Shareholder Pressure and GHG Emissions Leakage: Evidence from Divested Plants

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Abstract

This paper provides novel evidence on how the pressure of climate-conscious shareholders can propagate emissions to asset owners who are subject to less oversight. Using shareholder proposals, engagement, and activism campaigns, I find firms respond to shareholders' climate scrutiny by divesting greenhouse gas emitting plants. More importantly, such transactions can lead to an increase in emissions at the sold plants if the acquirers are less scrutinized by the climate-conscious shareholders. The increase in emissions is driven by cutting down costly emission abatement activities and is concentrated in plants bought by private independent buyers, sold by firms that have environmental reporting in place, or located in areas with low environmental regulation risks. Overall, the evidence highlights that climate-conscious shareholder oversight plays an important role in the allocation of carbon-intensive assets and the internalization of environmental externalities.

JEL classification: G32, G34, L33, P18, Q52

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"Pressed by investors, activists, and governments, the West's six biggest oil companies have shed $44bn of mostly fossil-fuel assets since the start of 2018."

- The Economist, February 12th, 2022[1]

"Divesting from entire sectors, or simply passing carbon-intensive assets from public markets to private markets, will not get the world to net zero."

- Larry Fink, 2022 Annual letter to CEO[2]

1 Introduction

There has been a visible rise in shareholder demand in advancing low-carbon transition, however, whether firms pressured by shareholders are likely to internalize the environmental externalities is unclear. In the 2021 proxy season, the number of approved shareholders' green proposals, such as on emission reporting and emission reduction targets, have tripled compared to 2015. Meanwhile, in response to growing interest in green investing, asset divestiture is becoming a key tool to help corporate achieve emission reduction goals. In fact, as the above Economist article points out, a significant number of fossil-fuel asset sales from public firms have taken place in recent years. However, pressed by the shareholders, those carbon-intensive assets are simply moving from the floodlit listed markets to shadier private markets that are subject to less oversight. Thus, the possibility is now greater than ever that the polluting assets will be 'swept under the rug' to be hidden from the public eye and yield even more environmental and climate issues.

With shareholders showing explicit attention and willingness-to-pay for selecting and impacting investments to address environmental and climate risks, it is essential

[1] "Who buys the dirty energy assets public companies no longer want?" February 12th, 2022 edition, The Economist, available at https://www.economist.com/finance-and-economics/who-buys-the-dirty-energy-assets-public-companies-no-longer-want/21807594.

[2] "The Power of Capitalism" January 17th, 2022 edition, Larry Fink, the founder and chief executive of BlackRock, published his annual Letter to CEOs, available at https://www.blackrock.com/corporate/investor-relations/larry-fink-ceo-letter.

to understand how firms respond to green shareholders and how such responses shape the equilibrium of emission behaviors among different organizational structures. This study is the first to provide a detailed empirical analysis of the association between green shareholder pressure and pollutive plant divestitures, and estimate the changes in emissions of the divested plants around the divestiture event. Given the potential ramifications of energy plant M&A dealmaking, this study sheds light on how such asset transfer can lead to emission spillover and affect the efficiency of achieving green outcomes that are demanded by green shareholders. More generally, this study helps to understand the role of shareholders in shaping public and private sectors' socio-economic development and the role of the financial market in tackling environmental and climate change issues.

Anecdotal evidence suggests that heavy GHG-emitting firms respond to the scrutiny of green shareholders by divesting pollutive assets. For example, Shell reports in their corporate sustainability reports that "divestments are a key part of our efforts as we drive towards our target to become a net-zero emission energy business by 2050, in step with society", and "the level of divestment reflects our green discipline and focus on capital efficiency and cash preservation." Thus, publicly listed firms are inclined to divest pollutive assets to achieve green expectations while stabilizing their financial performance. Moreover, according to the EPA pollution abatement survey, the routine operations of emission control (such as materials and supplies, equipment depreciation, and contracted services) are costly, and investing in new abatement devices to replace less effective abatement equipment or increase addition reduction is roughly two times more than the operating fees. In sum, evidence supports the rationale of divesting rather than investing in abatement or phasing-out is to cater to climate-conscious shareholders who often monitor the emission reduction on an annual basis and to maintain the financial performance without diverting resources to costly abatement activities in maintaining and even cleaning up sites.

To empirically analyze the potential effects of green investors on corporate selling off pollutive assets and its resulting emission leakages, I take advantage of detailed electricity generating unit level data from a combination of publicly available and restricted access data on the operations of the US power plants from 2010-2021.

Focusing on the power plants is important since those are the heaviest greenhouse gas emitters and toxic polluters across all industries (Hockstad and Hanel, 2018; Shive and Forster, 2020). Figure 1 presents the summary of greenhouse gas emissions in the United States from 2010 to 2021. As shown in panel A, the greenhouse gas emissions from power plants correspond to more than 75% of the total greenhouse gas emission, while chemical plants stand for less than 5%. Panel B further shows that the greenhouse gas emission sector composition barely changes over time. On the other hand, there has been a visible rise in shareholder demand in the low-carbon transition. In 2021, $357 billion flowed to climate-reduction focus funds, which are more than ten times the level a decade earlier. This coincides with a significant trend in divestiture transactions from the public market to private markets, especially in the energy and utility sectors. The trends of carbon-intensive asset sales indicate that a growing number of assets are at risk of weak climate stewardship. Thus, this study utilizes the most granular and accurate data about power plant emissions and operations to provide insights into understanding the interplay between shareholders' oversight and carbon-intensive asset transactions, and their real impacts on climate mitigation. The purpose of the paper is to inform the stakeholders about the effectiveness of climate change mitigation and highlight the importance of sustained green stewardship and monitoring.

[Figure 1 About Here]

The study has two main findings. First, using the existence and passage of shareholder climate proposals, the occurrence of Big three engagement, and being targeted by activism campaigns on climate issues, I find a positive association between the scrutiny of green shareholders and GHG-emitting plant divestitures. The results are robust to control for an array of firm financial and environmental characteristics as well as firm fixed effects and year fixed effects.

To sharpen the identification, I utilize the time variation in the association between Big Three ownership and test whether the likelihood of pollutive plant divestiture increases after BlackRock, State Street, and Vanguard commit to tackling environmental issues. The results show that the Big Three environmental commitment yields significant, positive coefficients for the likelihood of pollutive asset divestiture, confirming that firms respond to shareholder green stewardship.

The second main finding is that while the sellers earn higher environmental ratings after the divestitures, this change in ownership structure can lead to a 27 percentage point increase in greenhouse gas emissions at the plant that has been sold by its parent with shareholder green pressure to a firm without such pressure. To rule out the possibility that the changes in emissions are driven by changes in production activities, I control for plant-level productivity-related characteristics such as energy generated in the plant and the number of years that the plant has operated.

To further validate the emission changes are due to the changes in abatement activities rather than productivity, I compile a plant-unit-year panel and utilize the emission rates, the annual emission amount divided by annual net generation, provided by CAMPD which provides a more granular but less comprehensive coverage compared to GHGRP. Consistently, I find both emission amounts and emission rates of the divested plant increase after selling from a pressurized to a less pressurized firm. These results are robust to different specifications, including adding unit-by-plant, industry-by-year, and state-by-year fixed effects to rule out confounding explanations related to plant-unit-specific trends, industry dynamics, local economic conditions, or state-level policies.

Moreover, utilizing the detailed abatement activities and costs data, I test whether the changes in the total thousand dollar amount invested in emissions abatement activities are associated with the ownership changes and find such emission changes are related to the decrease in costly abatement activities.

To gain a deeper understanding of why asset divestiture can lead to emission leakage, I conduct three cross-sectional tests. First, I categorize buyers that are not pressurized by climate-conscious shareholders into publicly listed firms (e.g., Duke Energy, ExxonMobil, PGE, Dow Chemical Co.), state-owned entities (e.g., New York Power Authority, Los Angeles Department of Water and Power, Tennessee Valley Authority), private equity-backed private firms (e.g., KKR, LS Power, Macquarie), and independent private firms that are not held by private equity firms (e.g., Calpine, Caithness Energy, Terra Energy). The analysis reveals that only the sale of plants from shareholder green pressurized firms to independent private firms leads to an increase in emissions after the transaction, consistent with the notion that increased oversight can lead to a decrease in externalities. In contrast, we find no evidence that the greenhouse gas emissions level increases after the sale of plants from pressurized sellers to private sponsor-backed firms, state-owned entities, and publicly listed firms. This finding is consistent with the argument that increased oversight may decrease externalities.

Additionally, I conducted tests directly investigate the impact of the sellers' and buyers' ownership type on emissions. The analysis revealed that the increase in emissions is concentrated in the divestitures from public firms to private firms, while there is some weak evidence that divestitures from private firms to public firms may lead to a decrease in emissions. These findings further confirm that increased oversight can lead to internalizing externalities and suggest the importance of considering the ownership structure of the acquiring firms when evaluating the potential environmental impacts of divestitures.

Next, I focus on the sellers and investigate whether sellers' voluntary climate change disclosure and commitment are related to emission leakage through divestitures. I find if sellers are subject to reporting their materialized emission reduction activities to their shareholders, the emissions of divested plants are more likely to increase. This result may be related to the notion that firms have to advance their emission reductions in response to reduction-target-based shareholder green expectations, while buyers without such reporting pressure monitored by green shareholders can pick up the emissions slacks right after the transactions.

Moreover, I provide evidence that the emission increases are concentrated in the divested plants which located in the area that have (sudden) decreases in environmental regulation risks. The hypothesis is that when environmental enforcement is low, the plant with less green shareholder monitoring is more likely to pick up the emission slacks and increase the emissions. To test this hypothesis, I rely on an exogenous revision in the county's attainment designations which leads to a decrease in the county's environmental enforcement. Evidence confirms that emission increases are concentrated in areas where environmental enforcement is low or experiences a sudden drop, such that profit maximization independent private buyers can increase the emissions without being penalized by the EPA.

Taken together, evidence suggests there are emission slacks left from shareholder monitoring pressure, so private buyers that have fewer shareholder oversights can take up the emission margin to facilitate financial performance.

To better confirm seller incentives of divest pollutive plants, I investigate sellers' environmental ratings and stock market reaction after the divestitures of pollutive plants. The results show that firms earn higher environmental ratings and have more positive stock prices after divesting their pollutive plants. The findings indicate that divesting polluting assets can assist sellers in decreasing their emissions and thus being rewarded by stakeholders. However, shareholders seem not sophisticated enough to recognize the emission spillover consequences associated with selling such assets to the private market, where there is less shareholder governance. Additionally, the study finds suggestive evidence that there is no increase in green innovation and in acquiring non-pollutive plants after gaining income from divestitures. This finding may suggest that firms are likely to prioritize short-term financial gains over long-term environmental sustainability by divesting carbon-intensive plants to avoid further scrutiny.

To gain a better understanding of whether sellers divest to switch abatement resources to remaining plants, I examine the emissions of peer plants for sellers. Similarly, I also test whether buyers switch abatement resources from the newly-acquired plants to existing plants. The analysis reveals no significant changes in emissions for peer plants of both buyers and sellers, after divesting or acquiring pollutive plants during the sample period. This finding suggests that sellers may not be fully internalizing their externalities and are instead using divestitures primarily to appease shareholder preferences. Additionally, emissions from the buyers' pre-existing plants remain largely constant, coinciding with the argument that these facilities already operate at their maximum emission capacity.

This paper fits into a growing literature on climate finance. First, this paper generates a new perspective on the impact of the financial market in tackling emissions. One growing emission spillovers literature investigates how firms facing increasing environmental regulations tend to shift emissions to other chemical forms or to other regions with weak environmental regulations (e.g., Ben-David, Jang, Kleimeier, and Viehs 2021, Bartram, Hou, and Kim 2022, Dai, Duan, Liang, and Ng, 2022, Gibson 2019, Greenstone 2003). This paper contributes to this literature by documenting that pressed by green shareholders, asset transfer can transmit emission spillovers and affect the efficiency of achieving green outcomes that are demanded by green shareholders. The findings suggest careful attention needs to pay to asset sales which could lead to the transferred emission problem, stall the decarbonization movement and even propagate the toxics behind the scenes. Overall, this study highlights the importance of shareholder oversight to strengthen corporate social responsivity and pave the path to achieving universal emission reduction.

This paper also relates to the growing number of literature on the impact of shareholders on corporate emission activities (e.g., Akey and Appel 2021, Azar, Duro, Kadach, and Ormazabal 2021, Bellon 2023, Broccardo, Hart, and Zingales 2022, Chu and Zhao 2022, Davies and Van Wesep 2018, Friedman and Heinle 2021, Gibson, Glossner, Krueger, Matos, and Steffen 2022 Green, and Roth 2022, He, Kahraman, and Lowry 2022, Heath, Macciocchi, Michaely, and Ringgenberg 2022, Ilhan, Krueger, Sautner, and Starks 2022, Naaraayanan, Sachdeva, and Sharma 2022). The current study adds to this literature by documenting that firms react to shareholder green pressure by divesting their pollutive assets, in a concerted effort to improve their ESG ratings and alleviate the ESG reporting pressure. The findings complement the ongoing debate about the effectiveness of shareholder-led initiatives in reducing corporate carbon emissions in general equilibrium (Atta-Darkua, Glossner, Krueger, and Matos 2023, Edmans, Levit, and Schneemeier, 2022). The study highlights that shareholder green pressure can have a sorting effect on real assets with intensive carbon emissions, and such shareholder-induced real asset ownership transfers are likely to exert negative aggregate externalities.

This paper also contributes to the literature on corporate pollution and ownership structure. Previous research by Shive and Forster (2020) found that independent private firms are less likely to pollute than public firms and private equity-backed private firms, which was attributed to their more concentrated ownership and lower pressure from investors for short-term financial performance. I provide empirical evidence that switching the parent of the same plants to an independent private firm can lead to an increase in emissions, while there is no such increase when changing to public firms and private equity-backed private firms. These results are conditional on industry and year trends, state and year trends, and an array of productivity characteristics. These findings suggest that independent private firms have more concentrated ownership, less investor pressure for emission reduction, and more clear-cut objectives to make profit-maximizing decisions. Thus, after major events such as acquiring pollutive assets, independent private firms are more likely to be subject to financial constraints and may prioritize maximizing profits by squeezing the dollar from costly abatement.

This paper also links to the literature on real asset transaction motives, including but not limited to economic change (Mulherin and Boone 2000) managerial hubris and empire building (Jensen, 1986, Roll, 1986), stock misvaluation (Shleifer and Vishny, 2003), market power (Kim and Singal, 1993) and complementarity (Rhodes-Kropf and Robinson, 2008). Also, this paper adds to the literature on the resulting resource allocation and efficiency changes around real asset transactions (e.g., Bates 2005, Kaplan and Weisbach 1992, Maksimovic and Phillips 2001, Maksimovic, Phillips, and Prabhala 2011). Finally, in a contemporaneous study to mine, Duchin, Gao, and Xu (2023) use industrial plants and their toxic chemical emissions covered by Toxic Release Inventory (TRI) Program, and find firms divest toxic release heavy plants following scrutinized environmental risk incidents. They conclude that the asset market allows firms to redraw their boundaries in a manner perceived as environmentally friendly without real consequences for pollution levels or production processes.

This study contributes to this line of existing literature in several ways. Firstly, I focus specifically on the role of climate-conscious shareholders in the allocation of carbon-intensive assets, conditional on the level of environmental incidents. This is an important question as GHG emissions are not subject to federal limits, and shareholder oversight is becoming increasingly important in ensuring companies reduce their GHG emissions.[3]

[3]While toxic emissions are tightly regulated by the Environmental Protection Agency (EPA) under the Clean Air Act, GHG emissions are not subject to federal limits. Although the EPA has taken steps

Given the importance, this paper focuses on how power plant owners, who are the major greenhouse gas emitters, respond to their shareholders' climate scrutiny. By utilizing the plant and unit level accurately metered emission amounts and emission ratios data from Clean Air Markets Division (CAMPD) and the Greenhouse Gas Reporting Program (GHGRP), this paper provides evidence of greenhouse gas emission changes around divestitures for the power plants in the United States from 2010 to 2021.[4] Additionally, the study finds evidence suggesting asset sales can even propagate emissions if the buyers are in private markets, and such emission spillover along the asset sales is associated with the scrutiny of climate-conscious shareholders. To my knowledge, this paper is the first to provide evidence that asset sales can have a significant effect on not only slowing the process of climate mitigation but even engendering more emissions in the environment. Overall, the findings highlight that climate-conscious shareholders play an important role in allocating carbon-intensive real assets and in internalizing environmental externalities after the restructuring.

The paper is organized as follows. In Section II, I discuss the role of shareholder preference in corporate divestiture and emission decisions. In Section III, I describe the divestment and emission data sets. In Section IV, I describe the empirical strategies, and Section V presents evidence pointing to the impact of green shareholders on plant divestment decisions and emissions decisions. Section VI offers some concluding remarks.

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to regulate GHG emissions, these regulations have faced legal challenges and the current administration has signaled its intention to roll back some of them. As a result, shareholder oversight is becoming increasingly important in driving emissions reductions and promoting corporate responsibility. On the other hand, the need for shareholder oversight is particularly relevant given the significant risks associated with climate change. Companies that fail to address their GHG emissions may face reputational damage, litigation, and other financial impacts. Therefore, climate-conscious shareholders have a vested interest in advocating for GHG emissions reductions.

[4] GHGRP and CAMPD reportings focus on greenhouse gases emissions and as a result covers different chemicals than does the TRI.

2 Hypothesis

This paper investigates the hypothesis that firms facing increasing pressure from climate-conscious shareholders are more likely to divest high greenhouse gas (GHG) emitting assets, and that such divestitures can lead to emission spillovers if the acquiring firms face less climate-related shareholder pressure. The rationale behind this hypothesis is as follows.

Climate-conscious shareholders have been pushing companies, especially in carbon-intensive industries like utilities and energy, to reduce their GHG emissions and address climate risks. Firms can respond to this pressure in several ways - by reducing emissions from existing assets, acquiring cleaner assets, investing in low-carbon innovation, or divesting high-emitting assets (Gillan et al., 2021).

Divesting high-emitting assets may be an appealing option for several reasons. First, it provides a relatively quick way for firms to improve their emissions profile and avoid further scrutiny from climate-conscious shareholders. The reduction in emissions can boost the firm's ESG ratings, satisfying vocal shareholders. Second, divesting dirtier assets avoids the costs of maintaining and upgrading pollution controls at these facilities (Fowlie, 2010). Third, selling high-emitting assets may generate cash that can potentially fund investments in cleaner technologies and acquiring cleaner plants.

On the other hand, shareholders' short-term focus can lead the pressurized firms to sell off more emission-heavy plants. The logic is that environmentally conscious investors may be focused on a firm's immediate changes in emission reduction rates without fully considering the methods used to achieve the reductions or potential negative consequences.[5] This could lead firms to prioritize short-term emission reductions, such

[5]In fact, almost all the ESG rating agencies give significant weight to firm emission reduction ratios when measuring firm performance in addressing environmental issues, and many asset owners evaluate the changes in portfolio firms' emission and environmental ratings, and pledge to reduce portfolio emissions. See example, https://www.unep.org/news-and-stories/press-release/major-investors-reduce-portfolio-emissions-25-30-2025-inaugural-net.

as divesting polluting assets, instead of investing in green innovation to reduce emissions in the long term.[6]

However, there is a risk that divestitures simply shift emissions from shareholder-pressured firms to non-shareholder-pressured firms. If acquiring firms are not under the same shareholder pressure to reduce emissions, they may cut back on costly pollution abatement and increase emissions after an asset purchase to increase short-term financial performance. Specifically, independent buyers may be one avenue for pollutive assets to escape shareholder scrutiny.

This is related to independent private firms typically having a more consolidated ownership structure, which leads to a clear focus on maximizing profits as the primary goal. Secondly, independent private firms may not face heightened scrutiny by green shareholders to comply with environmental regulations and adopt environmentally responsible practices as other types of firms. Moreover, independent private firms face less demand for CSR reporting from their shareholders and are barely rated by ESG rating firms to provide information for shareholders. These differences in shareholder incentives indicate that independent private firms may prioritize financial performance over environmental concerns and may be less likely to devalue polluting assets, less restricted in acquiring such assets, and have fewer incentives to incur costs for reducing emissions. As a result, I expect private independent buyers to be more likely to acquire pollutive assets from the owners that are scrutinized by climate-conscious shareholders, and the emissions of such acquired plants are likely to increase following the transaction.

[6]According to Gao and Li (2022), green innovations only significantly reduce the developing firm's pollution in a nine-year window after patent filing dates.

3 Data

3.1 Divestment, Emission and Productivity Data

This study utilizes a detailed and comprehensive panel dataset with 18 publicly-available and restricted-access datasets on the operations of the US power plants from 2010 to 2021. Data on power plant mergers and acquisitions and power plant ownership are from the Securities Data Company (SDC) database, Energy Information Administration (EIA) forms EIA-860 and EIA-861.

The emission decision to switch emission abatement activities (such as installing a sulfur control scrubber) is unit-specific (a "unit" typically consists of a boiler connected to a generator, steam cooling, and pollution abatement equipment). Thus, in this study, I utilize data on the most comprehensive and detailed unit-level and plant-level emissions from mandatory reporting to Environmental Protection Agency (EPA)'s Clean Air Markets Division (CAMPD) and the Greenhouse Gas Reporting Program (GHGRP).[7]

The GHGRP program has mandated that sources that emit 25,000 metric tons or more of CO2 greenhouse gases per year must report their emissions since 2009, and the data are publicly available on an annual basis starting in 2010, including plant identity, geographic location, parent company, industry (NAICS), and greenhouse gas emissions. Emission reports for a given firm-year from the CAMPD and the GHGRP are almost identical where both are available. Differences arise in part because the GHGRP data provides one number of carbon dioxide equivalent emissions, whereas the CAMPD data breaks down emissions into carbon dioxide, nitrogen oxides, and sulfur dioxides. According to EPA, over 90 percent of U.S. greenhouse gas emissions and toxic emissions from energy sectors are covered in these datasets. More details on the summary of U.S.

[7]Unlike CAMPD and GHGRP data, TRI has no standardization for toxicity and as Currie, Davis, Greenstone, and Walker (2015), Shive and Forster (2019) point out, the TRI data is self-reported.

greenhouse gas emissions can be found in Figure 1 and Figure A1. [8]

To understand whether the emission changes are related to the change in abatement technologies, I compile EPA's data with EIA's emission abatement activities from forms EIA-860 and EIA-923. To observe data emission compliance data, I utilize unit-level and plant-level data from EPA's Enforcement and Compliance History Online (ECHO) with county-year-level environmental attainment data Air Quality System (AQS).

For the capacity and productivity, I use the EIA-860 form and derive coal input use (in MMBtu) and net generation (generation net of power used to create the generation given in MWh) using the EIA-923 form.

3.2 Green Pressure and Other Data

To explore the impact of institutional shareholders, this study begins by collecting engagement information from the most recent investment stewardship reports (ISRs) published by the Big Three. To gain a deeper understanding of the effects of green shareholder activities on firm decisions to divest pollutive plants, I follow Naaraayanan et al. (2021) and hand-collects information on the Boardroom Accountability Project (BAP), an environmental activist campaign initiated by the New York City Pension System (NYCPS). I also collect PRI signatory data from the UN Signatory directory to capture more broadly-defined green shareholders. In addition, I hand-collect sustainability reporting data from all sample firms to better understand the impact of green monitoring and reporting pressure.

For environmental ratings and environmental incidents, I incorporate Thomson Reuters ASSET4, Kinder, Lydenberg, and Domini (KLD), and Reprisk. For financial related data, I incorporate standard databases Compustat, Center for Research in Security Prices (CRSP), Institutional Shareholder Services (ISS), FactSet/LionShares. Table 1

[8] Other studies have used related data on emissions, such as voluntary annual disclosure data from CDP, which covers roughly half of SP 500 firms.

presents descriptive statistics for the variables used in the main tests.

[Table 1 About Here]

4 Empirical Strategy

In this section, I outline the empirical methodology to test the rational hypothesis. The study performs analyses at the unit level, the plant level, and the parent firm level to estimate the relationship between green shareholder oversight and corporate divestiture and emission decisions. The firm-level analysis investigates whether firms respond to increasing scrutiny from green shareholders by selling pollutive assets, and whether such sellers experience changes in ESG ratings, EPA enforcement costs, and operating performance around divestitures. At the plant level, the study examines whether a plant transferred from a parent with shareholder green pressure to a parent without such pressure generates more pollutants. To test whether the increasing emissions are due to productivity, the unit-level analysis examines changes in emission levels and emission efficiency rates around divestitures, and whether the changes in emissions are related to changes in abatement.

First, I test whether firms would respond to the increasing scrutiny of green shareholders by selling pollutive assets. I construct a sample including all publicly listed firms that have at least one power plant and estimate the following regression:

$$\begin{aligned} PollutivePlantDivestiture_{k,t+1} = {} & \beta Sharehold Green Pressure_{k,t} \\ & + \Phi_{k,t} + FirmFE + YearFE + \epsilon_{k,t} \end{aligned} \tag{1}$$

where k, and t denote a firm and year, respectively. The dependent variable is an indicator variable that equals one if a publicly listed firm divests at least one pollutive plant in a given year, and zero otherwise. *ShareholderGreenPressure*, includes five measurements of the scrutiny of green shareholders.

To test how green shareholder voice shapes the firm pollutive asset divestitures, I take advantage of the detailed data on shareholder proposals and their voting results from the Institutional Shareholder Services (ISS) database. Based on the keywords in ISS voting analytics brief and detailed descriptions, I follow He et al (2022) and group the proposals by whether they related to an environmental mandate. *ClimateProposal*, an indicator variable that equals one if the proposal relates to climate issues in the prior year, and zero otherwise. *ApprovedClimateProposal* is an indicator variable that equals one if the climate-related proposal has been approved in the prior year, and zero otherwise.

To gauge whether the large institutional shareholders' green preference can induce companies to reduce carbon emissions by selling pollutive asset, I take advantage of the recent trend of Big Three's self-disclosed detailed data on their private engagements with their portfolio firms in investment stewardship reports (ISR).[9] Following Azar et al. (2021), I manually collect engagement information from the most recent ISRs published by the Big Three. *Big3Engagement* is an indicator variable that equals one if a publicly listed firm is a target of any of Big Three engagement in the prior year, and zero otherwise. *AllBig3Engagement* is an indicator variable that equals one if a publicly listed firm is a target of all of Big Three engagement in the prior year, and zero otherwise.

To further understand the effects of green shareholder activities on firm decision to divest pollutive plants, I follow Naaraayanan et al. (2021) and exploit the environmental activist campaign, Boardroom Accountability Project (BAP), initiated by the New York

[9]According to the narrative in the ISRs, most engagements go beyond sending a letter to the firm. For example, BlackRock's ISR states that the fund's investment stewardship department had "substantive dialogue with the companies listed as engaged firms." The ISR also states that the fund "engages companies for the following reasons: (1) to ensure that BlackRock can make well-informed voting decisions; (2) to explain its voting and governance guidelines; (3) to convey its thinking on long-term value creation and sound governance practices."

City Pension System (NYCPS).[10] *ClimateActivismTarget* is an indicator variable that equals one if a publicly listed firm is a target of the activism campaign, Boardroom Accountability Project, for climate change related reasons in the prior year, and zero otherwise. The regression also includes an array of firm characteristics. Firm environmental characteristics include the logarithm of the total thousand dollar amount invested in emissions abatement activities in a given year and the logarithm of one plus the number of environmental incidents over the past three years ([t-2, t]), as measured in Reprisk data. Financial characteristics include firm size, leverage, profitability, and market-to-book ratio. The estimation also includes firm fixed effects and year fixed effects.

To sharpen the identification, I utilize the time variation in the association between Big Three ownership, and test whether the likelihood of pollutive plant divestiture increases after BlackRock, State Street, and Vanguard commit to tackling environmental issues.

$$\begin{aligned} PollutivePlantDivestiture_{k,t+1} = & \beta_1 BigThreeHolding_{k,t} \times BigThreeENVCommitment \\ & + \beta_2 BigThreeHolding_{k,t} + \Phi_{k,t} \\ & + FirmFE + YearFE + \epsilon_{k,t} \end{aligned} \tag{2}$$

The experimental variables are the fraction of the firm's equity owned by mutual funds sponsored by BlackRock, State Street, and Vanguard at the end of the prior year. *BlackRockENVCommitment*, *StateStreetENVCommitment*, *VanguardENVCommitment* are, respectively, indicators that equal one for years from 2016, 2013, and 2017 onwards, from which BlackRock, State Street, and Vanguard commit to tackling environmental issues and zero otherwise. Additionally, I collect PRI signatory data from the UN

[10] The goal of campaign was to hold boards of the portfolio companies accountable to long-term shareholders and give pensioners a voice in oversight concerning climate change and environmental risks and other ESG mandates.

Signatory directory to capture more broadly-defined green shareholders.

Next, to understand the implications of shareholder-induced divestiture, I begin by examining any changes in greenhouse gas emissions levels after asset transactions. I compile a plant-year panel containing all plants reported in the GHGRP database. Specifically, I estimate:

$$\begin{aligned} Emission_{i,t+1} = \beta PressurizedtoLessPressurized_i \times Post_{i,t} + \Psi_{i,t} \\ + PlantFE + YearFE + \epsilon_{i,t} \end{aligned} \tag{3}$$

where i, and t denote a plant, and year, respectively. The dependent variable,*Emission*, is the annual emission level at one plant at a year. *PressurizedtoLessPressurized* is an indicator variable that equals one if a plant has been sold by its parent that has shareholder green pressure (receives a climate-related proposal, is a target of any of Big Three engagement, or target of the activism campaign over the past three years) to a firm without such pressure during the sample period, and zero if a plant has no ownership changes. Post is an indicator for years after the transaction. In the regression, I also add plant-level productivity-related characteristics to control for the possible changes in emissions driven by changes in production activities. *Log(GenerationCapacity)* is the logarithm of the maximum rated output of a generator, prime mover, or other electric power production equipment in the prior year. *Log(OperatingAge)* is the logarithm of the number of years that the plant has operated in the prior year. The inclusions of plant fixed effects and year fixed effects are to control for plant-specific trends and time treads. In more rigorous specifications, I also control for industry-year interactive fixed effects and state-year interactive fixed effects. These controls help rule out confounding explanations related to industry dynamics, local economic conditions, or state-level policies.

To rule out the hypothesis that the increase in emission amounts is due to the changes in productivity, I compile a plant-unit-year panel that contains all plants reported in the CAMPD database. Specifically, I estimate:

$$
\begin{aligned}
EmissionRate_{i,j,t+1} = {} & \beta PressurizedtoLessPressurized_j \times Post_{j,t} + \Psi_{i,j,t} \\
& + UnitFE + YearFE + \epsilon_{i,j,t}
\end{aligned} \tag{4}
$$

where i, j, and t denote a unit, plant and year, respectively. The dependent variable, *EmissionRate*, the annual emission amount divided by annual net generation. *Log(CO2Rate)*, *Log(SO2Rate)*, and *Log(NOxRate)* are the logarithm of carbon dioxide, sulfur dioxide, and nitrogen oxide emission rates as measured by the Clean Air Markets Division, respectively. *Log(GHGRate)* is the logarithm of carbon dioxide equivalent emission rates as measured by the Clean Air Markets Division. The inclusion of plant-unit fixed effects and year fixed effects is to control for plant-unit-specific trends and time trends. In more rigorous specifications, I also control for industry-year interactive fixed effects and state-year interactive fixed effects. These controls help rule out confounding explanations related to industry dynamics, local economic conditions, or state-level policies. Next, I investigate whether the emission changes are related to the decrease in costly abatement activities. Specifically, I test whether the changes in the total thousand dollar amount invested in emissions abatement activities are associated with the ownership changes.

In the cross-sectional tests, I investigate whether there are emission slacks left for less shareholder-pressurized firms to emit without paying for the actual environmental regulation penalties. To capture the emission margin, I utilize the difference in buyers' shareholder oversights based on the buyers' ownership structures, sellers' socially responsible reporting pressure, and plant location-based environmental regulation risks.

Last, to understand whether firms' decision to divest pollutive assets is associated with catering to shareholder preference, I conduct firm-level analysis focusing on changes in sellers' environmental ratings. I construct a sample including all publicly listed firms in energy sections and estimate the following regression:

$$\begin{aligned} EnvironmentalRating_{k,t+1} = & \beta PollutivePlantDivestiture_{k,t} \\ & + \Phi_{k,t} + FirmFE + YearFE + \epsilon_{k,t} \end{aligned} \quad (5)$$

where k, and t denote a firm and year, respectively. The regression includes an array of firm characteristics, including firm size, leverage, profitability, and market-to-book ratio. Additionally, firm fixed effects and year fixed effects are included in the estimation to account for any time-invariant or time-varying unobserved factors that may affect a firm's environmental rating.

Furthermore, I also examine other implications for the sellers, such as whether there is an increase in green innovation and acquisition of non-pollutive plants after gaining income from divestitures.

Moreover, I examine whether sellers divest to reallocate abatement resources to remaining plants. Similar to the regression model represented by equation (3) and (4), I analyze the emissions and abatement costs of peer plants for sellers. Similarly, I also test whether buyers switch abatement resources from the newly-acquired plants to existing plants.

5 Results

5.1 The shareholder pressure and the likelihood of pollutive plant divestitures

I first consider whether climate-conscious shareholder oversight is associated with pollutive asset sales. Table 2 presents the results of testing the first hypothesis whether the firm is more likely to sell its pollutive plants when facing climate scrutiny from the shareholders.

As shown in columns (1) through (5), all the coefficients of climate-conscious shareholder oversight are positive and statistically significant. Specifically, having a shareholder climate proposal leads to a 17 percentage points greater likelihood that the firm sells a pollutive plant, and the passage of a shareholder climate proposal further increases the likelihood by 1.5 times. Similarly, I find being the target of any or all of the Big Three engagements can also explain the increasing likelihood of pollutive plant divestitures. If the public firm is targeted by the activism campaign, Boardroom Accountability Project, for climate change related reasons, then the likelihood of pollutive plant divestitures is 28.5 percentage points greater. The results in Column (6) demonstrate that the coefficients of all the shareholder oversight measures are positive, which is consistent with the fact that these measures are correlated as shown in Table A2. Furthermore, the strongest effect is observed for climate activism, indicating that the stronger the pressure a firm receives, the more likely it is to divest the GHG-emitting plants.

Importantly, I find these shareholder oversight measures are not significantly related to the likelihood of divesting non-GHG-emitting plants as shown in Table A3. In conclusion, the findings suggest that publicly listed firms actively respond to shareholder climate mandates by divesting their carbon-intensive assets.

[Table 2 About Here]

To sharpen the identification, I utilize the time variation in the association between Big Three ownership, and test whether the likelihood of pollutive plant divestiture increases after BlackRock, State Street, and Vanguard commit to tackling environmental issues.

Table A3 reports the analysis of the effects of changes in Shareholder green pressure on pollutive plant divestitures. The study examines whether a firm divests at least one GHG-emitting plant in a given year following the increase in shareholder green commitment. The variables *BlackRockENVCommitment*, *StateStreetENVCommitment*, *VanguardENVCommitment* are indicators that equal one for years from 2016, 2013, and 2017 onwards, respectively, from which BlackRock, State Street, and Vanguard commit to tackling environmental issues.

The results show that the Big Three environmental commitment leads to a significant increase in the likelihood of pollutive asset divestiture, indicating that firms respond positively to the pressure from shareholders on carbon reduction. In addition, the study finds weak evidence that the aggregate level of PRI holdings is positively related to the likelihood of pollutive asset divestiture, suggesting that firms are more likely to divest from pollutive assets when their investors prioritize environmental concerns.

5.2 The effects of ownership changes on emission decisions

The findings in the previous section suggest that pressure from climate-conscious shareholders plays an important role in driving brown asset divestitures. In this section, I investigate whether the changes in plants' ownership structure are associated with the changes in plants' emissions activities.

First, I investigate whether the plant getting away from shareholders' oversight is associated with the increase in emissions. Table 3 presents an analysis of the estimations of the changes in greenhouse gas emission levels of the divested plants which are divested from public firms to private firms around the divestiture event. *Log(GHGEmissions)* is the logarithm of CO2-equivalent emissions of carbon dioxide, methane, nitrous oxide, and fluorinated greenhouse gasses, in millions of metric tons as measured in Greenhouse Gas Reporting Program.

As shown in column (6), when a plant is sold by its parent firm with shareholder green pressure (i.e., receives a climate-related proposal, is a target of any of the Big Three engagements, or is a target of the activism campaign over the past three years) to a firm without such pressure during the sample period, there is a 27 percentage point increase in greenhouse gas emissions of the divested plant. This result holds after controlling for plant capacity and years of operation, plant fixed effects, state-year fixed effects, and industry-year fixed effects. Interestingly, as shown in panel B, transferring from a less pressurized parent to a less pressurized firm, from a pressurized parent to a pressurized firm, or from a less pressurized parent to a pressurized firm does not lead to a significant increase in GHG emissions. This finding suggests that divestitures can not only reduce the effectiveness of shareholder oversight but even lead to more GHG emissions from the divested plants, particularly when the parent firm is under shareholder green pressure.

[Table 3 About Here]

Figure 2 reports the results from the dynamic analysis of the estimations of the changes in greenhouse gas emission levels of the divested plants which are divested its parent that has (or has no) shareholder green pressure to a firm with (or without) such pressure around the divestiture event and the 90% confidence intervals for such effects. I replace the *Post* dummy with different relative year dummies around the divestiture completion year.

The results show that there is a parallel trend between the divested plants and the control group that has no ownership changes prior to the ownership transactions. The divergence between the two groups appears one year after the divestitures for the transactions between the pressurized sellers and less pressurized buyers. Therefore, the finding shown in the baseline analysis is likely causal. It is also interesting to note that the coefficient estimate of *PublictoPrivate* x *Year (+3)* decreases to 0.11 compared to *Year (–1)* and becomes statistically insignificant. It appears that after increasing the emissions for two years, some plants may have reached the emission safety margin without triggering regulatory enforcement. It is also possible two years enable buyers to have time to find other ways to absorb the financial pressure after buying the assets.

[Figure 2 About Here]

Next, to further confirm firm divest is to lower greenhouse gas emissions and reduce abatement costs, I look at which plants are divested by the public sellers. Table 4 presents an analysis of the association of pollutive plant divestitures and the historical emission levels and abatement costs of the divested plants. Across all measures and specifications, past pollution yields significant, positive coefficients for the likelihood of divestiture, suggesting that more pollutive plants are more likely to be sold to another firm.

[Table 4 About Here]

To better understand the reasons for the increase in emissions and to rule out the hypothesis that the increase in emission amounts is due to the changes in productivity, I compile a plant-unit-year panel that contains all plants reported in the CAMPD database. This database provides more granular but less comprehensive coverage compared to GHGRP.

Table 5 Panel A reports the results of the analysis of the changes in emission levels of the divested plants that were divested from public firms to private firms around the divestiture event. The results show that carbon dioxide, sulfur dioxide, and nitrogen oxide emission levels and emission rates have significantly increased after the divestitures from firms with shareholder green pressure to a firm without such pressure. Specifically, there is a 21 percentage point increase in pounds of CO2-equivalent emissions of carbon dioxide, nitrous oxide, and sulfur dioxide of the divested plant, and a 20 percentage point increase in pounds of CO2-equivalent emissions per British thermal unit after divestitures.

Similarly, Table 5 Panel B presents an analysis of the estimations of the changes in emission control of the divested plants which are divested from pressurized firms to less pressurized firms around the divestiture event. The results show that emission abatement activities have significantly decreased after the divestitures from pressurized firms to less pressurized firms. This finding is consistent with the argument that climate-conscious shareholders may provide incentives for firms to conduct costly abatement activities.

This result adds to the discussion on the importance of coordinating shareholder oversight across firms to engage in emission abatement activities. Without addressing the imbalance of shareholder oversight, carbon-intensive assets may transfer to firms that have less incentive to invest in abatement activities that could help reduce emissions and mitigate the impacts of climate change. Therefore, it is crucial to encourage shareholder coordination and engagement to ensure that divestitures do not result in a reduction of emission abatement activities and that firms continue to take meaningful actions to reduce their carbon footprint.

[Table 5 About Here]

5.3 Cross-sectional tests

Shareholder monitoring and Emission spillover. To further understand the power of shareholders' oversight on emission activities, I split the buyers that are not pressurized by climate-conscious shareholders into publicly listed firms (e.g., Duke Energy, ExxonMobil, PGE, Dow Chemical Co.), state-owned entities (e.g., New York Power Authority, Los Angeles Department of Water and Power, Tennessee Valley Authority), private equity-backed private firms (e.g., KKR, LS Power, Macquarie), and independent private firms that are not held by private equity firms (e.g., Calpine, Caithness Energy, Terra Energy).

Table 6 presents the estimations of the changes in emissions of the divested plants around the divestiture event, based on the parent ownership type. The analysis reveals that only the sale of plants from shareholder green pressurized firms to independent private firms leads to an increase in emissions after the transaction. This finding is consistent with the notion that increased oversight can lead to a decrease in externalities. In contrast, we find no evidence that greenhouse gas emissions levels increase after the sale of plants from pressurized sellers to private sponsor-backed firms, state-owned entities, and publicly listed firms. This finding supports the argument that increased oversight may decrease externalities.

[Table 6 About Here]

Similarly, in Appendix Table A5, I conducted additional tests by replacing the *PressurizedtoLessPressurized* measure with measures that capture the sellers' and buyers' ownership type to test whether shareholder oversight based on public listing status, state-owned status or private status has an impact on emissions. The analysis revealed that the increase in emissions is concentrated in the divestitures from public firms to private firms, while there is some weak evidence that divestitures from private firms to public firms may lead to a decrease in emissions.

These findings further confirm that increased oversight can lead to internalizing externalities and suggest the importance of considering the ownership structure of the acquiring firms when evaluating the potential environmental impacts of divestitures. Overall, these results highlight the need for continued research on the potential consequences of divestitures on the environment and the importance of maintaining strong oversight mechanisms to ensure that divestitures do not lead to an increase in emissions.

Information disclosure and Emission spillover. Next, I focus on the sellers and investigate whether sellers' voluntary climate change disclosure and commitment are related to emission leakage through divestitures.

Specifically, I split the sample by whether the pressurized sellers have started CSR reporting or not, and by whether the pressurized sellers have set emission reduction targets or not.

I find if sellers are subject to reporting their materialized emission reduction activities to their shareholders, the emissions of divested plants are more likely to increase. This result may be related to the notion that firms have to advance their emission reductions in response to reduction-target-based shareholder green expectations, while buyers without such reporting pressure monitored by green shareholders can pick up the emissions slacks right after the transactions.

[Table 7 About Here]

Environmental regulation risks and Emission spillover. Next, I investigate the role of environmental regulation risks on firm abatement and divestiture decisions. Specifically, I test the heterogeneous effects in the estimations of the changes in emissions of the divested plants which are divested from pressurized to less pressurized firms around the divestiture event, based on environmental regulation risks. The hypothesis is that when environmental enforcement is low, the plant from private firms is more likely to increase the emissions. Since those from public firms are more likely to be monitored by green shareholders based on the self-enforced emissions reduction outcomes, (which are often stricter than the regulatory standards), thus are less likely to pick up the emission slacks.

Table 8 Panels A and B utilize the EPA's Air Quality System (AQS) database for the county-year environmental attainment performances to capture the plant environmental regulation risks based on the plant location. Panel C reports the changes in plant actual environmental enforcement costs.

Evidence finds that emission increases are concentrated in areas where environmental enforcement is low or experiences a sudden drop, such that buyers without shareholder scrutiny can increase the emissions without being penalized by the EPA. Taken together, evidence suggests there are emission slacks left from sellers' CSR reporting pressure and from environmental regulation pressure, so independent private buyers that have fewer shareholder oversights can take up the emission margin to facilitate the financial performance.

[Table 8 About Here]

5.4 Implication for sellers

In this section, I conduct an analysis of seller's future performance to understand seller incentives further. Table 9 reports parent firms' environmental performance, overall ESG performance, and stock market reaction after the divestitures of pollutive plants. The results show that firms earn higher environmental ratings and have more positive stock prices after divesting their pollutive plants. The findings indicate that divesting polluting assets can assist sellers in decreasing their emissions and thus being rewarded by stakeholders. However, shareholders seem not sophisticated enough to recognize the emission spillover consequences associated with selling such assets from the public market to the private market.

[Table 9 About Here]

In Table A.6, I conducted additional tests to investigate whether the income gain from divestiture would be used to further reduce sellers' emissions. The analysis revealed some suggestive evidence that there is no increase in green innovation or in acquiring non-pollutive plants after gaining income from divestitures. This finding may suggest that firms are likely to prioritize short-term financial gains over long-term environmental sustainability by divesting carbon-intensive plants to avoid further scrutiny.

5.5 Changes in peer plants emissions

To gain a better understanding of whether sellers divest to switch abatement resources to remaining plants, I conduct an analysis of the estimations of the changes in greenhouse gas emission levels of the remaining plants which are the peers plants for the sellers around the divestiture event. Similarly, I also test whether buyers switch abatement resources from the newly-acquired plants to existing plants.

Panel A in Table 10 reports the changes in emissions of all the remaining plants from the firms that have divested pollutive plants in the sample period. Panel B in Table 10 reports the changes in emissions of all the remaining plants from the firms that acquired divested pollutive plants in the sample period. I find there were no changes in emissions observed in the peer plants of both buyers and sellers, after divesting or acquiring pollutive plants during the sample period. Based on the results, it appears that divestitures by sellers do not result in a meaningful decrease in emissions from their remaining plants when compared to the plants from the firms that have no ownership changes. This suggests that sellers may not be fully internalizing their externalities and are instead opting to divest in order to appease shareholder preferences. On the other hand, the emissions from the buyers' pre-existing plants appear to remain constant, which supports the argument that these facilities are already operating at their maximum emission capacity.

[Table 10 About Here]

6 Discussion and Conclusion

This paper uses detailed emission and procurement data at power plants to characterize the relationship between green shareholders and pollutive asset allocation, and its negative externalities in the US energy generation industries.

Consistent with the previous literature, I find evidence supports that firms respond to the shareholder green movement and reduce the 'on-balance' emission. However, the study highlights that firms can simply sell off their pollutive asset to reduce the carbon footprint, thus suggesting more attention is needed to better monitor how firms achieve emission reductions.

While the sellers earn higher environmental ratings after the divestitures, this shift in ownership structure can lead to an increase in emissions and a drop in costly pollution control activities at the sold power plants if the acquirers are independent private firms. The observed increase in emissions of the divested plants that were sold by a climate-pressurized parent to a firm without such pressure supports the argument that the limited presence of institutional investors, such as the Big Three, PRI investors, and activist investors, can lead to emission leakage.

This study has important implications for advancing the transition to a low-carbon economy, which is currently a topic of increasing discussion as environmental and climate risks become more pressing. For instance, there are extensive debates about whether and what ESG-related disclosures the Securities and Exchange Commission (SEC) should mandate (Karpoff, Litan, Schrand, and Weil, 2022). The conclusions drawn from this study suggest that SEC disclosure pertaining to emissions reduction should not only include information on the reduction amount and rates, but should also place greater emphasis on the methods employed by firms to achieve these reductions. In particular, it is important to disclose the portion of emissions reductions that result from divestiture, as this provides a clearer picture of how a firm is achieving its emissions reduction goals and its potential emission spillover effects along the transactions. Furthermore, while the current disclosure requirements only apply to public firms, the study suggests such mandatory disclosure would further exacerbate the imbalance in oversights between the public and private markets and hinder the process of sustainability.

Overall, the analysis is predicated on the core ideas of agency problems, which highlights the importance of how shareholder oversight affects corporate prosocial activities and internalizing environmental externalities. As many shareholders are stepping in the right direction to achieve net-zero GHG emissions, greater oversights from other stakeholders (such as government, creditors, customers, and employees) are called for alliance in order to advance the process of mitigating climate change to ensure that efforts made by green blocs don't go in vain.

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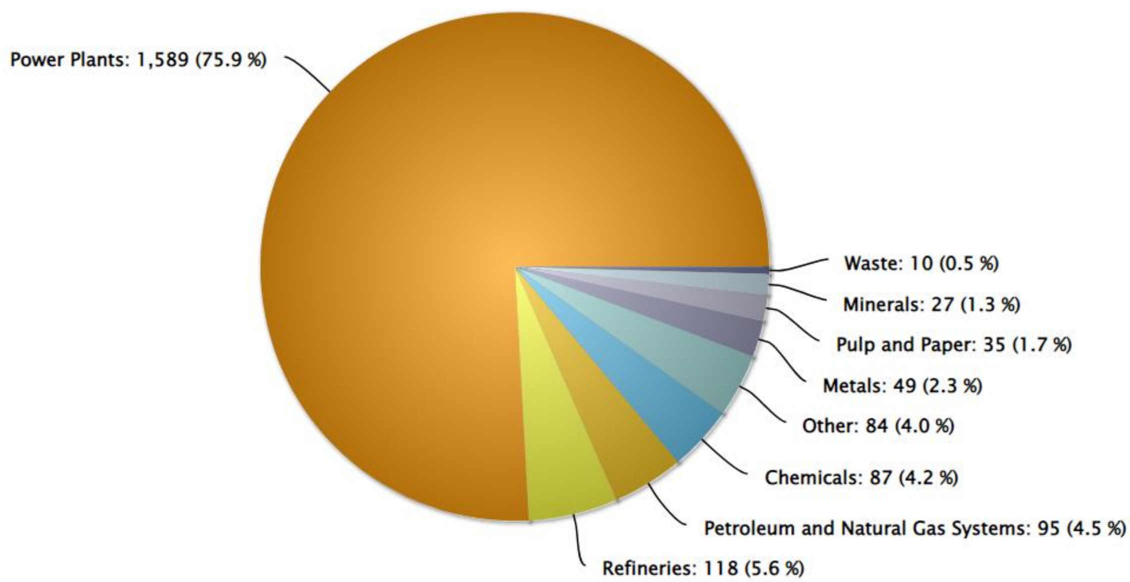
Figure 1 Greenhouse Gas Emissions in the United States

This figure presents the summary of greenhouse gas emissions in the United States in the sample period. Panel A reports the average greenhouse gas emissions by sector and panel B reports the time trend of greenhouse gas emissions by sector.

Panel A Average GHG Emissions by Sector in Million Metric Tons of CO_2e



Panel B Trend of GHG Emissions by sector in Million Metric Tons of CO_2e

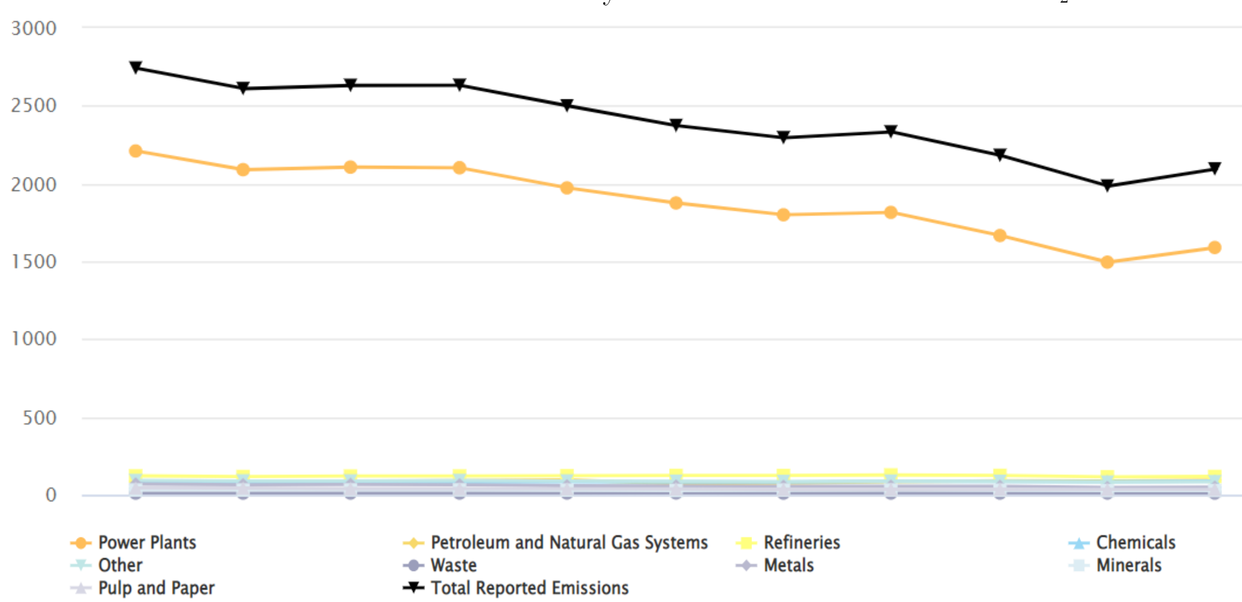
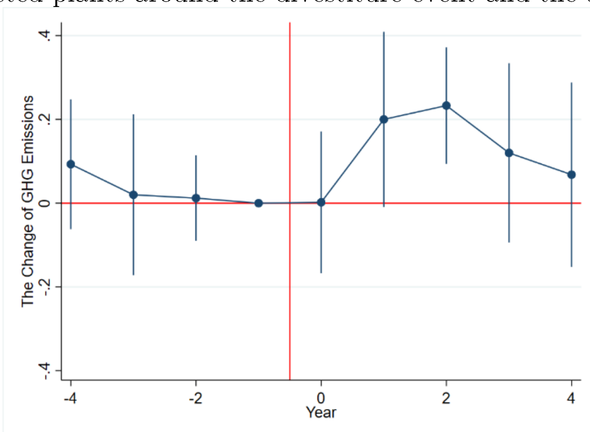
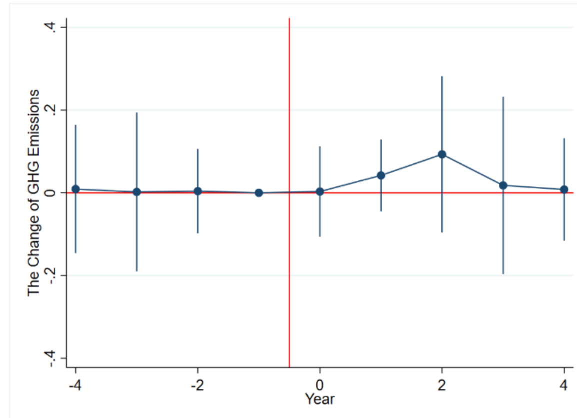


Figure 2 Dynamic analysis of the effect of shareholder green pressure induced divestitures on plant-level greenhouse gas emissions

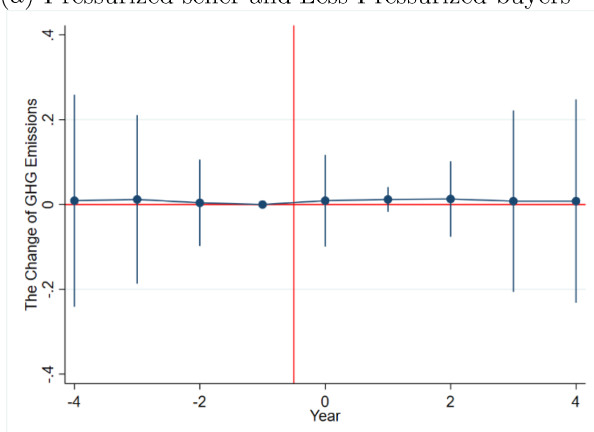
This figure presents a dynamic analysis of the estimations of the changes in greenhouse gas emission levels of the divested plants around the divestiture event and the 90% confidence intervals for such effects.



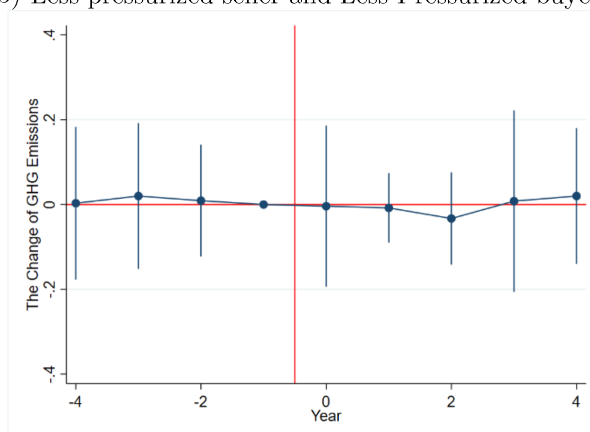
(a) Pressurized seller and Less Pressurized buyers



(b) Less pressurized seller and Less Pressurized buyers



(c) Pressurized seller and Pressurized buyers



(d) Less pressurized seller and Pressurized buyers

Table 1 Summary Statistics

The table presents sample summary statistics. Panel A presents summary statistics for variables for public firms that have GHG-emitting plant divestitures and have no GHG-emitting plant divestitures in the sample period. The sample period is 2010–2021. Panel B presents statistics for plant variables for plants that have GHG-emitting plant divestitures and have no GHG-emitting plant divestitures in the sample period. Plant emission data is from Greenhouse Gas Reporting Program. Panel C presents statistics for unit variables for units that have divestitures and have no divestitures in the sample period. Unit emission data is from Clean Air Markets Division.

Panel A Firm-level characteristics

	Has Pollutive Plant Divestiture Firms		***No Pollutive Plant Divestiture Firms***			
	Mean	Median	Mean	T-value	Median	T-value
Climate_Proposal	0.122	0.102	0.082	3.175	0.075	2.220
Approved_Climate_Proposal	0.015	0.010	0.008	2.980	0.007	2.178
Big3_Engagement	0.030	0.027	0.024	2.122	0.012	2.100
All_Big3_Engagement	0.015	0.011	0.008	2.950	0.008	2.125
Climate_Activism_Target	0.013	0.013	0.008	2.413	0.007	2.620
Emission_Reduction_Target	0.088	0.078	0.028	2.987	0.022	3.410
CSR_Reporting	0.159	0.150	0.092	2.549	0.080	2.226
Environmental_Incidents_3yr	2.205	2	2.200	2.010	2	1.201
Environmental_Score	0.108	0.102	0.105	1.782	0.098	0.899
ESG_Score	0.199	0.129	0.192	1.701	0.120	1.670
$\log(AT)$	6.776	5.988	6.652	2.623	5.781	1.780
ROA	0.071	0.060	0.063	1.780	0.060	0.973
M/B	3.293	3.011	2.933	1.760	2.945	1.745
Leverage	0.475	0.398	0.477	0.894	0.401	0.719

Panel B Plant-level characteristics

	Has Pollutive Plant Divestiture Firms		***No Pollutive Plant Divestiture Firms***			
	Mean	Median	Mean	T-value	Median	T-value
log(*GHG_Emissions*)	12.359	12.462	12.340	3.175	12.360	2.230
log(*Enforcement_Cost)*	0.951	0.027	0.940	2.480	0	2.580
Environmental_Violation	0.012	0.010	0.011	1.677	0	1.230

Panel C Unit-level characteristics

	Has Pollutive Plant Divestiture Firms		***No Pollutive Plant Divestiture Firms***			
	Mean	Median	Mean	T-value	Median	T-value
log(*GHG_Emission*)	12.718	11.582	12.711	3.012	11.572	2.198
log(*GHG_Rate*)	14.451	16.641	14.447	2.401	16.634	2.298
$\log(CO_2\_Emission)$	11.277	11.442	11.270	3.175	11.430	2.230
$\log(CO_2\_Rate)$	2.671	2.825	2.669	2.480	2.820	2.580
$\log(SO_2\_Emission)$	0.671	0.020	0.670	1.790	0.021	1.780
$\log(SO_2\_Rate)$	5.890	6.908	5.889	1.783	6.907	1.210
$\log(NO_X\_Emission)$	0.770	0.120	0.771	1.090	0.121	1.509
$\log(NO_X\_Rate)$	5.890	6.908	5.889	1.783	6.907	1.410
$SO_2\_Control$	0.130	0	0.131	1.119	1	1.296
$NO_X\_Control$	0.151	0	0.150	1.239	1	1.401
Other_Emissions_Control	0.838	0	0.839	1.077	1	1.301

Table 2 Shareholder green pressure and firm decision to divest pollutive plant

This table presents an analysis of the association between green shareholder pressure and pollutive plant divestiture. The dependent variable, *Pollutive_Plant_Divestiture,* is an indicator variable that equals one if a firm divests at least one GHG-emitting plant in a given year, and zero otherwise. *Climate_Proposal* is an indicator variable that equals one if a firm receives a proposal related to climate issues in the prior year, and zero otherwise. *Approved_Climate_Proposal* is an indicator variable that equals one if a firm approves climate-related proposal in the prior year, and zero otherwise. *Big3_Engagement* is an indicator variable that equals one if a firm is a target of any of Big Three engagement in the prior year, and zero otherwise. *All_Big3_Engagement* is an indicator variable that equals one if a firm is a target of all of Big Three engagement in the prior year, and zero otherwise. *Climate_Activism_Target* is an indicator variable that equals one if a firm is a target of the activism campaign, Boardroom Accountability Project, for climate-related reasons in the prior year, and zero otherwise. *GreenPressure* is an indicator variable that equals one if a firm has received a climate-related proposal, is a target of any of Big Three engagement, or target of the activism campaign, and zero otherwise. The control variables are defined in Appendix A. *Total_Abatement_Cost* is the total thousand dollars amount invested in emissions abatement activities in a given year. *Environmental_Incidents_3yr* is the number of environmental incidents over the past three years ([t-2, t]), as measured in Reprisk data. Independent variables are measured at the end of the prior year. Standard errors are clustered at the firm level. T-statistics are in parentheses. ∗, ∗∗, and ∗∗∗ denote significance at the 10%, 5%, and 1% levels in two-tailed tests, respectively. Intercepts are omitted.

Dependent Variable:	***Pollutive_Plant_Divestiture***						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Climate_Proposal	0.174***					0.098*	
	(2.710)					(1.649)	
Approved_Climate_Proposal		0.282***				0.137**	
		(3.311)				(2.049)	
Big3_Engagement			0.161**			0.068	
			(1.977)			(0.981)	
All_Big3_Engagement				0.316***		0.243	
				(3.824)		(1.571)	
Climate_Activism_Target					0.285***	0.245***	
					(4.553)	(4.127)	
GreenPressure							0.270***
							(3.824)
log(1+*Total_Abatement_Costs*)	0.143***	0.144***	0.145***	0.143***	0.143***	0.142***	0.142***
	(3.412)	(3.482)	(3.498)	(3.410)	(3.562)	(3.550)	(3.550)
log(*1+Environmental_Incidents_3yr*)	0.043***	0.042***	0.040***	0.041***	0.043***	0.041***	0.041***
	(3.402)	(3.421)	(3.598)	(3.800)	(3.262)	(3.550)	(3.550)
log(*AT*)	0.007***	0.007***	0.007***	0.008***	0.007***	0.007***	0.007***
	(3.712)	(3.782)	(3.798)	(3.810)	(3.662)	(3.750)	(3.750)
ROA	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-4.134)	(-4.225)	(-4.234)	(-4.274)	(-4.233)	(-4.203)	(-4.203)
M/B	0.000	0.000	0.000	0.000	-0.000	0.000	0.000
	(1.211)	(1.229)	(1.250)	(1.222)	(-0.262)	(1.193)	(1.193)
Leverage	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-1.451)	(-1.574)	(-1.523)	(-1.565)	(-0.323)	(-1.580)	(-1.580)
Firm FE	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y
Observation	17,733	17,733	17,733	17,733	17,733	17,733	17,733
Adjusted R-squared	0.758	0.763	0.760	0.764	0.768	0.770	0.770

Table 3 Changes in plant-level greenhouse gas emissions following shareholder green pressure induced divestitures

This table presents an analysis of the estimations of the changes in greenhouse gas emission levels of the divested plants around the divestiture event based on the shareholder green pressure that the parents received. The dependent variable, Log(*GHG_Emissions*), is the logarithm of CO2-equivalent emissions of carbon dioxide, methane, nitrous oxide, and fluorinated greenhouse gasses, in millions of metric tons. *Pressurized_to_LessPressurized* is an indicator variable that equals one if a plant has been sold by its parent that has shareholder green pressure (receives a climate-related proposal, is a target of any of Big Three engagement, or target of the activism campaign over the past three years) to a firm without such pressure during the sample period, and zero if a plant has no ownership changes. Similarly, *LessPressurized_to_LessPressurized, LessPressurized_to_Pressurized, and Pressurized_to_Pressurized* are indicator variables that equal one if a plant has been sold by its parent that has (or has no) shareholder green pressure to a firm with (or without) such pressure, and zero if a plant has no ownership changes. Log(*Generation_Capacity*) is the logarithm of the maximum rated output of a generator, prime mover, or other electric power production equipment in the prior year. Log(*Operating_Age*) is the logarithm of the number of years that the plant has operated in the prior year. Standard errors are clustered at the plant level. t -statistics are in parentheses. $*$, $**$, and $***$ denote significance at the 10%, 5%, and 1% levels in two-tailed tests, respectively. Intercepts are omitted.

Panel A Green pressurized seller and Less Pressurized buyers

Dependent Variable:	**log(*GHG_Emissions*)**					
	(1)	(2)	(3)	(4)	(5)	(6)
Pressurized_to_LessPressurized × *Post*	0.287^{**}	0.286^{**}	0.283^{**}	0.280^{**}	0.277^{***}	0.270^{***}
	(2.002)	(2.023)	(2.034)	(2.450)	(2.720)	(2.771)
log(*Generation_Capacity*)				0.869^{***}	0.876^{***}	0.869^{***}
				(6.334)	(6.069)	(6.007)
log(*Operating_Age*)				0.516^{***}	0.533^{***}	0.560^{***}
				(6.868)	(6.808)	(6.851)
Plant FE	Y	Y	Y	Y	Y	Y
Year FE	Y	N	N	Y	N	N
State-Year FE	N	Y	Y	N	Y	Y
Industry-Year FE	N	N	Y	N	N	Y
Observation	87,892	87,892	87,892	87,892	87,892	87,892
Adjusted R-squared	0.890	0.892	0.899	0.900	0.901	0.904

Panel B Other divestitures

Dependent Variable:	**log(*GHG_Emissions*)**		
	(1)	(2)	(3)
LessPressurized_to_LessPressurized × *Post*	0.080		
	(0.803)		
Pressurized_to_Pressurized × *Post*		0.011	
		(1.203)	
LessPressurized_to_Pressurized × *Post*			-0.001
			(-0.934)
log(*Generation_Capacity*)	0.870^{***}	0.869^{***}	0.869^{***}
	(6.081)	(6.007)	(6.011)
log(*Operating_Age*)	0.560^{***}	0.560^{***}	0.560^{***}
	(6.859)	(6.851)	(6.810)
Plant FE	Y	Y	Y
Year FE	N	N	N
State-Year FE	Y	Y	Y
Industry-Year FE	Y	Y	Y
Observation	79,502	79,990	78,178
Adjusted R-squared	0.904	0.901	0.904

Table 4 Emission and the likelihood of divestitures

This table presents an analysis of the association of pollutive plant divestitures and the historical greenhouse gas emission levels of the divested plants. The dependent variable, *Pollutive_Plant_Divestiture,* is an indicator variable that equals one if a firm divests at least one GHG-emitting plant in a given year, and zero otherwise. Log(*Historical_GHG_Emissions*) is the logarithm of the average level of greenhouse gases generated by a plant over the last three years. log(1+*Total_Abatement_Cost*) is the logarithm of one plus the total thousand dollars amount invested in emissions abatement activities in a given year. Log(*Generation_Capacity*) is the logarithm of the maximum rated output of a generator, prime mover, or other electric power production equipment in the prior year. Log(*Operating_Age*) is the logarithm of the number of years that the unit has operated in the prior year. Independent variables are measured at the end of the prior year. Standard errors are clustered at the firm level. T -statistics are in parentheses. $*$, $**$, and $***$ denote significance at the 10%, 5%, and 1% levels in two-tailed tests, respectively. Intercepts are omitted.

Dependent Variable:	***Pollutive_Plant_Divestiture***					
	(1)	(2)	(3)	(4)	(5)	(6)
log(*Historical_GHG_Emissions*)	0.004*	0.004**	0.004**	0.004*	0.004**	0.004**
	(1.891)	(1.982)	(1.985)	(1.921)	(1.976)	(1.977)
log(1+*Total_Abatement_Costs*)	0.123***	0.124***	0.125***	0.123***	0.123***	0.122***
	(3.312)	(3.389)	(3.458)	(3.421)	(3.445)	(3.591)
log(*Generation_Capacity*)				0.006	0.006	0.006
				(0.564)	(0.632)	(0.611)
log(*Operating_Age*)				-0.004	0.002	0.002
				(-0.492)	(0.190)	(0.194)
Plant FE	Y	Y	Y	Y	Y	Y
Year FE	Y	N	N	Y	N	N
State-Year FE	N	Y	Y	N	Y	Y
Industry-Year FE	N	N	Y	N	N	Y
Observation	91,984	91,984	91,984	91,984	91,984	91,984
Adjusted R-squared	0.579	0.580	0.580	0.580	0.580	0.580

Table 5 Changes in unit-level emissions following shareholder pressure induced divestitures

This table presents an analysis of the estimations of the changes in unit-level emissions of the divested plants around the divestiture event based on the shareholder green pressure that the parents received. Panel A and B show the changes in emission and abatement around the divestiture. Log(*CO_2_Emission*), Log(*SO_2_Emission*), and Log(*NO_x_Emission*) are the logarithm of pounds of carbon dioxide, sulfur dioxide, and nitrogen oxide emissions as measured by the Clean Air Markets Division. Log(*GHG_Emissions*) is the logarithm of CO2-equivalent emissions of carbon dioxide, nitrous oxide, and sulfur dioxide. Log(*CO_2_Rate*), Log(*SO_2_Rate*), and Log(*NO_x_Rate*) are the logarithm of carbon dioxide, sulfur dioxide, and nitrogen oxide emission rates as measured by the Clean Air Markets Division, respectively. Log(*GHG_Rate*) is the logarithm of carbon dioxide equivalent emission rates as measured by the Clean Air Markets Division. *SO_2_Control* and *NO_x_Control* are indicators that equal one if a unit has emissions abatement activities to control for sulfur dioxide and nitrogen oxides in a given year, and zero otherwise. *Other_Emissions_Control* is an indicator that equals one if a unit has emissions abatement activities besides controls for two precursor greenhouse gasses sulfur dioxide and nitrogen oxides in a given year, and zero otherwise. *SO_2_Abatement_Cost and NO_x_Abatement_Cost* are the total thousand dollars amount invested in emissions abatement activities to control for sulfur dioxide and nitrogen oxides in a given year. *Total_Abatement_Cost* is the total thousand dollars amount invested in emissions abatement activities in a given year. *Pressurized_to_LessPressurized* is an indicator variable that equals one if a plant has been sold by its parent that has green pressure (receives a climate-related proposal, is a target of any of Big Three engagement, or target of the activism campaign over the past three years) to a firm without such pressure during the sample period, and zero if a plant has no ownership changes. Log(*Gross_Generation*) is the logarithm of gross electricity generation expressed in megawatt-hours MWh in the prior year. Log(*Operating_Age*) is the logarithm of the number of years that the unit has operated in the prior year. Independent variables are measured at the end of the prior year. Standard errors are clustered at the plant level. t -statistics are in parentheses. $*$, $**$, and $***$ denote significance at the 10%, 5%, and 1% levels in two-tailed tests, respectively. Intercepts are omitted.

Panel A Changes in carbon dioxide and two precursor greenhouse gasses emission amount and emission intensity

Dependent Variable:	**log(*CO_2_Emission*)**	**log(*SO_2_Emission*)**	**log(*NO_X_Emission*)**	**log(*GHG_Emissions*)**	**log(*CO_2_Rate*)**	**log(*SO_2_Rate*)**	**log(*NO_X_Rate*)**	**log(*GHG_Rate*)**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Pressurized_to_LessPressurized × *Post*	0.209^{***}	0.202^{***}	0.130^{***}	0.208^{***}	0.208^{***}	0.186^{***}	0.167^{***}	0.200^{***}
	(4.156)	(5.790)	(3.970)	(4.264)	(3.956)	(6.019)	(4.596)	(4.002)
log(*Operating_Age*)	0.097^{***}	0.098^{***}	0.091^{***}	0.097^{***}	0.089^{***}	0.090^{***}	0.089^{***}	0.089^{***}
	(6.396)	(7.095)	(8.088)	(6.911)	(6.397)	(7.123)	(7.320)	(6.745)
log(*Gross_Generation*)	1.008^{***}	1.102^{***}	1.132^{***}	1.009^{***}				
	(40.474)	(42.382)	(47.382)	(40.014)				
Unit FE	Y	Y	Y	Y	Y	Y	Y	Y
State-Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Observation	45,686	45,686	45,686	45,686	45,686	45,686	45,686	45,686
Adjusted R-squared	0.908	0.900	0.910	0.908	0.908	0.900	0.910	0.908

Panel B Changes in emission abatement activities

Dependent Variable:	***SO_2_Control***	***NO_x_Control***	***Other_Emissions_Control***	**log(1+*SO_2_Abatement_Cost*)**	**log(1+*NO_x_Abatement_Cost*)**	**log(*1+Total_Abatement_Cost*)**
	(1)	(2)	(3)	(4)	(5)	(6)
Pressurized_to_LessPressurized × *Post*	-0.117^{***}	-0.098^{***}	-0.083^{**}	-0.149^{***}	-0.100^{***}	-0.110^{***}
	(-5.640)	(-3.740)	(-2.271)	(-4.640)	(-4.030)	(-4.171)
log(*Operating_Age*)	0.001^{**}	0.002^{*}	0.001*	0.001^{**}	0.001^{**}	0.001
	(2.401)	(1.731)	(1.785)	(2.401)	(2.011)	(1.187)
log(*Gross_Generation*)	0.090	0.090	0.089	0.090	0.090	0.089
	(0.762)	(0.780)	(0.952)	(0.780)	(0.771)	(0.870)
Unit FE	Y	Y	Y	Y	Y	Y
State-Year FE	Y	Y	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y	Y	Y
Observation	45,686	45,686	45,686	45,686	45,686	45,686
Adjusted R-squared	0.910	0.907	0.908	0.890	0.897	0.898

Table 6 Emissions and buyers' shareholder oversights

This table repeats the previous analysis and presents the estimations of the changes in emissions of the divested plants around the divestiture event, based on the parent type. Log(*GHG_Emissions*) is the logarithm of CO2-equivalent emissions of carbon dioxide, methane, nitrous oxide, and fluorinated greenhouse gasses, in millions of metric tons. *Pressurized_to_LessPressurized* is an indicator variable that equals one if a plant has been sold by its parent that has green pressure (receives a climate-related proposal, is a target of any of Big Three engagement, or target of the activism campaign over the past three years) to a firm without such pressure during the sample period, and zero if a plant has no ownership changes. *Independent_Private* is an indicator variable that equals one if a plant has been sold by its parent to an independent private firm that does not hold by private equity firms during the sample period, and zero otherwise. (e.g, Calpine, Caithness Energy, Terra Energy). *PE-backed_Private* is an indicator variable that equals one if a plant has been sold by its parent to a private equity backed private firm during the sample period, and zero otherwise. (e.g., KKR, LS Power, Macquarie). *Public* is an indicator variable that equals one if a plant's parent is a public listed firm during the sample period, and zero otherwise. (e.g., Duke Energy, ExxonMobil, PG&E, Dow Chemical Co). *State* is an indicator variable that equals one if a plant's parent is a state-owned firm during the sample period, and zero otherwise. (e.g., New York Power Authority, Tennessee Valley Authority, Los Angeles Department of Water and Power). *Post* is an indicator for years after the transaction. Independent variables are measured at the end of the prior year. Standard errors are clustered at the plant level. t -statistics are in parentheses. $*$, $**$, and $***$ denote significance at the 10%, 5%, and 1% levels in two-tailed tests, respectively. Intercepts are omitted.

Dependent Variable:	**log(*GHG_Emissions*)**			
Split by Less Pressurized buyer's type:	*Private*		*Public*	*State*
	Independent_ Private	*PE-backed_ Private*		
	(1)	(2)	(3)	(4)
Pressurized_to_LessPressurized × *Post*	0.273***	-0.004	0.002	0.008
	(3.802)	(-0.818)	(0.079)	(0.677)
log(*Generation_Capacity*)	0.872***	0.873***	0.872***	0.872***
	(6.721)	(6.024)	(6.921)	(6.553)
log(*Operating_Age*)	0.521***	0.511***	0.501***	0.513***
	(7.701)	(6.411)	(6.580)	(6.410)
Plant FE	Y	Y	Y	Y
State-Year FE	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y
Observation	35,842	41,204	7,826	3,846
Adjusted R-squared	0.902	0.906	0.910	0.910

Table 7 Emissions and seller's CSR reporting and commitment

This table presents an analysis of the heterogeneous effects in the estimations of the changes in greenhouse gas emission levels of the divested plants which are divested from green pressurized to less pressurized firms around the divestiture event, based on whether sellers have green reporting and emission reduction targets. Panel A reports the changes in plant greenhouse gas emissions based on whether sellers have CSR reports in the year before divestitures or not. Panel B reports the changes in plant greenhouse gas emissions based on whether sellers have emission reduction mandates in the year before divestitures or not. Log(*GHG_Emissions*) is the logarithm of CO2-equivalent emissions of carbon dioxide, methane, nitrous oxide, and fluorinated greenhouse gasses, in millions of metric tons. *Pressurized_to_LessPressurized* is an indicator variable that equals one if a plant has been sold by its parent that has shareholder green pressure (receives a climate-related proposal, is a target of any of Big Three engagement, or target of the activism campaign over the past three years) to a firm without such pressure during the sample period, and zero if a plant has no ownership changes. *Post* is an indicator for years after the transaction. Log(*Generation_Capacity*) is the logarithm of the maximum rated output of a generator, prime mover, or other electric power production equipment in the prior year. Log(*Operating_Age*) is the logarithm of the number of years that the unit has operated in the prior year. Independent variables are measured at the end of the prior year. Standard errors are clustered at the plant level. T -statistics are in parentheses. $*$, $**$, and $***$ denote significance at the 10%, 5%, and 1% levels in two-tailed tests, respectively. Intercepts are omitted.

Panel A Based on whether the sellers have CSR reports in the year before divestitures or not.

Dependent Variable:	**log(*GHG_Emissions*)**	
Split by whether pressurized sellers have started CSR reporting or not:	*CSR_Reporting*	*Others*
	(1)	(2)
Pressurized_to_LessPressurized × *Post*	0.269***	0.114*
	(3.780)	(1.889)
log(*Generation_Capacity*)	0.872***	0.882***
	(6.720)	(6.920)
log(*Operating_Age*)	0.521***	0.531***
	(7.719)	(6.880)
Plant FE	Y	Y
State-Year FE	Y	Y
Industry-Year FE	Y	Y
Observation	39,430	48,462
Adjusted R-squared	0.902	0.904

Panel B Based on whether the sellers have emission reduction mandates in the year before divestitures or not.

Dependent Variable:	**log(*GHG_Emissions*)**	
Split by whether pressurized sellers have set emission reduction target or not:	*Emission_Reduction_Target*	*Others*
	(1)	(2)
Pressurized_to_LessPressurized × *Post*	0.310***	0.121*
	(3.990)	(1.801)
log(*Generation_Capacity*)	0.879***	0.880***
	(6.688)	(6.890)
log(*Operating_Age*)	0.511***	0.530***
	(6.894)	(6.854)
Plant FE	Y	Y
State-Year FE	Y	Y
Industry-Year FE	Y	Y
Observation	21,630	66,262
Adjusted R-squared	0.911	0.907

Table 8 Emissions and plant location-based potential environmental regulation risks

This table presents an analysis of the heterogeneous effects in the estimations of the changes in greenhouse gas emission levels of the divested plants which are divested from green pressurized to Less Pressurized firms around the divestiture event, based on plant location based environmental regulation risks. Panels A and B utilize the EPA's Air Quality System (AQS) database for the county-year environmental attainment performances to capture the plant environmental regulation risks based on the plant location. Panel A reports the changes in plant greenhouse gas emissions and environmental regulation risks. *Attainment_Counties* is an indicator variable that equals one if a plant located in a county that is in compliance with the National Ambient Air Quality Standard, and zero if located in a county that fails to comply. Panel B reports the changes in plant greenhouse gas emissions and unexpected decreases in environmental regulation risks (i.e., unexpected redesignations of attainment status). *Unexpected_Attainment_Redesignations* is an indicator variable that equals one if a plant located in a county that is just in compliance with the National Ambient Air Quality Standard "design values" (DV), and zero if located in a county that just fails to comply. Panel C reports the changes in plant actual environmental enforcement costs. Log(*GHG_Emissions*) is the logarithm of CO2-equivalent emissions of carbon dioxide, methane, nitrous oxide and fluorinated greenhouse gasses, in millions of metric tons. *Environmental_Violation* is an indicator that equals one if a plant has experienced an environmental regulation enforcement event in a given year, and zero otherwise. Log(1+*Enforcement_Cost*) is the logarithm of one plus total environmental regulation enforcement cost in a given year. *Pressurized_to_LessPressurized* is an indicator variable that equals one if a plant has been sold by its parent that has shareholder green pressure (receives a climate-related proposal, is a target of any of Big Three engagement, or target of the activism campaign over the past three years) to a firm without such pressure during the sample period, and zero if a plant has no ownership changes. *Post* is an indicator for years after the transaction. Log(*Generation_Capacity*) is the logarithm of the maximum rated output of a generator, prime mover, or other electric power production equipment in the prior year. Log(*Operating_Age*) is the logarithm of the number of years that the unit has operated in the prior year. Independent variables are measured at the end of the prior year. Standard errors are clustered at the plant level. t -statistics are in parentheses. $*$, $**$, and $***$ denote significance at the 10%, 5%, and 1% levels in two-tailed tests, respectively. Intercepts are omitted.

Panel A Changes in plant greenhouse gas emissions and county-level environmental regulation risks

Dependent Variable:	**log(*GHG_Emissions*)**	
Spilt by plant location-based monitoring and enforcement intensity:	*Attainment_Counties (Low regulation risks)*	*Nonattainment_Counties (High regulation risks)*
	(1)	(2)
Pressurized_to_LessPressurized × *Post*	0.279***	0.093*
	(3.791)	(1.804)
log(*Generation_Capacity*)	0.877***	0.881***
	(6.722)	(6.220)
log(*Operating_Age*)	0.501***	0.509***
	(6.814)	(6.806)
Plant FE	Y	Y
State-Year FE	Y	Y
Industry-Year FE	Y	Y
Observation	31,838	56,054
Adjusted R-squared	0.901	0.900

Panel B Changes in plant greenhouse gas emissions and unexpected decreases in county-level environmental regulation risks (i.e., unexpected redesignations of attainment status)

Dependent Variable:	**log(*GHG_Emissions*)**	
Spilt by plant location-based monitoring and enforcement intensity:	*Unexpected_Attainment_ Redesignations (Decrease in regulation risks)*	*Unexpected_Nonattainment_ Redesignations (Increase in regulation risks)*
	(1)	(2)
Pressurized_to_LessPressurized × *Post*	0.312***	0.090*
	(4.891)	(1.774)
log(*Generation_Capacity*)	0.860***	0.868***
	(8.042)	(6.047)
log(*Operating_Age*)	0.560***	0.560***
	(8.452)	(6.819)
Plant FE	Y	Y
State-Year FE	Y	Y
Industry-Year FE	Y	Y
Observation	7,650	7,920
Adjusted R-squared	0.914	0.912

Panel C Changes in actual environmental enforcement costs

Dependent Variable:	***Environmental_Violation***	**log*(1+Enforcement_Cost)***
	(1)	(2)
Pressurized_to_LessPressurized × *Post*	0.008	0.109
	(1.412)	(1.389)
log(*Generation_Capacity*)	0.000	0.001
	(0.839)	(0.962)
log(*Operating_Age*)	-0.009	0.019
	(-0.791)	(1.030)
Plant FE	Y	Y
State-Year FE	Y	Y
Industry-Year FE	Y	Y
Observation	87,892	87,892
Adjusted R-squared	0.889	0.889

Table 9 Implication for sellers

This table presents an analysis of the association between pollutive plant divestiture and sellers' environmental performance and stock market reaction after the divestitures of pollutive plants. *Environmental_Score* is the strength and concern count for the environmental dimension of the KLD data set in column (1) and the environmental score of the ASSET4 data set in column (3). *ESG_Score* is the aggregate strength and concern count across six dimensions of the KLD data set in column (2) and the environmental score of the ASSET4 data set in column (4). Log(*Historical_GHG_Emissions*) is the logarithm of the average level of greenhouse gases generated by a plant over the last three years. The control variables are defined in Appendix A. Independent variables are measured at the end of the prior year. Standard errors are clustered at the firm level. T-statistics are in parentheses. $*$, $**$, and $***$ denote significance at the 10%, 5%, and 1% levels in two-tailed tests, respectively. Intercepts are omitted.

Panel A ESG Performance.

Dependent Variable:	***Environmental_Score***	***ESG_Score***	***Environmental_Score***	***ESG_Score***
Rating Source:	*KLD*		*ASSET4*	
	(1)	(2)	(3)	(4)
Pollutive_Plant_Divestiture	0.156**	0.271*	0.201**	0.221**
	(1.970)	(1.870)	(2.021)	(1.981)
log(*AT*)	-0.167**	-0.022	-0.100	-0.050
	(-1.992)	(-0.164)	(-1.210)	(-1.164)
ROA	0.021	-0.062**	0.021	0.071
	(1.573)	(-2.257)	(1.573)	(1.257)
M/B	-0.023	-0.044	-0.040	-0.060
	(-1.167)	(-0.596)	(-1.107)	(-0.750)
Leverage	0.090	0.194	0.090	0.194
	(0.756)	(0.755)	(0.666)	(0.670)
Firm FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
Observation	15,726	15,726	16,964	16,964
Adjusted R-squared	0.564	0.706	0.580	0.711

Panel B. Stock Reaction

Dependent Variable:	***CAR [-1, +1]***	
Benchmark:	*Market*	*FF*
	(1)	(2)
Log(*Historical_GHG_Emissions*)	0.010***	0.010***
	(4.146)	(3.995)
Firm FE	Y	Y
Year FE	Y	Y
Observation	643	643
Adjusted R-squared	0.350	0.350

Table 10 Implication for remaining plants

This table presents an analysis of the estimations of the changes in greenhouse gas emission levels of the remaining plants which are the peers of the divested plants around the divestiture event. Panel A reports all the remaining plants from the firms that have divested pollutive plants in the sample period, and Panel B reports all the remaining plants from the firms that have acquired pollutive plants in the sample period. Log(*GHG_Emissions*) is the logarithm of CO2-equivalent emissions of carbon dioxide, methane, nitrous oxide, and fluorinated greenhouse gasses, in millions of metric tons. *Seller_Remaining_Plant* is an indicator variable that equals one if a plant that has no ownership change and is from a firm that has sold pollutive plants during the sample period, and zero if a plant is from a firm that has neither divest nor acquire pollutive assets. *Buyer_Remaining_Plant* is an indicator variable that equals one if a plant that has no ownership change and is from a firm that has bought pollutive plants during the sample period, and zero if a plant is from a firm that has neither divest nor acquire pollutive assets. *Post* is an indicator for years after the transaction. Log(*Generation_Capacity*) is the logarithm of the maximum rated output of a generator, prime mover, or other electric power production equipment in the prior year. Log(*Operating_Age*) is the logarithm of the number of years that the plant has operated in the prior year. Standard errors are clustered at the plant level. t -statistics are in parentheses. $*$, $**$, and $***$ denote significance at the 10%, 5%, and 1% levels in two-tailed tests, respectively. Intercepts are omitted.

Panel A Seller's remaining plants

Dependent Variable:	**log(*GHG_Emissions*)**					
	(1)	(2)	(3)	(4)	(5)	(6)
Seller_Remaining_Plant × *Post*	-0.003	0.003	0.002	-0.002	0.003	0.003
	(-0.702)	(0.983)	(0.990)	(-0.120)	(1.088)	(1.071)
log(*Generation_Capacity*)				0.869***	0.876***	0.869***
				(6.314)	(6.089)	(6.092)
log(*Operating_Age*)				0.516***	0.533***	0.560***
				(6.859)	(6.871)	(6.810)
Plant FE	Y	Y	Y	Y	Y	Y
Year FE	Y	N	N	Y	N	N
State-Year FE	N	Y	Y	N	Y	Y
Industry-Year FE	N	N	Y	N	N	Y
Observation	50,438	50,438	50,438	50,438	50,438	50,438
Adjusted R-squared	0.878	0.890	0.890	0.890	0.891	0.892

Panel B Buyer's remaining plants

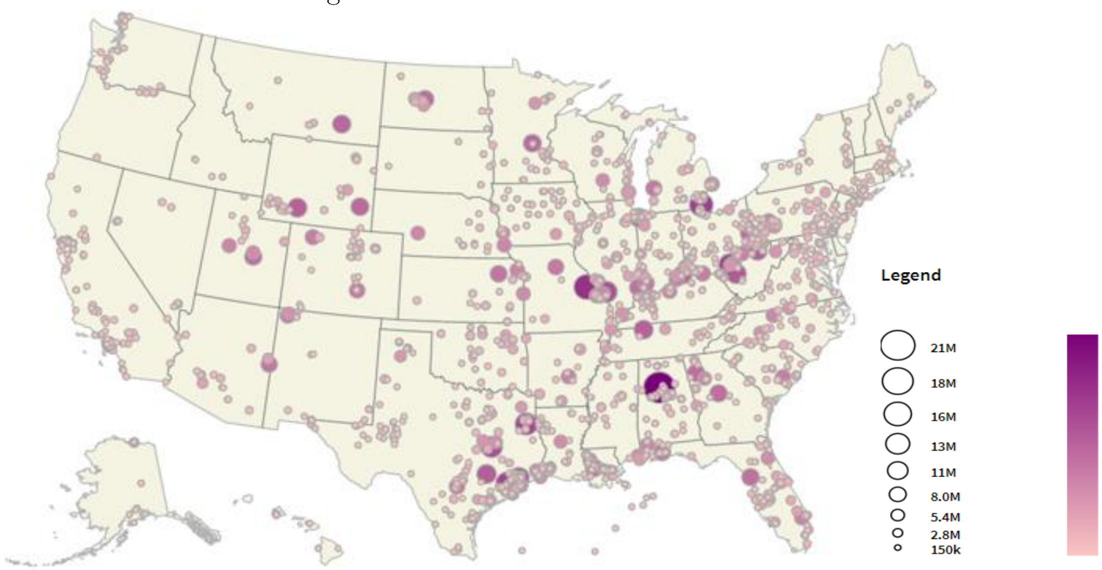
Dependent Variable:	**log(*GHG_Emissions*)**					
	(1)	(2)	(3)	(4)	(5)	(6)
Buyer_Remaining_Plant × *Post*	0.006	0.005	0.006	0.004	0.004	0.004
	(0.702)	(1.032)	(1.070)	(1.220)	(0.902)	(0.988)
log(*Generation_Capacity*)				0.869***	0.860***	0.861***
				(6.810)	(6.889)	(7.092)
log(*Operating_Age*)				0.516***	0.533***	0.560***
				(5.819)	(5.217)	(5.409)
Plant FE	Y	Y	Y	Y	Y	Y
Year FE	Y	N	N	Y	N	N
State-Year FE	N	Y	Y	N	Y	Y
Industry-Year FE	N	N	Y	N	N	Y
Observation	28,890	28,890	28,890	28,890	28,890	28,890
Adjusted R-squared	0.890	0.899	0.899	0.899	0.901	0.901

Appendix

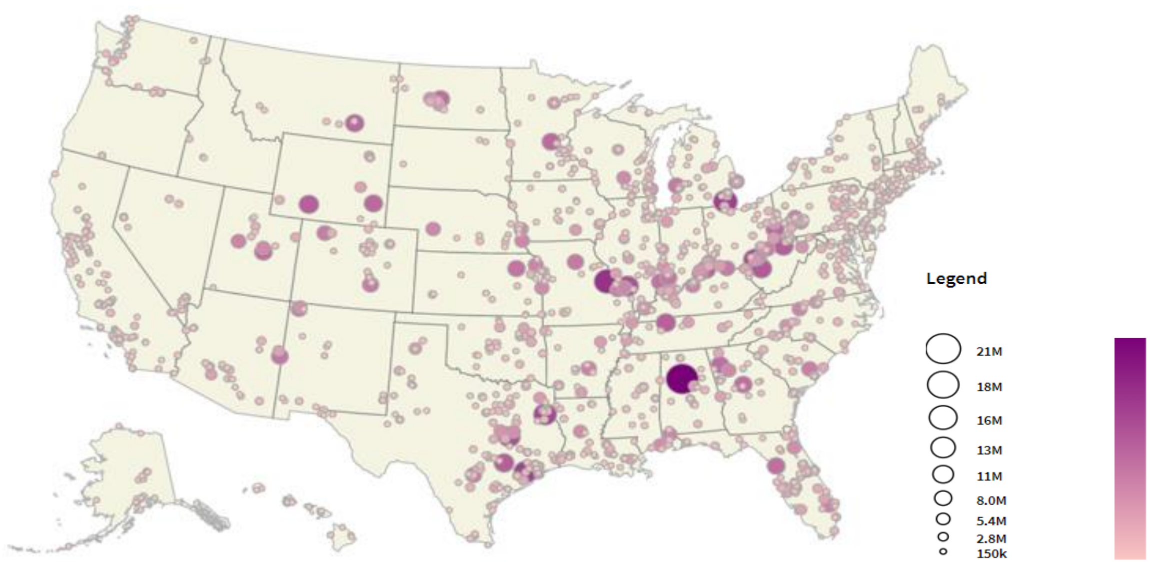
Figure A.1 Location and Total Reported Emissions from GHGRP Facilities

This figure presents the summary of greenhouse gas emissions in the United States. Panel A reports the GHG emissions from all the sectors, and panel B reports the GHG emissions from the power plants in the United States in 2021. Panel C reports the average greenhouse gas emissions by type, and panel D reports the average greenhouse gas emissions and power generation by power plants' fuel types according to EPA's calculation.

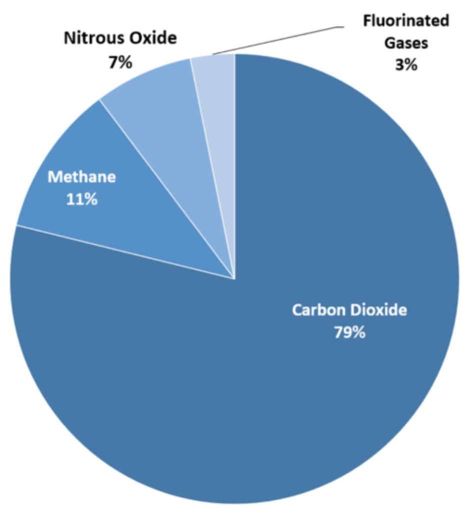
Panel A Greenhouse gas emissions for all the sectors in the United States in 2021



Panel B Greenhouse gas emissions for power plants in the United States in 2021



Panel C Average greenhouse gas emissions by emission types in the United States



Panel D Average greenhouse gas emissions and power generation by power plants' fuel types

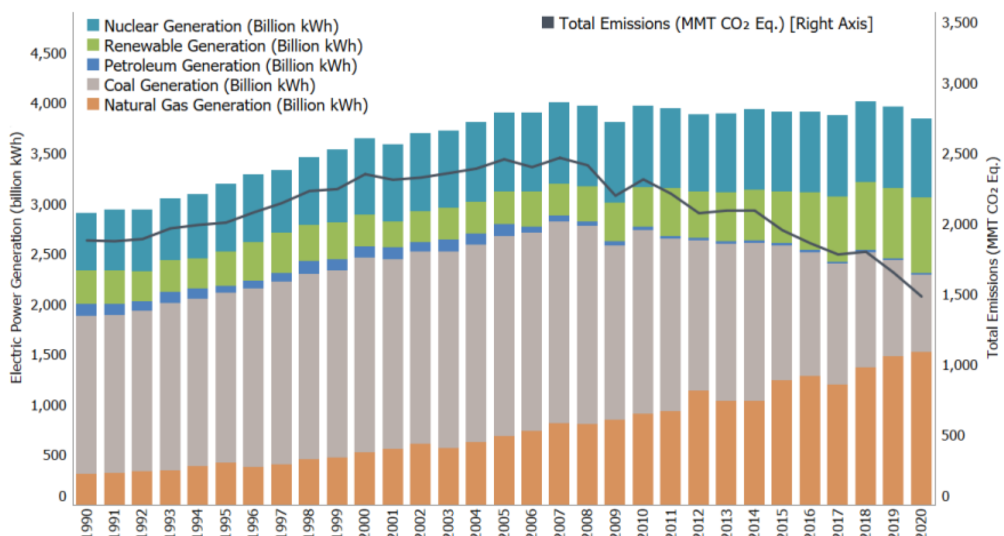


Table A.1 Variable Definitions

Variable	*Definition*
Pollutive_Plant_Divestiture	An indicator variable that equals one if a firm divests at least one GHG-emitting plant in a given year, and zero if a firm has no divestiture in a year.
NonPollutive_Plant_Divestiture	An indicator variable that equals one if a firm divests at least one plant that has no GHG emissions in a given year, and zero if a firm has no divestiture in a year.
Pressurized_to_LessPressurized	An indicator variable that equals one if a plant has been sold by its parent that has shareholder green pressure (receives a climate-related proposal, is a target of any of Big Three engagement, or target of the activism campaign over the past three years) to a firm without such pressure during the sample period, and zero if a plant has no ownership changes.
Independent_Private	An indicator variable that equals one if a plant's parent is an independent private firm that does not hold by private equity firms during the sample period, and zero otherwise. (e.g., Calpine, Caithness Energy, Terra Energy)
PE-backed_Private	An indicator variable that equals one if a plant's parent is a private equity backed private firm during the sample period, and zero otherwise. (e.g., KKR, LS Power, Macquarie)
State	An indicator variable that equals one if a plant's parent is a state-owned firm during the sample period, and zero otherwise. (e.g., New York Power Authority, Los Angeles Department of Water and Power, Tennessee Valley Authority)
Public	An indicator variable that equals one if a plant's parent is a public listed firm during the sample period, and zero otherwise. (e.g., Duke Energy, ExxonMobil, PG&E, Dow Chemical Co)
Seller_Remaining_Plant	An indicator variable that equals one if a plant that has no ownership change and is from a firm that has sold pollutive plants during the sample period, and zero if a plant is from a firm that has neither divest nor acquire pollutive assets.
Buyer_Remaining_Plant	An indicator variable that equals one if a plant that has no ownership change and is from a firm that has bought pollutive plants during the sample period, and zero if a plant is from a firm that has neither divest nor acquire pollutive assets.
Climate_Activism_Target	An indicator variable that equals one if a firm is a target of the activism campaign, Boardroom Accountability Project, for climate change related reasons in the prior year, and zero otherwise.
Climate_Proposal	An indicator variable that equals one if a firm receives a proposal relates to climate issues in the prior year, and zero otherwise.
Approved_Climate_Proposal	An indicator variable that equals one if a firm approves a climate-related proposal in the prior year, and zero otherwise.
Big3_Engagement	An indicator variable that equals one if a firm is a target of any of Big Three engagement in the prior year, and zero otherwise.
All_Big3_Engagement	An indicator variable that equals one if a firm is a target of all of Big Three engagement in the prior year, and zero otherwise.
BlackRock_Holding	Fraction of the firm's equity owned by mutual funds sponsored by BlackRock in the prior year.

StateStreet_Holding	Fraction of the firm's equity owned by mutual funds sponsored by StateStreet in the prior year.
Vangurard_Holding	Fraction of the firm's equity owned by mutual funds sponsored by Vanguard in the prior year.
Big3_Holding	Fraction of the firm's equity owned by mutual funds sponsored by BlackRock, Vanguard, or State Street in the prior year.
PRI_Holding	Fraction of the firm's equity owned by PRI funds in the prior year.
BlackRock_ENV_Commitment	An indicator that equals one for years from 2016 onwards, from which BlackRock commits to tackling environmental issues, and zero otherwise.
StateStreet_ENV_Commitment	An indicator that equals one for years from 2013 onwards, from which State Street commits to tackling environmental issues, and zero otherwise.
Vanguard_ENV_Commitment	An indicator that equals one for years from 2017, from which Vanguard commits to tackling environmental issues, and zero otherwise.
Big3_ENV_Commitment	An indicator that equals one if BlackRock, State Street, or Vanguard commits to tackling environmental issues in the prior year.
CSR_Reporting	An indicator variable that equals one if a firm issues standalone CSR report in a given year, and zero otherwise.
Emission_Reduction_Target	An indicator variable that equals one if a firm commits to achieve emission reductions in a given year, and zero otherwise.
Environmental_Incidents_3yr	Number of environmental incidents over the past three years ([t-2, t]), as in the Reprisk data set.
Environmental_Score	Strength and concern count for the environmental dimension in the KLD data set.
ESG_Score	Aggregate strength and concern count across six dimensions in the KLD data set.
Environmental_Score_ASSET4	Environmental score in the ASSET4 data set.
ESG_Score_ASSET4	ESG score in the ASSET4 data set.
GHG_Emissions	CO2-equivalent emissions of carbon dioxide, methane, nitrous oxide, and fluorinated greenhouse gasses, in millions of metric tons in a given year as measured by the Greenhouse Gas Reporting Program.
Historical_GHG_Emissions	The average level of greenhouse gases generated by a plant over the last three years as measured by the Greenhouse Gas Reporting Program.
CO_2*_Emission*	Pounds of carbon dioxide emissions as measured by the Clean Air Markets Division in a given year.
SO_2*_Emission*	Pounds of sulfur dioxide emissions as measured by the Clean Air Markets Division in a given year.
NO_x*_Emission*	Pounds of nitrogen oxide emissions as measured by the Clean Air Markets Division in a given year.
GHG_Rate	Carbon dioxide equivalent emission rates, pounds of carbon dioxide emission per British thermal unit, as measured by the Clean Air Markets Division.
SO_2*_Rate*	Sulfur dioxide emission rates, pounds of sulfur dioxide emissions per

	British thermal unit, as measured by the Clean Air Markets Division.
NO_x_Rate	Nitrogen oxide emission rates, pounds of nitrogen oxide emissions per British thermal unit, as measured by the Clean Air Markets Division.
SO_2_Control	An indicator that equals one if a unit has emissions abatement activities to control for sulfur dioxide in a given year, and zero otherwise.
NO_x _Control	An indicator that equals one if a unit has emissions abatement activities to control for nitrogen oxide in a given year, and zero otherwise.
Other_Emissions_Control	An indicator that equals one if a unit has emissions abatement activities besides controls for two precursor greenhouse gasses sulfur dioxide and nitrogen oxides in a given year, and zero otherwise.
SO_2_Abatement_Costs	Total thousand dollars amount invested in emissions abatement activities to control for sulfur dioxide in a given year.
Total_Abatement_Costs	Total thousand dollars amount invested in emissions abatement activities in a given year.
Attainment_Counties	An indicator variable that equals one if a plant located in a county that is in compliance with the National Ambient Air Quality Standard, and zero if located in a county that fails to comply.
Unexpected_Attainment_Redesig nations	An indicator variable that equals one if a plant located in a county that is just in compliance with the National Ambient Air Quality Standard "design values" (DV), and zero if located in a county that just fails to comply.
Environmental_Violation	An indicator that equals one if a plant has experienced an environmental regulation enforcement event in a given year, and zero otherwise.
Enforcement_Cost	Total environmental regulation enforcement cost in a given year.
Generation_Capacity	Maximum rated output of a generator, prime mover, or other electric power production equipment in the prior year.
Gross_Generation	Average gross electricity generation expressed in megawatt-hours MWh in a given year.
Operating_Age	Number of years that the facility has operated in a given year.
AT	Total assets in the prior year.
ROA	The return on assets ratio as measured by net income divided by total assets in the prior year.
M/B	Book value of liabilities plus market value of equity divided by total assets in the prior year.
Leverage	The ratio of interest-bearing liability (dlc+dltt) to total assets (at) in the prior year.

Table A.2 Correlations of shareholder green pressure measurements

This table presents the correlations between green shareholder pressure measurements. *Climate_Proposal* is an indicator variable that equals one if the proposal relates to climate issues in the prior year, and zero otherwise. *Approved_Climate_Proposal* is an indicator variable that equals one if the climate-related proposal has been approved in the prior year, and zero otherwise. *Big3_Engagement* is an indicator variable that equals one if a firm is a target of any of Big Three engagement in the prior year, and zero otherwise. *All_Big3_Engagement* is an indicator variable that equals one if a firm is a target of all of Big Three engagement in the prior year, and zero otherwise. *Climate_Activism_Target* is an indicator variable that equals one if a firm is a target of the activism campaign, Boardroom Accountability Project, for climate change related reasons in the prior year, and zero otherwise.

	Climate_ Proposal	*Approved_ Climate_ Proposal*	*Big3_ Engagement*	*All_Big3_ Engagement*	*Climate_ Activism_ Target*
Climate_Proposal	1				
Approved_Climate_Proposal	0.093	1			
Big3_Engagement	0.101	0.201	1		
All_Big3_Engagement	0.063	0.089	0.201	1	
Climate_Activism_Target	0.088	0.050	0.095	0.112	1

Table A.3 Shareholder green pressure and firm decision to divest pollutive plant

This table presents an analysis of the association between green shareholder pressure and pollutive plant divestiture. The dependent variable, *NonPollutive_Plant_Divestiture,* is an indicator variable that equals one if a firm divests at least one plant that has no GHG emissions in a given year, and zero if a firm has no divestiture in a year. *Climate_Proposal* is an indicator variable that equals one if a firm receives a proposal related to climate issues in the prior year, and zero otherwise. *Approved_Climate_Proposal* is an indicator variable that equals one if a firm approves climate-related proposal in the prior year, and zero otherwise. *Big3_Engagement* is an indicator variable that equals one if a firm is a target of any of Big Three engagement in the prior year, and zero otherwise. *All_Big3_Engagement* is an indicator variable that equals one if a firm is a target of all of Big Three engagement in the prior year, and zero otherwise. *Climate_Activism_Target* is an indicator variable that equals one if a firm is a target of the activism campaign, Boardroom Accountability Project, for climate-related reasons in the prior year, and zero otherwise. *GreenPressure* is an indicator variable that equals one if a firm has received a climate-related proposal, is a target of any of Big Three engagement, or target of the activism campaign, and zero otherwise. The control variables are defined in Appendix A. *Total_Abatement_Cost* is the total thousand dollars amount invested in emissions abatement activities in a given year. *Environmental_Incidents_3yr* is the number of environmental incidents over the past three years ([t-2, t]), as measured in Reprisk data. Independent variables are measured at the end of the prior year. Standard errors are clustered at the firm level. T-statistics are in parentheses. $*$, $**$, and $***$ denote significance at the 10%, 5%, and 1% levels in two-tailed tests, respectively. Intercepts are omitted.

Dependent Variable:	***NonPollutive_Plant_Divestiture***						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Climate_Proposal	0.008					0.003	
	(0.109)					(0.023)	
Approved_Climate_Proposal		0.002				0.002	
		(0.431)				(0.009)	
Big3_Engagement			0.011			0.004	
			(1.077)			(0.110)	
All_Big3_Engagement				0.017		0.008	
				(0.884)		(0.078)	
Climate_Activism_Target					0.020	0.009	
					(0.135)	(0.255)	
GreenPressure							0.015
							(0.447)
log(1+*Total_Abatement_Costs*)	0.001	0.001	0.001	0.000	0.001	0.001	0.001
	(0.120)	(0.008)	(0.203)	(0.140)	(0.028)	(0.420)	(0.320)
log(*1+Environmental_Incidents_3yr*)	0.010	0.010	0.010	0.010	0.010	0.010	0.010
	(1.402)	(1.450)	(1.308)	(1.324)	(1.433)	(1.429)	(1.450)
log(*AT*)	0.007^{***}	0.007^{***}	0.007^{***}	0.008^{***}	0.007^{***}	0.007^{***}	0.007^{***}
	(3.755)	(3.682)	(3.718)	(3.806)	(3.629)	(3.599)	(3.811)
ROA	-0.001^{***}	-0.001^{***}	-0.001^{***}	-0.001^{***}	-0.001^{***}	-0.001^{***}	-0.001^{***}
	(-4.139)	(-4.266)	(-4.244)	(-4.288)	(-4.210)	(-4.200)	(-4.220)
M/B	0.000	0.000	0.000	0.000	-0.000	0.000	0.000
	(1.218)	(1.229)	(1.250)	(1.232)	(-0.220)	(1.193)	(1.194)
Leverage	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-1.451)	(-1.574)	(-1.436)	(-1.565)	(-0.329)	(-1.581)	(-1.578)
Firm FE	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y
Observation	12,848	12,848	12,848	12,848	12,848	12,848	12,848
Adjusted R-squared	0.758	0.763	0.760	0.764	0.768	0.770	0.770

Table A.4 Variation in shareholders commitment to the environment and divestitures

This table presents an analysis of time variation in the association between green shareholder ownership and pollutive plant divestiture based on the commitment of BlackRock, State Street, and Vanguard to tackle environmental issues and United Nations Principles for Responsible Investment (PRI) funds. The dependent variable is an indicator of whether a firm divests at least one GHG-emitting plant in a given year. The experimental variables, *BlackRock_Holding, StateStreet_Holding, Vangurard_Holding, Big3_Holding*, are respectively, the fraction of the firm's equity owned by mutual funds sponsored by BlackRock, Vanguard, State Street, and either of the above mentioned in the prior year. *BlackRock_ENV_Commitment*, *StateStreet_ENV_Commitment*, *Vanguard_ENV_Commitment* are, respectively, indicators that equal one for years from 2016, 2013, and 2017 onwards, from which BlackRock, State Street, and Vanguard commit to tackling environmental issues, and zero otherwise. *Big3_ENV_Commitment* is an indicator that equals one if BlackRock, State Street, or Vanguard commits to tackling environmental issues in the prior year. *PRI_Holding* is the fraction of the firm's equity owned by PRI funds in the prior year. The control variables are defined in Appendix A. Independent variables are measured at the end of the prior year. Standard errors are clustered at the firm level. t -statistics are in parentheses. ∗, ∗∗, and ∗∗∗ denote significance at the 10%, 5%, and 1% levels in two-tailed tests, respectively. Intercepts are omitted.

Dependent Variable:	***Pollutive_Plant_Divestiture***				
	(1)	(2)	(3)	(4)	(5)
BlackRock_Holding × *BlackRock_ENV_Commitment*	0.011***				
	(2.710)				
BlackRock_Holding	0.004				
	(0.881)				
StateStreet_Holding × *StateStreet_ENV_Commitment*		0.009**			
		(1.981)			
StateStreet_Holding		0.002			
		(0.859)			
Vangurard_Holding × *Vangurard_ENV_Commitment*			0.010**		
			(1.979)		
Vangurard_Holding			0.003		
			(0.946)		
Big3_Holding × *Big3_ENV_Commitment*				0.011**	
				(1.998)	
Big3_Holding				0.003	
				(0.899)	
PRI_Holding					0.020*
					(1.79)
log(1+*Total_Abatement_Costs*)	0.140***	0.144***	0.143***	0.142***	0.142***
	(3.412)	(3.482)	(3.412)	(3.702)	(3.481)
log(*1+Environmental_Incidents_3yr*)	0.043***	0.040***	0.040***	0.041***	0.041***
	(3.822)	(3.401)	(3.782)	(3.602)	(3.433)
log(*AT*)	0.007***	0.007***	0.007***	0.007***	0.007***
	(3.772)	(3.793)	(3.797)	(3.900)	(3.990)
ROA	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-4.133)	(-4.224)	(-4.234)	(-4.444)	(-4.201)
M/B	0.000	0.000	0.000	0.000	0.000
	(1.217)	(1.221)	(1.240)	(1.220)	(1.219)
Leverage	-0.000	-0.000	-0.000	-0.000	-0.000
	(-1.458)	(-1.544)	(-1.533)	(-1.530)	(-1.511)
Firm FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
Observation	17,733	17,733	17,733	17,733	17,733
Adjusted R-squared	0.702	0.701	0.702	0.701	0.689

Table A.5 Changes in greenhouse gas emissions following divestitures

This table presents the estimations of the changes in emissions of the divested plants around the divestiture event. Panel A shows changes in greenhouse gases amount around the divestiture. Log(*GHG_Emissions*) is the logarithm of CO2-equivalent emissions of carbon dioxide, methane, nitrous oxide, and fluorinated greenhouse gasses, in millions of metric tons. Panel B and C show the changes in emission rates and abatement costs around the divestiture. Log(*GHG_Rate*) is the logarithm of carbon dioxide equivalent emission rates as measured by the Clean Air Markets Division. *Total_Abatement_Cost* is the total thousand dollars amount invested in emissions abatement activities in a given year. *Public(Private/State)_to_Public(Private/State)* are indicator variables that equal one if a plant has been sold by its *public(private/state)* parent to a *public(private/state)* firm during the sample period, and zero if a plant has no ownership changes. *Post* is an indicator for years after the transaction. Log(*Generation_Capacity*) is the logarithm of the maximum rated output of a generator, prime mover, or other electric power production equipment in the prior year. Log(*Operating_Age*) is the logarithm of the number of years that the plant has operated in the prior year. Independent variables are measured at the end of the prior year. Standard errors are clustered at the plant level. t -statistics are in parentheses. $*$, $**$, and $***$ denote significance at the 10%, 5%, and 1% levels in two-tailed tests, respectively. Intercepts are omitted.

Panel A Greenhouse gases emission amount at plant level

Dependent Variable:	**log(*GHG_Emissions*)**								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Public_to_Private × *Post*	0.294***								
	(2.761)								
Private_to_Private × *Post*		0.058							
		(0.181)							
State_to_Private × *Post*			0.108						
			(0.890)						
Public_to_Public × *Post*				0.060					
				(0.144)					
Private_to_Public × *Post*					-0.082*				
					(-1.782)				
State_to_Public × *Post*						-0.008			
						(-0.206)			
State_to_State × *Post*							0.003		
							(0.661)		
Public_to_State × *Post*								0.005	
								(0.831)	
Private_to_State × *Post*									-0.002
									(-0.231)
log(*Generation_Capacity*)	0.869***	0.871***	0.889***	0.890***	0.872***	0.882***	0.831***	0.859***	0.878***
	(6.007)	(6.001)	(6.001)	(5.984)	(6.010)	(6.001)	(6.001)	(6.001)	(6.001)
log(*Operating_Age*)	0.560***	0.523***	0.512***	0.514***	0.523***	0.518***	0.520***	0.522***	0.533***
	(6.851)	(6.026)	(6.330)	(6.356)	(6.314)	(6.390)	(6.386)	(6.336)	(6.026)
Plant FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
State-Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observation	79,958	77,912	73,412	79,902	78,890	73,302	73,092	73,020	73,012
Adjusted R-squared	0.907	0.906	0.903	0.907	0.906	0.905	0.903	0.902	0.901

Panel B Carbon dioxide equivalent emission efficiency at unit level

Dependent Variable:	**log(*1+GHG_Rate*)**								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Public_to_Private × *Post*	0.203***								
	(3.915)								
Private_to_Private × *Post*		0.033							
		(0.459)							
State_to_Private × *Post*			0.118						
			(0.890)						
Public_to_Public × *Post*				0.016					
				(0.100)					
Private_to_Public × *Post*					-0.079*				
					(-1.802)				
State_to_Public × *Post*						-0.008			
						(-0.206)			
State_to_State × *Post*							0.003		
							(0.661)		
Public_to_State × *Post*								0.005	
								(0.831)	
Private_to_State × *Post*									-0.002
									(-0.231)
log(*Operating_Age*)	0.089***	0.088***	0.089***	0.089***	0.089***	0.089***	0.089***	0.089***	0.089***
	(6.397)	(6.537)	(6.407)	(6.387)	(6.377)	(6.403)	(6.399)	(6.412)	(6.387)
Plant FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
State-Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observation	44,320	38,012	31,318	38,028	38,986	31,210	31,010	30,990	30,982
Adjusted R-squared	0.950	0.906	0.907	0.907	0.906	0.905	0.903	0.902	0.901

Panel C Emission abatement costs at unit level

Dependent Variable:	**log(*1+Total_Abatement_Cost*)**								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Public_to_Private × *Post*	-0.110***								
	(-4.171)								
Private_to_Private × *Post*		0.058							
		(0.181)							
State_to_Private × *Post*			-0.010						
			(-0.906)						
Public_to_Public × *Post*				0.060					
				(0.144)					
Private_to_Public × *Post*					0.082*				
					(1.782)				
State_to_Public × *Post*						0.013			
						(0.206)			
State_to_State × *Post*							0.003		
							(0.698)		
Public_to_State × *Post*								0.001	
								(0.431)	
Private_to_State × *Post*									0.009
									(0.931)
log(*Gross_Generation*)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(1.187)	(1.187)	(1.187)	(1.187)	(1.187)	(1.187)	(1.187)	(1.187)	(1.187)
log(*Operating_Age*)	0.089	0.089	0.088	0.089	0.089	0.088	0.091	0.089	0.080
	(0.970)	(0.979)	(0.940)	(0.903)	(0.889)	(0.760)	(0.534)	(0.792)	(0.472)
Plant FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
State-Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observation	44,320	38,012	31,318	38,028	38,986	31,210	31,010	30,990	30,982
Adjusted R-squared	0.950	0.906	0.907	0.907	0.906	0.905	0.903	0.902	0.901

Table A.6 Other implications for sellers

This table presents an analysis of the association between pollutive plant divestiture and sellers' future performance after the divestitures of pollutive plants. *Has_ M&A_Income* is an indicator of whether parent firms have M&A gain in a given year. *Has_Dividend* is an indicator of whether parent firms give dividends in a given year. *GreenPatent* is the number of green patent that has been filed by parent firms over the next three years. I define a patent as a "green" one, if at least one of its IPC/CPC codes is categorized as an environmental technology by this search strategy. *NonPollutive_Plant_Acquisition* is an indicator variable that equals one if a firm acquires at least one plant that has no GHG emissions in a given year, and zero otherwise. The control variables are defined in Appendix A. Independent variables are measured at the end of the prior year. Standard errors are clustered at the firm level. T-statistics are in parentheses. $*$, $**$, and $***$ denote significance at the 10%, 5%, and 1% levels in two-tailed tests, respectively. Intercepts are omitted.

Dependent Variable:	***Has_M&A_ Income***	***Has_ Dividend***	***Log(1+ GreenPatent)***	***NonPollutive_ Plant_ Acquisition***
	(1)	(2)	(3)	(4)
Pollutive_Plant_Divestiture	0.991**	0.124*	-0.002	0.001
	(1.982)	(1.852)	(-0.113)	(0.078)
log(*AT*)	0.001	-0.000**	0.001**	0.001
	(1.419)	(-2.515)	(2.420)	(1.420)
ROA	-0.001***	0.000**	0.001**	0.001**
	(-2.728)	(2.064)	(2.160)	(2.251)
M/B	-0.000	-0.000*	0.001	0.001
	(-0.045)	(-1.705)	(1.005)	(0.905)
Leverage	-0.000**	-0.000	-0.001	-0.002
	(-2.500)	(-1.578)	(-1.188)	(-1.264)
Firm FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
Observation	17,733	17,733	17,733	17,733
Adjusted R-squared	0.809	0.853	0.731	0.704