Appendix A Variable Definitions

Variable of interest (variable name)	Definition	Source
GHG Scope 1	GHG emissions from sources that are owned or controlled by the company (tonnes of CO2)	S&P Trucost Environmental
GHG Scope 2	GHG emissions from consumption of purchased electricity, heat or steam by the company (tonnes of CO2)	S&P Trucost Environmental
GHG Scope 3 upstream	GHG emissions from other upstream activities not covered in scope 2 (tonnes of CO2)	S&P Trucost Environmental
Waste direct (waste) & indirect	Quantity of waste that is generated by the company (tons)	S&P Trucost Environmental
Water consumption (water) from utility companies (m^3)	Volume of water consumption by the company	S&P Trucost Environmental
Covariates	**Definition**	**Source**
Employees (emp)	All part-time and seasonal employees, all employees of consolidated subsidiaries, both domestic and foreign, consultants, contract workers, employees of unconsolidated subsidiaries. (scale 0.01 employee)	S&P Global Compustat
Total asset (ta)	Total value of assets reported on the Balance Sheet ($M)	S&P Global Compustat
Total revenue (revt)	Sales/Turnover (Net) plus Operating Revenues (industrial definition) or gross income received from all divisions of the company (financial services definition) ($M)	S&P Global Compustat
Industry group	Industry classification based on Standard Industrial Classification	S&P Global Compustat
US Greenhouse gases reporting program (GHGRP)	Binary variable indicating whether the US company is part of the Greenhouse Gas Reporting Program	United States Environmental Protection Agency
US Subsidiaries located in the EU	Binary variable indicating whether US company has at least one subsidiary in EU	Exchange Commission's Electronic Data Gathering, Analysis, and Retrieval (EDGAR)
Data source (Scope 1 & Scope 2)	Binary variable indicating whether the environmental indicator has been provided by the company itself (=1) or estimated by S&P (=0)	S&P Global Compustat
Oil price (country level measure)	Crude oil import prices (from the IEA's Crude Oil Import Register). This indicator is measured in USD per barrel of oil. The real price was calculated using the deflator for GDP at market prices and rebased with reference year 1970 = 100.	OECD

Appendix B Data selection and sample distribution

Table B2 Data Selection Process

Step 1: Raw Data *All data available when merging S&P Trucost environmental data and Compustat financial indicators*			
	TOTAL	**EU**	**U.S.**
Nb observations	***45034***	15740	29294
Nb companies	6593	2260	4333
Step 2: Data Used for Analysis *Selection process:* *- Keep only companies with at least one observation before and one after 2016* *- Removal of outliers using Hampel method at the company level* *- U.S. companies with at least one subsidiary in the EU dropped from the control group* *- Companies with number of employees > 500 and total assets > €20 million*			
	TOTAL	**EU**	**U.S.**
Nb observations	***15414***	6333	8781
Nb companies	2702	1081	1621

Table B3 Sample distribution per year

Number of observations per year	**Step 1: Row Data**		**Step 2: Data Used for Analysis**	
Year	EU	U.S.	EU	U.S.
2010	727	1125	267	314
2011	753	1119	335	360
2012	784	1120	413	403
2013	1005	1230	542	449
2014	1047	1251	577	469
2015	1035	1240	632	502
2016	1580	3545	840	1271
2017	1626	3567	746	1214
2018	1681	3678	702	934
2019	1727	3574	697	1059
2020	1987	3997	555	1044
2021	1788	3848	327	762
TOTAL	15740	29294	6633	8781

Table B4 Sample distribution per country

	Step 1: Row Data		**Step 2: Data Used for Analysis**	
country	Nb of companies	(%)	Nb of companies	(%)
Austria	51	(2,26)	26	(2,41)
Belgium	84	(3,72)	49	(4,53)
Bulgaria	5	(0,22)	1	(0,09)
Cyprus	11	(0,49)	4	(0,37)
Czech Republic	12	(0,53)	5	(0,46)
Denmark	76	(3,36)	42	(3,89)
Estonia	3	(0,13)	1	(0,09)
Finland	89	(3,94)	41	(3,79)
France	375	(16,59)	213	(19,70)
Germany	373	(16,50)	185	(17,11)
Greece	48	(2,12)	23	(2,13)
Hungary	6	(0,27)	4	(0,37)
Ireland	78	(3,45)	49	(4,53)
Italy	199	(8,81)	84	(7,77)
Latvia	1	(0,04)	0	(0,00)
Lithuania	4	(0,18)	2	(0,19)
Luxembourg	54	(2,39)	22	(2,04)
Malta	5	(0,22)	4	(0,37)
Netherlands	131	(5,80)	67	(6,20)
Poland	100	(4,42)	37	(3,42)
Portugal	22	(0,97)	10	(0,93)
Romania	30	(1,33)	5	(0,46)
Slovakia	2	(0,09)	0	(0,00)
Slovenia	7	(0,31)	4	(0,37)
Spain	127	(5,62)	65	(6,01)
Sweden	367	(16,24)	138	(12,77)
TOTAL	2260	(100)	1081	(100)

Table B5 Sample distribution per industry (Standard Industrial Classification (SIC))

	Step 1: Raw Data				**Step 2: Data Used for Analysis**			
Number of companies per industry group:	EU (%)		U.S. (%)		EU (%)		U.S. (%)	
Communication Services	150	(6,63)	157	(3,62)	77	(7,12)	67	(4,13)
Consumer Discretionary	223	(9,85)	359	(8,27)	108	(9,99)	160	(9,87)
Consumer Staples	78	(3,45)	110	(2,54)	35	(3,24)	28	(1,73)
Energy	57	(2,52)	262	(6,04)	29	(2,68)	87	(5,37)
Financials	341	(15,1)	646	(14,9)	157	(14,5)	331	(20,4)
Health Care	248	(11)	800	(18,4)	107	(9,9)	234	(14,4)
Industrials	358	(15,8)	396	(9,13)	190	(17,6)	141	(8,7)
Information Technology	295	(13)	599	(13,8)	126	(11,7)	180	(11,1)
Materials	153	(6,76)	173	(3,99)	72	(6,66)	57	(3,52)
Utilities	360	(15,9)	837	(19,3)	180	(16,7)	336	(20,7)
TOTAL	2263	(100)	4339	(100)	1081	(100)	1621	(100)

Appendix C Descriptive statistics

Table C6 Descriptive statistics - EU group

	mean	sd	min	max
GHG Scope1	1756732.60	10470323.12	0.11	185049381.52
GHG Scope2	242214.06	947295.88	0.13	21950456.00
GHG Scope3 upstream	1439585.32	4309344.15	0.43	71285082.69
Water consumption	2832311.92	22547482.90	0.00	800906323.00
Waste production	411799.42	4826707.86	0.00	159061296.00
employees	23.62	51.68	0.00	548.04
Revenue	19318.50	182192.49	-13297.00	5522316.00
Total assets	75618.17	630032.80	6.80	27553384.00
Crude oil import prices	71.01	24.80	40.10	115.60
owndata_scope1	0.49	0.50	0.00	1.00
owndata_scope2	0.42	0.49	0.00	1.00

Table C7 Descriptive statistics - U.S. group

	mean	sd	min	max
GHG Scope1	976713.05	6047728.58	0.19	139316232.15
GHG Scope2	171489.66	706779.88	0.46	14950174.00
GHG Scope3 upstream	716297.71	3396487.12	0.67	69442617.97
Water consumption	2502445.89	11613300.32	0.00	235460183.79
Waste production	43635.47	159886.11	0.01	3037252.82
employees	14.19	45.19	0.00	1608.00
Revenue	5445.78	18139.59	-1408.00	469822.00
Total assets	13875.38	49356.16	6.44	958784.00
Crude oil import prices	59.09	21.16	36.60	102.40
owndata_scope1	0.17	0.37	0.00	1.00
owndata_scope2	0.14	0.34	0.00	1.00

Table C8 Correlation matrix - EU group (Pearson method)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) GHG Scope1	1.00	0.60	0.64	0.22	0.09	0.20	0.06	0.01	0.06	0.14	0.09
(2) GHG Scope2	0.60	1.00	0.61	0.30	0.12	0.32	0.07	0.01	0.08	0.16	0.14
(3) GHG Scope3 upstream	0.64	0.61	1.00	0.21	0.09	0.47	0.11	0.02	0.10	0.21	0.20
(4) Water consumption	0.22	0.30	0.21	1.00	0.09	0.17	0.02	0.00	0.01	0.09	0.08
(5) Waste production	0.09	0.12	0.09	0.09	1.00	0.05	0.00	-0.00	0.00	0.06	0.06
(6) Employee	0.20	0.32	0.47	0.17	0.05	1.00	0.08	0.09	0.10	0.26	0.26
(7) Revenue	0.06	0.07	0.11	0.02	0.00	0.08	1.00	0.48	0.04	0.07	0.05
(8) Total assets	0.01	0.01	0.02	0.00	-0.00	0.09	0.48	1.00	0.02	0.07	0.04
(9) Crude oil import prices	0.06	0.08	0.10	0.01	0.00	0.10	0.04	0.02	1.00	0.06	0.05
(10) owndata_scope1	0.14	0.16	0.21	0.09	0.06	0.26	0.07	0.07	0.06	1.00	0.83
owndata_scope2	0.09	0.14	0.20	0.08	0.06	0.26	0.05	0.04	0.05	0.83	1.00

Table C9 Correlation matrix - U.S. Group (Pearson method)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) GHG Scope1	1.00	0.31	0.42	0.20	0.34	0.17	0.32	0.24	0.09	0.24	0.13
(2) GHG Scope2	0.31	1.00	0.53	0.49	0.58	0.38	0.52	0.23	0.08	0.30	0.26
(3) GHG Scope3 upstream	0.42	0.53	1.00	0.32	0.64	0.31	0.63	0.25	0.07	0.23	0.16
(4) Water consumption	0.20	0.49	0.32	1.00	0.42	0.37	0.47	0.21	0.08	0.17	0.16
(5) Waste production	0.34	0.58	0.64	0.42	1.00	0.56	0.80	0.36	0.09	0.28	0.24
(6) Employee	0.17	0.38	0.31	0.37	0.56	1.00	0.68	0.33	0.09	0.24	0.24
(7) Revenue	0.32	0.52	0.63	0.47	0.80	0.68	1.00	0.54	0.09	0.28	0.24
(8) Total assets	0.24	0.23	0.25	0.21	0.36	0.33	0.54	1.00	0.07	0.24	0.25
(9) Crude oil import prices	0.09	0.08	0.07	0.08	0.09	0.09	0.09	0.07	1.00	0.12	0.10
(10) owndata_scope1	0.24	0.30	0.23	0.17	0.28	0.24	0.28	0.24	0.12	1.00	0.86
owndata_scope2	0.13	0.26	0.16	0.16	0.24	0.24	0.24	0.25	0.10	0.86	1.00

Table C11 Firm Characteristics

Size & Financials				
Group	**Period**	**Employees (SD)**	**Revenues (SD)**	**Assets (SD)**
US Firms	After 2016	10.79 (43.28)	4,238.43 (17,567.86)	11,019.23 (42,567.78)
US Firms	Before 2016	22.73 (48.67)	8,484.24 (19,174.46)	21,063.23 (62,734.13)
US Firms w/ EU Subsidiaries	After 2016	31.95 (106.25)	11,736.51 (31,276.37)	41,495.60 (205,392.41)
US Firms w/ EU Subsidiaries	Before 2016	44.34 (115.09)	16,666.38 (34,326.58)	57,931.82 (239,496.02)
Environmental Metrics				
Group	**Period**	**Water (SD)**	**Waste (SD)**	**GHG (SD)**
US Firms	After 2016	11.77 (2.47)	8.21 (2.24)	11.35 (2.37)
US Firms	Before 2016	13.35 (2.36)	9.73 (1.74)	13.00 (1.98)
US Firms w/ EU Subsidiaries	After 2016	13.18 (2.20)	10.03 (2.02)	13.26 (1.98)
US Firms w/ EU Subsidiaries	Before 2016	14.09 (1.83)	10.80 (1.86)	13.99 (1.68)

Appendix D Tables of results

Table D12 Effect of NFRD on GHG (Scope1 + Scope2 + Scope3 upstream) emissions - iFECT estimator

	ATT	S.E.	CI.lower	CI.upper	p.value
Treat obs equally weighted	-0.2496	0.04775	-0.3432	-0.1561	1.715e-07 ***
size: *employee*	2.186e-03	2.339e-03	-2.399e-03	6.771e-03	0.349965
size: *revenue*	2.102e-07	1.243e-06	-2.226e-06	2.646e-06	0.865721
size: *at*	2.021e-07	5.616e-07	-8.986e-07	1.303e-06	0.718989
owndata_scope1	1.321e-01	4.177e-02	5.024e-02	2.140e-01	0.001562 **
owndata_scope2	1.426e-03	3.025e-02	-5.787e-02	6.072e-02	0.962411
Crude oil import prices	-3.329e-03	2.545e-03	-8.317e-03	1.659e-03	0.190819
U.S. Greenhouse gases reporting program	9.419e-03	4.504e-02	-7.887e-02	9.771e-02	0.834369
F test p-value	0.00				

Firm fixed effects and industry-year trends fixed effects
Standards errors clustered at company level
Nb bootstrap iterations: 500
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table D13 Effect of NFRD on water consumption - iFECT estimator

	ATT	S.E.	CI.lower	CI.upper	p.value
Treat obs equally weighted	-0.1452	0.07493	-0.2921	0.001646	0.05262 *
size: *employee*	2.002e-03	2.192e-03	-2.294e-03	6.298e-03	0.36106
size: *revenue*	-4.246e-07	1.580e-06	-3.522e-06	2.673e-06	0.78816
size: *at*	1.465e-07	4.528e-07	-7.411e-07	1.034e-06	0.74637
owndata_scope1	-6.109e-02	6.727e-02	-1.929e-01	7.076e-02	0.36386
owndata_scope2	2.655e-02	5.280e-02	-7.694e-02	1.300e-01	0.61513
Crude oil import prices	-1.461e-02	6.052e-03	-2.647e-02	-2.747e-03	0.01578 *
U.S. Greenhouse gases reporting program	-1.656e-02	5.470e-02	-1.238e-01	9.066e-02	0.76213
F test p-value	0.621				

Firm fixed effects and industry-year trends fixed effects
Standards errors clustered at company level
Nb bootstrap iterations: 500
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table D14 Effect of NFRD on waste production **-** iFECT estimator

	ATT	**S.E.**	**CI.lower**	**CI.upper**	**p.value**
Treat obs equally weighted	-0.2389	0.07246	-0.3809	-0.09687	0.0009781 ***
size: *employee*	1.993e-03	1.908e-03	-1.747e-03	5.732e-03	0.2962
size: *revenue*	-8.741e-08	1.402e-06	-2.834e-06	2.660e-06	0.9503
size: *at*	1.108e-07	4.575e-07	-7.858e-07	1.007e-06	0.8086
owndata_scope1	1.127e-01	8.176e-02	-4.757e-02	2.729e-01	0.1682
owndata_scope2	-6.105e-02	8.262e-02	-2.230e-01	1.009e-01	0.4600
Crude oil import prices	6.180e-03	6.451e-03	-6.465e-03	1.882e-02	0.3381
U.S. Greenhouse gases reporting program	-1.941e-02	4.927e-02	-1.160e-01	7.715e-02	0.6936
F test pvalue	0.012				

Firm fixed effects and industry-year trends fixed effects
Standards errors clustered at company level
Nb bootstrap iterations: 500
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table D15 Average Treatment Effect (ATT) of NFRD per industry group - iFECT estimator

Industry group Models	Total GHG (1)	Scope1 (2)	Scope2 (3)	Scope3 upstream (4)	Water (5)	Waste (6)
Communication services	-0.0516	-0.1019	0.0936	-0.1099	-0.2321	0.0048
	(0.1773)	(0.1994)	(0.1948)	(0.1799)	(0.2039)	0.7672
Ftest pvalue	*0.423*	*0.411*	*0.677*	*0.143*	*0.324*	*0.928*
Consumer Discretionary	-0.06647	-0.6724***	-0.2369	-0.0558	0.2179	-0.3376*
	(0.1055)	(0.1568)	(0.1562)	(0.0972)	(0.3440)	(0.1793)
Ftest pvalue	*0.448*	*0.225*	*0.583*	*0.803*	*0.683*	*0.329*
Consumer Staples	insufficient number of observations to conduct the analysis					
Energy	-0.08491	-0.7176**	-0.1221	0.09	0.0048	-0.0563
	(0.6178)	(0.347)	(0.2858)	(0.1365)	(0.7672)	(0.2151)
Ftest pvalue	*0.944*	*0.999*	*0.826*	*0.889*	*0.928*	*0.874*
Financials	-0.248***	-0.08056	-0.1339	-0.244***	-0.0945	-0.4996***
	(0.07)	(0.1220)	(0.1864)	(0.07351)	(0.1172)	(0.183)
Ftest pvalue	*0.023*	*0.854*	*0.107*	*0.003*	*0.618*	*0.485*
Health Care	-0.2914***	-0.2072	-0.2458	-0.2894**	0.038	-0.2592
	(0.1153)	(0.1603)	(0.1164)	(0.1105)	(0.1697)	(0.1784)
Ftest pvalue	*0.043*	*0.44*	*0.528*	*0.014*	*0.582*	*0.520*
Industrials	-0.1783*	-0.0817	-0.191*	-0.2122**	-0.0719	-0.3808**
	(0.08046)	(0.1221)	(0.1002)	(0.0891)	(0.1488)	(0.1655)
Ftest pvalue	*0.104*	*0.797*	*0.517*	*0.107*	*0.233*	*0.229*
Information Technology	-0.215	0.0614	-0.1566	-0.254	-0.2115	-0.1656
	(0.1263)	(0.1938)	(0.1415)	(0.1521)	(0.1979)	(0.1293)
Ftest pvalue	*0.566*	*0.496*	*0.259*	*0.659*	*0.61*	*0.337*
Materials	-0.1203	-0.1771	-0.4369**	-0.144	-0.2404	0.3118
	(0.0997)	(0.2225)	(0.0473)	(0.1009)	(0.2335)	(0.3111)
Ftest pvalue	*0.698*	*0.757*	*0.039*	*0.333*	*0.895*	*0.765*
Utilities	-0.1452	-0.1503	-0.1003	-0.1345*	-0.1468	0.0262
	(0.1232)	(0.1779)	(0.1003)	(0.0763)	(0.2377)	(0.1729)
Ftest pvalue	*0.223*	*0.39*	*0.771*	*0.112*	*0.877*	*0.233*
Industry × year fixed effects: Yes						
Firm fixed effects: Yes						
Control variables: Yes						

Clustered (firm) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Appendix E Robustness checks

Table E16 Pre-trend and Placebo Tests for Main EU Models

	Pre-trend		Placebo	
Model	**F test (p)**	**TOST (p)**	**F test (p)**	**TOST (p)**
GHG emissions (IFect)	0.000	0.000	0.287	0.000
Waste production (IFect)	0.006	0.000	0.735	0.475
Water consumption	0.555	0.000	0.613	0.613

Table E17 ATT of NFRD with TWFE + IPTW estimator

Dependent Variables:	GHG Scope1	GHG Scope2	GHG Scope3	GHG total	Water	Waste
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
ATT	-0.1473***	-0.2104***	-0.1818***	-0.1814***	-0.0742	-0.1181**
	(0.0471)	(0.0485)	(0.0289)	(0.0306)	(0.0527)	(0.0468)
emp	0.0021***	0.0003	0.0011***	0.0012***	0.0009**	0.0011***
	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0003)
revt	6.72×10^{-7}	4.53×10^{-7}	9.63×10^{-7}**	4.78×10^{-7}	1.35×10^{-6}*	-3.74×10^{-8}
	(5.15×10^{-7})	(4.26×10^{-7})	(4.12×10^{-7})	(3.83×10^{-7})	(7.45×10^{-7})	(3.86×10^{-7})
at	-3.1×10^{-8}	3.3×10^{-8}	1.16×10^{-8}	1.2×10^{-8}	-2.92×10^{-8}	3.41×10^{-8}
	(3.13×10^{-8})	(3.25×10^{-8})	(3×10^{-8})	(2.21×10^{-8})	(3.36×10^{-8})	(2.36×10^{-8})
owndata_scope1	-0.2711***		0.0858***	0.0934***	-0.0881	0.1113**
	(0.0666)		(0.0228)	(0.0303)	(0.0707)	(0.0526)
ghgrepus	0.0326	-0.0129	-0.0170	0.0009	-0.0528	-0.0441
	(0.0506)	(0.0429)	(0.0242)	(0.0259)	(0.0424)	(0.0420)
OilPrice	-0.0068**	-0.0028	-0.0031*	-0.0039*	-0.0057*	0.0053
	(0.0033)	(0.0031)	(0.0019)	(0.0020)	(0.0033)	(0.0052)
owndata_scope2		-0.0813	-0.0008	-0.0023	0.0435	-0.0092
		(0.0501)	(0.0181)	(0.0219)	(0.0607)	(0.0576)
Fixed-effects						
gvkey	Yes	Yes	Yes	Yes	Yes	Yes
industryyear	Yes	Yes	Yes	Yes	Yes	Yes
Fit statistics						
Observations	15,414	15,414	15,414	15,414	15,414	15,414
R^2	0.97968	0.96844	0.98399	0.98484	0.95201	0.93507
Within R^2	0.03432	0.01051	0.03487	0.03112	0.00597	0.00571

Clustered (gvkey) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table E18 Effect of the 2016 NFRD Treatment on Japanese/Swiss placebo sample – iFECT Estimator

	(1) GHG Total	(2) Waste production	(3) Water consumption
Treat obs equally weighted	-0.2422***	-0.2461**	-0.2097**
	(0.05411)	(0.1075)	(0.1039)
size: *employee*	2.076e-03	2.035e-03	1.903e-03
	(2.874e-03)	(2.321e-03)	(2.682e-03)
size: *revenue*	6.971e-07	2.242e-07	7.302e-07
	(1.432e-06)	(1.391e-06)	(1.501e-06)
size: *at*	2.653e-08	1.139e-07	7.647e-10
	(1.074e-07)	(1.906e-07)	(1.606e-07)
owndata_scope1	1.333e-01**	6.206e-02	-9.824e-02
	(5.335e-02)	(8.195e-02)	(9.011e-02)
owndata_scope2	-9.762e-03	3.108e-02	7.696e-02
	(4.296e-02)	(7.284e-02)	(8.492e-02)
ghgrepus	1.186e-02	-2.272e-02	-1.701e-02
	(4.633e-02)	(5.053e-02)	(6.024e-02)
Fit statistics			
Observations	18,538	18,538	18,538

Firm fixed effects and industry-year trends fixed effects
Standard errors clustered at company level
Nb bootstrap iterations: 200 (Models 2–3), 500 (Model 1)
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table E19 Pre-trend Tests for Japanese/Swiss placebo sample – iFECT Estimator

Model	F test (p-value)	TOST (p-value)
(1) GHG Total	0.000	0.238
(2) Waste production	0.000	0.472
(3) Water consumption	0.012	0.013