



## **SPEAKER SERIES** **The Future Of Finance**



# **THE GREEN TRANSITION: Evidence from Corporate Green Revenues**

[ January 2026 ]



**Pedro Matos**

James A. and Stacy Cooper Bicentennial Professor of Business  
Administration



**DARDEN SCHOOL**  
*of* **BUSINESS**

# ESG INVESTING, DECARBONIZATION & THE GREEN TRANSITION

I.

## ESG INVESTING



### Do Responsible Investors Invest Responsibly?

Simon Glossner, Rajna Gibson, Philipp Krueger, Pedro Matos, Tom Steffen



### Decarbonizing Institutional Investor Portfolios: *Helping to Green the Planet or Just Greening Your Portfolio?*

Vaiko Atar Dantua – UVA Darden School of Business  
Simon Glossner – Federal Reserve Board\*  
Philipp Krueger – University of Geneva  
Pedro Matos – UVA Darden School of Business

\* The authors are responsible for their own views and do not necessarily reflect the views of the Board of Governors of the Federal Reserve System, its members, or its staff.

II.

## THE GREEN TRANSITION

### The Green Transition: Evidence from Corporate Green Revenues

Johannes Klausmann, Philipp Krueger & Pedro Matos

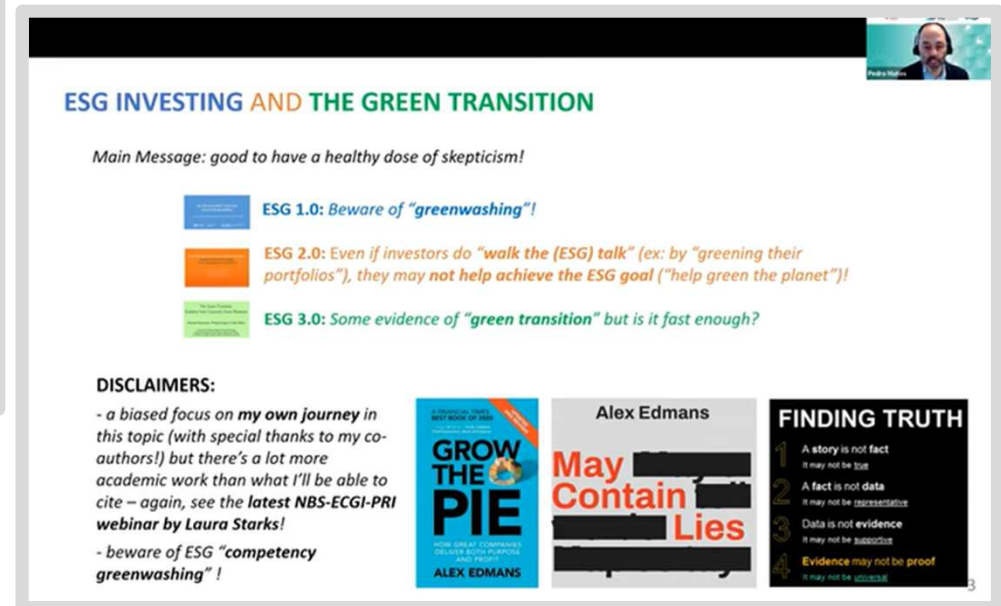
University of Houston Bauer College of Business  
University of Geneva, Swiss Finance Institute and ECGI  
University of Virginia Darden School of Business and ECGI

# ESG INVESTING, DECARBONIZATION & THE GREEN TRANSITION



The slide is part of a public lecture series on sustainable business. It features logos for Nanyang Technological University, Nanyang Business School, PRI (Principles for Responsible Investment), and ECGI. The date is 20th February 2025. The title is "ESG Investing and the Green Transition". The speaker is Pedro Matos, James A. & Stacy Cooper Bicentennial Professor of Business Administration at the University of Virginia and ECGI. A large image of a modern building is on the right.

**PUBLIC LECTURE SERIES ON SUSTAINABLE BUSINESS**  
**20th February 2025**  
**"ESG Investing and the Green Transition"**  
Delivered by  
**Pedro Matos**  
James A. & Stacy Cooper Bicentennial  
Professor of Business Administration  
University of Virginia and ECGI



The slide discusses the main message of the lecture: good to have a healthy dose of skepticism. It lists three ESG goals and their challenges. It also includes disclaimers and references to books by Alex Edmans.

**ESG INVESTING AND THE GREEN TRANSITION**  
*Main Message: good to have a healthy dose of skepticism!*

- ESG 1.0:** Beware of "greenwashing"!
- ESG 2.0:** Even if investors do "walk the (ESG) talk" (ex: by "greening their portfolios"), they may **not** help achieve the ESG goal ("help green the planet")!
- ESG 3.0:** Some evidence of "green transition" but is it fast enough?

**DISCLAIMERS:**  
- a biased focus on *my own journey* in this topic (with special thanks to my co-authors!) but there's a lot more academic work than what I'll be able to cite – again, see the **latest NBS-ECGI-PRI webinar by Laura Starks!**  
- beware of ESG "competency greenwashing"!

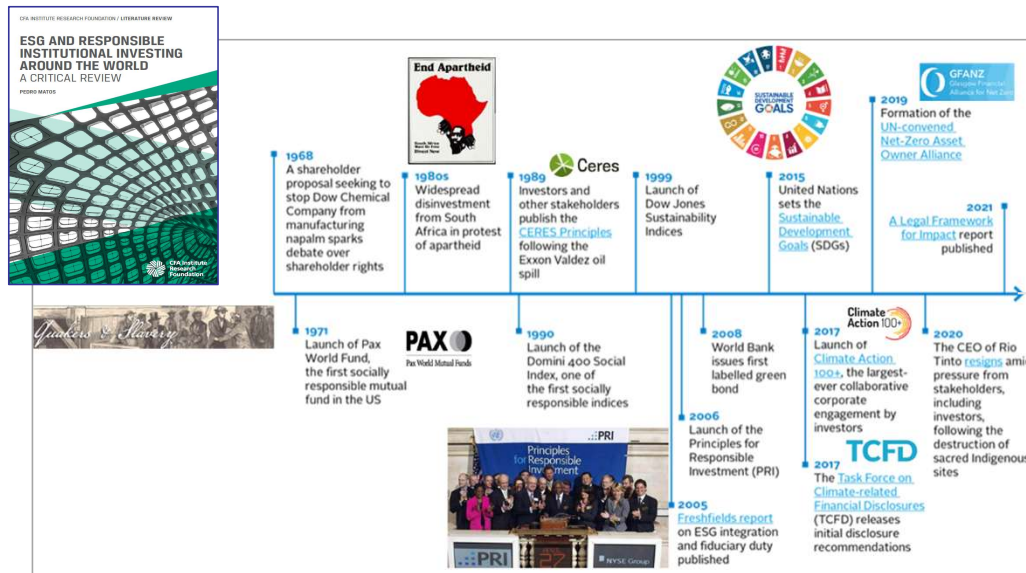
**References:**  
- **GROW THE PIE** by Alex Edmans  
- **May Contain Lies** by Alex Edmans  
- **FINDING TRUTH** by Alex Edmans

**FINDING TRUTH**  
1 A story is not fact  
2 A fact is not data  
3 Data is not evidence  
4 Evidence may not be proof

<https://www.ecgi.global/publications/videos/esg-investing-and-the-green-transition>

# ESG INVESTING, DECARBONIZATION & THE GREEN TRANSITION

## ESG Investing: from boom ... to backlash / greenlash?



### How 2021 became the year of ESG investing

December 23, 2021



Who killed the ESG party? | FT Film

YouTube · Financial Times · Jul 17, 2024

The question is who killed the ESG party does a number of suspects.

[https://www.youtube.com/watch?v=hMW\\_pT7w-Y8](https://www.youtube.com/watch?v=hMW_pT7w-Y8)

## 2022-24



**The Economist** How ESG became part of America's culture wars

**FT** ESG put to the test in a high-inflation world



<https://www.ropesgray.com/en/sites/navigating-state-regulation-of-esg>

## 2025-26?



**FT** Year in a word: Greenlash

(portmanteau noun) the backlash against environmental policies. Not to be confused with greenwashing, green hushing or green wishing



On 8 April 2025, the CFA Institute **Certificate in ESG Investing** will be renamed the Sustainable Investing Certificate.

**WSJ**

**Step Aside, ESG. BlackRock Is Doing 'Transition Investing' Now.**

The world's biggest asset manager has abandoned the acronym while pumping billions of dollars into clean energy

**Bloomberg.com**

**BlackRock's Trans-Atlantic ESG Dilemma**

BlackRock Inc., the world's largest money manager, is facing very different ESG pressures on opposite sides of the Atlantic.

1 week ago





# ESG INVESTING, DECARBONIZATION & THE GREEN TRANSITION

## Reasons to be a pessimist...

FT

DEC 8 2025

### Three-year temperature average set to exceed 1.5C for first time

Data shows 2025 is on track to be the third-warmest on record after November temperature rise of 1.54C

Annual global surface air temperature compared with pre-industrial\* average, degrees Celsius



The Economist

### COP30 ends with a whimper

The climate conference acknowledged that more climate action is needed, then failed to provide it | International.

1 month ago

COP30  
BRASIL  
AMAZONIA  
BELEM 2025

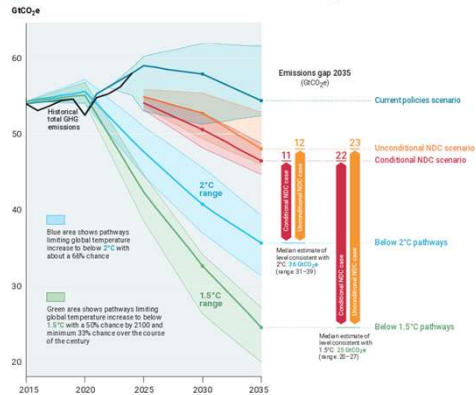
### Trump orders mass US pullout from international organisations

JAN 8 2026

Bodies targeted include key UN climate treaty and those promoting development, democracy and human rights



Figure ES.5 Global GHG emissions under different scenarios and the emissions gap in 2030 and 2035



<https://www.unep.org/resources/emissions-gap-report-2025>

The Economist

Nov 14th 2024

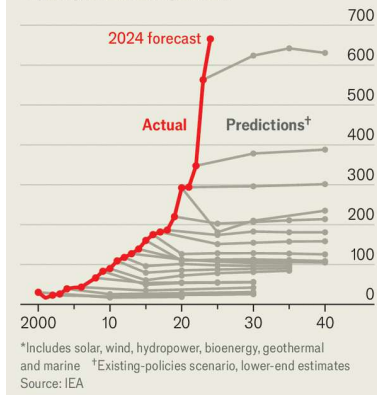


The energy transition will be much cheaper than you think

Most analysts overestimate energy demand and underestimate technological advances

### Unshakable pessimism

Global renewable energy\*, capacity added each year, GW



NY: The Wall Street Journal

### Why Solar and Wind Power Can Thrive Without Subsidies

Rising electricity demand, in part due to AI needs, along with the increasing cost of alternatives should cushion the impact for green energy

Aug 22, 2025



NOV 8TH 2025

### The world's renewable-energy superpower

China's moment for climate leadership has arrived

Bloomberg.com

### Watch BYD Beats Tesla with Five-Minute EV Battery

BYD unveiled a new battery and charging system that can charge almost as fast as it takes to refuel a regular car.

Mar 17, 2025



### BYD Tops the Race for Speed Charging

Automaker	Kilometer per minute charging	Claim
BYD	90	400 km in 5 mins
Li Auto	42	500 km in 12 mins
Mercedes-Benz	33	325 km in 10 mins
Tesla	18	275 km in 15 mins

Source: Bloomberg reporting  
Note: Selected carmakers

Bloomberg.com

### The Green Revolution Is Alive and Well — Just Not in the US

Global investment in renewable energy sources hit \$386.5 billion in the first half of 2025 despite the pullback in the US.

Aug 29, 2025

Bloomberg.com

### The US Keeps Breaking Renewable Energy Records

The US Keeps Breaking Renewable Energy Records - Power Source. More than one quarter of US electricity this year has come from renewable sources...

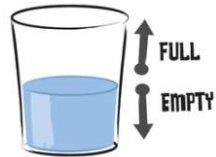
Sep 9, 2025

Bloomberg.com

### Clean Energy Stocks Extend Rally on AI Demand as Oil Falts

Clean-energy stocks are extending their rally into 2026 on optimism over artificial intelligence demand, while oil companies are under...

2 days ago



# ESG INVESTING, DECARBONIZATION & THE GREEN TRANSITION



<https://www.ecgi.global/publications/videos/esg-investing-and-the-green-transition>

## ESG 0.0: Defining ESG & How big is ESG investing?



## ESG 1.0: Do ESG Investors “Walk the (ESG) Talk”?



## ESG 2.0: Even if ESG Investors “Walk The Talk”, Do They Actually Help Achieve ESG Goals?





# Matos (CFA Institute, 2020) *ESG and Responsible Institutional Investing Around the World: A Critical Review*

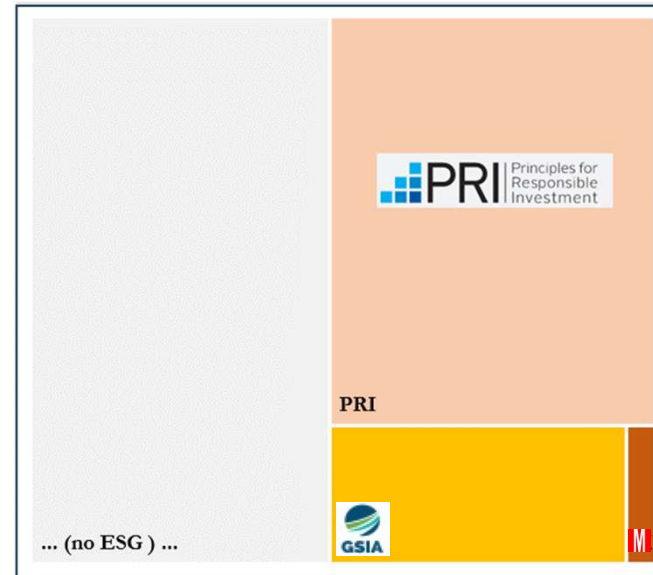
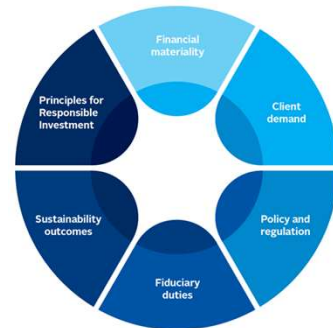
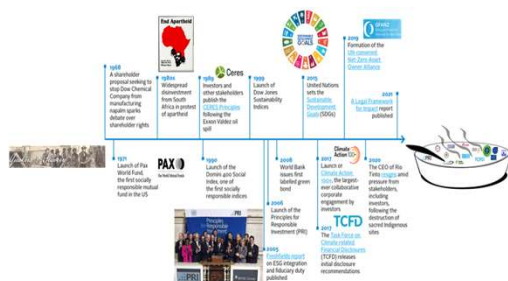
## DEFINING ESG INVESTING



## HOW BIG IS ESG INVESTING?

SIFMA:  
 Total Global Capital Markets = \$ 231 Trillion  
 [Equity Market Cap + Fixed Income Outstanding in 2023]

## ESG INVESTING COMES OF AGE



... depends  
 where you  
 look!!!

<https://www.unpri.org/investment-tools/introductory-guides-to-responsible-investment>

<https://rpc.cfainstitute.org/en/research/foundation/2020/esg-and-responsible-institutional-investing>



## Matos (CFA Institute, 2020) *ESG and Responsible Institutional Investing Around the World: A Critical Review*



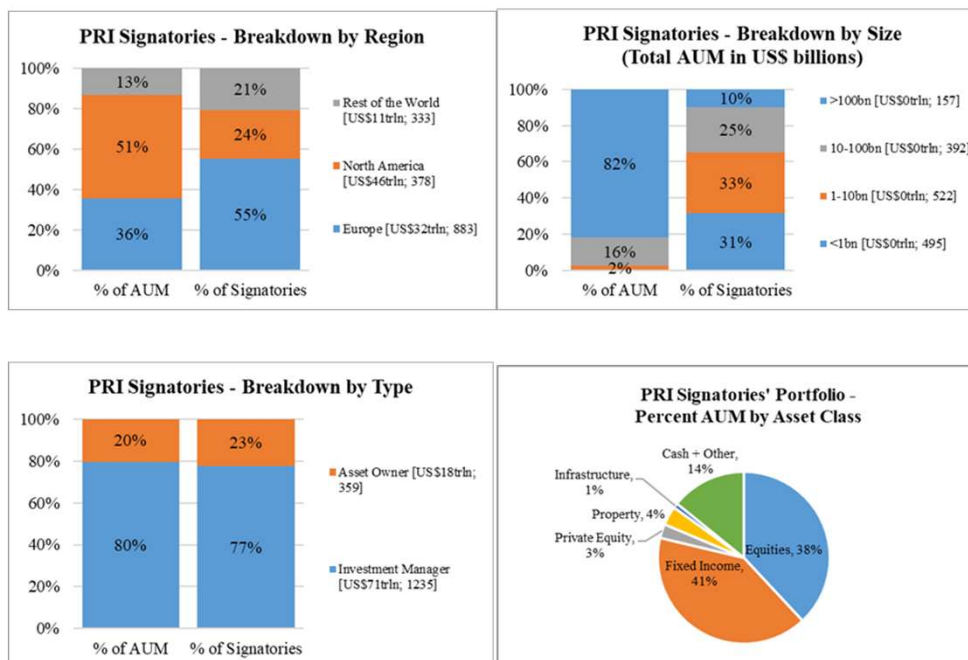
<https://www.unpri.org/about-pri>

### THE SIX PRINCIPLES AND SIGNATORIES' COMMITMENT

- 1 We will incorporate ESG issues into investment analysis and decision-making processes.
- 2 We will be active owners and incorporate ESG issues into our ownership policies and practices.
- 3 We will seek appropriate disclosure on ESG issues by the entities in which we invest.
- 4 We will promote acceptance and implementation of the Principles within the investment industry.
- 5 We will work together to enhance our effectiveness in implementing the Principles.
- 6 We will each report on our activities and progress towards implementing the Principles.

Launched in 2006, the Principles for Responsible Investing (PRI) is widely recognized as the most influential organization devoted to the advancement of ESG investing globally

**Figure 5. Statistics on PRI Signatories Reporting in 2019: AUM and Number of Signatories**



<https://rpc.cfainstitute.org/en/research/foundation/2020/esg-and-responsible-institutional-investing>





## Matos (CFA Institute, 2020) ESG and Responsible Institutional Investing Around the World: A Critical Review

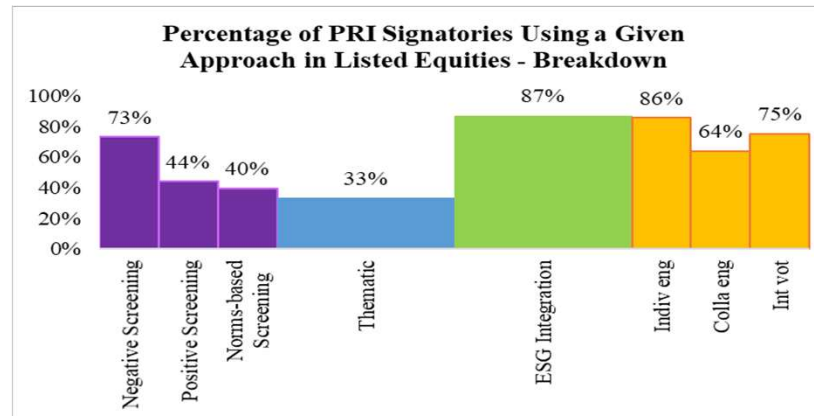
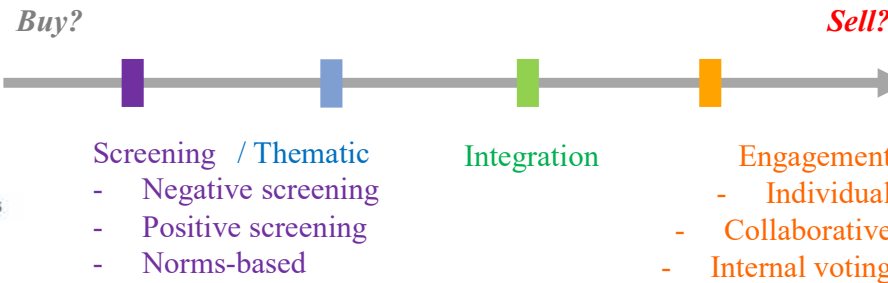


<https://www.unpri.org/about-pri>

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Launched in 2006, the Principles for Responsible Investing (PRI) is widely recognized as the most influential organization devoted to the advancement of ESG investing globally



**Figure 6. ESG Incorporation—Extensive Margin: Percentage of PRI Signatories Using a Given Approach**



Do Responsible Investors Invest Responsibly? <sup>FREE</sup>

Rajna Gibson Brandon, Simon Glossner, Philipp Krueger, Pedro Matos, Tom Steffen

Review of Finance, Volume 26, Issue 6, November 2022, Pages 1389–1432,

<https://doi.org/10.1093/rof/rfac064>

Published: 22 September 2022 Article history ▼

PDF Split View Cite Permissions Share ▼

## Abstract

We study whether institutional investors that sign the Principles for Responsible Investment (PRI), a commitment to responsible investing, exhibit better portfolio-level environmental, social, and governance (ESG) scores. Signatories outside of the USA have superior ESG scores than nonsignatories, but US signatories have at best similar ESG ratings, and worse scores if they have underperformed recently, are retail-client facing, and joined the PRI late. US signatories do not improve the ESG scores of portfolio companies after investing in them. Commercial motives, uncertainty about fiduciary duties, and lower ESG market maturity explain why US-domiciled PRI signatories do not follow through on their responsible investment commitments.

<https://academic.oup.com/rof/article/26/6/1389/6711405>

The Economist

## Dubious green funds are rampant in America

New research suggests Wall Street is banking on bogus claims

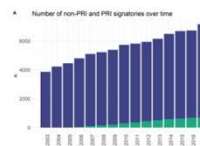


Dec 1st 2022

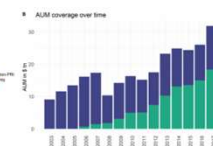
Saved Share Give

<https://www.economist.com/finance-and-economics/2022/12/01/dubious-green-funds-are-rampant-in-america>
Gibson, Glossner, Krueger, Matos & Steffen (Review of Finance, 2022) *Do Responsible Investors Invest Responsibly?*

→ Growth in number of PRI signatories



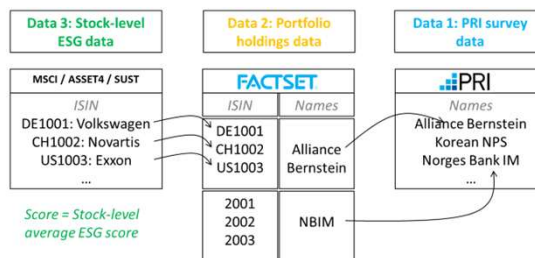
→ U.S. PRI signatories: late, ~55% of AUM



→ Growth in \$ AUM of PRI signatories: ~60% by 2017!

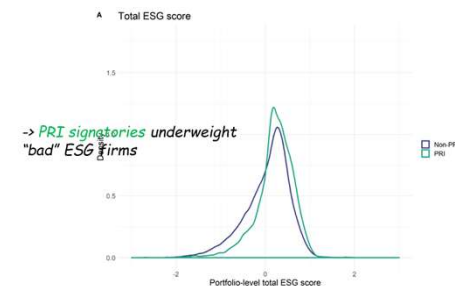


→ Non-U.S. PRI signatories: early, ~75% of AUM!



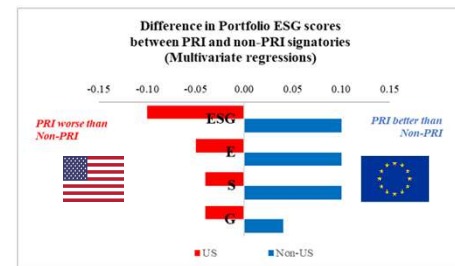
$$\text{Portfolio Score}_{i,t} = \sum_{j=1}^{N_{i,t}} w_{j,t} \times \text{Score}_{j,t}$$

Portfolio-level ESG footprint = value-weighted ESG score of the stocks in the portfolio



→ PRI signatories underweight "bad" ESG firms

PRI signatories "walk the ESG talk" in their portfolio holdings, but US-domiciled PRI signatories do not: is it "GREENWASHING"?



Institutional Investor

ESG's Failed U.S. Invasion  
PRI is required to Europe to invest sustainably. But in North America not. Why? — See more at — [www.institutionalinvestor.com](https://www.institutionalinvestor.com)

There Are 2,698 Signatories to the United Nations' ESG Code. Has It Changed Anyone's Behavior?

## VERY ACTIVE ACADEMIC LITERATURE:

### - Further evidence on PRI signatories:

**Humphrey & Li** (JBF 2021, lower carbon footprint), **Liang, Sun & Theo** (RF 2022, hedge funds), **Kim & Yoon** (MSc 2023, US mutual funds), **Dimson, Karakas & Li** (2023, coordinated engagements), **Dikolli, Frank, Guo & Lynch** (RAS 2022, US mutual funds voting on shareholder proposals), **Ceccarelli, Glossner & Homanen** (2023), **Zou** (2024)

### - Potential greenwashing / impact washing by US mutual funds:

**Dumitrescu, Gil-Bazo & Zhou** (2022), **Parise & Rubin** (2023), **Heath, Macciocchi, Michaely & Ringgenberg** (RF 2022), **Michaely, Ordonez-Calafi & Rubio** (RF 2024), **Sachdeva, Li & Naaraayanan** (2023), **Andrikogiannopoulou, Krueger, Mitali & Papakonstantinou** (2022)

### - Potential greenwashing by banks:

**Kacperczyk & Peydró** (2022), **Kim, Kumar, Lee & Oh** (2023), **Giannetti, Jasova, Loumiotis & Mendicino** (2023)

### - Potential greenwashing by corporations:

**Yang** (2018), **Raghunandan & Rajgopal** (2020), **Duchin, Gao & Xu** (2022), **Bingler, Kraus, Leippold & Webersinke** (2022), **Dzieliński, Eugster, Sjöström & Wagner** (2023), **Cornaggia & Cornaggia** (2023), **Baker, Larcker, McClure, Saraph & Watts** (JAR 2024)

### - Potential issues with ESG rating agencies:

**Berg, Kölbel & Rigobon** (RF 2022), **Berg, Fabisik & Sautner** (2020)

# GREENWASHING SCANDALS?



FT Financial Times

## SEC fines BNY Mellon over ESG in first case of its kind

The US Securities and Exchange Commission has fined BNY Mellon's investment adviser division \$1.5mn for allegedly mistating and omitting information.  
May 23, 2022

FT Financial Times

## Goldman Sachs to pay \$4mn penalty over ESG fund claims

Goldman Sachs has agreed to pay a \$4mn penalty over US regulatory charges that the bank's asset management division misled customers about environmental...  
Nov 22, 2022

B Barron's

## Invesco to Pay \$17.5 Million to Resolve 'Greenwashing' Allegations

The Atlanta-based advisor is the latest to get penalized for its claims about investing in environmental, social, and corporate governance...  
Nov 11, 2024



FT Financial Times

## German police raid DWS and Deutsche Bank over greenwashing allegations

Asset manager accused of misleading investors about ESG factors in its financial products.  
May 31, 2022



B Bloomberg

## Vanguard Fined for Greenwashing as Australia Targets ESG Claims

Australia's federal court has fined Vanguard Investments Australia Ltd. A\$12.9 million (\$8.9 million) for making misleading claims about a...  
Sep 24, 2024

# COMBATING GREENWASHING?

## Voluntary Standards:



CFA Institute

## GLOBAL ESG DISCLOSURE STANDARDS FOR INVESTMENT PRODUCTS

2021

<https://rpc.cfainstitute.org/en/esg-standards>

## Regulation:

EU Taxonomy CSRD SFDR TCFD MiFID and IDD



Sustainable Finance Disclosure Regulation (SFDR)

[https://finance.ec.europa.eu/sustainable-finance/overview-sustainable-finance\\_en](https://finance.ec.europa.eu/sustainable-finance/overview-sustainable-finance_en)

Lambillon & Chesney (2023), Scheitza & Busch (2023)  
Bassen, Kordsachia, Lopatta & Tan (JBF 2025)

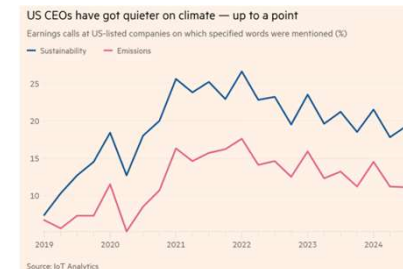
# ... GREENHUSHING?

FT Financial Times

## Have CEOs really gone quiet on climate change?

New data puts 'greenhushing' concerns in perspective.

Sep 30, 2024



## FT Year in a word: Greenlash

(portmanteau noun) the backlash against environmental policies. Not to be confused with greenwashing, green hushing or green wishing

FT Financial Times

## US multinationals purge website references to climate change

Walmart and Kraft Heinz among big corporations deleting or rewriting statements as Trump climate attacks intensify.

Mar 14, 2025

WSJ The Wall Street Journal

## Temperatures Are Higher Than Ever, but Companies Don't Want to Talk About It

Businesses are divulging fewer details about the hazards of extreme weather, from droughts to flooding.

Jun 30, 2025

E The Economist

## The remarkable rise of "greenhushing"

Once companies were accused of "greenwashing": making nonsense promises, and doing nothing to achieve them. Now they seem to be "greenhushing"—...

Jul 29, 2025





# ESG INVESTING, **DECARBONIZATION** & THE GREEN TRANSITION

## ESG 0.0: Defining ESG & How big is ESG investing?



<https://www.ecgi.global/publications/videos/esg-investing-and-the-green-transition>



## ESG 1.0: Do ESG Investors “Walk the (ESG) Talk”?



## ESG 2.0: Even if ESG Investors “Walk The Talk”, Do They Actually Help Achieve ESG Goals?





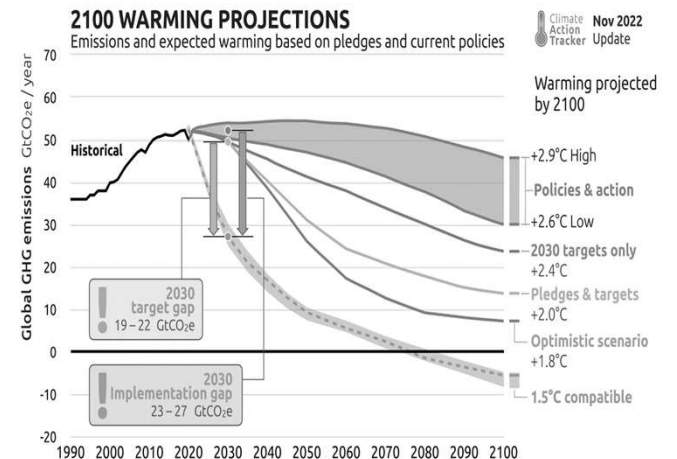
**Need to reduce Greenhouse Gas (GHG)/carbon emissions to keep global temperature increase below 1.5C**  
[Paris Agreement (2015), IPCC(2018)]



**Coordination to achieve the necessary actions is hard**



**Can investor coalitions contribute to solving the climate crisis?**



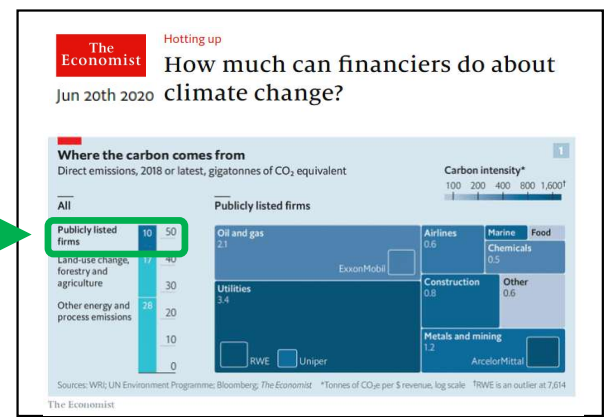
**Are climate conscious institutional investors decarbonizing their portfolios?**



**If so, how are they achieving decarbonization?**



**Going beyond emissions, are investors helping with green transition?**



# Atta-Darkua, Glossner, Krueger & Matos (working paper) *Decarbonizing Institutional Investor Portfolios: Helping to Green the Planet or Just Greening Your Portfolio?*



## Institutional Investor

PORTFOLIO

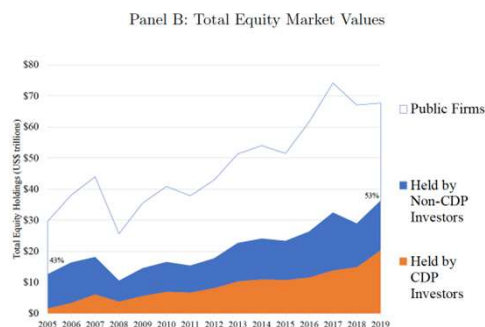
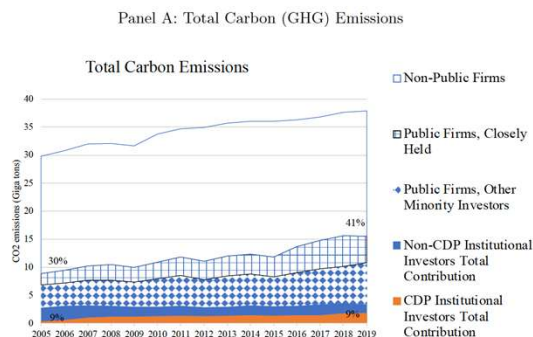
### Divesting Is 'Counterproductive,' New Research Says

Tilting a portfolio away from carbon emitters just continues the cycle of pollution.

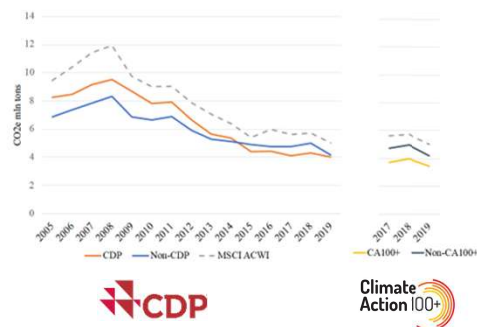
By Jessica Hamlin September 26, 2022



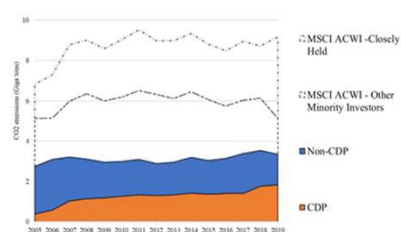
<https://www.institutionalinvestor.com/article/b1zyz6wwc0l59t/Divesting-Is-Counterproductive-New-Research-Says>



### Scope 1

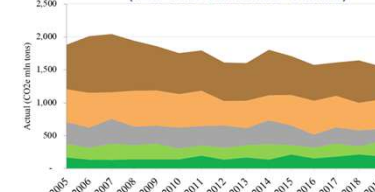


### SCOPE 1 FOOTPRINT



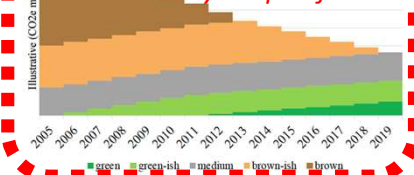
### Portfolio Decarbonization Strategies:

#### INSTITUTIONAL INVESTOR TOTAL SCOPE 1 FOOTPRINT (TOP 100 EMITTING FIRMS)



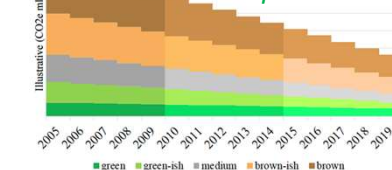
#### TILTING

Tilt to "green your portfolio"?



#### ENGAGEMENT

Engage to "green the planet"?



[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4212568](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4212568)

## VERY ACTIVE ACADEMIC LITERATURE:

- **Carbon Pricing vs. Green Finance:** Pedersen (2023)
- **CDP/CA100+ and the Big 3:** Cohen, Kadach & Ormazabal (2023)
- **“Tilting in” vs. “tilting away” and the cost of capital channel:** Heinkel, Krauss & Zechner (2001) , Hong & Kacpercyck (2009), Bessembinder, (2016), Davies & Van Wesep (2018), Berk & Van Binsbergen (2021), Choi, Gao, Jiang & Zhang (2023), Pedersen, Fitzgibbons & Pomorski (2021), Giglio, Maggiori, Rao, Stroebel & Weber (2021), Ardia, Bluteau, Boudt & Ingelbrecht (2022), Edmans, Levit & Schneemeier (2022), Pastor, Stambaugh & Taylor (2023), Hartzmark & Shue (2023), Becht, Pajuste & Toniolo (2023)
- **The debate over “carbon/green premium”:** Bolton & Kacperczyk (several papers), Pastor, Stambaugh & Taylor (2021, 2022), Aswani, Raghunandan & Rajgopal (2022), Karaolyi, Wu & Xiong (2023), Zerbib (2022), Sautner, Van Lent, Vilkov & Zhang (2023)
- **Spillovers along supply chain / outsourcing:** Duchin Gao, Xu (2022), Dai, Duan, Liang & Ng (2021), Bisetti, She & Zaldokas (2023)
- **Other asset classes:** Zerbib (2019), Baker, Bergstresser, Serafeim & Wurgler (2018), Painter (2020), Flammer (2021), Bauer & Rudebusch (2021), Berrada, Engelhardt, Gibson & Krueger (2022), Caramichael & Rapp (2022), D’Amico, Klausmann & Pancost (2023)
- **Monetary policy:** Papoutsis, Piazzesi & Schneider (2021), Hansen (2022)



# ESG INVESTING, DECARBONIZATION & THE GREEN TRANSITION

I.

## ESG INVESTING



II.

## THE GREEN TRANSITION



### The Green Transition: Evidence from Corporate Green Revenues

Johannes Klausmann, Philipp Krueger & Pedro Matos

University of Houston Bauer College of Business  
University of Geneva, Swiss Finance Institute and ECGI  
University of Virginia Darden School of Business and ECGI



Transition has been slow to a “green” low-carbon, resource-efficient and more environmentally sustainable economy

### How to speed up the “greening” of the economy?

Some jurisdictions have introduced green classification systems [ex: the EU Taxonomy on Sustainable Finance (Regulation EU 2020/852) - Inderst and Opp (2025)]



► **Do firms have the technological solutions?** proxy: green patents [Acemoglu et al. (2016)]

► **Are investors willing to finance the transition?** proxy: green-aligned institutional investors [Oehmke and Opp (2024)]

**% Green Revenues** = revenues a firm derives from “green” products/services that contribute positively to the environment

► FTSE Russell: Green Revenues Classification System (GRCS) 2.0 data model [disclosed + company-specific estimates + sector estimates]; backfill point estimates from 2016 going back to 2008



-> new measure of transition to green has **low correlation** with measures used in prior literature:

(1) S&P Trucost: **greenhouse gas emissions** [ex: Bolton & Kacperczyk (2021, 2023)]

(2) MSCI: industry-adjusted **ESG scores** or Pastor, Stambaugh & Taylor (2022) modified E-score

[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4850449](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4850449)

Klausmann, Krueger & Matos (working paper) *The Green Transition: Evidence from Corporate Green Revenues*

## THE GREEN TRANSITION ... “Taxomania” (or not ?)

UNEP Finance Initiative

## Principles for Taxonomy Interoperability

The Principles for Taxonomy interoperability, developed by partners in the Taxonomy Roadmap Initiative, are intended to help countries and regulators design...

Nov 7, 2025



ESG Today

## Canada to Launch Sustainable Investment Taxonomy

The Government of Canada outlined a plan to develop a new sustainable investment taxonomy, a set of guidelines to help categorize sustainable economic...

Oct 10, 2024



Valor International

## Brazil pushes “supertaxonomy” at COP30 to align global standards

Finance Ministry says proposal will set principles to make national rules for sustainable activity comparable and boost investment in developing countries.

Sep 23, 2025



## Global Landscape of Sustainable Finance Taxonomies

Last update May, 2025

STATUS: ● Developed and implemented ● Under development ● Plan to develop

Bloomberg.com

## UK Abandons Green Taxonomy Plan to Focus on Other Policies

Takeaways by Bloomberg AI Hide - The UK will not create its own framework for sustainable investments, according to a consultation document...

Jul 15, 2025

ESG Today

## Australia Launches Sustainable Finance Taxonomy

A new voluntary classification system for categorizing green and transition-focused economic activities, aimed at improving transparency and facilitating...

Jun 17, 2025

CCAP

Authors: Adriane Becker Farias,  
Joshua Joseph Pangelinan,  
Anthony Maria

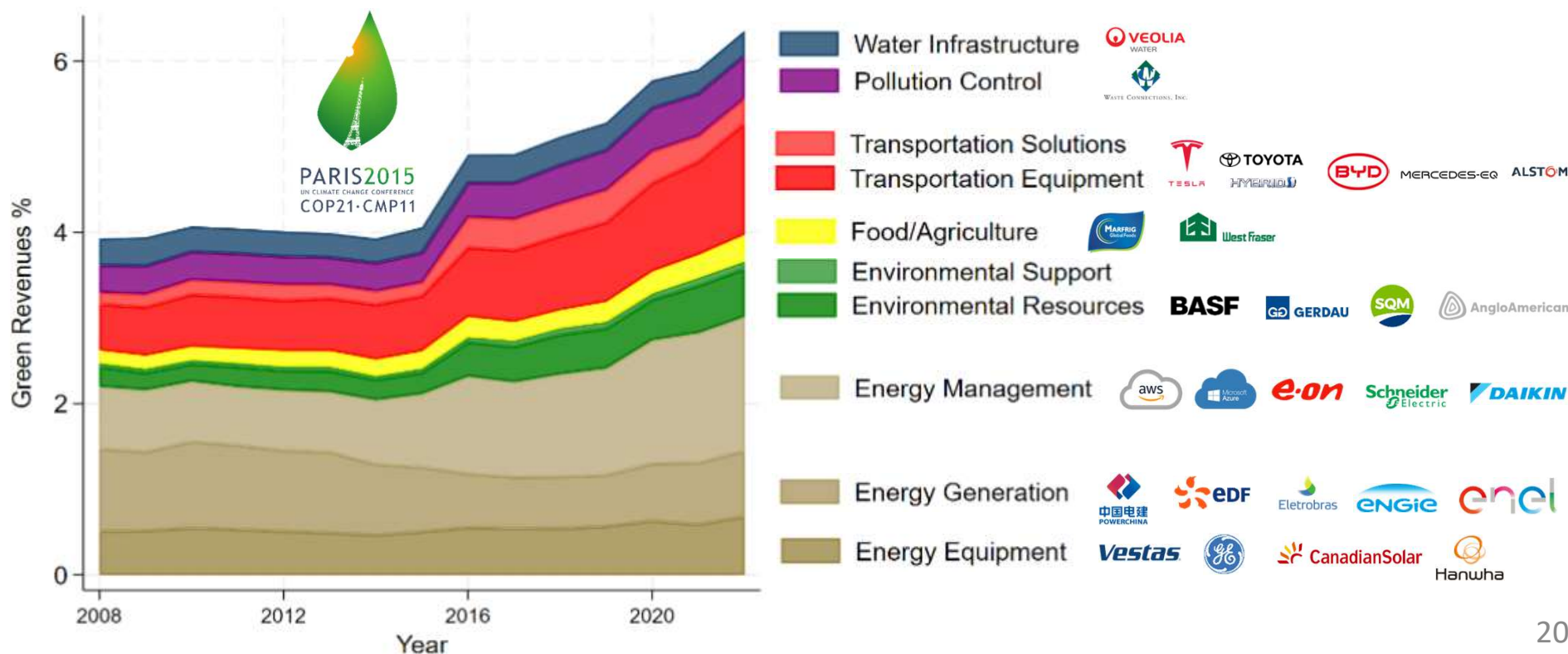


## Q1: Sizing the green economy?

Green Revenues accelerate post Dec 2015 Paris Agreement  
[data: FTSE Russell's 10 GRCS green sectors]

2022: 6.5 % revenues

(aggregate USD \$4 trillion ~ Oil & Gas sector)!

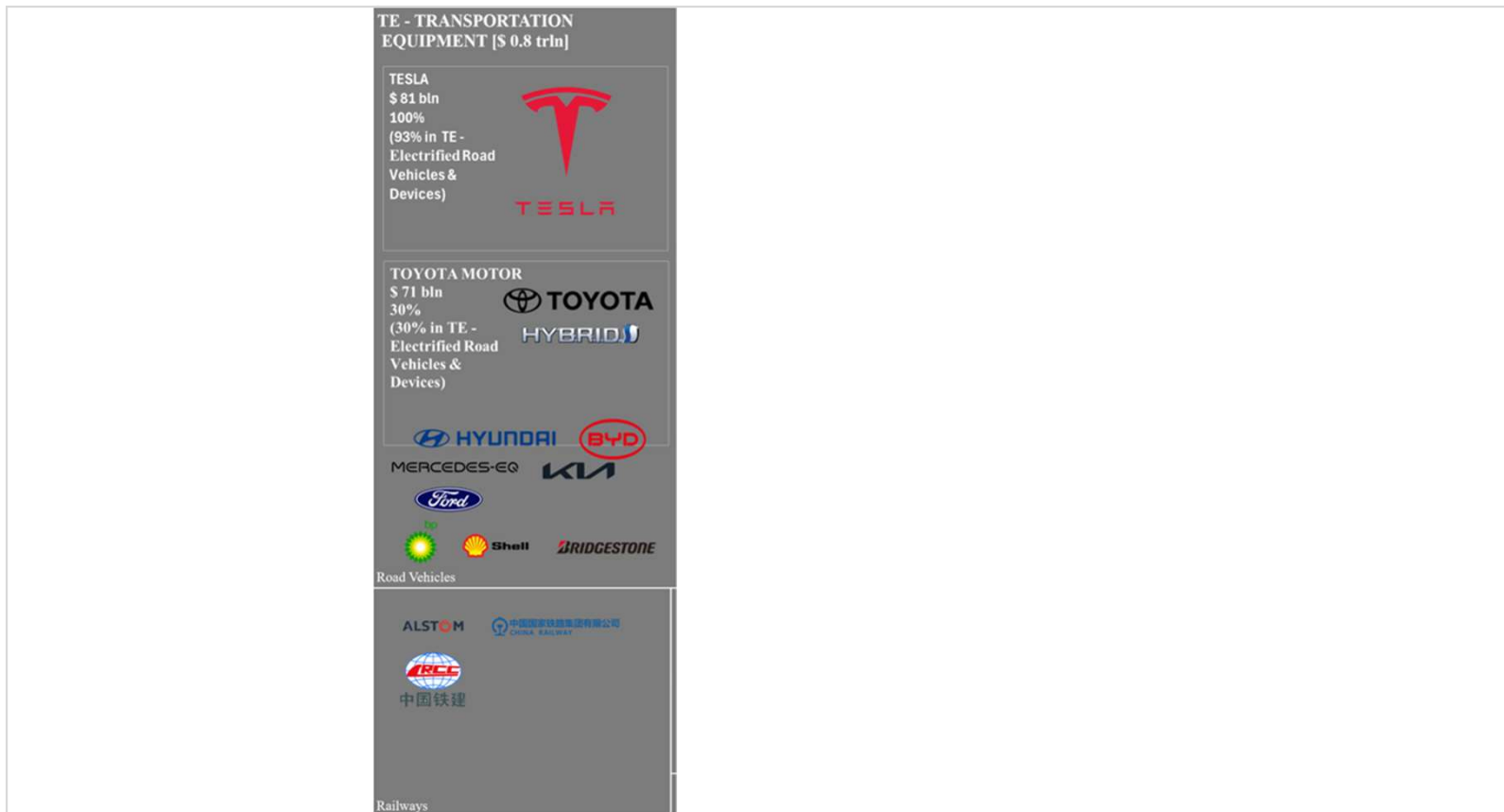






## Q1: Sizing the green economy?

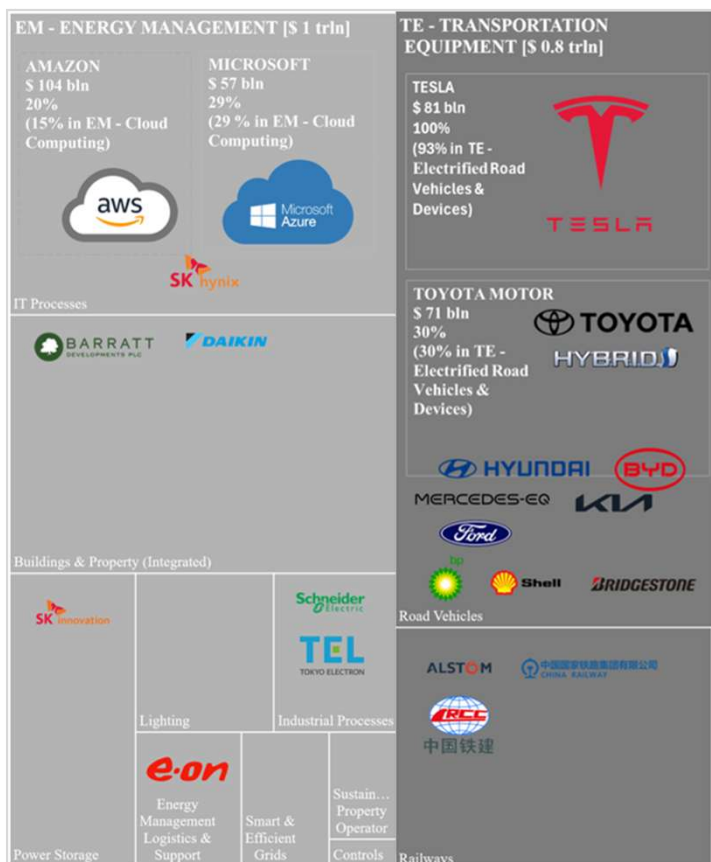
Green Revenues in 2022: USD \$4 trillion



Klausmann, Krueger & Matos (working paper) [\*The Green Transition: Evidence from Corporate Green Revenues\*](#)

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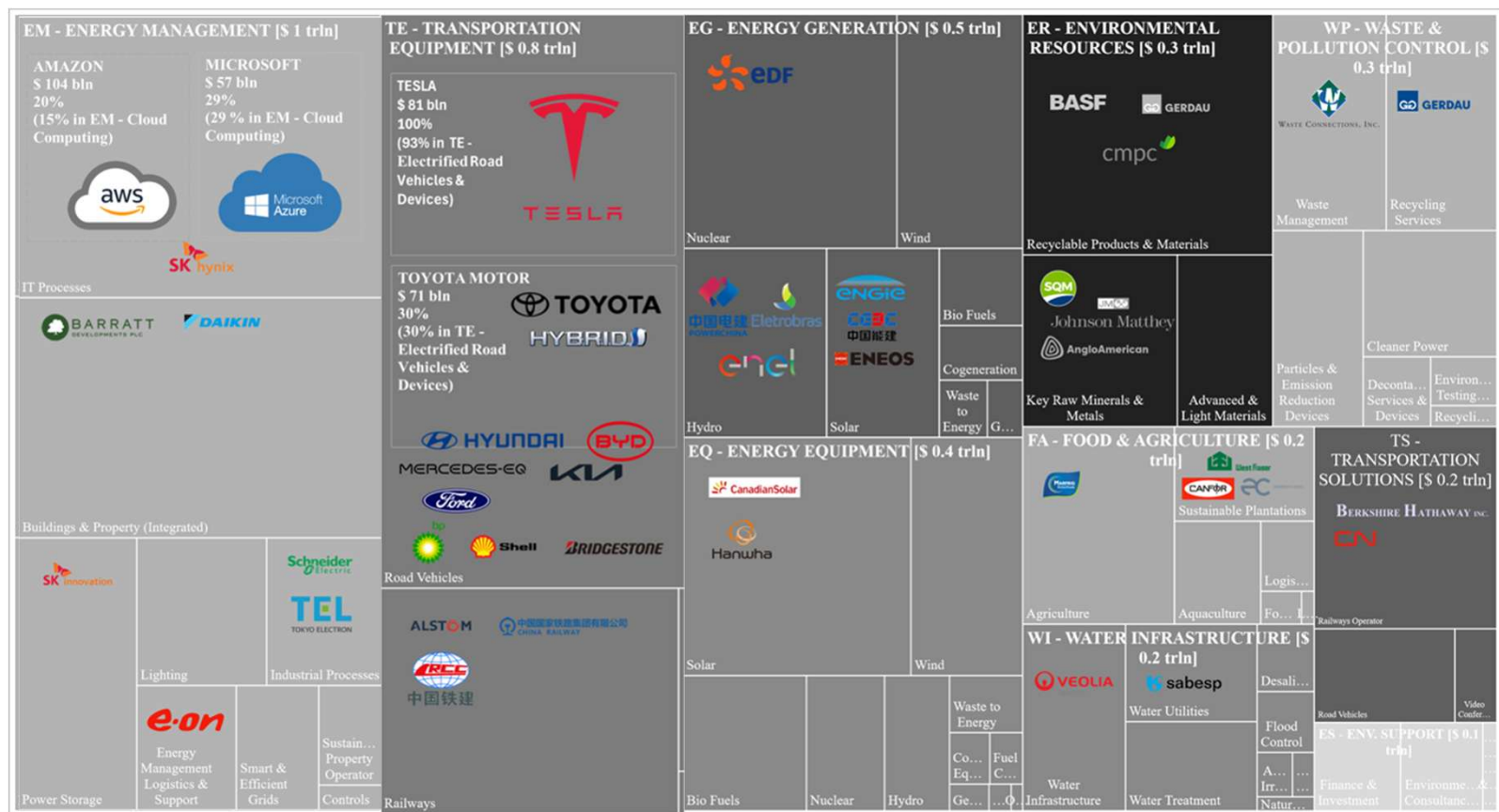
Green Revenues in 2022: USD \$4 trillion



Klausmann, Krueger & Matos (working paper) *The Green Transition: Evidence from Corporate Green Revenues*

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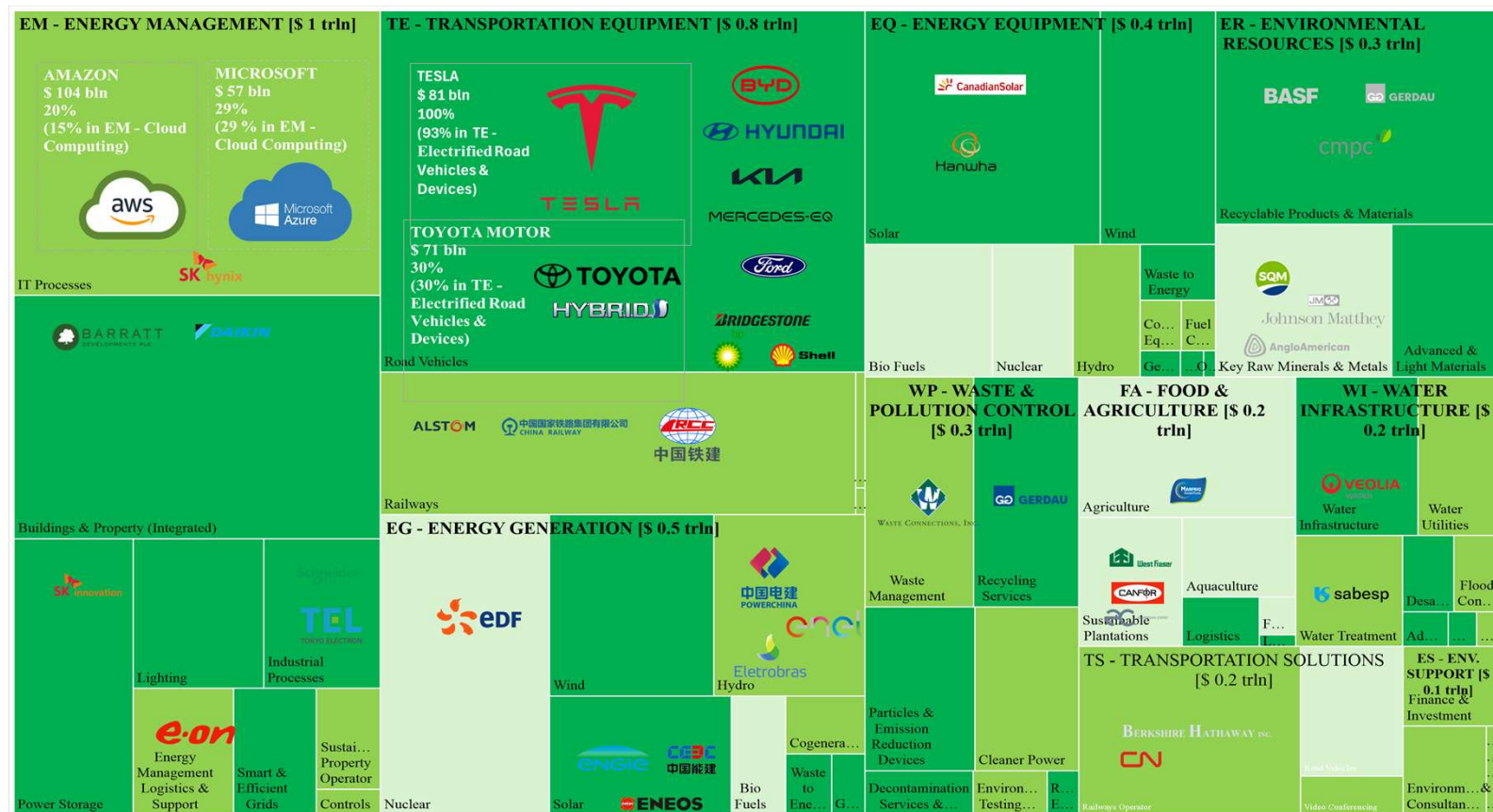
Green Revenues in 2022: USD \$4 trillion



Klausmann, Krueger & Matos (working paper) *The Green Transition: Evidence from Corporate Green Revenues*

## Q1: Sizing the green economy?

Green Revenues in 2022: FTSE Russell GRCS by Tier 1/2/3 of greenness







## Q1: Sizing the green economy?

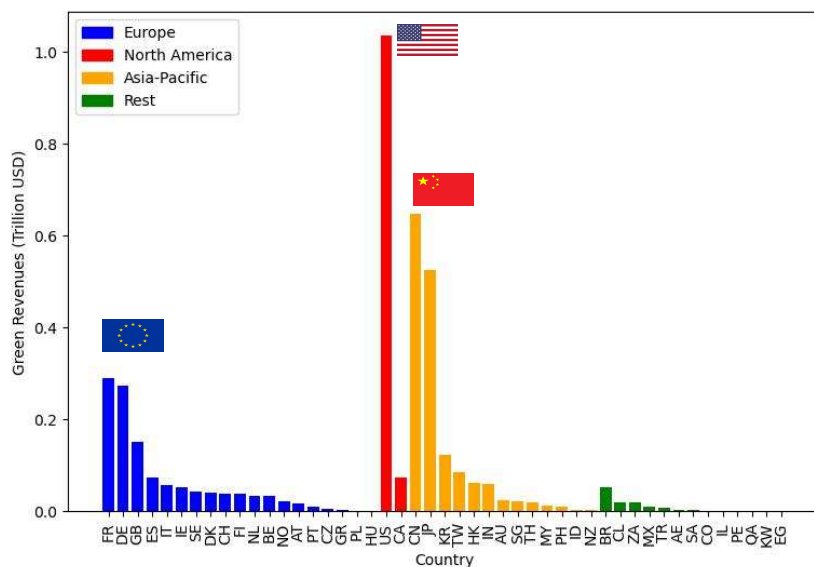
Green Revenues accelerate post Dec 2015 Paris Agreement  
[data: FTSE Russell's 10 GRCS green sectors]

**Concentrated in Europe!** 

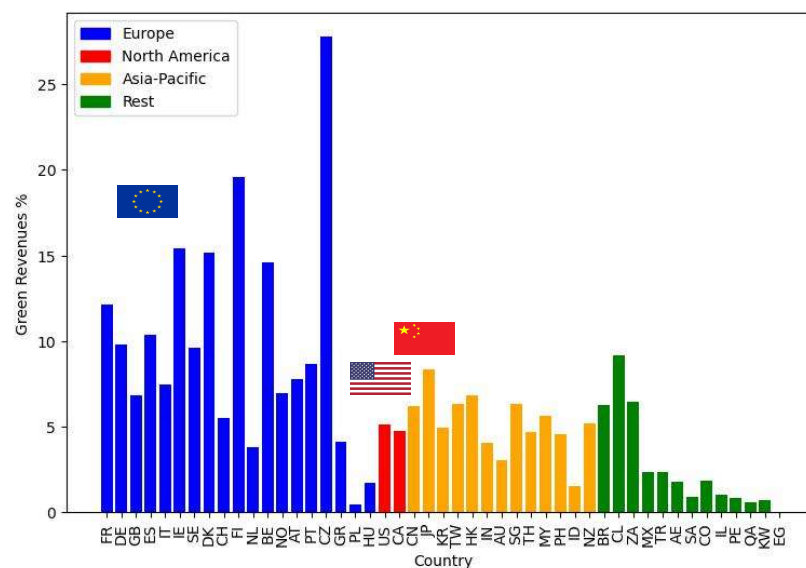
[ Paris Shock and EU lead: 2018 - Technical Expert Group;  
2020 - roll out of EU Taxonomy for Sustainable Finance ]

### Green Revenues by Country

Absolute (\$ trillions)



Relative (% of total revenue)



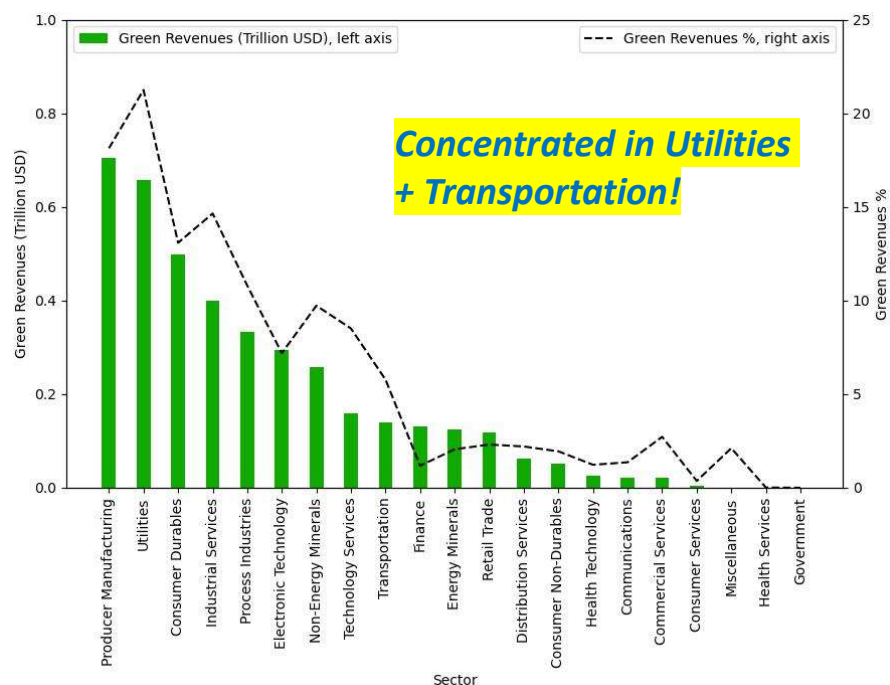


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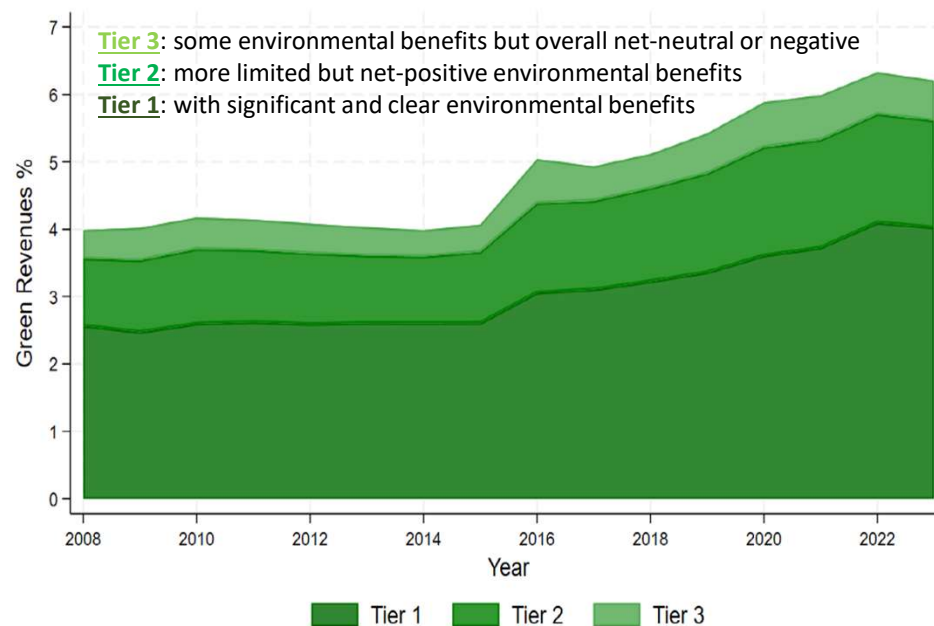
Green Revenues accelerate post Dec 2015 Paris Agreement

[data: FTSE Russell's 10 GRCS green sectors]

### Green Revenues by Industry



### Green Revenues Tier 1/2/3 of greenness





## Q2: Identify the drivers of the green economy?

### ► #1 – Internal capabilities (green patents):

*US firms with green patents better able to take innovations to market*

Result: firms with green patents *pre Paris* experienced an increase of 2.3% in green revenues *post Paris*

UVA DARDEN

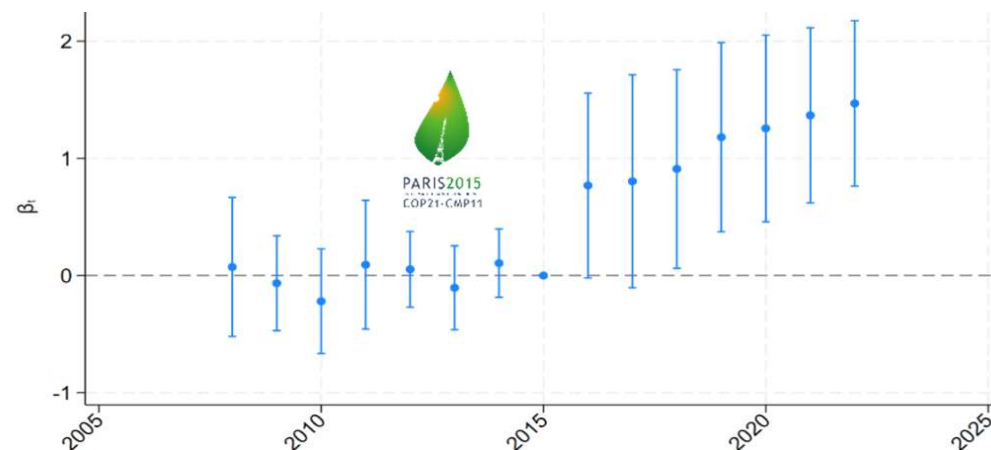
GLOBAL CORPORATE  
PATENT DATASET



Bena, Ferreira, Matos & Pires (2017)

<https://patents.darden.virginia.edu/>

green patents based on Hascic & Migotto - OECD, 2015 [used by Cohen et al. (2023), Hegeet al. (2022), Atta-Darkua et al. (2022)]



### Additional results:

- Similar magnitudes for alternative green revenue definitions (**Tier 1** or EU Taxonomy-eligible green revenues)
- Firm FEs, Intensive margin, Process vs. product patents
- No “substitution” of brown by green revenues
- Placebo test: green (not any type of) patents
- Driven primarily by firms outside of Europe
- Energy hold green patents but do not seem take them to market (preemption?)

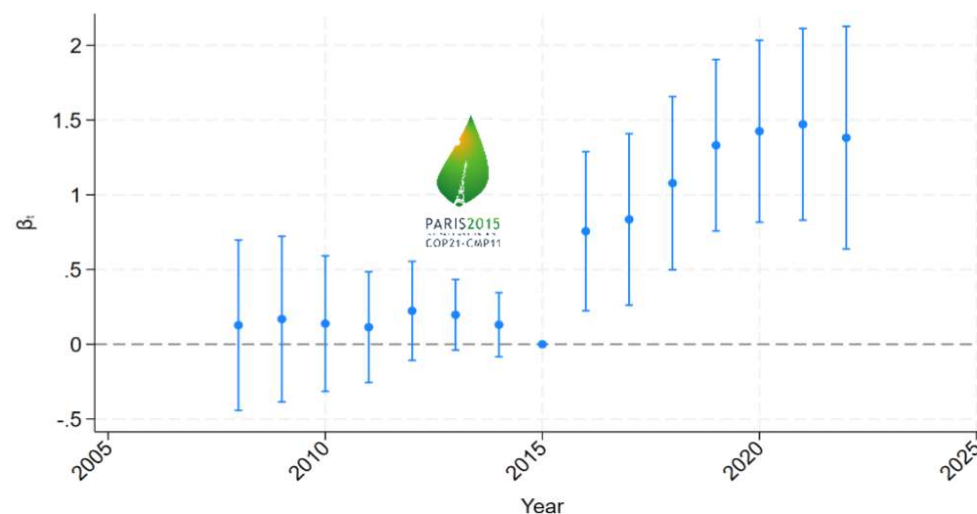


## Q2: Identify the drivers of the green economy? (Cont.)

### ► #2 – External financing (green-aligned institutional investors):

Responsible (IO PRI), Climate-aware (IO CDP) and Longer-term (low Turnover) institutional ownership associated with higher green revenues

FactSet:  
institutional ownership data



Additional regression test results:

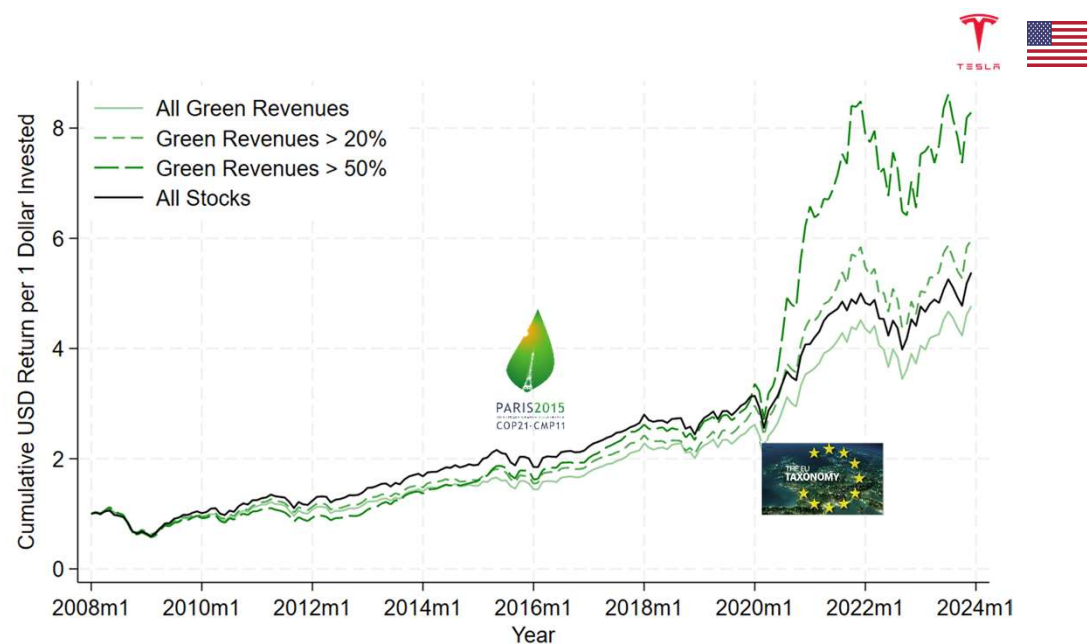
- Similar magnitudes for alternative green revenue definitions (Tier 1 or EU Taxonomy-eligible green revenues)
- Dollar green (vs. brown) revenues, time-varying IO



### Q3: Do Investors Value Green Revenues?

Plot cumulative return of value-weighted green portfolios (stocks with green revenues  $> 0\%$  ,  $> 20\%$  ,  $> 50\%$  )

► Question: Is there a “green alpha” if we control for asset pricing factors?







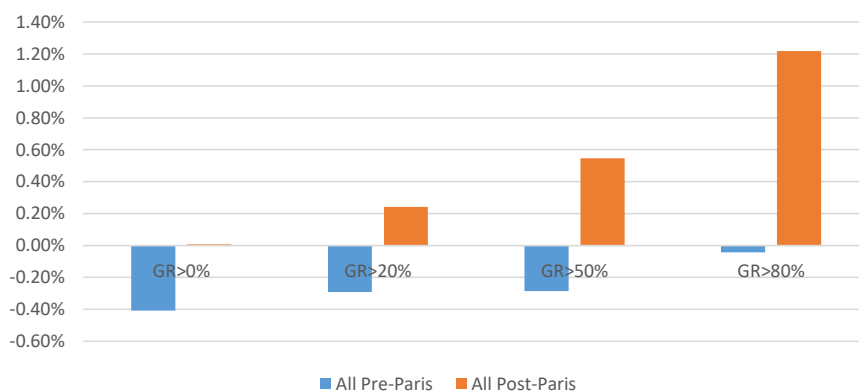
### Q3: Do Investors Value Green Revenues?

Value-weighted portfolios: “green stocks” (green revenues > 0% , > 20% , > 50%, >80% ) – “legacy” (no green revenue)

► Evidence of “green alpha” limited to US firms with high green revenues, post Paris  
[ Roy (1951) “sorting” effect? ]



Green Minus Legacy (GML)  
Five-Factor Alphas - Pre- and Post Paris  
[average (in % per month)]



Stronger post Paris for:

- US stocks
- with high green patents
- with high IO

[US value-weighted results hold even if exclude Tesla or do equally-weighted]

## EMERGING ACADEMIC LITERATURE:

- **Green Patents & R&D:** Cohen, Gurun & Nguyen (2023), Hege, Pouget & Zhang (2024), Bolton, Kacperczyk & Wiedemann (2022)
- **Greenium:** Pastor, Stambaugh, & Taylor (2021, 2022), Zerbib (2022), D'Amico, Klausmann & Pancost (2024)
- **Green Taxonomies:** Bassen et al. (2023, 2024), Lel (2024), Hoepner et al. (2024)
- **EU Policy Frameworks:** Sautner et al. (2022), Hoepner et al. (2023), Dai et al. (2023), Lambillon & Chesney (2023), Giglio, Kuchler, Stroebel & Zeng (2023), Scheitza & Busch (2024), Opp & Inderst (2025)
- **Paris Agreement shock:** Seltzer, Starks & Zhu (2022), Ramadorai & Zeni (2021)

# ESG INVESTING, DECARBONIZATION & THE GREEN TRANSITION

I.

## ESG INVESTING



II.

## THE GREEN TRANSITION



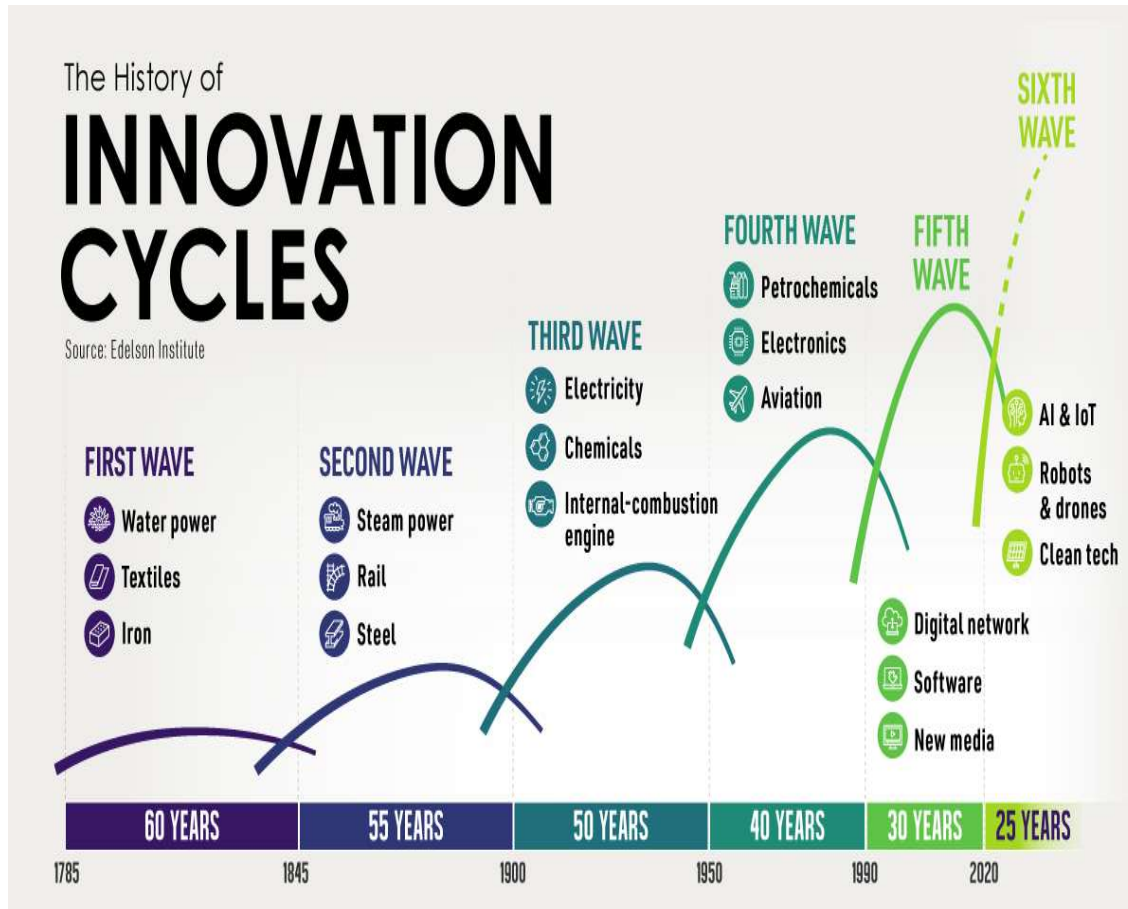
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## III. WHAT'S NEXT: GREEN TRANSITION & THE A.I. REVOLUTION ?

# WHAT'S NEXT: GREEN TRANSITION & THE A.I. REVOLUTION ?



The New York Times

## Will A.I. Ruin the Planet or Save the Planet?

It's a notorious energy hog. But artificial intelligence can also foster innovation and discovery, and it could speed the global transition...

Aug 26, 2024

FT

MARCH 26 2024

## AI is accelerating the energy transition, say industry leaders

The technology is transforming all areas of the sector, with new roles generated and more traditional, lower-skilled jobs at possible risk

WSJ

July 3, 2024

## AI Threatens Tech Companies' Climate Commitments

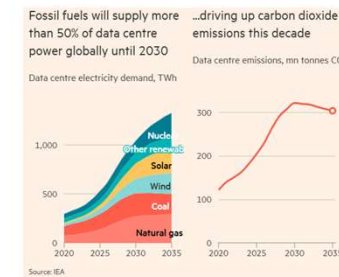
The numbers are starting to roll in, and tech giants' energy use is way up

Financial Times

## How we made it: can energy hungry AI ever be truly green?

AI data centres. This is the second part in a series exploring the race for AI capacity and the data centres at the heart of billions of dollars...

Aug 12, 2025



Bloomberg.com

## Green Stocks Are Big Winners as Tech Boom Drives Energy Demand

It was supposed to be a glum year for green stocks as President Donald Trump pushed his Big Oil agenda. Instead, the sector is booming as...

1 month ago



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## Upcoming 2026: NBS-PRI-ECGI Public Lecture Series

13 January | Marcin Kacperczyk  
(Imperial College London and ECGI) |  
Online

[Event page](#) | [Register](#)

10 February 2026 | Johannes Stroebe  
(New York University) | Online

[Event page](#) | [Register](#)

10 March 2026 | Adriana Robertson  
(University of Chicago and ECGI) | Hybrid

[Event page](#) | [Online Registration](#) | [In-person Registration](#)

14 April 2026 | Jeffrey York (University  
of Colorado Boulder) | Online

11 August 2026 | Shiva Rajgopal  
(Columbia University) | Hybrid

8 September 2026 | Witold Henisz  
(University of Pennsylvania) | Online

13 October 2026 | Renée Adams  
(University of Oxford and ECGI) | Online

10 November 2026 | Caroline Flammer  
(Columbia University and ECGI) | Hybrid



The background of the slide is a photograph of the University of Virginia campus, featuring a large bronze statue of Thomas Jefferson on the left, a circular fountain in the foreground, and the iconic Rotunda building in the distance. The entire image has a warm, orange-brown color filter.

# Thanks!

[MatosP@darden.virginia.edu](mailto:MatosP@darden.virginia.edu)



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