CARBON PRICING UNLOCKED
CARBON PRICING FOR SUSTAINABLE GROWTH

generation foundation

Guidehouse

Managing Hidden Carbon Risks in Financial Portfolios

Part 1 of the Webinar Series
“What is Next for Internal Carbon Pricing?”

5 May 2020

Webinar agenda

Ian Trim
Director
Guidehouse

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Welcome

Alison Paton
Associate
The Generation Foundation

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Thomas Kansy
Director
Vivid Economics

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Long Lam
Managing Consultant
Guidehouse

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Maurice Quant
Senior Consultant
Guidehouse

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Global Dataset for Investigating Embedded Emissions and Value at Risk

Use the chat box to type your question

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Moderated Q&A

Alison Paton
Associate

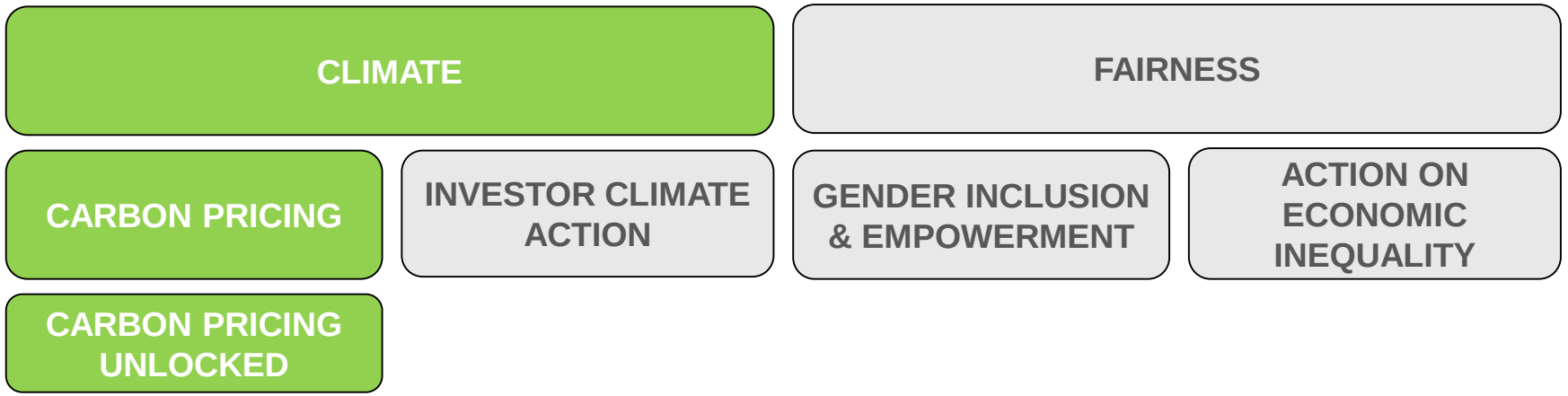
generation foundation

Carbon Pricing Unlocked

About us

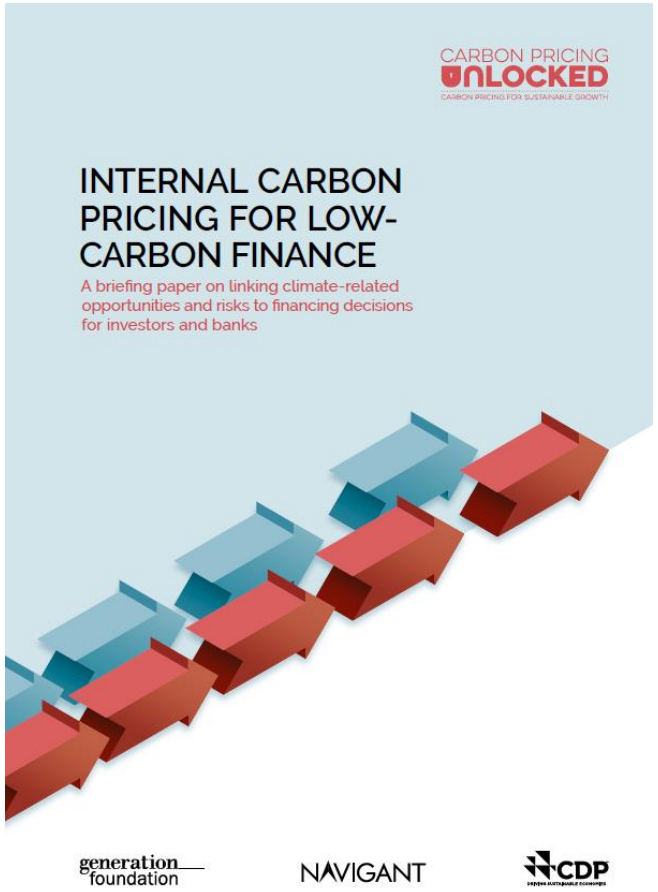
The Generation Foundation is the philanthropic initiative established alongside Generation Investment Management in 2004. Our aim is to accelerate the transition to a more sustainable economic system, one that is low-carbon, prosperous, healthy, safe and fair.

Our priorities:



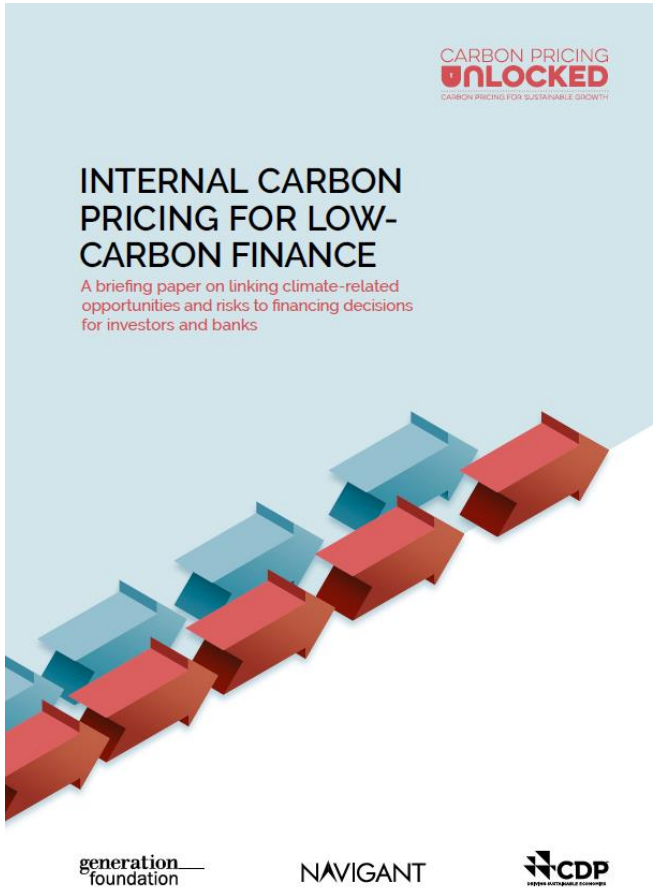
Carbon Pricing Unlocked

- **Carbon prices are currently set far too low** to meet the goals of the 2015 Paris Agreement – yet carbon pricing has the potential to drive sweeping changes throughout the real economy.
- Carbon Pricing Unlocked is a series of **five actionable research papers,** examining the power of carbon pricing to decarbonise key aspects of the real economy.
- **The next ten years will be crucial** for the transition to a sustainable, low-carbon economy. We are focused on achieving an adequate carbon price in major markets which is why we partnered with Navigant / Guidehouse to create Carbon Pricing Unlocked.

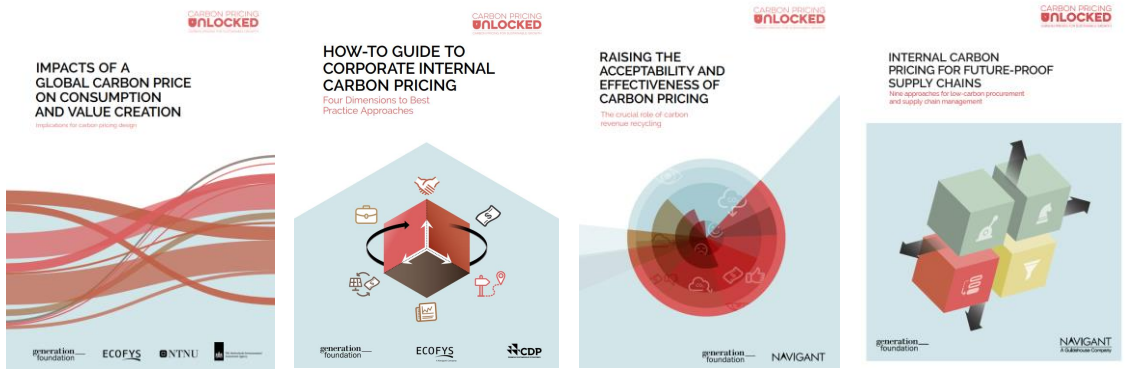


Why this matters

- Carbon pricing can facilitate sustainable global economic growth and help deliver a 1.5°C future.
- Financial institutions are key actors in the transition to a low-carbon economy.
- The sector also faces increasing pressure to incorporate climate-related risks and opportunities into their decision making.
- We want to develop this sector's understanding of the opportunities presented by internal carbon pricing.



Other reports:



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Director

:vivideconomics

Climate Change: Preparing for an Inevitable Policy Response

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Climate Change: Preparing for an Inevitable Policy Response

Thomas Kansy, Director, Vivid Economics

Consortium partners

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- This project was commissioned by the PRI with support from:

Financial markets are underprepared for climate-related policy risks

A forceful policy response to climate change is not priced into today's markets.

Yet it is inevitable that governments will be forced to act more decisively than they have so far, leaving investor portfolios **exposed to significant risk.**

The longer the delay, the more disorderly, disruptive and abrupt the policy will inevitably be.

PRI, Vivid Economics and ETA are building a **high conviction policy-based forecast** of the financial impact of this Inevitable Policy Response (IPR), including a Forecast Policy Scenario:

- How will it affect the economy?
- Which sectors are most at risk?
- Which asset classes will be impacted?

Growing awareness and momentum on climate issues makes a near-term, forceful policy response more likely

Extreme weather events

Impacts on security

The effects of a changing climate are **a national security issue.**

- US Dept. of Defense

Cheaper renewable energy

FINANCIAL TIMES

Europe 'watershed' as green energy set to overpower coal

JUNE 3, 2019

New climate research

Global warming report, an 'ear-splitting wake-up call' warns UN chief

Civil society action

Regulators warning on stability

The catastrophic effects of climate change are already visible around the world. We need collective leadership and action across countries, and we need to be ambitious.

Uninsurable World

Munich RE

"Climate change could make insurance too expensive for most people"

Moody's INVESTORS SERVICE

"Climate change risks outweigh opportunities for P&C (re)insurers"

Influence Shifting

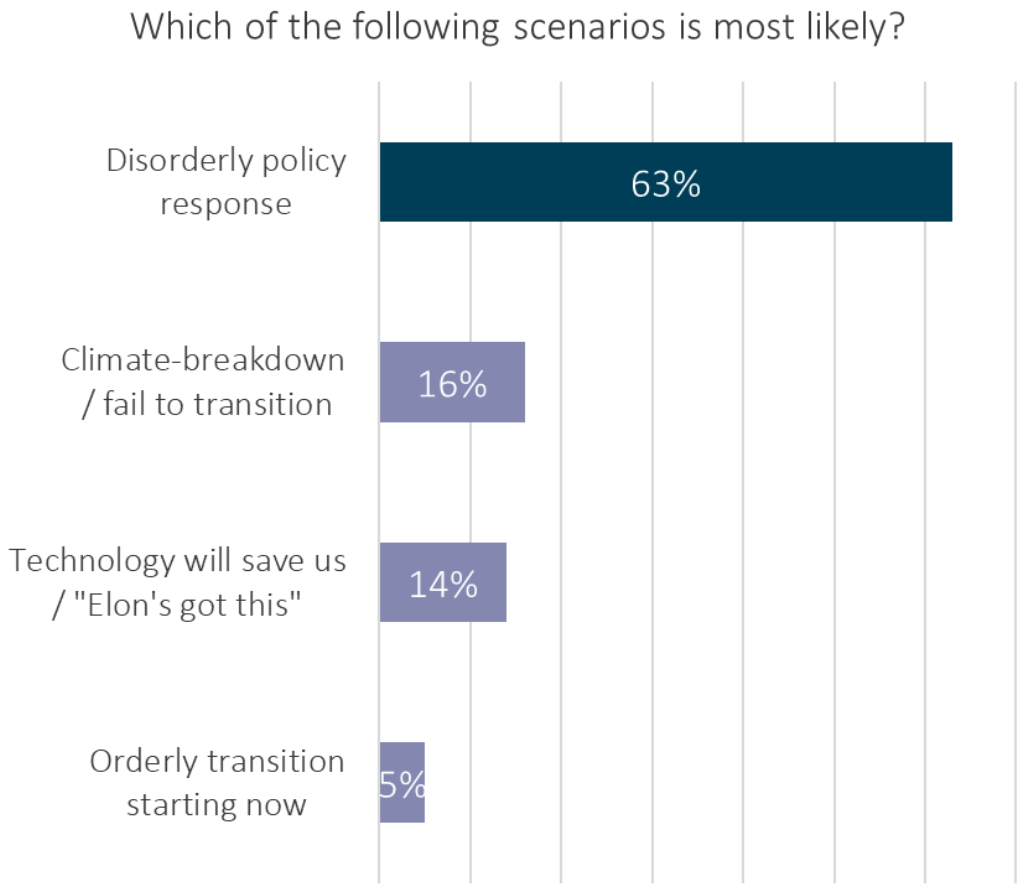
FINANCIAL TIMES

GRAPHICS OPINION WORK & CAREERS LIFE & ARTS HOW TO SPEND IT

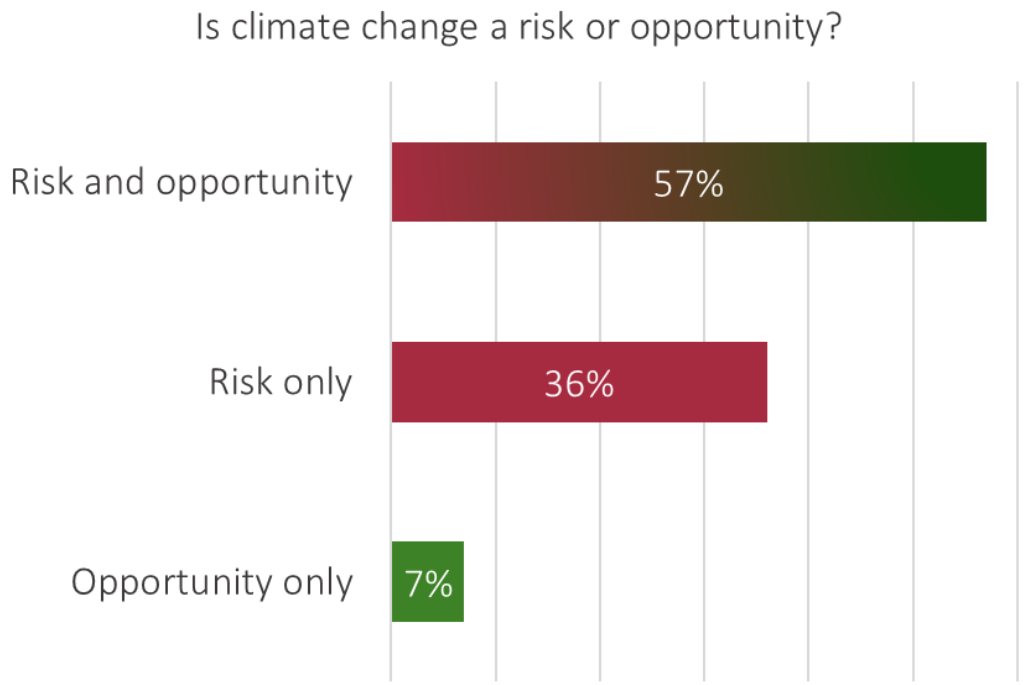
BHP UK investors urge halt to fossil fuel lobbying

Activist shareholders make history in anti-lobby resolution at Origin AGM

Investors acknowledge that there will be a policy response, and that it will be delayed and disruptive, but do not appear to have priced in the risk



Source: UN PRI September 2018



93% of institutional investors say climate change is still not being priced in by the key global financial markets as an investment risk

Source: BNY Mellon Investment Management and CREATE-Research

Key policies we forecast are detailed in the Policy Forecasts:

Coal phase-outs

- Early coal phase-out for first mover countries by 2030
- Steady retirement of coal-fired power generation after 2030 in lagging countries

ICE sales ban

- Early sales ban for first mover countries by 2035
- Other countries follow suit as automotive industry reaches tipping point

Carbon pricing

- US$40-80/$tCO_2$ prices by 2030 for first movers
- Global convergence accelerated by BCAs to ≥$100/$tCO_2$ by 2050

CCS and industry decarbonisation

- Limited CCS support in power
- Policy incentives primarily for industrial and bioenergy CCS
- Public support for demonstration, and then deployment of hydrogen clusters

Zero carbon power

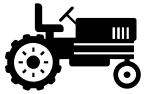
- Significant ramp-up of renewable energy globally
- Policy support for nuclear capacity increase in a small set of countries, nuclear managed out elsewhere

Energy efficiency

- Increase in coverage and stringency of performance standards
- Utility obligation programs,
- Financial and behavioral incentives

Land use-based GHG removal

- Strong policy support for re/afforestation
- Stronger enforcement of zero deforestation
- Controlled expansion of bioenergy crops



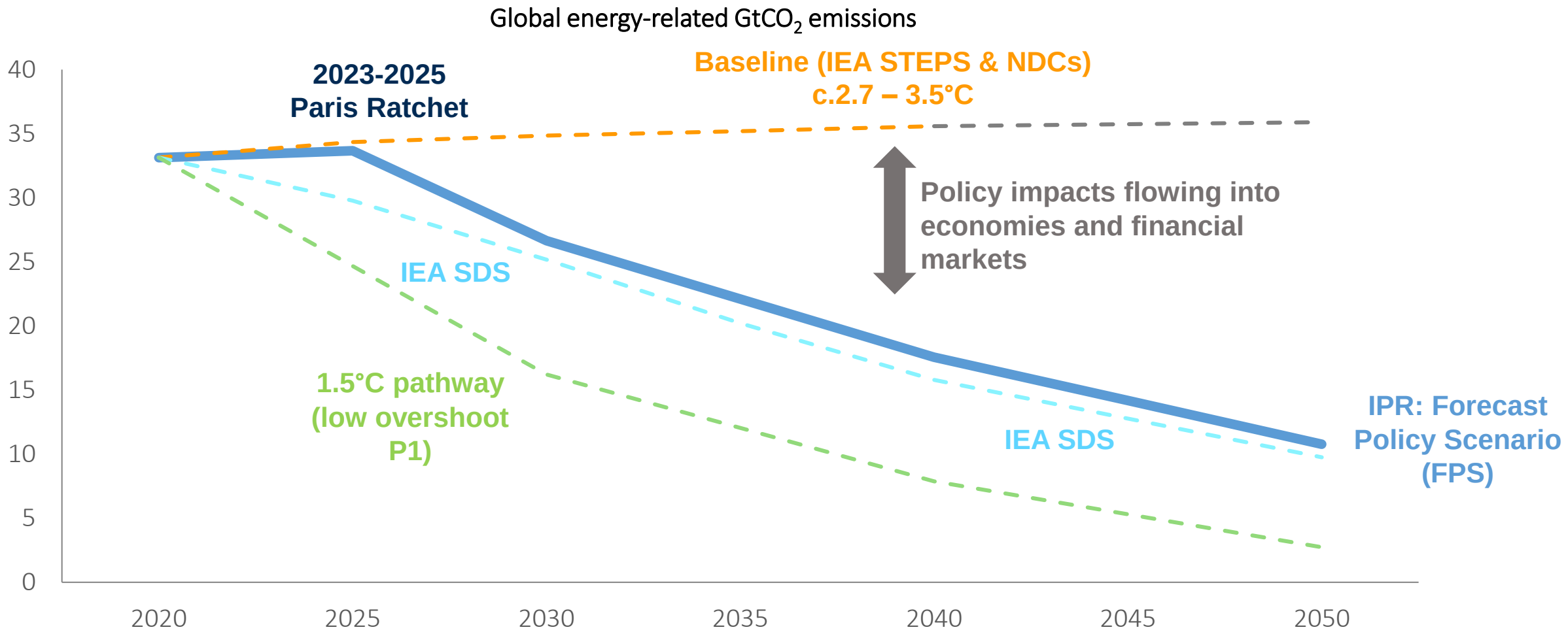
Agriculture

- Technical support to increase agricultural productivity
- Increasing public investment in irrigation and AgTech
- Incremental behavioural incentives away from beef

Enabling a green economy

'Just Transition' lens to ensure social and political feasibility

The IPR: Forecast Policy Scenario (FPS) facilitates discussion around a business planning case to fully value climate-related policy risk



Headline takeaways for investors

Deep and rapid changes in the energy system

- Oil to peak in 2026-28
- Thermal coal virtually non-existent by 2040
- Renewables generating approximately half of all electricity in 2030

Transport electrified inside 20 years

- ICE sales bans, supported by falling cost of EVs, drive rapid deployment of ultra-low emissions vehicles
- Making up over two-thirds of passenger vehicles by 2040

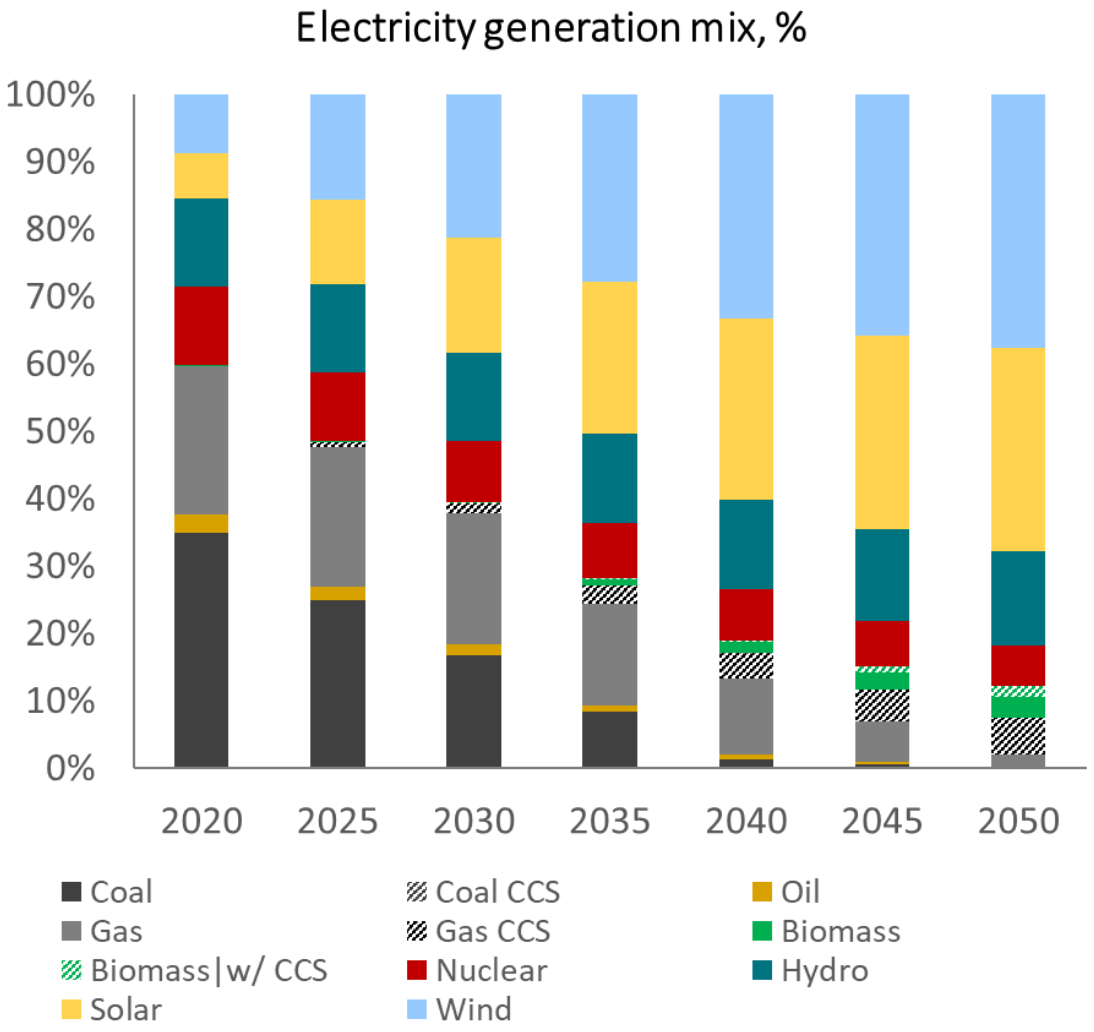
Major changes in land use

- Deforestation virtually eliminated by 2030, with pressures on supply chains
- Large opportunities to invest in nature-based solutions

Rapid reductions in carbon emissions, but not enough to hit 1.5°C

- >60% fall in global CO_2 emissions by 2050
- New innovative policy and industrial solutions, not yet proven or achieved at scale, are needed to achieve 1.5°C

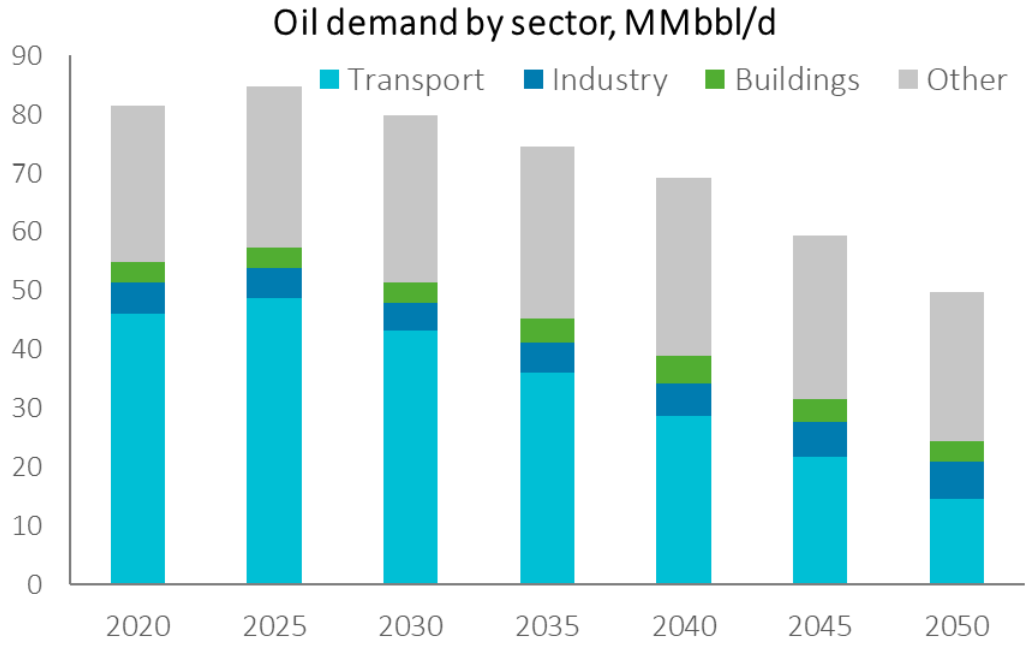
Coal demand is at its peak and will decline rapidly by 2025, while renewable generation grows quickly and supersedes fossil fuels by 2030

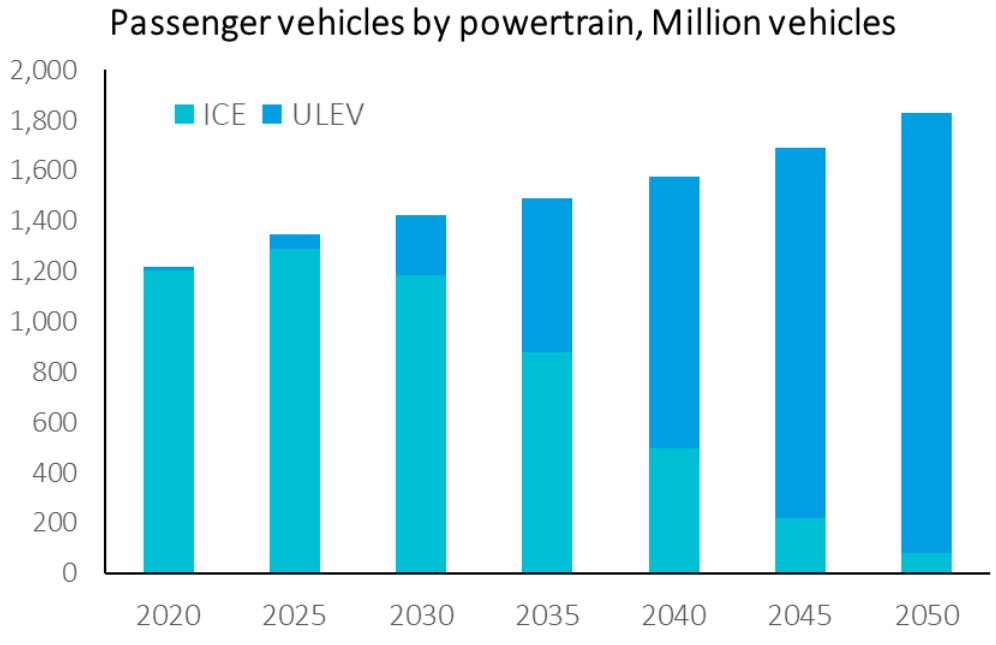


Renewables replace virtually all fossil fuels in electricity generation by 2050

- Coal is phased out by 2050 while gas retains a minor role.
- Slow development of CCS is a barrier to use of biomass as a negative emissions technology as are land use constraints
- Solar and wind alone will generate approximately 2/3 of all electricity in 2050
- IPR FPS has 74% renewable generation in 2040, more than in the IEA SDS, IEA NPS, and BNEF NEO
- Nuclear doesn't grow to replace fossil fuels or renewables given cost and societal issues

Oil demand peaks 2026-28 and falls rapidly as transport uses alternative fuels

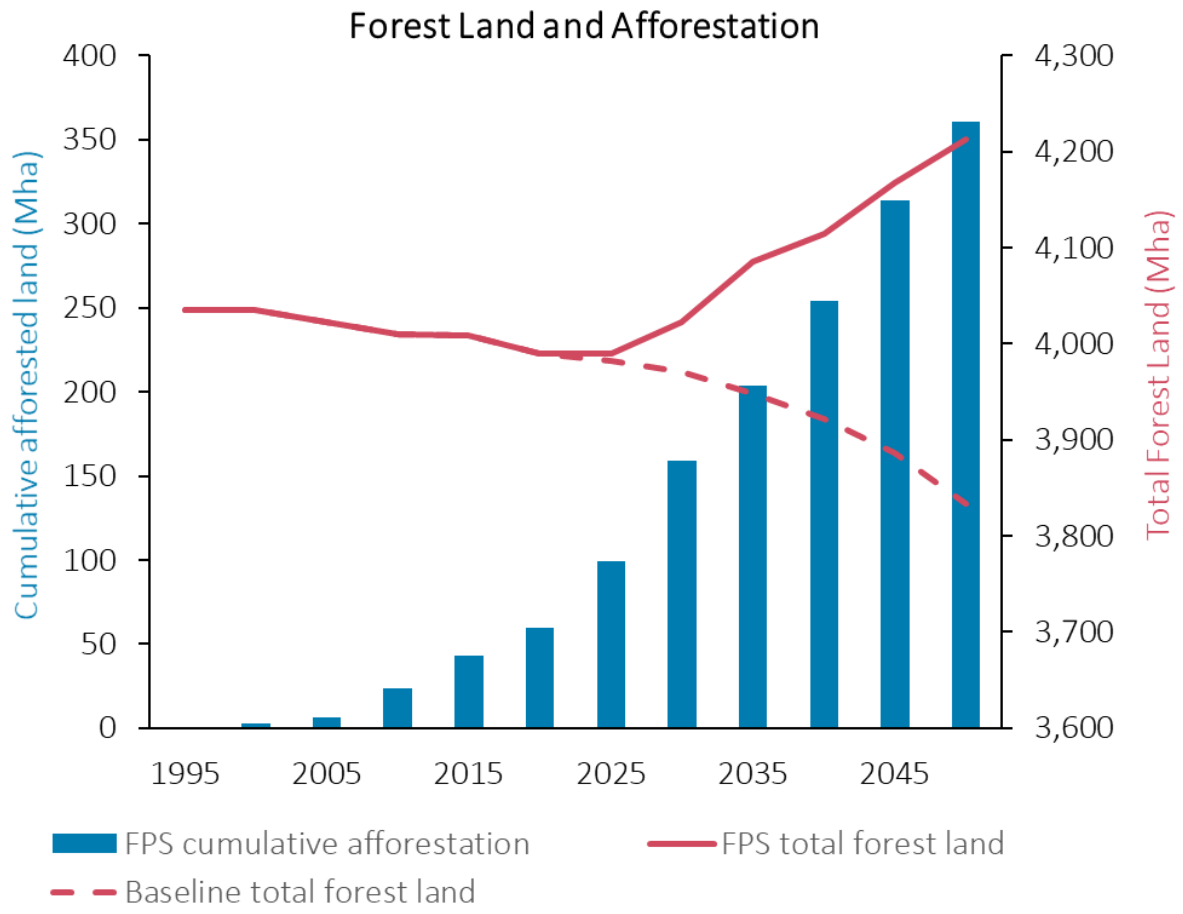




Oil demand peaks between 2026-28 driven by improving ICE efficiency and early uptake of electric vehicles

- Oil in transport decreases by around 70%, while total oil demand decreases around 40% 2025-2050
- Road transport oil demand peaks in 2025, while oil demand in aviation and shipping and as a feedstock for petrochemicals remains significant through to 2050

Deforestation falls rapidly, afforestation and reforestation efforts ramp up, inducing substantial investment in yield-enhancing technologies



Note: 'Total Forest Land' is defined here as dense, high-carbon stock forest land only

Deforestation practically eliminated by 2030, as domestic climate policy targets implemented, and international payments increasingly introduced

- Rapid re/afforestation to meet feasible NDC land use targets in coming decade
- Re/afforestation is driven by emerging payment systems – national and international – and increasing prices in carbon markets
- World meets the Bonn Challenge of 350 Mha of land restoration, but with large delay

Re/afforestation market produces **US$2.8 trillion in revenues** through to 2050.

Global estimates for **yield enhancing investments total more than $20 trillion** from 2015 to 2050

Key Equity Market Findings: Disruption at the Sector and Company level

Overall, **risk to financial markets is significant**, **but appears manageable with the** iShares MSCI ACWI ETF fall by a noncyclical **3.1% or $1.6trn**

This includes downside demand and cost exposure of $2.1trn (or a 4% fall in share values) offset by about $0.5trn from green demand creation.

If repricing occurs in 2025, when the policy forecasts start to affect cash flows of companies, **the impact further rises to -4.5%.**

Increased volatility is also likely with a more event-driven price adjustment so the impact could be more significant

The most disruption is seen at sector and company level, with some big winners and losers

Some primary sectors will be pure losers or winners – mean company valuations in energy sector fall by 33%

Within other sectors there is large variation across companies, for example, 80% of impacts in the Utilities sector lie between -62% to 41% of current valuation

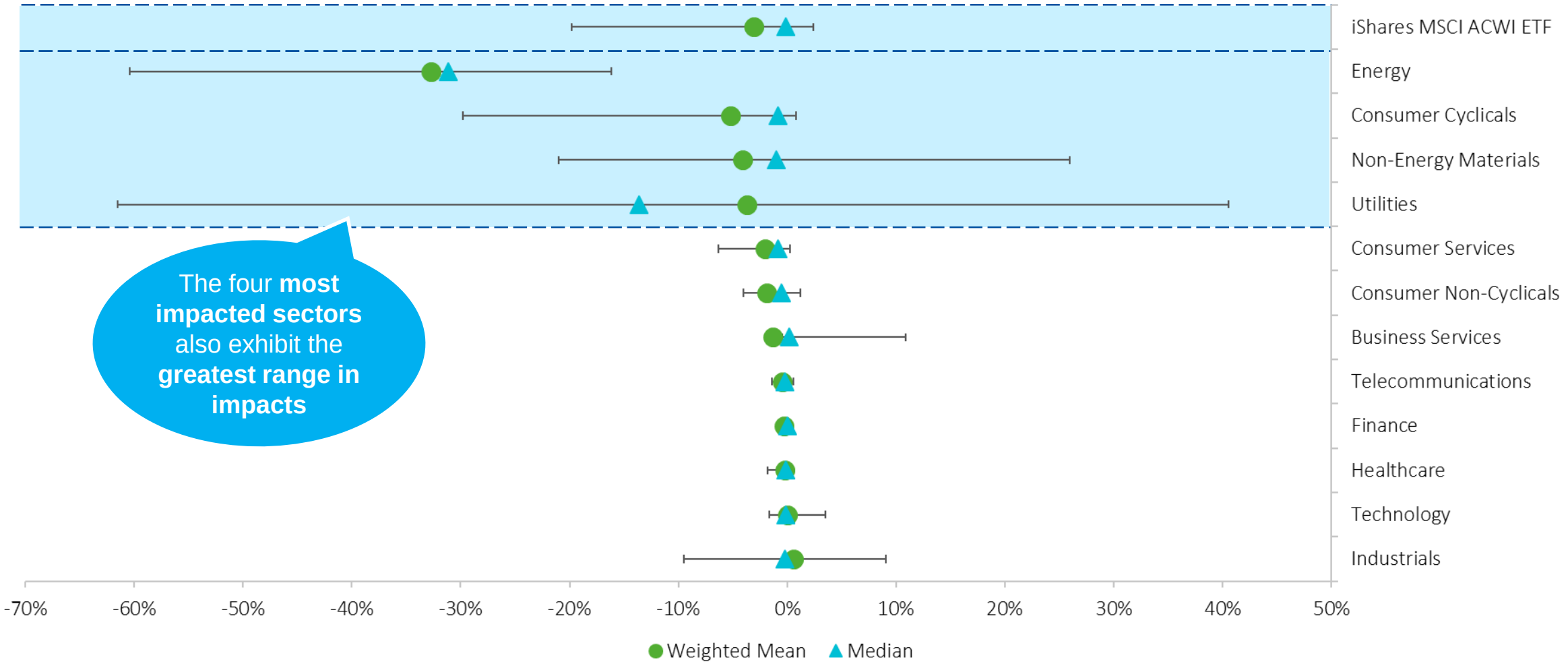
Non-OECD domiciled companies are more negatively affected on average – although in some regions (like China) this may reflect the lack of listed vehicles.

Nevertheless, at a country domicile level there is **significant dispersion of results** – for example, in the United States

Many companies likely to succeed in the green upside are not listed in the common indices

Passive investors are therefore unlikely to be as exposed to the upside as the downside of the Inevitable Policy Response.

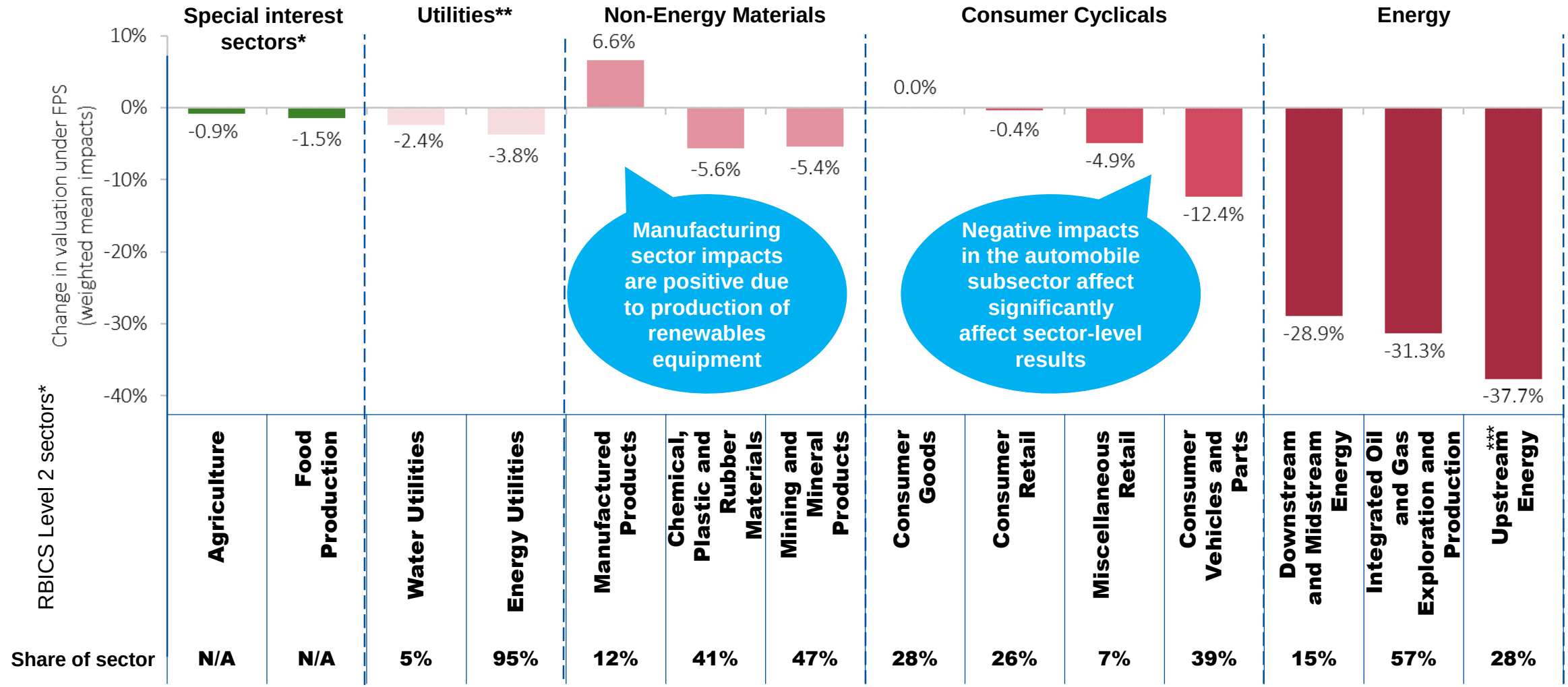
Sectoral: Within-sector variation can be significant, particularly for the four most impacted sectors in the index: Energy, Consumer Cyclicals, Non-Energy Materials and Utilities



The four **most impacted sectors** also exhibit the **greatest range in impacts**

- Notes: Error bars indicate the 10th and 90th percentiles of impact within each sector. Sectors: RBICS level 1.
- Source: Vivid Economics Net Zero Toolkit

Sectoral: Zooming in on the sectors with the most negative impacts on average and special interest sectors, it is clear that subsectors can experience considerably different impacts

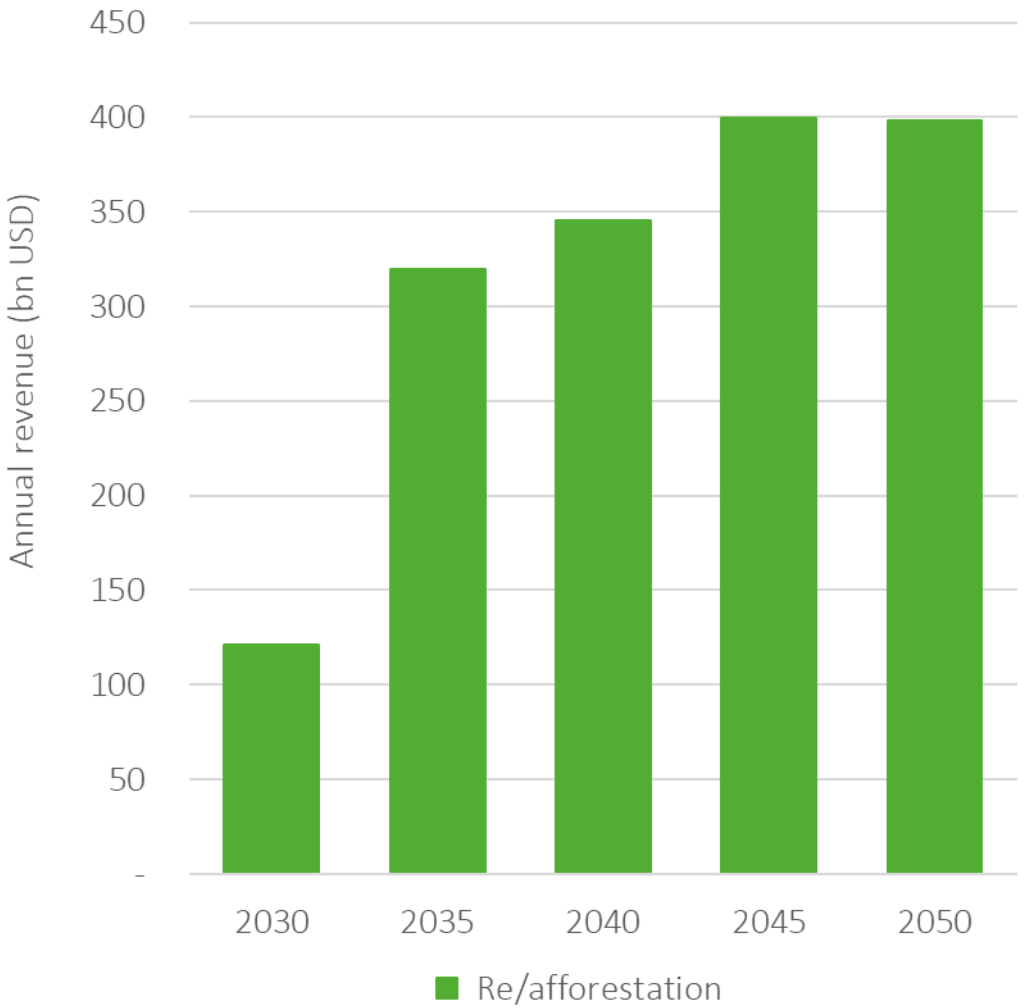


INEVITABLE POLICY RESPONSE

* The special interest sectors are contained Consumer Non-Cyclicals. Agriculture is a Level 3 subsector, Food production a Level 4 subsector. Sector shares are not available as results for the 'Agriculture' sector are based on oversampling of companies – there are very few agriculture companies in the index.
** Utilities sector broken down to RBICS level 3 to provide further detail.*** Upstream energy includes coal mining and oil and gas exploration and production.

:vivideconomics

Nature Based Solutions: Pricing land-based carbon unlocks an estimated US$2.8 tr in forestry investment opportunities and new revenue streams for land-owners.



- Nature based solutions (NBS) are opportunities to restore or expand the extent of carbon-rich ecosystems, such as peat bogs or tropical forests, to provide negative CO_2 emissions
- Annual revenues, representative of growth in market size, total **US$2.8 trillion** through 2050.
- Land owners and developers can **monetise sequestration potential by selling offsets** to emitters, such as oil and gas
- Opportunities concentrated in areas with historically wide ranging forest lands - Africa, Brazil, Central and South America, and Other Developing Asia
- Avoided deforestation from IPR FPS represents an extra US$4.8 trillion if fully compensated. Finance will largely be public, but green bonds may offer private sector some opportunities
- Existing agriculture interests are a surprising co-beneficiary of pricing land-based carbon. Appropriate valuation of land increases commodity prices and incentivises productivity investment

Investor actions

- The analysis highlights the importance of **forward-looking climate risk assessment** and the limitations of portfolio carbon foot printing in capturing the nuance of impacts across and particularly within sectors.
- Draw on IPR in investor implementation of the **TCFD recommendations** on forward-looking risk assessment and climate scenario analysis alongside Paris aligned scenarios
- **Asset owners**: Prepare for FPS as a likely central business case
  - At the same time, continue to advocate and engage for earlier and more ambitious climate action to minimize the disruption from a disorderly transition and from physical impacts resulting from global mean temperatures exceeding 1.5°C
  - Review equity asset allocation and define mitigation strategies for both passive and active investments.
  - Incorporate IPR into manager selection, appointment and monitoring
  - Engage service providers on IPR, including in appropriate indices and proxy voting recommendations
  - Consider climate as a factor potentially creating alpha
- **Passive investors**: draw on IPR in stewardship and consider benchmarks informed by IPR
- **All investors**: draw on IPR to engage exposed sectors to transition

Thank you

Please see PRI website for further details:

https://www.unpri.org/climate-change/what-is-the-inevitable-policy-response/4787.article

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Internal Carbon Pricing for Managing Hidden Carbon Risks

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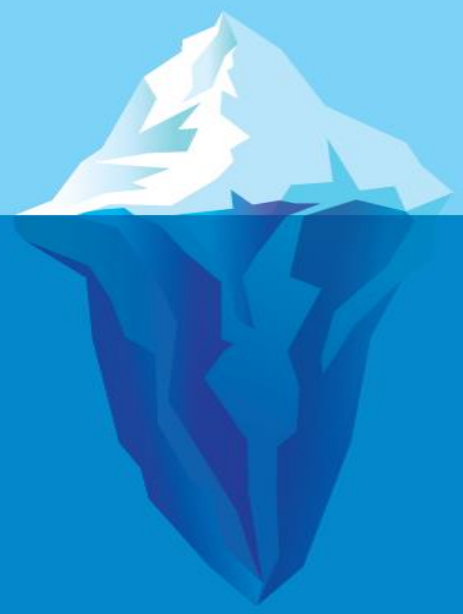
Pricing carbon beyond the market price

The costs a company or asset will face during decarbonisation is more than just the market price for carbon emissions, but also implicit and indirect cost.



MARKET CARBON PRICE

Prices charged by governments to companies via emission trading systems or carbon tax.

THE HIDDEN CARBON PRICE

Costs related to decarbonisation policies and initiatives such as emission abatement cost, pass-through carbon and price from suppliers

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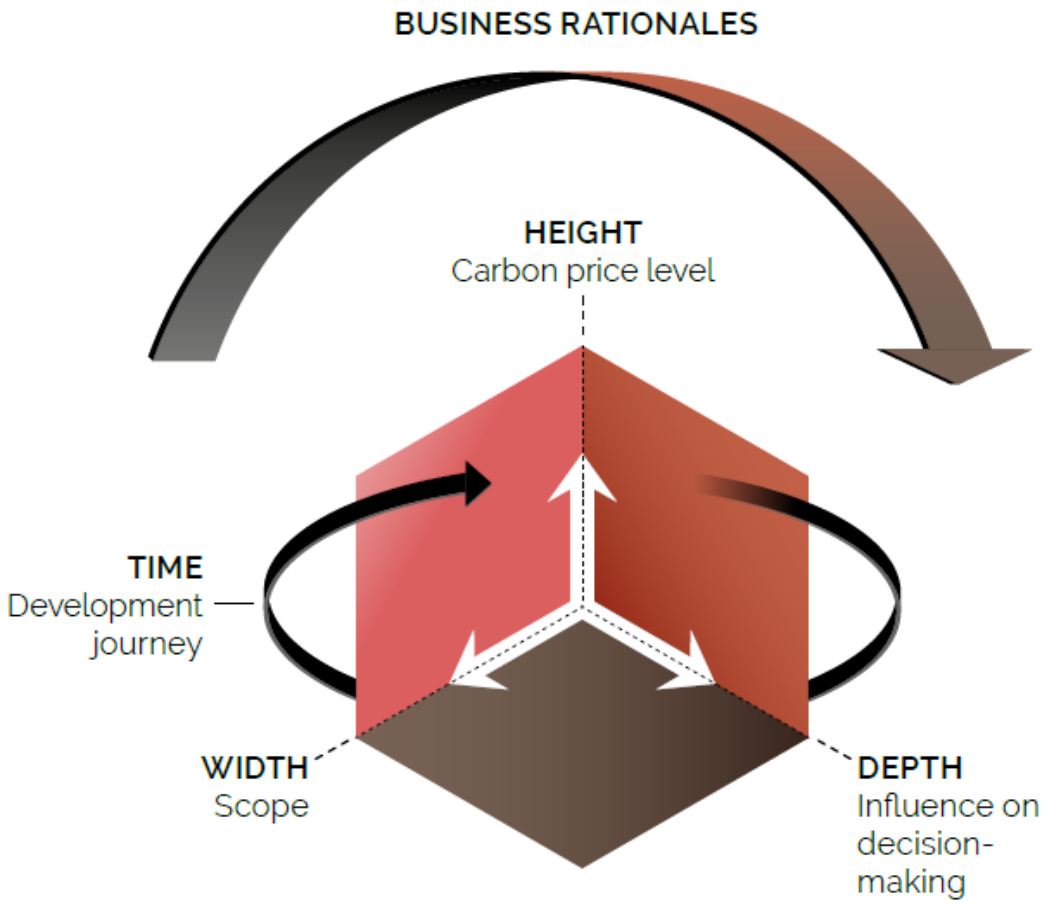
Materiality – are you assessing it right?



Consider sector characteristics

Value chain exposure, emissions abatement

Understand financial exposure

Asset class, portfolio weighting, investment value

Factor in time horizon

Liquidity and liability horizon

Identify geographic location

Regional climate policies and prices

Look beyond market prices

Understanding the indirect carbon costs

Use a range of prices

Operational, upstream and downstream costs

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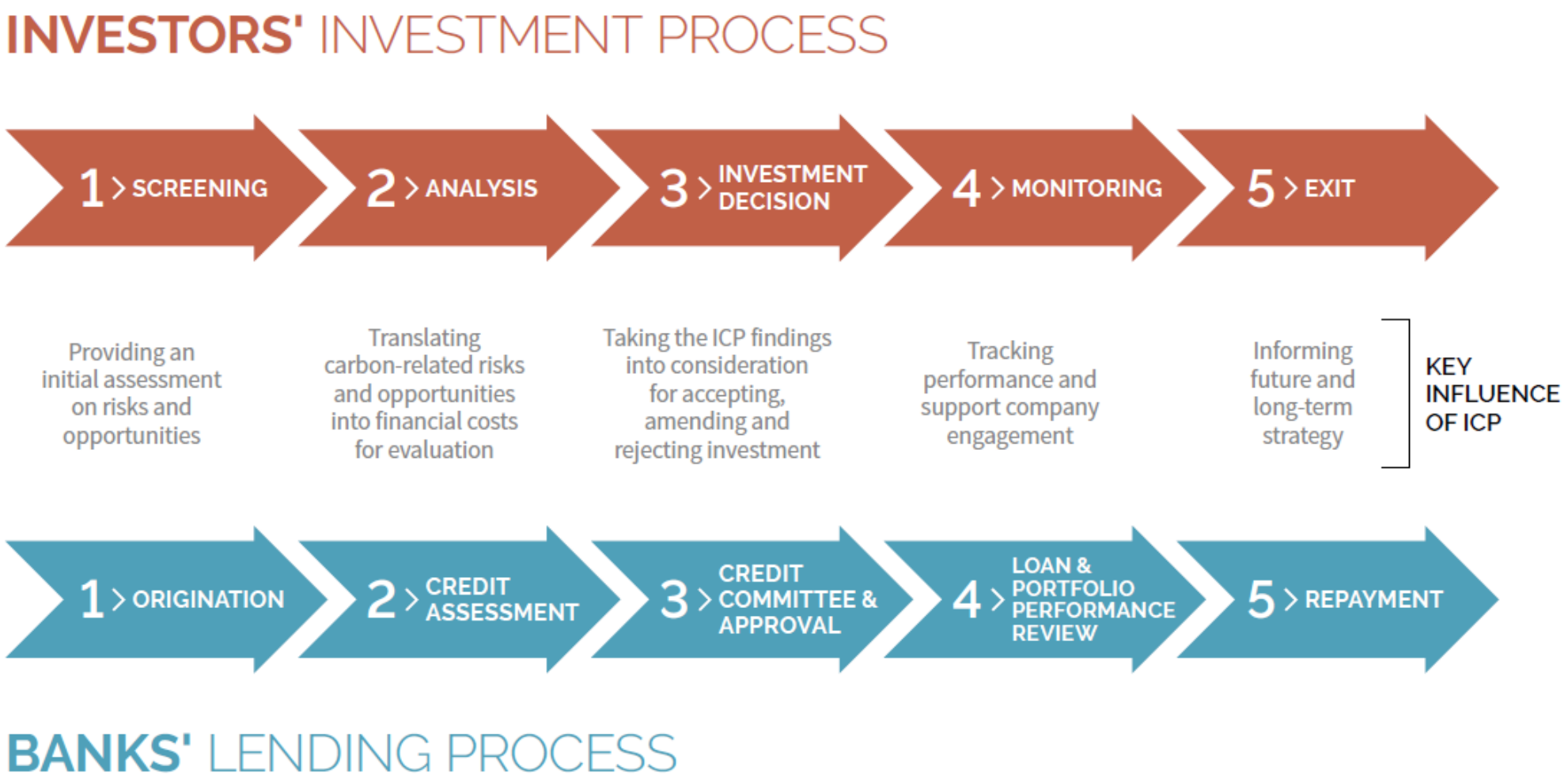
ICP can play different roles in lending and investment



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Reflection on ICP use by financial institutions

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Global Dataset for Investigating Embedded Emissions and Value at Risk

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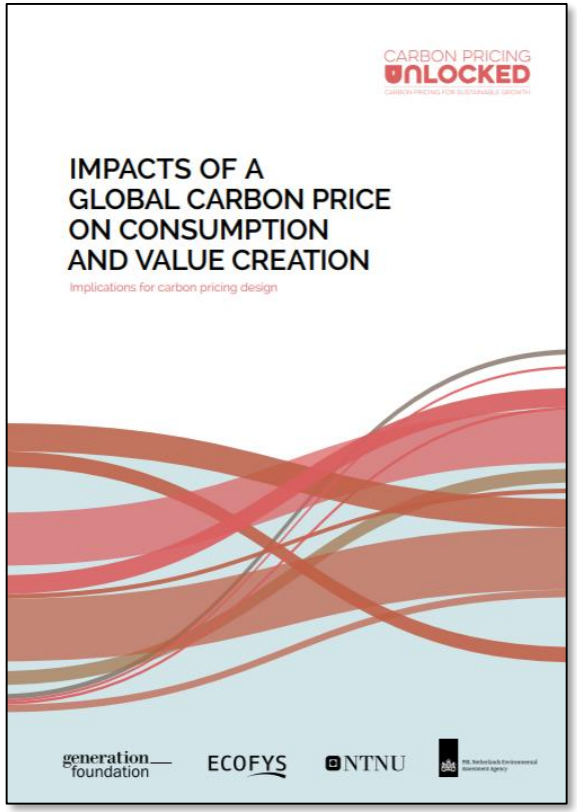
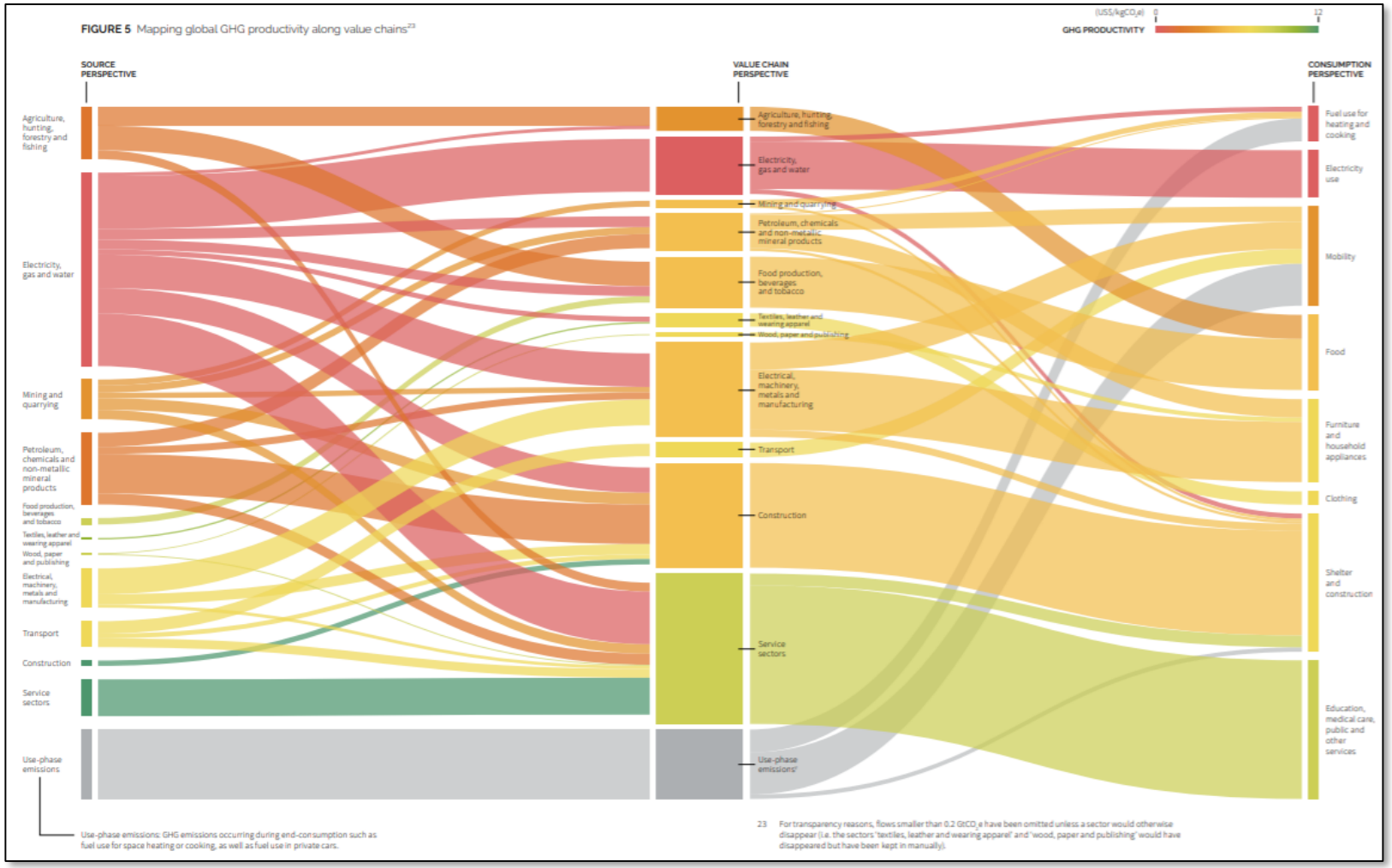
GHG emissions and value creation in global value chains





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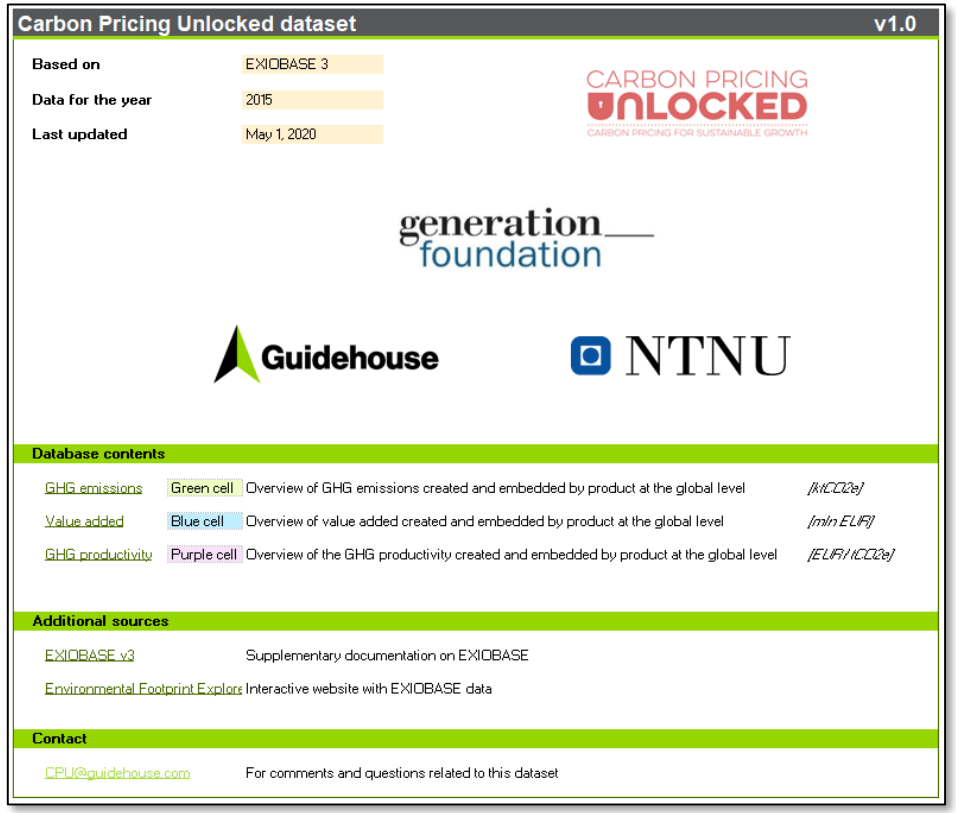
Available at: https://guidehouse.com/-/media/www/site/downloads/energy/2018/carbonpricingunlocked2016impactonvaluecreation.pdf

New dataset by Guidehouse and The Generation Foundation helps companies quantify embedded emissions and value at risk



Carbon Pricing Unlocked dataset v1.0

Based on	EXIOBASE 3
Data for the year	2015
Last updated	May 1, 2020

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Database contents

GHG emissions	Green cell	Overview of GHG emissions created and embedded by product at the global level	*[ktCO2e]*
Value added	Blue cell	Overview of value added created and embedded by product at the global level	*[mln EUR]*
GHG productivity	Purple cell	Overview of the GHG productivity created and embedded by product at the global level	*[EUR/tCO2e]*

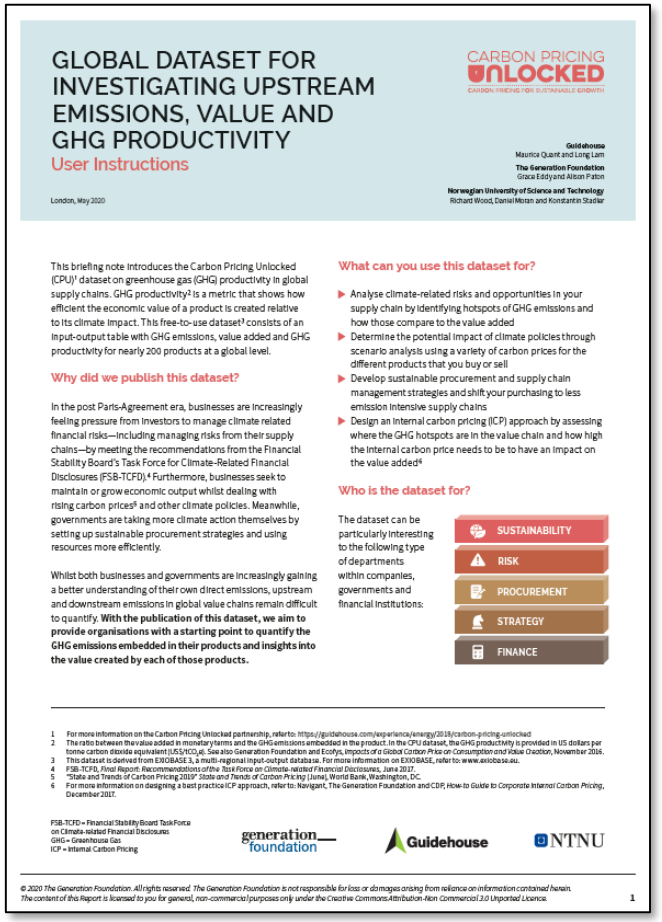
Additional sources

EXIOBASE v3	Supplementary documentation on EXIOBASE
Environmental Footprint Explore	Interactive website with EXIOBASE data

Contact

CPU@guidehouse.com	For comments and questions related to this dataset

Dataset (in Excel)



GLOBAL DATASET FOR INVESTIGATING UPSTREAM EMISSIONS, VALUE AND GHG PRODUCTIVITY

User Instructions

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The Generation Foundation
Grace Eddy and Alison Paton
Norwegian University of Science and Technology
Richard Wood, Daniel Moran and Konstantin Stadler

London, May 2020

This briefing note introduces the Carbon Pricing Unlocked (CPU)[1] dataset on greenhouse gas (GHG) productivity in global supply chains. GHG productivity[2] is a metric that shows how efficient the economic value of a product is created relative to its climate impact. This free-to-use dataset[3] consists of an input-output table with GHG emissions, value added and GHG productivity for nearly 200 products at a global level.

Why did we publish this dataset?

In the post Paris-Agreement era, businesses are increasingly feeling pressure from investors to manage climate related financial risks—including managing risks from their supply chains—by meeting the recommendations from the Financial Stability Board's Task Force for Climate-Related Financial Disclosures (FSB-TCFD).[4] Furthermore, businesses seek to maintain or grow economic output whilst dealing with rising carbon prices[5] and other climate policies. Meanwhile, governments are taking more climate action themselves by setting up sustainable procurement strategies and using resources more efficiently.

Whilst both businesses and governments are increasingly gaining a better understanding of their own direct emissions, upstream and downstream emissions in global value chains remain difficult to quantify. **With the publication of this dataset, we aim to provide organisations with a starting point to quantify the GHG emissions embedded in their products and insights into the value created by each of those products.**

What can you use this dataset for?

- Analyse climate-related risks and opportunities in your supply chain by identifying hotspots of GHG emissions and how those compare to the value added
- Determine the potential impact of climate policies through scenario analysis using a variety of carbon prices for the different products that you buy or sell
- Develop sustainable procurement and supply chain management strategies and shift your purchasing to less emission intensive supply chains
- Design an internal carbon pricing (ICP) approach by assessing where the GHG hotspots are in the value chain and how high the internal carbon price needs to be to have an impact on the value added[6]

Who is the dataset for?

The dataset can be particularly interesting to the following type of departments within companies, governments and financial institutions:

SUSTAINABILITY
RISK
PROCUREMENT
STRATEGY
FINANCE

1 For more information on the Carbon Pricing Unlocked partnership, refer to: https://guidehouse.com/experience/energy/2018/carbon-pricing-unlocked
2 The ratio between the value added in monetary terms and the GHG emissions embedded in the product. In the CPU dataset, the GHG productivity is provided in US dollars per tonne carbon dioxide equivalent (US$/tCO2e). See also Generation Foundation and Ecofys, Impacts of a Global Carbon Price on Consumption and Value Creation, November 2016.
3 This dataset is derived from EXIOBASE 3, a multi-regional input-output database. For more information on EXIOBASE, refer to: www.exiobase.eu.
4 FSB-TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures*, June 2017.
5 "State and Trends of Carbon Pricing 2019" *State and Trends of Carbon Pricing* (June), World Bank, Washington, DC.
6 For more information on designing a best practice ICP approach, refer to: Navigant, The Generation Foundation and CDP, *How-to Guide to Corporate Internal Carbon Pricing*, December 2017.

FSB-TCFD = Financial Stability Board Task Force on Climate-related Financial Disclosures
GHG = Greenhouse Gas
ICP = Internal Carbon Pricing

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2 pager with instructions

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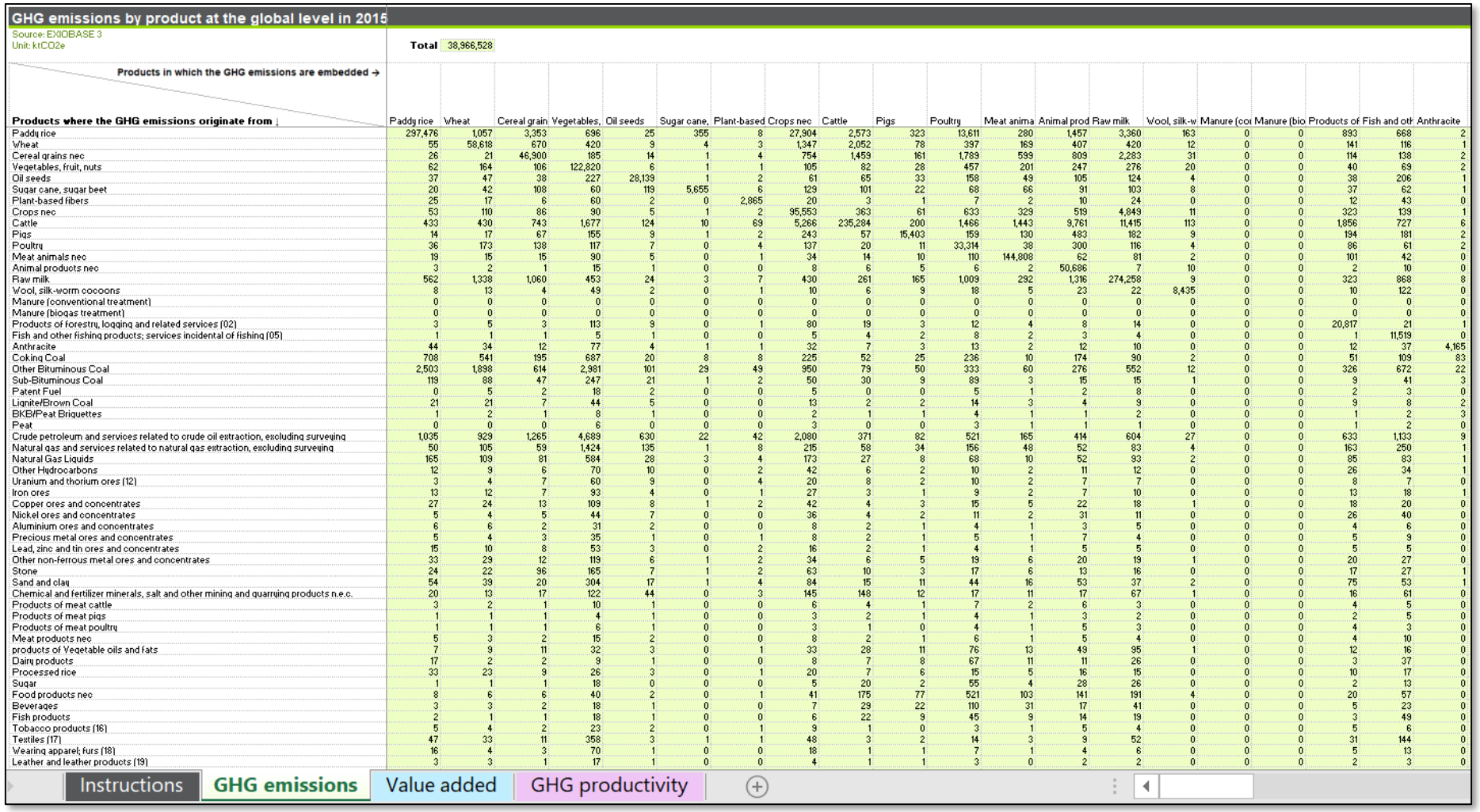
Snapshot of the new dataset showing embedded emissions



GHG emissions by product at the global level in 2015

Source: EXIOBASE 3
Unit: ktCO2e

Total 38,966,528

Products in which the GHG emissions are embedded →

Products where the GHG emissions originate from ↓	Paddy rice	Wheat	Cereal grain	Vegetables,	Oil seeds	Sugar cane,	Plant-based	Crops nec	Cattle	Pigs	Poultry	Meat anima	Animal prod	Raw milk	Wool, silk-w	Manure (co	Manure (bio	Products of	Fish and oth	Anthracite
Paddy rice	297,476	1,057	3,353	696	25	355	8	27,904	2,573	323	13,611	280	1,457	3,360	163	0	0	893	668	2
Wheat	55	58,618	670	420	9	4	3	1,347	2,052	78	397	169	407	420	12	0	0	141	116	1
Cereal grains nec	26	21	46,900	185	14	1	4	754	1,459	161	1,789	593	809	2,283	31	0	0	114	138	2
Vegetables, fruit, nuts	62	164	106	122,820	6	1	1	105	82	28	457	201	247	276	20	0	0	40	69	2
Oil seeds	37	47	38	227	28,139	1	2	61	65	33	158	49	105	124	4	0	0	38	206	1
Sugar cane, sugar beet	20	42	108	60	119	5,655	6	129	101	22	68	66	91	103	8	0	0	37	62	1
Plant-based fibers	25	17	6	60	2	0	2,865	20	3	1	7	2	10	24	0	0	0	12	43	0
Crops nec	53	110	86	90	5	1	2	95,553	363	61	633	329	519	4,849	11	0	0	323	139	1
Cattle	433	430	743	1,677	124	10	69	5,266	235,284	200	1,466	1,443	9,761	11,415	113	0	0	1,856	727	6
Pigs	14	17	67	155	9	1	2	243	57	15,403	159	130	483	182	9	0	0	194	181	2
Poultry	36	173	138	117	7	0	4	137	20	11	33,314	38	300	116	4	0	0	86	61	2
Meat animals nec	19	15	15	90	5	0	1	34	14	10	110	144,808	62	81	2	0	0	101	42	0
Animal products nec	3	2	1	15	1	0	0	8	6	5	6	2	50,686	7	10	0	0	2	10	0
Raw milk	562	1,338	1,060	453	24	3	7	430	261	165	1,009	292	1,316	274,258	9	0	0	323	868	8
Wool, silk-worm cocoons	8	13	4	49	2	0	1	10	6	9	18	5	23	22	8,435	0	0	10	122	0
Manure (conventional treatment)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manure (biogas treatment)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Products of forestry, logging and related services (02)	3	5	3	113	9	0	1	80	19	3	12	4	8	14	0	0	0	20,817	21	1
Fish and other fishing products; services incidental of fishing (05)	1	1	1	5	1	0	0	5	4	2	8	2	3	4	0	0	0	1	11,519	0
Anthracite	44	34	12	77	4	1	1	32	7	3	13	2	12	10	0	0	0	12	37	4,165
Coking Coal	708	541	195	687	20	8	8	225	52	25	236	10	174	90	2	0	0	51	109	83
Other Bituminous Coal	2,503	1,898	614	2,981	101	29	49	950	79	50	333	60	276	552	12	0	0	326	672	22
Sub-Bituminous Coal	119	88	47	247	21	1	2	50	30	9	89	3	15	15	1	0	0	9	41	3
Patent Fuel	0	5	2	18	2	0	0	5	0	0	5	1	2	8	0	0	0	2	3	0
Lignite/Brown Coal	21	21	7	44	5	0	0	13	2	2	14	3	4	9	0	0	0	9	8	2
BKB/Peat Briquettes	1	2	1	8	1	0	0	2	1	1	4	1	1	2	0	0	0	1	2	3
Peat	0	0	0	6	0	0	0	3	0	0	3	1	1	1	0	0	0	1	2	0
Crude petroleum and services related to crude oil extraction, excluding surveying	1,035	929	1,265	4,689	630	22	42	2,080	371	82	521	165	414	604	27	0	0	633	1,133	9
Natural gas and services related to natural gas extraction, excluding surveying	50	105	59	1,424	135	1	8	215	58	34	156	48	52	83	4	0	0	163	250	1
Natural Gas Liquids	165	109	81	584	28	3	4	173	27	8	68	10	52	93	2	0	0	85	83	1
Other Hydrocarbons	12	9	6	70	10	0	2	42	6	2	10	2	11	12	0	0	0	26	34	1
Uranium and thorium ores (12)	3	4	7	60	9	0	4	20	8	2	10	2	7	7	0	0	0	8	7	0
Iron ores	13	12	7	93	4	0	1	27	3	1	9	2	7	10	0	0	0	13	18	1
Copper ores and concentrates	27	24	13	109	8	1	2	42	4	3	15	5	22	18	1	0	0	18	20	0
Nickel ores and concentrates	5	4	5	44	7	0	0	36	4	2	11	2	31	11	0	0	0	26	40	0
Aluminium ores and concentrates	6	6	2	31	2	0	0	8	2	1	4	1	3	5	0	0	0	4	6	0
Precious metal ores and concentrates	5	4	3	35	1	0	1	8	2	1	5	1	7	4	0	0	0	5	9	0
Lead, zinc and tin ores and concentrates	15	10	8	53	3	0	2	16	2	1	4	1	5	5	0	0	0	5	5	0
Other non-ferrous metal ores and concentrates	33	29	12	119	6	1	2	34	6	5	19	6	20	19	1	0	0	20	27	0
Stone	24	22	96	165	7	1	2	63	10	3	17	6	13	16	0	0	0	17	27	1
Sand and clay	54	39	20	304	17	1	4	84	15	11	44	16	53	37	2	0	0	75	53	1
Chemical and fertilizer minerals, salt and other mining and quarrying products n.e.c.	20	13	17	122	44	0	3	145	148	12	17	11	17	67	1	0	0	16	61	0
Products of meat cattle	3	2	1	10	1	0	0	6	4	1	7	2	6	3	0	0	0	4	5	0
Products of meat pigs	1	1	1	4	1	0	0	3	2	1	4	1	3	2	0	0	0	2	5	0
Products of meat poultry	1	1	1	6	1	0	0	3	1	0	4	1	5	3	0	0	0	4	3	0
Meat products nec	5	3	2	15	2	0	0	8	2	1	6	1	5	4	0	0	0	4	10	0
products of Vegetable oils and fats	7	9	11	32	3	0	1	33	28	11	76	13	49	95	1	0	0	12	16	0
Dairy products	17	2	2	9	1	0	0	8	7	8	67	11	11	26	0	0	0	3	37	0
Processed rice	33	23	9	26	3	0	1	20	7	6	15	5	16	15	0	0	0	10	17	0
Sugar	1	1	1	18	0	0	0	5	20	2	55	4	28	26	0	0	0	2	13	0
Food products nec	8	6	6	40	2	0	1	41	175	77	521	103	141	191	4	0	0	20	57	0
Beverages	3	3	2	18	1	0	0	7	29	22	110	31	17	41	0	0	0	5	23	0
Fish products	2	1	1	18	1	0	0	6	22	9	45	9	14	19	0	0	0	3	49	0
Tobacco products (16)	5	4	2	23	2	0	1	9	1	0	3	1	5	4	0	0	0	5	6	0
Textiles (17)	47	33	11	358	3	1	1	48	3	2	14	3	9	52	0	0	0	31	144	0
Wearing apparel; furs (18)	16	4	3	70	1	0	0	18	1	1	7	1	4	6	0	0	0	5	13	0
Leather and leather products (19)	3	3	1	17	1	0	0	4	1	1	3	0	2	2	0	0	0	2	3	0

Instructions | GHG emissions | Value added | GHG productivity

Note: the online dataset covers a full table with 200 products / sectors for GHG emissions and value added

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What can you use this dataset for?

- Analyze climate-related risks and opportunities in your portfolio or value chain
- Determine the potential impact of climate policies through scenario analysis
- Develop sustainable investment and lending strategies
- Design an internal carbon pricing approach

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Q&A – use the chat box to type your questions

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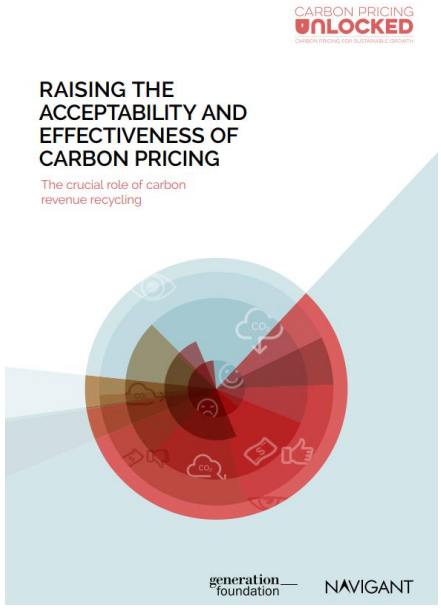
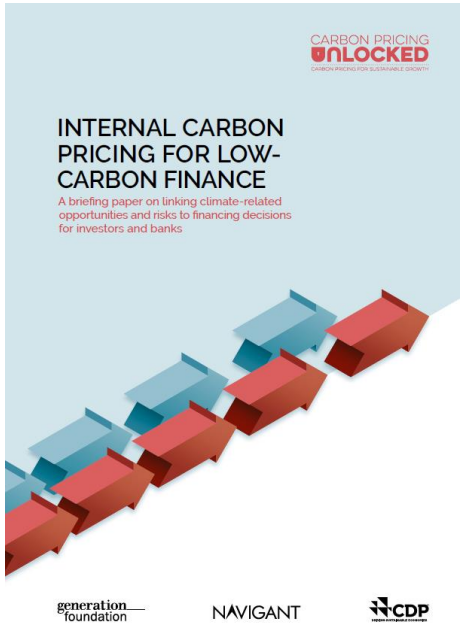
For all publications under the Carbon Pricing Unlocked partnership, visit https://guidehouse.com/experience/energy/2018/carbon-pricing-unlocked





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