*, MICROSOFT BLOG (Mar. 10, 2022), <https://blogs.microsoft.com/blog/2022/03/10/working-toward-a-net-zero-future-evolving-our-work-with-energy-companies/>.

with burning the fossil fuels produced as a result of using Microsoft's technologies.<sup>313</sup> Microsoft and other tech giants that provide services for fossil fuel companies should expand their net zero pledges to encompass these emissions as well.<sup>314</sup> Such an approach could impact fossil fuel producers worldwide, including state-owned and privately held companies.<sup>315</sup>

Net zero pledges also should address intertemporal net zero leakage. To prevent companies from merely shifting their emissions forward in time, net zero obligations should include detailed pathways that spell out specific steps for reducing GHG emissions from the present going forward and not just a target date for achieving net zero. Interim targets and implementation plans should be sufficiently ambitious such that, if adopted widely, they would achieve the Paris Agreement temperature targets. This approach is consistent with the Net Zero Standard's recommendation that companies reduce emissions in accordance with 1.5°C-aligned pathways.<sup>316</sup>

## 2. *Within an Industry*

Net zero leakage can occur within an industry if only some of its members make net zero pledges. To avoid leakage when companies transfer carbon-intensive assets, buyers as well as sellers should be governed by net zero pledges that cover those assets. To counter net zero leakage from divestment, broad investor participation in net zero efforts is needed. The more investors that screen out carbon-intensive companies, the stronger the incentives those companies will face to adopt climate-friendly practices.<sup>317</sup> And if all lenders refuse to lend to coal companies, then new coal extraction projects will dwindle. Unfortunately, broadening industry participation in net zero pledges—among fossil fuel companies, investors, and lenders—may prove challenging, as the actors who have not already made such commitments may be especially disinclined to do so.

Initiatives aimed at coordinating industry action can be critical in extending the reach of net zero pledges and magnifying their impact. Establishment of the Glasgow Financial Alliance for Net Zero ("GFANZ")—a coalition of banks, investors, asset managers, insurers, and other institutions<sup>318</sup>—represents an important starting point but

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313. Hiar, *supra* note 246.

314. *Cf.* Donaghy et al., *supra* note 310 (recommending "[p]ublic commitment [by Microsoft, Amazon, Google, and other cloud computing companies] to no longer offer machine learning or high performance computing capabilities for the oil and gas sector for the purpose of new exploration or increased production").

315. *See supra* text accompanying notes 136–38.

316. SBTi, *supra* note 49, at 4, 9.

317. Kolbel et al., *supra* note 208, at 568.

318. *Accelerating the Transition to a Net-Zero Global Economy*, GLASGOW FIN. ALL. FOR NET ZERO, <https://www.gfanzero.com/> (last visited Jan. 31, 2023).

must be followed with concrete actions. The NZIA, a group of insurers within the GFANZ, considered a mandate that its members avoid underwriting coal<sup>319</sup> but ultimately declined to adopt it in light of antitrust concerns.<sup>320</sup> More recently, the GFANZ also refrained from explicitly prohibiting members from financing new coal projects, notwithstanding the issuance of guidelines by GFANZ's accrediting organization calling for such a prohibition.<sup>321</sup>

The feasibility of universalizing net zero coverage across an industry will depend on the specific context. In concentrated industries, net zero commitments by a handful of actors might dramatically curb net zero leakage. Furthermore, whether companies are willing to make such commitments may depend on potential alternative lines of business. For example, relatively few insurers operate in the insurance market for fossil fuel projects, and insurance companies often underwrite diverse policies covering various risks.<sup>322</sup> A common commitment among insurers to stop underwriting fossil fuel projects could bring major new projects to a halt.<sup>323</sup> Coal and tar sands projects have experienced growing difficulty in securing insurance, demonstrating the potential effectiveness of universalizing net zero among insurers.<sup>324</sup>

Investor divestment efforts face a more difficult collective action challenge. The proportion of sustainability investors (and the assets they represent) is relatively small.<sup>325</sup> Moreover, the number of potential investors is large. In the United States, individual, noninstitutional investors own more than half of all stocks, posing a daunting challenge for organizing and universalizing net zero efforts.<sup>326</sup> Promises to reduce fossil fuel investments are likely to be

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319. Marsh, *supra* note 255.

320. Such concerns are not insurmountable: a broad construction of the foundational antitrust concept of consumer welfare could allow collaborative industry efforts to advance public health and safety to withstand antitrust scrutiny. See Amelia Miazad, *Prosocial Antitrust*, 73 HASTINGS L.J. 1637, 1689–95 (2022).

321. Polly Bindman, *What Race to Zero's New Guidelines Mean for GFANZ*, CAPITAL MONITOR (Aug. 17, 2022), <https://capitalmonitor.ai/sdgs/sdg-13-climate-action/gfanz-what-the-race-to-zeros-new-guidelines-mean/>.

322. Hirsch, *supra* note 245.

323. *Id.*

324. See Hiar, *supra* note 246.

325. See *What Is Environmental, Social, and Governance (ESG) Investing?*, INVESTOPEDIA (last updated Sept. 27, 2022), <https://www.investopedia.com/terms/e/environmental-social-and-governance-esg-criteria.asp> (noting survey finding that 19 percent of respondents “reported using ESG considerations in selecting investments”).

326. Felix Mormann, *Why the Divestment Movement Is Missing the Mark*, 10 NATURE CLIMATE CHANGE 1067, 1068 (2020) (“Counting both direct and indirect stock ownership, such as through mutual funds, retail investors own nearly 60% of US equities at a total value of almost \$25 trillion.”).

undermined by other investors' willingness to invest. As long as enough buyers are willing to purchase high-carbon assets, share prices will not be affected. Even with growing net zero commitments from institutional investors and asset managers, capital for oil and gas development and extraction remains readily available.<sup>327</sup>

Net zero should be universalized within companies and across industries. Within a company, extending net zero coverage to more activities will often be a feasible way to make net zero pledges more meaningful. However, unless net zero coverage becomes widespread across an industry sector—a more difficult proposition—net zero leakage will continue to be significant.

### C. Transactional Options

Several financial mechanisms can address net zero leakage arising from transferred emissions. These include buyer-seller agreements that incorporate net zero provisions, managed transition vehicles, and climate bad banks. These mechanisms allocate the losses associated with stranded assets in various ways. Well-designed mechanisms can ensure that claimed emissions reductions are real.

#### 1. Buyer-Seller Agreements

Contracts for the sale of fossil fuel assets should incorporate provisions to curb net zero leakage. Columbia Law Professor John Coffee has proposed, for example, that investors pressure large public companies not to sell fossil fuel assets unless “the buyer agrees to observe a ‘net zero’ emissions pledge roughly comparable to its seller’s.”<sup>328</sup> Such an approach would take advantage of the fact that “the seller is exposed to shareholder pressure, even if the buyer is not.”<sup>329</sup>

A private buyer's net zero pledge, even if incorporated into a sales agreement, might not be readily enforced or enforceable, however.<sup>330</sup> A seller has little incentive to police a buyer's compliance with its pledge, and no third-party beneficiary is likely to have standing to sue a buyer for noncompliance.<sup>331</sup> Furthermore, likely remedies may be unsatisfactory: An award of damages to the seller will do nothing to address the excess carbon emissions resulting from breach of the agreement, and courts may hesitate to order specific performance.<sup>332</sup>

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327. LÜTKEHERMÖLLER ET AL., *supra* note 165, at 8.

328. Coffee, *supra* note 11113.

329. *Id.*

330. *Id.*

331. RESTATEMENT (SECOND) OF CONTRACTS § 315 (AM. L. INST. 1981) (“An incidental beneficiary acquires by virtue of the promise no right against the promisor or the promisee.”); *id.* § 302 (Intended and Incidental Beneficiaries).

332. RESTATEMENT (SECOND) OF CONTRACTS § 345 cmt. b (AM. L. INST. 1981) (“In most contract cases, what is sought is enforcement of a contract.

It is also uncertain whether courts would find a net zero pledge enforceable.<sup>333</sup>

Asset sale agreements nonetheless should include more concrete, climate-related requirements that can be more easily enforced against buyers. Courts may be more willing to enforce specific commitments to control flaring and venting or otherwise mitigate GHG emissions from oil and gas production, plug inactive wells that leak methane into the air, and disclose emissions and the existence of emissions reduction strategies.<sup>334</sup> Parties other than sellers, such as banks, also should insist on incorporating such conditions into contracts.<sup>335</sup> In addition, contracts should identify a third-party beneficiary, such as a bank, a net zero certifier, or a NGO to serve as a potential enforcement agent. Indirect enforcement can occur through investors voting against the re-election of directors who approve of transactions that fail to incorporate climate-related provisions into asset sale agreements.<sup>336</sup>

## 2. *Managed Transition Vehicles*

Another tool for curbing net zero leakage is managed transition vehicles—investment funds that buy up fossil fuel assets in order to responsibly wind down production and retire the assets.<sup>337</sup> Such funds can be financially viable if they purchase discounted assets or face lower capital costs than the original asset owner.<sup>338</sup> Carbon accounting rules should allow companies with net zero pledges to take credit for selling fossil fuel assets to these vehicles but only to the extent that lower carbon emissions would result.

One type of managed transition vehicle, the Energy Transition Mechanism (“ETM”), would purchase coal power plants and wind down their operations while also financing clean energy expansion.<sup>339</sup>

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Enforcement usually takes the form of an award of a sum of money due under the contract or as damages.”); *id.* § 357 cmt. a (specific performance “is seldom granted unless there has been a breach of contract, either by non-performance or by repudiation”).

333. Lin, *supra* note 20, at 725.

334. See MALEK, *supra* note 71, at 8.

335. *Id.*

336. Coffee, *supra* note 113.

337. KOBEN CALHOUN ET AL., FINANCING THE COAL TRANSITION: PRAGMATIC SOLUTIONS TO ACCELERATE AN EQUITABLE, CLEAN ENERGY FUTURE 19 (2021); Ben Dummett & Joe Wallace, *Investors Balk at Plan to Buy Coal Mines and Close Them*, WALL ST. J. (Dec. 18, 2021, 7:13 AM), <https://www.wsj.com/articles/investors-balk-at-plan-to-buy-coal-mines-and-close-them-11639829583>.

338. CALHOUN ET AL., *supra* note 337, at 19.

339. *Id.*; Donald Perry Kanak, *How to Accelerate the Energy Transition in Developing Economies*, WORLD ECON. F. (Jan. 25, 2021), <https://www.weforum.org/agenda/2021/01/how-to-accelerate-the-energy-transition-in-developing-economies/>.



The Asian Development Bank is currently working with Indonesia and the Philippines to pilot this approach.<sup>340</sup> Investors, including national development finance institutions and multilateral banks, would finance the ETM by offering capital at a relatively low cost.<sup>341</sup> The inexpensive capital would enable the ETM to buy out coal plant owners, phase down operations, and retire the plants early.<sup>342</sup> The phaseout of coal-generated power via an ETM would be coordinated with a country's overall emission reduction commitments and the buildout of renewable energy.<sup>343</sup> ETM investors would receive returns from coal plant operations and renewable energy production.<sup>344</sup> The ETM offers the prospect of hastening the phaseout of coal plants while accelerating demand for renewables. Nonetheless, determining when a coal plant would have been retired and calculating emissions avoided will pose challenges. Resolving such issues is essential to avoid net zero leakage and windfall payments to plant owners.<sup>345</sup>

A carbon retirement portfolio could similarly address leakage from the transfer of carbon-emitting assets.<sup>346</sup> This type of managed transition vehicle would buy up oil and gas wells, coal mines, or fossil fuel power plants in order to retire these assets early.<sup>347</sup> The Coal to Zero fund, proposed by Citigroup in partnership with a commodities trader and private equity firm, offers one example.<sup>348</sup> The fund would have purchased coal mines and continued to operate them, while promising to end production of coal from the mines by 2040 and

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340. Press Release, Asian Dev. Bank, *ADB, Indonesia, the Philippines Launch Partnership to Set Up Energy Transition Mechanism* (Nov. 3, 2021), <https://www.adb.org/news/adb-indonesia-philippines-launch-partnership-set-energy-transition-mechanism>.

341. CALHOUN ET AL., *supra* note 337, at 20.

342. *Id.* at 19; DONALD P. KANAK, FOR HEALTH AND CLIMATE: RETIRING COAL-FIRED ELECTRICITY AND PROMOTING SUSTAINABLE ENERGY TRANSITION IN DEVELOPING COUNTRIES 14 (2020) (proposing “Coal Retirement Mechanism to acquire and retire existing coal-fired power plants in 10-15 years instead of a current expected lifetime of 30-40 years”).

343. CALHOUN ET AL., *supra* note 337, at 20; KANAK, *supra* note 342, at 13–15 (proposing coupling of Coal Retirement Mechanism with a “Sustainable Energy Transition Mechanism” to provide technical expertise and supplementary finance to replace coal plants with a combination of energy efficiency, renewable energy and storage, and possibly gas-fired plants).

344. Kanak, *supra* note 339.

345. *See* CALHOUN ET AL., *supra* note 337, at 24 (noting “risks that financial mechanisms will support plants that would have retired regardless”).

346. Brad Handler & Morgan Bazilian, *Exploring Carbon Retirement Portfolios*, PAYNE INST. FOR PUB. POLY (2021), <https://payneinstitute.mines.edu/wp-content/uploads/sites/149/2021/07/Payne-Institute-Commentary-Carbon-Retirement-Portfolio-Discussion.pdf>.

347. *Id.*

348. Dummett & Wallace, *supra* note 337.

leaving 75 percent of coal reserves in the ground.<sup>349</sup> In furtherance of this objective, the fund pledged not to expand production or extend the lifetimes of the mines.<sup>350</sup> However, whether such funds can attract enough investment to succeed is questionable. Low investor interest in the Coal to Zero proposal led to its abandonment.<sup>351</sup> Some potential investors expressed reluctance to invest in fossil fuel projects at all, whereas others were unnerved by coal's uncertain regulatory environment.<sup>352</sup>

Government financial support is likely needed for a carbon retirement portfolio to work.<sup>353</sup> Such support might take the form of a “carbon avoidance bonus” for each ton of avoided emissions—a payment that would incentivize further emissions reductions and enable competitive bids for assets.<sup>354</sup> Payments might be distributed through a reverse auction in which power plant operators submit bids expressing their willingness to decommission early.<sup>355</sup> Financial support might also occur through government guarantees that would lower borrowing costs.<sup>356</sup>

The abandonment of the Coal to Zero proposal nonetheless underscores a fundamental challenge posed by stranded assets: Someone will have to bear the cost of leaving fossil fuels in the ground. Absent a sale, current asset owners would take the hit. Shareholders who are willing to assume the burden could pressure corporate managers to close mines and wells and threaten to replace executives who refuse to do so.<sup>357</sup> If fossil fuel assets are sold, purchasers—including speculators who overestimate future markets for coal and governments or private entities that implement a “leave it in the ground” policy—might bear the costs.<sup>358</sup> If sellers accept a discounted price, they too would bear part of the cost.

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349. *Id.*

350. CALHOUN ET AL., *supra* note 336, at 19.

351. Dummett & Wallace, *supra* note 337.

352. *Id.*

353. Handler & Bazilian, *supra* note 346.

354. *Id.*

355. See JESSE SCOTT ET AL., COAL PHASE-OUT IN GERMANY: THE ROLE OF COAL EXIT AUCTIONS 13 (June 2022) (discussing Germany's reliance on reverse auctions to accelerate the phaseout of coal-fired power plants).

356. Handler & Bazilian, *supra* note 346.

357. James Mackintosh, *Investing to Stop Climate Change Is Trickier Than It Seems*, WALL ST. J. (Jan. 26, 2022, 11:24 AM), <https://www.wsj.com/articles/investing-to-stop-climate-change-is-trickier-than-it-seems-11643214062>.

358. *Id.*

### 3. *Climate Bad Bank*

Stranded assets present a problem for banks as well as fossil fuel companies.<sup>359</sup> Net zero leakage can occur not only when companies sell off fossil fuel assets but also when banks sell off fossil fuel loans. A “climate bad bank” (“CBB”) could acquire these loans and perhaps also physical assets with the objective of ensuring fossil fuel assets are retired.<sup>360</sup> Patterned after “bad banks” that mitigate risks to the financial system by buying up nonperforming assets of financially distressed companies, a CBB could reduce financial shocks from the sudden depreciation of stranded fossil fuel assets and encourage lenders to support climate-friendly investments.<sup>361</sup>

CBBs would be implemented by national and regional banks or even a coordinated network of institutions.<sup>362</sup> Under one proposal, the Federal Reserve Bank, in coordination with the European Central Bank and other major central banks, would establish a holding company to purchase fossil fuel assets from private banks.<sup>363</sup> In contrast to conventional bad banks, CBBs would seek primarily to extinguish assets rather than liquidate them.<sup>364</sup> The costs of extinguishing fossil fuel assets—estimated to be trillions of dollars—would be borne by asset sellers as well as the general public.<sup>365</sup>

Like other managed transition vehicles, CBBs could have the perverse effect of encouraging involvement in fossil fuels and rewarding actors who should have known better than to invest in them.<sup>366</sup> Buyout programs should not generate windfalls for fossil fuel asset owners, yet offers to purchase assets must be sufficiently attractive for owners to accept them. To address moral hazard concerns, CBBs should purchase assets at a discount to their market

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359. For a more comprehensive survey of options for addressing stranded assets, see Arthur Rempel & Joyeeta Gupta, *Equitable, Effective, and Feasible Approaches for a Prospective Fossil Fuel Transition*, 13 WIREs CLIMATE CHANGE 756, at 3–8 (2022).

360. Louis Daumas & Mathilde Salin, *A “Climate Bad Bank” To Navigate Stranded Assets? Exploring an Emerging Policy Proposal*, EUROPEAN COMM’N, [https://ec.europa.eu/economy\\_finance/arc2021/documents/posters/A\\_climate\\_bad\\_bank\\_to\\_navigate\\_stranded\\_assets\\_Exploring\\_an\\_emerging\\_policy\\_proposal\\_paper.pdf](https://ec.europa.eu/economy_finance/arc2021/documents/posters/A_climate_bad_bank_to_navigate_stranded_assets_Exploring_an_emerging_policy_proposal_paper.pdf) (last visited Jan. 31, 2023).

361. *Id.*

362. *Id.*

363. Frank Van Gansbeke, *Climate Change, CFTC, CBDC, and Federal Reserve Bank Audacity*, FORBES (Sept. 16, 2020, 4:16 PM), <https://www.forbes.com/sites/frankvangansbeke/2020/09/16/climate-change-cftc-cbdc-and-federal-reserve-bank-audacity/?sh=7be391320d8b>; see also GAEL GIRAUD, ET AL., *supra* note 326, at 18–23.

364. Daumas & Salin, *supra* note 360.

365. *Id.* at 4.

366. See *id.*; Kyra Bos & Joyeeta Gupta, *Stranded Assets and Stranded Resources: Implications for Climate Change Mitigation and Global Sustainable Development*, 56 ENERGY RSCH. & SOC. SCI. 101215, at 7, 9 (2019).

value, cap purchases at a fixed proportion of a seller's fossil fuel assets, and require sellers to agree not to support fossil fuel projects going forward.<sup>367</sup> And to encourage owners to sell sooner rather than later, CBBs should establish a schedule of offers that incorporates larger discounts over time.<sup>368</sup>

Another objection to CBBs is that they would subsidize lenders and fossil fuel companies that contributed to and profited from the climate crisis.<sup>369</sup> General critiques allege that such compensation programs direct payments to the wealthy, waste public funds on assets that would have been retired anyway, and reward speculation in risky assets.<sup>370</sup> The high price of implementing CBBs, combined with uncertain support for an apparent bailout for banks and fossil fuel companies, casts doubt on their political feasibility. Defining the stranded assets eligible for purchase also poses a challenge, as owners would be inclined to overestimate their assets' magnitude and value.<sup>371</sup> Coupled with programs to address impacts on affected communities, CBBs or similar mechanisms nonetheless can ameliorate financial disruption from stranded assets and share the costs of the energy transition between owners and the public.<sup>372</sup> Directives to halt fossil fuel activity, such as a prohibition or phaseout, may be less feasible in comparison, particularly where fossil fuel interests are politically powerful.<sup>373</sup>

#### D. *Investor Engagement*

Divestment's limited direct impact on fossil fuel companies' access to capital warrants a second look at engagement strategies for reducing GHG emissions.<sup>374</sup> Whether investors seeking social change

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367. Daumas & Salin, *supra* note 360.

368. *Id.* Similar incentives can be found in Germany's phaseout of coal-fired electricity, which relies on auctions to incentivize the early retirement of power plants. The phaseout mechanism reduces the maximum potential payment in successive auction rounds, with any plants remaining after 2026 subject to closure without compensation. See CALHOUN ET AL., *supra* note 336, at 21; SIERRA CLUB, *supra* note 269, at 3, 9.

369. Daumas & Salin, *supra* note 360.

370. Bos & Gupta, *supra* note 365, at 7, 9; Ben Caldecott et al., *Stranded Assets: Environmental Drivers, Societal Challenges, and Supervisory Responses*, 46 ANN. REV. ENV'T & RES. 417, 431–32 (2021).

371. Daumas & Salin, *supra* note 359.

372. Jeremy Moss, *BHP Is Selling Its Dirty Oil and Gas Assets, But Hold the Applause*, CONVERSATION (Aug. 18, 2021), <https://theconversation.com/bhp-is-selling-its-dirty-oil-and-gas-assets-but-hold-the-applause-166333>; Gillian Tett, *Cleaning Dirty Assets Needs Fair Regulations and a "Bad Bank" Model*, FIN. TIMES (July 15, 2021), <https://www.ft.com/content/2ff8562e-bf86-42f3-8341-3bb4871f2ba>.

373. SIERRA CLUB, *supra* note 297, at 5.

374. *Cf.* Berk & van Binsbergen, *supra* note 209, at 2 (suggesting that socially conscious investors, rather than divesting, can have a greater impact by

should pursue a strategy of divestment or engagement is the subject of extensive debate.<sup>375</sup> Divestment seemingly offers climate-conscious investors an easy way to duck the issue of stranded fossil fuel assets. The problem of net zero leakage nonetheless highlights the limitations of a pure divestment strategy. Universalizing net zero among investors—an approach that relies heavily on divestment from fossil fuel companies—poses a daunting challenge considering the number of investors and the deep pool of available capital.<sup>376</sup> Divestment can even worsen corporate behavior—and climate consequences—as shareholders who are relatively unconcerned about climate change replace climate-conscious investors.<sup>377</sup>

Afraid of missing out on financial returns and reluctant to relinquish influence as owners, institutional investors and asset managers have typically opted to engage rather than divest.<sup>378</sup> Engagement pushes investors and financial institutions to wrestle with the problem of stranded assets.<sup>379</sup> The objective of engaging with significant GHG emitters is typically to “encourage producers to keep their polluting assets but to run them down responsibly.”<sup>380</sup> Although an immediate and complete halt to fossil fuel production may not be

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purchasing stock and bringing about change “through the proxy process or by gaining a majority stake and replacing upper management”).

375. See, e.g., Berk & van Binsbergen, *supra* note 209; Broccardo et al., *supra* note 201, at 3, 37; Brest et al., *supra* note 201, at 223, 228.

376. See *supra* Subpart III.B.2.

377. Chris James, *Don't Sell Your Fossil-Fuel Stock If You Want to Make a Climate-Change Difference in 2022*, TIME (Jan. 11, 2022, 8:00 AM), <https://time.com/6138266/fossil-fuel-divestment-downside/>; GFANZ, THE MANAGED PHASEOUT OF HIGH-EMITTING ASSETS 15 (2022).

378. Patrick Temple-West, *The ESG Investor's Dilemma: To Engage or Divest?*, FIN. TIMES (Jan. 26, 2021), <https://www.ft.com/content/814cbd2c-00db-41b7-91af-28435301a8a2>. In some instances, contractual obligations may rule out divestment. E.g., Ben Butler, *“People Are Sceptical”: Why Mining Giant BHP Wants to Get to Net Zero and How It Plans to Do It*, GUARDIAN (May 15, 2021), <https://www.theguardian.com/business/2021/may/16/people-are-sceptical-why-mining-giant-bhp-wants-to-get-to-net-zero-and-how-it-plans-to-do-it> (“shuttering assets can be complicated because often BHP holds licences to produce minerals that don't allow mines to be closed”).

379. VACCARO 2021, *supra* note 153, at 22 (“The harder but more climate-friendly path is to work with clients to reduce the emissions from their assets. Seen from a bank's perspective, a portfolio of assets in transition will emit more carbon but would provide a bigger real economy delta as the bank's engagement helps the clients to decarbonise the assets.”).

380. Marques & Cook, *supra* note 293; see also AARON MALTAIS ET AL., STOCKHOLM ENV'T INST., WHAT DOES IT TAKE TO ACHIEVE NET ZERO? 31 (2021) (“One important recommendation for investors seeking to advance sector-wide transitions is to push companies to fix problems with their polluting assets or supply chains, rather than off-loading them.”).

feasible,<sup>381</sup> investors can ask fossil fuel companies to adopt more sustainable practices, avoid exploration and development of new resources, and end lobbying efforts against climate policy.<sup>382</sup> Coordinated engagement—where long-term institutional investors cooperate to influence the companies they invest in—can be powerful, especially when spearheaded by a lead investor.<sup>383</sup> Climate Action 100+, an investor-led initiative representing over \$65 trillion in investments, focuses on engaging with 167 of the world’s largest listed corporate emitters.<sup>384</sup> The initiative’s Net Zero Company Benchmark aims to measure these companies’ progress with respect to emissions reduction, governance, and disclosure.<sup>385</sup> Even amid such engagement efforts, investors retain divestment “as a last resort that strengthens the position of shareholders.”<sup>386</sup>

Engagement can take various forms, including informal discussions, formal shareholder resolutions, or campaigns to replace directors.<sup>387</sup> Informal discussions can explore industry-specific strategies for reducing emissions, shifting business models, and otherwise transitioning to net zero emissions.<sup>388</sup> Shareholder resolutions can alter corporate behavior even though they are nonbinding and usually fail to attract a majority of shareholder votes.<sup>389</sup> A growing trend in corporate governance is for management to implement proposals that are approved by shareholders and even

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381. Benjamin J. Richardson, *Divesting from Climate Change: The Road to Influence*, 39 LAW & POL’Y 325, 338 (2017) (“engagement can surely do little for a coal or oil company whose raison d’être is to supply fossil fuels”).

382. Adams-Heard, *supra* note 91; MALTAIS ET AL., *supra* note 380, at 29.

383. Oguzhan Karakas et al., *Coordinated Engagements*, HARV. L. SCH. F. ON CORP. GOVERNANCE (Jan. 22, 2021), <https://corpgov.law.harvard.edu/2021/01/22/coordinated-engagements/>; *see also* Broccardo et al., *supra* note 201, at 37 (finding that “in a competitive world exit is less effective than voice in pushing firms to act in a socially responsible manner”).

384. CLIMATE ACTION 100+, 2021 YEAR IN REVIEW: A PROGRESS UPDATE 3–4 (2022).

385. *Id.* at 6.

386. Nick Huber, *Stay or Sell? Should You Ditch Your Shares in Polluting Companies?*, GUARDIAN LABS (Dec. 3, 2021), <https://www.theguardian.com/the-invested-generation/2021/dec/03/divestment-or-engagement-whats-the-most-effective-way-for-responsible-investors-to-change-corporate-behaviour>.

387. *See* CERES, THE ROLE OF INVESTORS IN SUPPORTING BETTER CORPORATE ESG PERFORMANCE: INFLUENCE STRATEGIES FOR SUSTAINABLE AND LONG-TERM VALUE CREATION 23–39 (2019).

388. For a discussion of decarbonization pathways that investors might encourage in the steel, cement, agricultural commodities, and oil and gas sectors, *see* MALTAIS ET AL., *supra* note 380, at 10–29.

389. Elise N. Rindfleisch, *Shareholder Proposals: A Catalyst for Climate Change-Related Disclosure, Analysis, and Action?*, 5 BERKELEY BUS. L.J. 45, 61 (2008).

some that are not.<sup>390</sup> In addition, the withdrawal of a shareholder resolution often signifies that its sponsor achieved its desired outcome through negotiation with the board.<sup>391</sup> Climate-related resolutions in particular are on the rise.<sup>392</sup> Boosted by heightened involvement and support from institutional investors, a growing number of these resolutions result in negotiated settlements or shareholder approval.<sup>393</sup> Finally, the successful 2021 campaign by hedge fund Engine No. 1 to elect three independent, climate-conscious directors at ExxonMobil illustrates that board election efforts, while difficult, can be effective.<sup>394</sup>

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390. Yonca Ertimur et al., *Board of Directors' Responsiveness to Shareholders: Evidence from Shareholder Proposals*, 16 J. CORP. FIN. 53, 54 (2010) (finding that corporate boards implemented 40 percent of majority-approved proposals in 2004, as opposed to 16 percent in 1997); Gilligan, *supra* note 209, at 192 (suggesting that “the fact that management often adopts actions from failed proposals[] attests that management often views such proposals favorably and shares the concerns of the shareholders who submit these proposals”).

391. Rob Bauer et al., *Corporate Directors Learn from Environmental Shareholder Engagements 2–3* (January 21, 2022), <https://ssrn.com/abstract=3981634>; CERES, *supra* note 387, at 29 (explaining that negotiated withdrawals often “represent a win-win outcome for investors and companies”).

392. Karin Rives, *Climate Resolutions Top “Unprecedented” Number of Shareholder Proposals in 2022*, S&P GLOB. MKT. INTEL. (Apr. 4, 2022), <https://www.spglobal.com/marketintelligence/en/>. An even more recent phenomenon is anti-ESG proposals, which have received relatively meager support. Amrith Ramkumar, *Some GOP States Push Back Against ESG Investing Trend*, WALL. ST. J. (Aug. 30, 2022), <https://www.wsj.com/articles/esg-backlash-at-odds-with-shift-by-companies-and-investors-11661825320>; Corbin Hiar, *Conservative Shareholders Attack “Climate Clown Show,”* CLIMATEWIRE (June 10, 2022), <https://www.eenews.net/articles/conservative-shareholders-attack-climate-clown-show/>.

393. Tim McDonnell, *Climate Activist Shareholders Are Finally Starting to Win*, QUARTZ (Feb. 9, 2022), <https://qz.com/2124167/climate-activist-shareholders-are-finally-starting-to-win>; Marc Trevino et al., *2021 Proxy Season Review: Shareholder Proposals on Environmental Matters*, HARV. L. SCH. F. ON CORP. GOVERNANCE (Aug. 11, 2021), <https://corpgov.law.harvard.edu/2021/08/11/2021-proxy-season-review-shareholder-proposals-on-environmental-matters/>; MALTAIS ET AL., *supra* note 380, at 29–31.

394. Matt Phillips, *Exxon’s Board Defeat Signals the Rise of Social-Good Activists*, N.Y. TIMES (June 9, 2021), <https://www.nytimes.com/2021/06/09/business/exxon-mobil-engine-no1-activist.html>. The founder of Engine No. 1 advocates active engagement to prioritize scaled-back and cleaner fossil fuel production while investing in the transition to renewables. Deb Kelly, *COP26: Fund Warns Against Fossil Fuel Divestment*, ENERGY INTEL. (Nov. 5, 2021), <https://www.energyintel.com/0000017c-ef2b-dcf6-a37e-ef3f6eb10000> (reporting Engine No. 1 founder Chris James’ characterization of divestment of fossil fuel assets as “very dangerous”).

Institutional investor State Street's interactions with mining giant Glencore provide a further example of apparently productive engagement. State Street claims to have a "long-term relationship" with Glencore, which allowed it to share its views on climate risk.<sup>395</sup> Glencore's plan to gradually reduce production from its coal holdings, State Street contends, demonstrates how investors can "leverage long-term relationships with companies to track progress" and promote responsible management of fossil fuel assets.<sup>396</sup>

Engagement alone will not be enough.<sup>397</sup> Investors must retain divestment as an option to maintain leverage in their engagement efforts.<sup>398</sup> Moreover, persuading polluters to operate more cleanly and wind down operations will address net zero leakage but yield only modest emissions reductions.<sup>399</sup> A successful transition to net zero operations "will often depend on policy changes, the development of new infrastructure, and changes to both upstream and downstream value chains," in combination with companies' own efforts.<sup>400</sup>

### E. Regulation

Finally, regulation and other forms of government intervention can also address net zero leakage. Of course, comprehensive and effective government intervention might make net zero pledges unnecessary. At bottom, net zero pledges and other forms of private environmental governance are a complement to—not a substitute for—government action on climate change.<sup>401</sup> Such action, which is essential but often politically difficult, might regulate GHG emissions directly or curb demand for fossil fuels by promoting energy efficiency or renewable energy.<sup>402</sup> While a full analysis of possible government

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395. CARLO MAXIMILIAN FUNK & ROBERT WALKER, STATE ST. GLOB. ADVISORS, ENGAGE OR DIVEST? THE QUESTION AT THE HEART OF CLIMATE IMPACT 3 (July 2021).

396. *Id.*

397. MALTAIS ET AL., *supra* note 380, at 29 ("It seems clear that investors serious about making a real impact on the production of oil and gas cannot rely only on engagement.").

398. George Serafeim, *ESG: Hyperboles and Reality* 4 (Harv. Bus. Sch. Rsch. Paper Series, Working Paper No. 22-031, 2021), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3966695](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3966695) (recommending engagement, backed by threat of divestment if investee fails to meet standards communicated by investor).

399. MALTAIS ET AL., *supra* note 390, at 27.

400. *Id.* at 31.

401. *Id.* at 24, 30.

402. *See* IPCC, CLIMATE CHANGE 2022: MITIGATION OF CLIMATE CHANGE, SUMMARY FOR POLICYMAKERS 32 (2022) (discussing options for reducing GHG emissions from the energy sector); Karolina Daszkiewicz, *Policy and Regulation of Energy Transition*, in THE GEOPOLITICS OF THE GLOBAL ENERGY TRANSITION 203 (Manfred Hafner & Simone Tagliapietra eds., 2020), [https://doi.org/10.1007/978-3-030-39066-2\\_9](https://doi.org/10.1007/978-3-030-39066-2_9).



actions on climate change is beyond the scope of this Article, the following discussion highlights selected government measures that directly counter net zero leakage.

To universalize net zero, governments could simply mandate that companies adopt net zero targets and interim plans. The Chancellor of the United Kingdom announced an intent to require companies to develop and disclose net zero transition plans beginning in 2023, although it has not finalized such a mandate.<sup>403</sup> In the United States, proposed legislation in California would have required large companies doing business in the state to set science-based emission targets consistent with the Paris Agreement's 1.5°C temperature goal.<sup>404</sup>

Restrictions on fossil fuel asset development and sales are one obvious tool for curbing leakage. Prohibiting the transfer of such assets to private companies can maintain pressure on public companies to manage the assets responsibly.<sup>405</sup> Such a prohibition could be enacted to complement contract provisions aimed at minimizing net zero leakage from the sale of fossil fuel assets.<sup>406</sup> Similarly, court orders requiring companies to reduce emissions might specify asset transfers or sales as unacceptable means for satisfying judicial mandates. Furthermore, setting target dates for phasing out carbon-intensive technologies can facilitate the establishment of schedules for retiring facilities that utilize those technologies.<sup>407</sup>

Regulatory strategies can directly curb the supply of fossil fuels. These strategies could require fossil fuel companies to balance fossil fuel sales with investments in renewables, penalize or limit fossil fuel exploration, impose quotas on production, or restrict leasing of state-owned fossil fuel resources.<sup>408</sup> Indeed, a few countries have banned

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403. Rob Doepel et al., *What Mandated Net Zero Transition Plans Mean for UK-Listed Companies*, EY (May 26, 2022), [https://www.ey.com/en\\_uk/sustainability/what-mandated-net-zero-transition-plans-mean-for-uk-listed-companies](https://www.ey.com/en_uk/sustainability/what-mandated-net-zero-transition-plans-mean-for-uk-listed-companies); *Fact Sheet: Net Zero-Aligned Financial Centre*, GOV.UK (Nov. 2, 2021), <https://www.gov.uk/government/publications/fact-sheet-net-zero-aligned-financial-centre/fact-sheet-net-zero-aligned-financial-centre>; *About, TRANSITION PLAN TASKFORCE*, <https://transitiontaskforce.net/about/> (last visited Jan. 31, 2023).

404. S.B. 260, Cal. Leg., Reg. Sess. (Cal. 2021).

405. Coffee, *supra* note 113.

406. *Id.*

407. GFANZ, *supra* note 318, at 19.

408. Bos & Gupta, *supra* note 366, at 9; Michael Lazarus & Harro van Asselt, *Fossil Fuel Supply and Climate Policy: Exploring the Road Less Taken*, 150 CLIMATIC CHANGE 1, 6–8 (2018). Similarly, regulations might aim at phasing out fossil fuel plants, whether through direct mandates, renewable portfolio standards, or otherwise.

new oil, gas, or coal exploration and development.<sup>409</sup> At the international level, analogous measures could include a global moratorium on new coal mines, a cap on fossil fuel extraction, or a global system to auction off fossil fuel production rights.<sup>410</sup> A global ban on new fossil fuel development would be consistent with the International Energy Agency's recommendation against further investment in new fossil fuel supply.<sup>411</sup> At a minimum, the elimination of fossil fuel subsidies—estimated at \$500 billion per year worldwide—would offer dual benefits of reducing inefficiencies and curbing leakage.<sup>412</sup>

Incentive programs to scrap used gasoline- and diesel-powered vehicles and landscaping equipment can accelerate the transition to electric-powered machinery and prevent the resale and further use of carbon-polluting machinery.<sup>413</sup> These programs are analogous to managed transition vehicles, reverse auctions, and other approaches aimed at retiring fossil fuel plants early and keeping fossil fuel reserves in the ground.<sup>414</sup> However, vehicle scrapping programs are relatively inefficient at reducing carbon emissions if payments are made to owners who would have scrapped their aging vehicles anyway.<sup>415</sup> Rather than offering a fixed sum that encourages owners to retire cars that are unlikely to be driven much, payments ideally should reflect a scrapped vehicle's estimated future emissions.<sup>416</sup> Tailoring payments according to vehicle age, class, emissions rate, and odometer reading can increase program efficiency.<sup>417</sup>

Ensuring the actual destruction of vehicles accepted for scrappage is essential to generating climate benefits.<sup>418</sup> Such vehicles

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409. Catherine Higham & Arnaud Koehl, Commentary, *Domestic Limits to Fossil Fuel Production and Expansion in the G20*, LONDON SCH. ECON. & POL. SCI. (Oct. 19, 2021), <https://www.lse.ac.uk/granthaminstitute/news/domestic-limits-to-fossil-fuel-production-and-expansion-in-the-g20/>.

410. Tim Rayner, *Keeping it in the Ground? Assessing Global Governance for Fossil-Fuel Supply Reduction*, 8 EARTH SYS. GOVERNANCE 100061, at 3 (2021); G.B. Asheim et al., *The Case for a Supply-Side Climate Treaty*, 365 SCI. 325, 325–27 (2019).

411. Int'l Energy Agency, *supra* note 17, at 21.

412. Jocelyn Timperley, *Why Fossil Fuel Subsidies Are So Hard to Kill*, 598 NATURE 403, 403–04 (2021).

413. Joshua Linn, *How Targeted Vehicle Scrappage Subsidies Can Reduce Pollution Effectively*, RES. FOR FUTURE 1 (2020), [https://media.rff.org/documents/IB\\_20-09\\_Linn\\_vWnxgDH.pdf](https://media.rff.org/documents/IB_20-09_Linn_vWnxgDH.pdf).

414. See Mackintosh, *supra* note 356.

415. Linn, *supra* note 414, at 1–2.

416. *Id.* at 2–3.

417. *Id.* at 2; Geoffrey M. Morrison et al., *Abating Greenhouse Gas Emissions Through Cash-for-Clunker Programs*, 2191 TRANSP. RSCH. REC.: J. TRANSP. RSCH. BD. 111, 117 (2010).

418. Cf. UNEP, *supra* note 140, at 25 (noting illegal export of vehicles designated for scrappage); Arianna Skibell, “Free-for-all” Used Car Export

are sometimes exported—illegally—to developing countries.<sup>419</sup> Even the legal export of used vehicles gives rise to leakage, warranting the adoption of import regulations aimed at vehicle emissions as well as safety.<sup>420</sup> Regional or global agreements should establish minimum environmental and safety standards and promote the transfer of low- or no-emissions technology.<sup>421</sup>

#### CONCLUSION

Net zero leakage undermines the integrity of corporate net zero pledges and threatens to exacerbate the climate crisis. Developing strategies to fix net zero leakage is essential. Such strategies include ensuring that carbon accounting rules reflect actual carbon impacts, universalizing net zero pledges, deploying financial mechanisms that account for leakage or address stranded assets, incorporating engagement, and adopting regulatory approaches. Many of these strategies rely heavily on the companies that emit GHGs, but other actors also have a role to play.

What are these strategies' prospects for success? Designing carbon accounting rules to reflect actual carbon impacts is a relatively straightforward task. Having companies adhere to and implement those rules is another matter. Transparency on net zero targets, planning, and performance is critical and must be demanded by regulators, investors, customers, and other stakeholders. Universalizing net zero will require companies that have already made net zero pledges to deepen their commitments and in some instances make short-term sacrifices. These steps, though not easy, will separate net zero greenwashing from genuine and meaningful climate action. An even more challenging task will be to persuade or pressure companies without pledges to make net zero commitments. Once the costs of these commitments become clear, such companies may be even more hesitant to undertake them. Within the investment community, universalizing net zero may not be feasible—or desirable. In some circumstances, investor engagement may be a more effective means of spurring climate-friendly action. Finally, financial mechanisms such as managed transition vehicles and climate bad banks in theory could phase out fossil fuel production and reduce leakage. However, they likely would need significant financial support from governments or other entities to succeed.

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*Threatens Climate Goals*, CLIMATEWIRE (May 20, 2021, 6:56 AM), <https://www.eenews.net/articles/free-for-all-used-car-export-threatens-climate-goals> (reporting concerns that vehicles traded in under Cash for Clunkers program were not destroyed).

419. UNEP Finance Initiative, *supra* note 149, at 25.

420. *Id.* at 35–47 (discussing wide range of importing country policies).

421. *Id.* at 35.

None of these strategies alone can fix net zero leakage, but each of them can reduce the leakage and assist in the battle against climate change.