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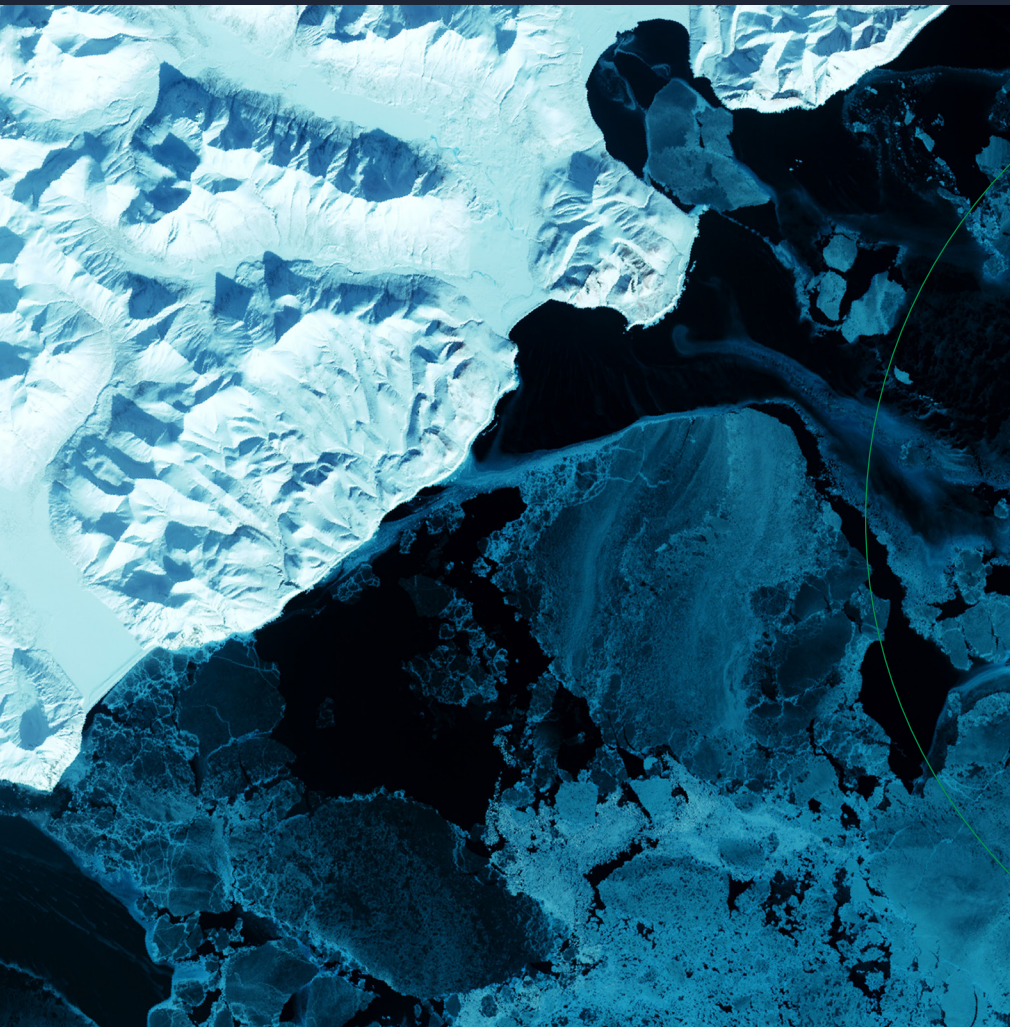
THROUGH THE LOOKING GLASS

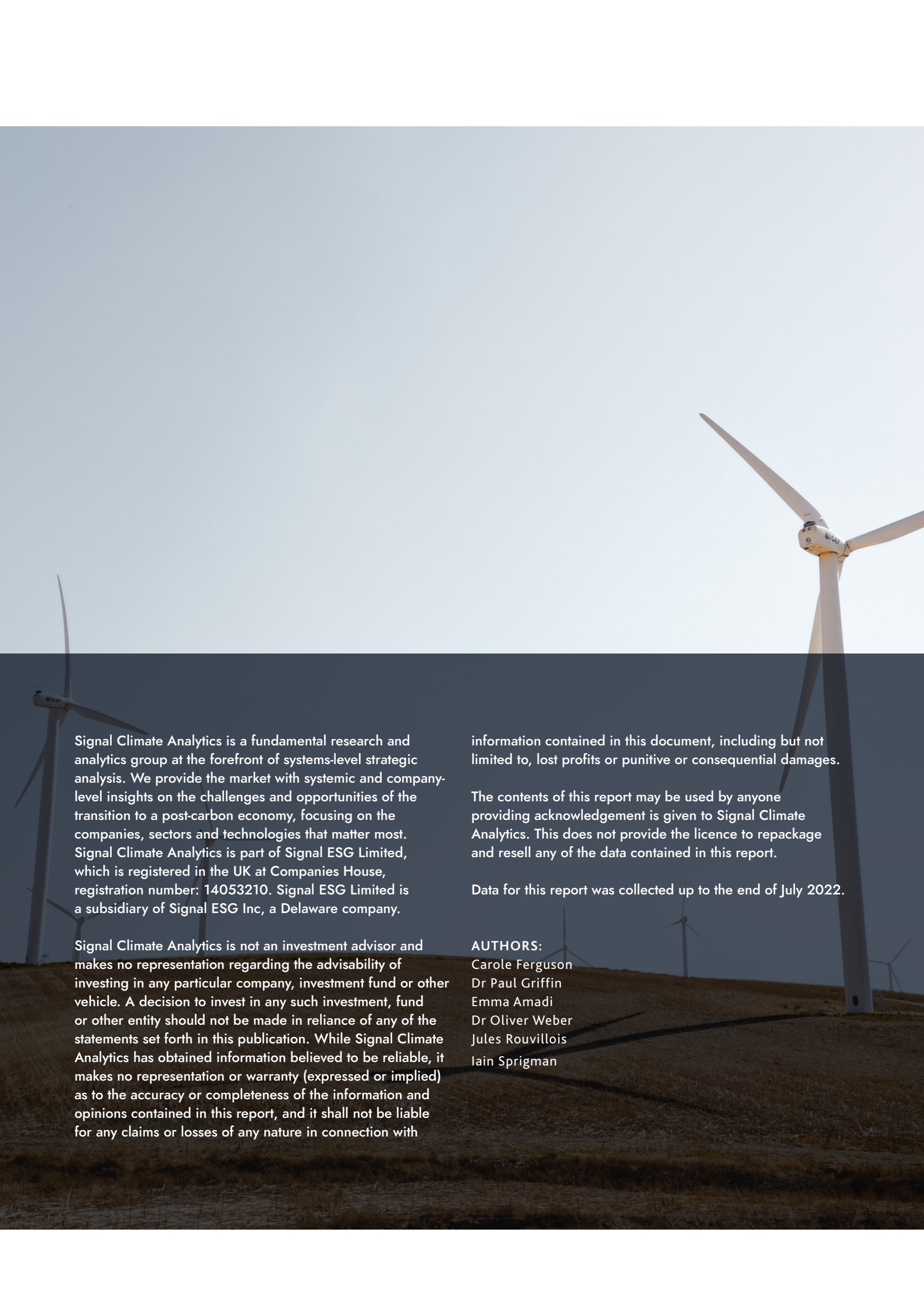
Assessing 250 of the Largest Carbon
Emitters for Transparency

September 2022

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Transparency of corporate reporting

This report introduces the research of Signal Climate Analytics. We will be producing a series of reports on the largest global companies in the high carbon emitting sectors and how well-positioned they are to transition to a post-carbon economy. We will be assessing the risks, opportunities, strategic positioning, and the cost of transitioning.

To be able to assess transition planning, there has to be an understanding of the fundamental drivers of the activities of companies across the value chain, the impact of these activities on the emissions profiles of companies, and the scope they have for cutting these emissions.

Voluntary disclosure on climate policy and reporting on GHG emissions has been available to the markets for a number of years through CDP (the largest platform for environmental disclosure), which has been leading in providing disclosure on emissions accounting to policy and target setting for over 20 years.

The framework provided by the Task Force for Climate Related Financial Disclosure (TCFD) introduced in 2017 the requirement to disclose on the materiality of climate change for companies in terms of transition risks, physical risks, transition opportunities and climate governance and strategy. This has led to a significant quantum of reporting by companies on materiality but has not provided the quality of data or the visibility on how to assess the business and financial impacts of climate change and what business models will need to be in place to align with top-down climate ambitions.

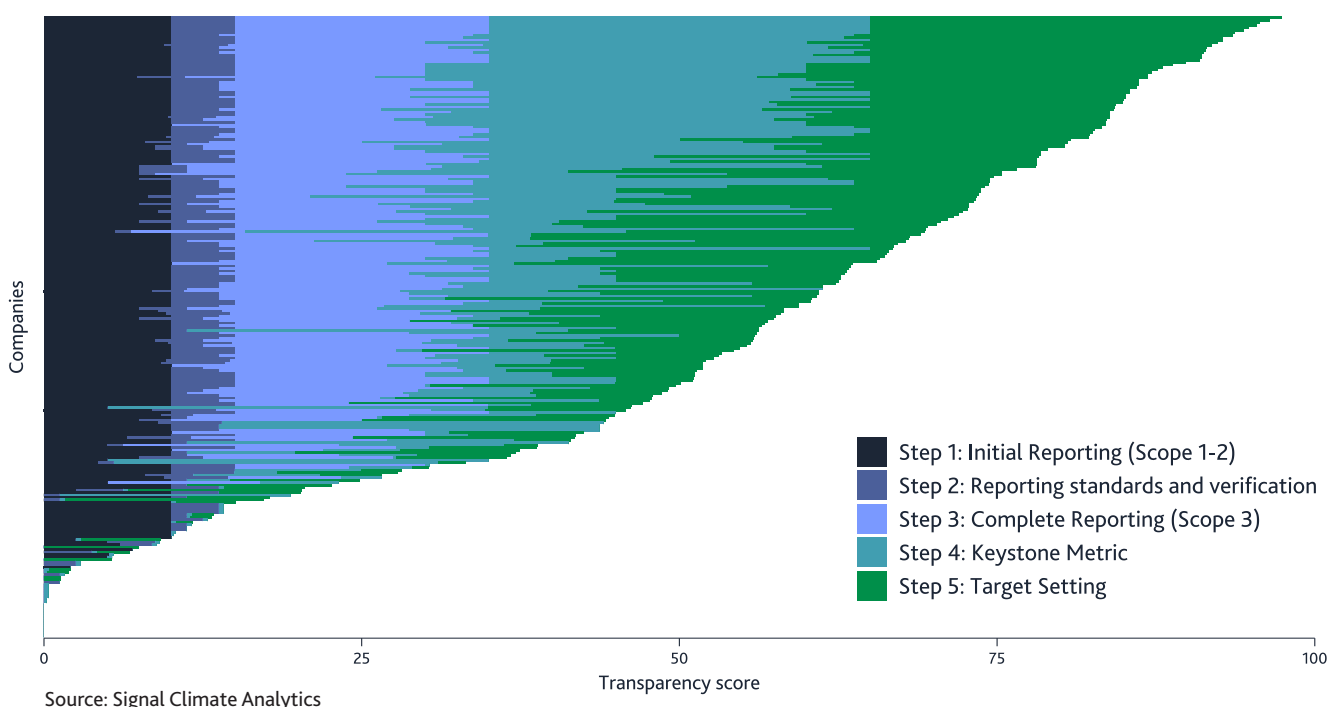
In order for key stakeholders in the financial community to assess the transition pathway for companies in high carbon emitting sectors, they need transparency on the dominant scope of carbon emissions for companies and what commitments and actions are needed by these companies to achieve reduction plans that align with the Paris Agreement to stabilise temperature rise to not more than 1.5°C by the end of the century.

In this report on transparency we look at the 250 largest global emitters to evaluate if they provide the transparency for stakeholders to assess climate impact and performance in terms of emissions accounting and target setting.

We look for an important metric to benchmark and track company emissions performance over time – the keystone metric. Even with transparency, lack of standardization is a huge problem that must be overcome if corporate emissions are to be compared, benchmarked, and tracked in any meaningful way. While transparency as measured in this report gives a good insight into scope for performance, it is not sufficient to assess transition planning.

We also highlight the importance of looking beyond CO₂ emissions to disclosure and transparency on methane the second largest GHG in terms of emissions. There is a regulatory drive to cut methane emissions with fugitive emissions from oil and gas production becoming increasingly important as gas starts playing a central role in the energy transition.

Figure 1: Distribution of final scores over the Top 250 universe



Overview

The need for Transparency

Corporate transparency is needed now more than ever. In recent years there has been a rapid proliferation in the number of countries setting net-zero emissions targets, such that now over 90% of the global economy is covered by one. Through the UN's 'Race to Zero Campaign', the 'Glasgow Financial Alliance for Net Zero' (GFANZ), companies too are being asked to set targets to reach net-zero by 2050. This is in line with the central aim of the Paris Agreement – to hold global temperature rise to well-below 2°C and pursue efforts to limit rise to 1.5°C. As net-zero targets among companies have surged, investors and other stakeholders face a transparency challenge in distinguishing good from bad and understanding what transition plans and actions must follow.

This comes at a time when institutional investors need to demonstrate that their sustainability and ESG fund strategies are implementing what they say, as they face greater scrutiny from regulators on greenwashing. After an extensive consultation process, the SEC is expected to announce new proposals with a focus on three categories of disclosure: material risks and strategic implications, greenhouse gas emissions, and targets or transition planning. This follows moves by the EU and UK on disclosure standards with the International Financial Reporting Standards Board (IFRS) creating the International Sustainability Standards Board (ISSB), which goes further on indirect 'Scope 3' emissions and forward-looking analysis under decarbonisation scenarios¹.

What is Transparency?

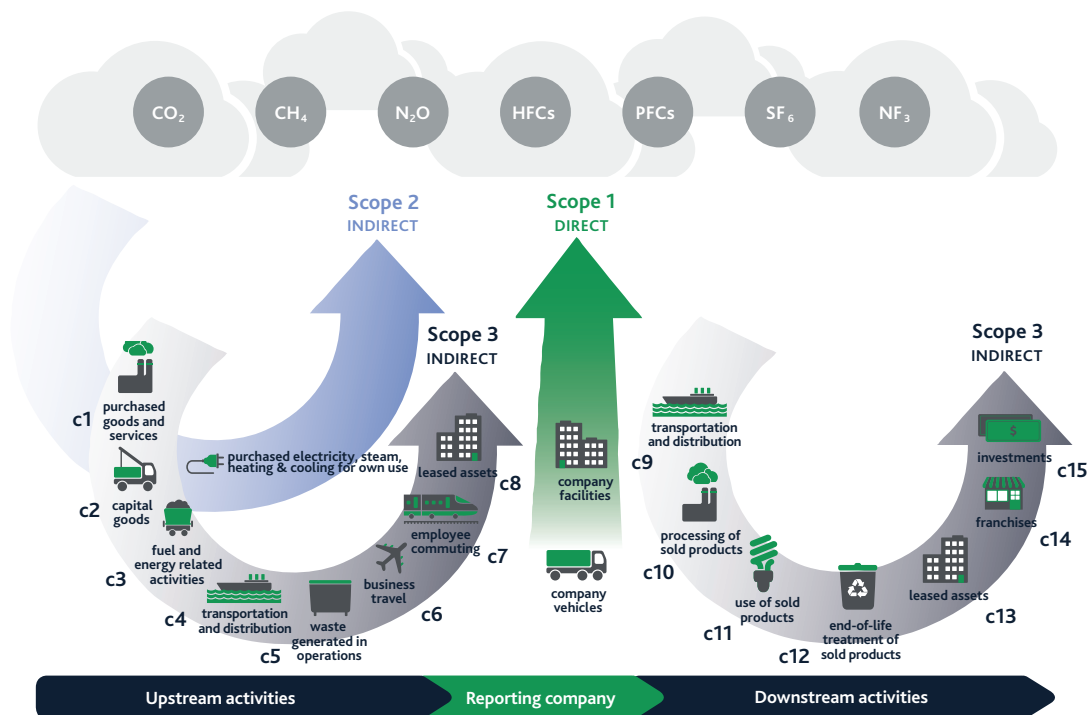
Transparency is measured by the company's completeness and quality of data and information relating to emissions accounting, benchmarking metrics, emissions reduction targets, transition planning, and the risks and opportunities associated with transition and a changing climate.

From our earlier research we observed that transparency is a journey that can take companies a decade or so to fulfil. In this report, we score companies on a number of steps on the path to transparency, focusing on disclosure:

1. Initial emissions reporting (Scopes 1 & 2)
2. Reporting standards and verification
3. Complete emissions (Scope 3)
4. Keystone metric reporting
5. Target setting

The first three steps relate to corporate emissions accounting as defined by the GHG Protocol² of the World Resources Institute (WRI). Step 4 moves beyond accounting and into the realm of benchmarking. We introduce the keystone metric: an important performance metric for tracking, comparing, and benchmarking corporate emissions to net-zero, e.g., vehicle gCO₂e/km. The fifth and final step is on the quality of data disclosed for emissions reduction target setting.

Figure 2: Emission Scopes and categories of the GHG Protocol



¹ McKinsey & Company, 2022, Understanding the SEC's proposed climate risk disclosure rule

² GHG Protocol Initiative, 2015, [The Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard](#)

Emissions accounting - starting with the basics

Emissions accounting begins when a company discloses its first emissions data point. This usually means Scope 1 and 2 emissions as these are the easiest parts of an emissions inventory to calculate - Scope 1 emissions being part of company’s organisational boundary and Scope 2 the indirect emissions from the purchase of electricity, heat and steam from outside the boundary.

The GHG protocol lays out clear definitions of all three scopes related to a company’s activities -Scope 1, 2 and 3 in its ‘Corporate Accounting and Reporting standard’ published in 2004. Scope 3 emissions accounting starts introducing complexity, covering all other indirect emissions that occur outside a company’s boundaries. These are split into 15 Categories across the value chain.

Along with these definitions, the standard outlines a core set of reporting principles: relevance, completeness, consistency, transparency, and accuracy. Transparency in this instance relates specifically to the information around the disclosed emissions data itself, which is crucial for third-party verification. Getting Scope 1 and 2 emissions reported and verified constitute steps 1 and 2 of our path to transparency.

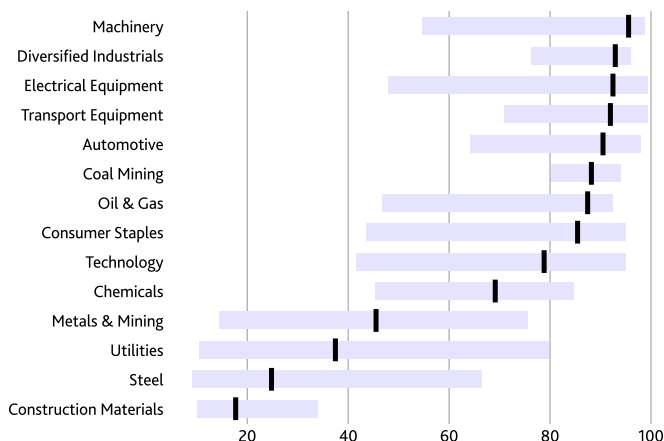
The GHG accounting standard provides comprehensive guidelines and allows for ‘accounting transparency’, however, it is not fully suited to performance benchmarking. More established approaches in Life Cycle Analysis and standard setting on key variables need to be adopted for some sectors, detailed in our case study on the Automotive sector (page 18).

Scope 3 emissions accounting - the value chain

The relevance of Scope 3 emissions accounting depends on the activities of a sector and company. In sectors such as Construction Materials and Steel, process emissions within the company’s operations dominate. However, in a number of sectors that have a large presence in this report, such as Oil and Gas and Coal Mining, Category 11 use of sold products dominates.

A critical component of Scope 3 emissions reporting is the company’s definition of the inventory boundary, i.e., which categories are considered relevant enough to include. The GHG Protocol’s Scope 3 supplement to the reporting standard identifies the following

Figure 3: Scope 3 emissions as a % of total emissions by sector - median and range



Source: Company reports, CDP, Signal Climate Analytics

relevance criteria: size, influence, risk, stakeholders, outsourcing, sector characteristics.

Reporting on Scope 3 emissions can be difficult or easy depending on the company, its activities, and the category. For example, accounting for Category 1 (purchased goods and services) for a capital goods company such as Samsung Electronics can entail a vast project of data collection spanning the company’s entire upstream supply chain. Conversely, Oil and Gas giant Saudi Aramco can easily report a basic estimate of Category 11 (about 1.8 GtCO₂) by simply multiplying production or sales of oil and gas by well-established fuel emission factors.

For every company in our top 250 universe, we define the ‘dominant scope’, which is the scope or category of greatest impact to climate change. The biggest challenge is Scope 3. Unless companies understand and recognise their Scope 3 footprint, they risk getting caught out by increasing regulatory standards and pressures, whether it’s vehicle fleet emissions in the automotive sector or energy use in electrical products to meet tightening efficiency standards.

From accounting to benchmarking - the keystone metric

Emissions accounting and emissions benchmarking are not the same thing. Emissions accounting is a ‘stock-take’ of all relevant greenhouse gas emissions that result, directly or indirectly, from a company’s activities. Conversely, emissions benchmarking is the means by which emissions performance is tracked, peers are compared on a like-for-like basis, and progress towards a specified goal is measured. Companies must therefore go beyond the GHG Protocol standard by providing the necessary data to benchmark. Unfortunately, while the protocol does provide some sector-specific guidance, there is no standard on emissions benchmarking.

Figure 4: Major keystone metrics and related scopes

Sector	Metric	Dominant scopes
Coal	tCO ₂ e / tonne coal	Scope 3 cat 11 + Scope 1
Oil and Gas (Primary Energy)	gCO ₂ e / MJ	Scope 3 cat 11 + Scope 1
Utilities	tCO ₂ e / MWh electricity	Scope 1
Steel	tCO ₂ e / tonne crude steel	Scope 1 + Scope 2
Cement	tCO ₂ e / tonne cement	Scope 1
Aluminium	tCO ₂ e / tonne aluminium	Scope 1 + Scope 2
Automotive	gCO ₂ e / km	Scope 3 cat 11
Airlines	tCO ₂ e / revenue-passenger km	Scope 1

Source: Signal Climate Analytics

Step 4 of transparency is achieved by disclosure of the keystone metric. The keystone metric is an emissions intensity metric that covers the dominant emissions Scopes and Categories (with the largest climate impact) for a company and its value chain. It is not everything, but it serves as the principal measure for tracking, comparing, and benchmarking progress towards net-zero. The metric works best in homogeneous sectors with a clearly defined physical output (Figure 4). However, with heterogeneous sectors where output has many disparate products that cannot be represented by a single unit, a value based proxy such as revenue is often used. As revenue can be influenced by factors other than activity, tracking absolute emissions performance is more suitable.

A critical requirement of benchmarking and the keystone metric is what we call 'structural granularity'. This is the disaggregation of emissions data down to the level or sector, activity, or product. Guidance on disaggregating emissions data is absent from the GHG Protocol standard, which instead focuses on aggregating up to the corporate level. But without drilling down, it is difficult to compare apples with apples or attribute primary drivers of change over time. We go beneath the surface and score the keystone metric at the activity-level.

Target setting - an explosion of net-zero

Net-zero targets now cover 61%³ of global emissions looking at pledges from governments, cities and states and companies listed in Forbes Global 2000 list. The setting of targets and pledges by companies is being driven by a number of factors, from Nationally Determined Contributions (NDCs), initiatives by non-state actors such as the UN's Race to Net Zero Campaign and, more importantly for corporates, a number of initiatives in the financial community covering investors (CA 100+), asset owners (Net Zero Asset Owner Alliance, TPI), banks and insurance companies (GFANZ).

What is net-zero? From a climate perspective, net-zero GHG emissions are achieved when total aggregate GHG emissions over a given period are equal to an equivalent amount of GHG removal⁴. This definition applies to net-zero CO₂ emissions, while other terms such as 'carbon neutrality' and 'climate neutrality' are often used interchangeably for net-zero CO₂ and net-zero GHG emissions respectively⁵.

In step 5 of our transparency assessment, we look at the target setting on net-zero, how credible these are and how well supported they are by near-term commitments.

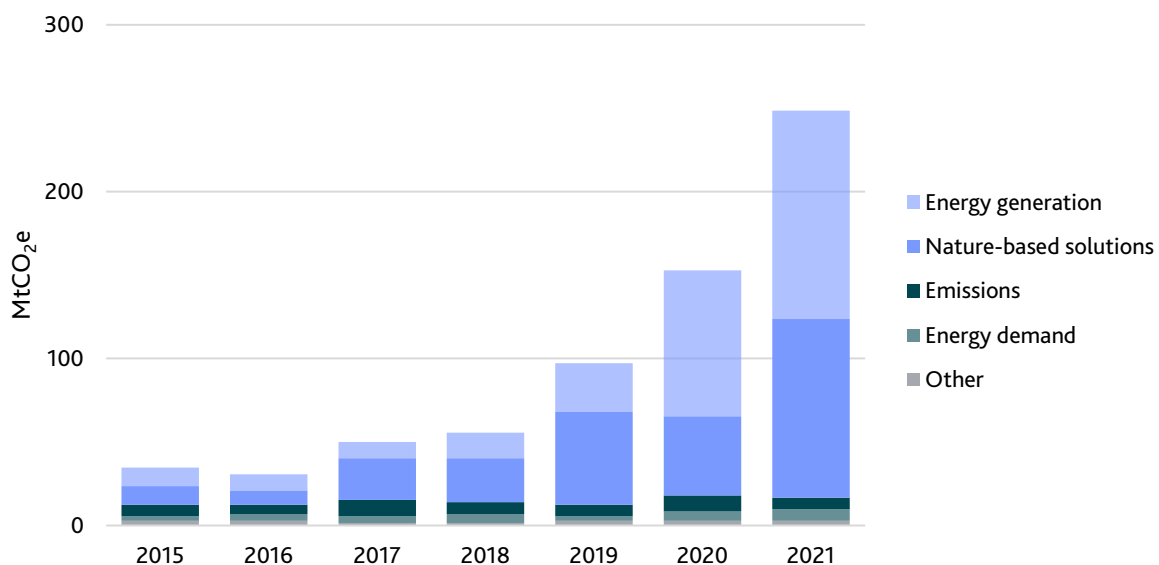
Target setting – a growing use of offsets but without the clarity

There has been a growing appetite for carbon offsets from countries via their NDCs and companies to achieve net-zero commitments. Carbon offsets work by enabling emission reductions from one party to be offered to another through carbon credits. In principle, this market mechanism should enable efficient allocation of capital towards projects and countries with lower mitigation costs.

Companies' use of carbon offsets has developed via a voluntary carbon market – corporates can invest in projects, that remove or avoid carbon on a per ton basis, indirectly neutralising or offsetting any emissions generated through their operations. The supply of offsets has grown significantly - 66% annually since 2018. Future demand for offsets is projected to grow to 5.2 GtCO₂e by 2050⁶.

Quality of supply is improving with major carbon offset registries such as Verra and Gold Standard only accepting clean energy projects in the least-developed markets. The Science Based Targets Initiative (SBTi) has also stipulated in its net-zero framework that companies only purchase offsets that remove carbon rather than the carbon avoidance offsets that currently dominate the market.

Figure 5: Growth in carbon offsets 2015-2021



Source: Adapted from Bloomberg NEF

³ Net Zero Tracker, 2022, Net Zero Stocktake 2022

⁴ Rogelj, J., et al., 2015 Corrigendum: Mitigation choices impact carbon budget size compatible with low temperature goals, Environmental Research Letters

⁵ UNEP, 2021, Emissions Gap Report 2021

⁶ Bloomberg NEF, 2022, Long term offset outlook

The aligning of NDCs with ambitions for emissions reductions by SOEs

Publicly listed entities are driven by increasing financial regulation and scrutiny from lenders and investors to align targets with net-zero. State owned enterprises (SOEs), however, will depend mainly on governments' positioning both in terms of NDCs and the availability of public financing.

This is particularly the case in China, where many large companies are state-owned or have limited exposure to financial markets through listed subsidiaries. Target setting here will be driven by the Government, which in China entails reaching peak emissions in 2030 and net-zero by 2060.

Engaging with SOEs, particularly the National Oil Companies (NOCs) will be critical in addressing a significant proportion of emissions within our top 250 universe. These entities may fall outside the normal channels of engagement with financial markets, unless explicitly included in Sovereign Bond funding or multilateral funding arrangements for these countries.

Progressing transparency and engagement for this important group of NOCs could come through the listed Oil and Gas companies which jointly own assets with governments. Lenders to listed Oil and Gas companies should review joint assets in the context of providing the transparency to assess net-zero commitments.

Transparency with full GHG accounting of methane emissions

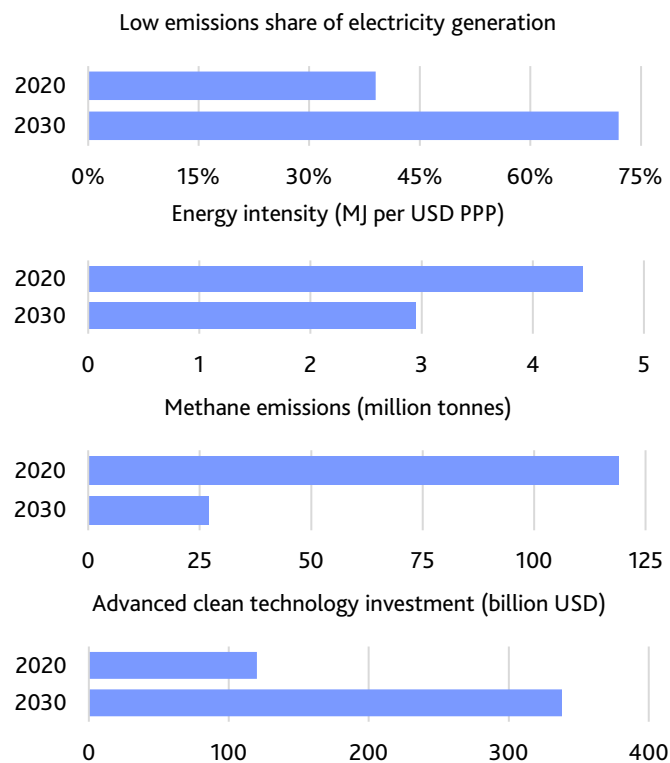
Methane is now attracting regulatory attention. The IPCC has found that methane emissions are higher than at any time in at least 800,000 years and methane has contributed to around 30% of observed global warming to date⁷. At COP 26 a global methane pledge was launched to commit to methane emissions reductions.

As methane is the main component of natural gas, there will be greater scrutiny of reported methane emissions from the sector. We include a case study to look at whether these reported emissions are aligned with observed methane emissions levels and whether there is a failure in transparency.

Moving from transparency to assessing transition to net-zero

Completing the transparency steps on disclosure provides the information to measure companies' climate impact, the first step in managing emissions. However, detailed low-carbon transition plans with clear actions and timelines are still missing. To assess how companies are positioned to achieve alignment with net-zero goals, a much deeper analysis is required. Our future reports will undertake forward-looking analysis of the climate risks and opportunities facing companies and assess the capital, regulations and technologies needed to put transition plans into action.

Figure 6: Four key priorities to keep the door to 1.5°C open in the IEA net-zero emissions by 2050 scenario



Source: Adapted from IEA

⁷ Rogelj, J., et al., 2015 Corrigendum: Mitigation choices impact carbon budget size compatible with low temperature goals, Environmental Research Letters

The top 250 Universe

Our transparency universe comprises 250 of the largest emitting public and private companies globally. The sample was selected primarily on the basis of total inventory emissions (Scopes 1, 2, 3).

The universe is made up of 213 publicly listed companies and 37 private companies. There are 57 state-owned enterprises (SOEs), of which about half are publicly listed with government taking the majority share.

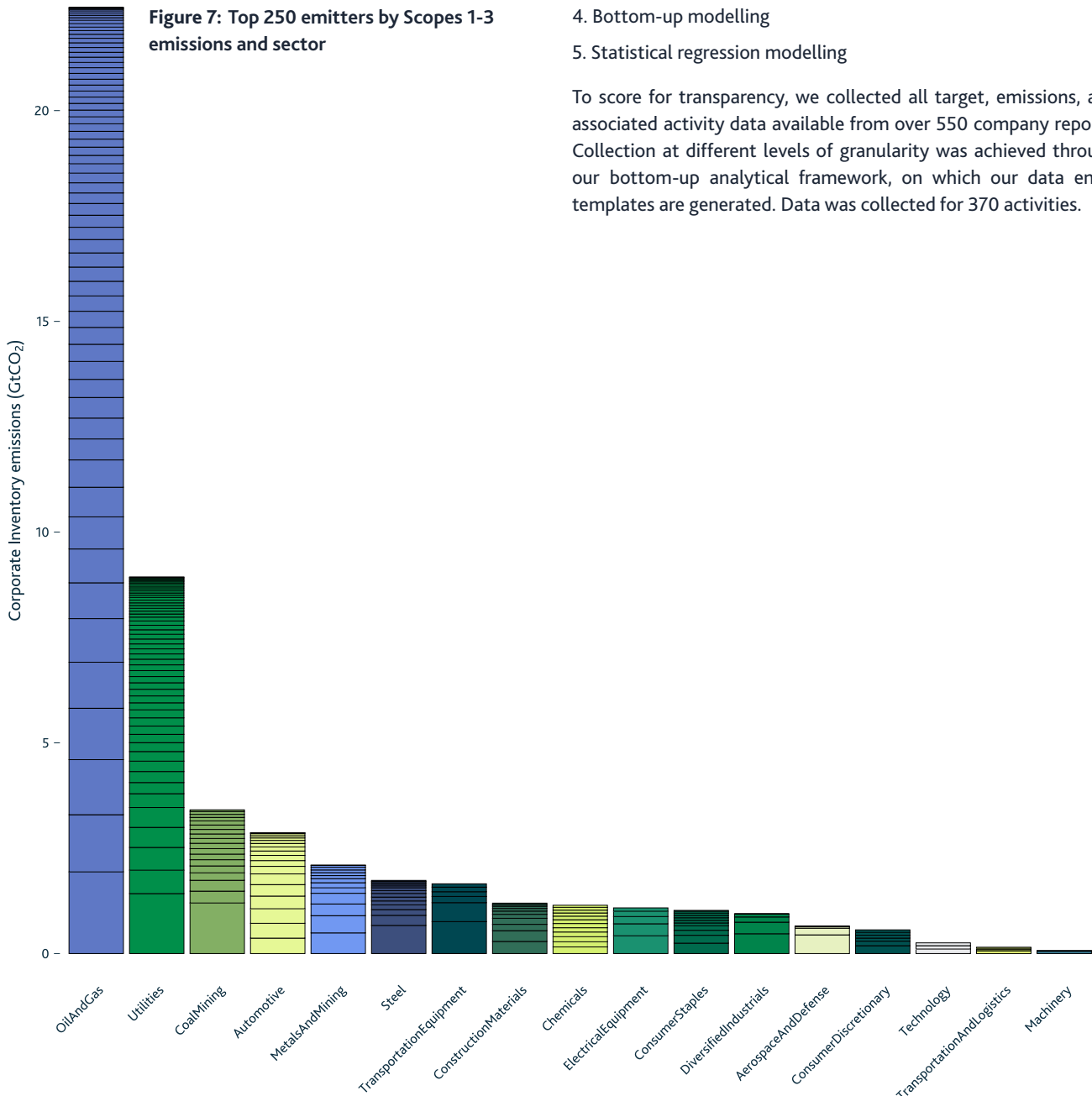
In 2020 our universe directly emitted 10 GtCO₂, which amounts to 30% of global CO₂. When also taking Scope 3 Category 11 'use of sold products' into account, our 65 Coal Mining and Oil and Gas producing companies were the source of 23 GtCO₂, two-thirds of global CO₂ emissions.

The universe is headquartered across 11 globally significant countries and regions and is split into 17 sectors derived from the Bloomberg Industrial Classification system (BICS). The sample is dominated by the biggest players in Oil and Gas (upstream and downstream), Coal Mining, Utilities, and Automobile Manufacturing. These four sectors make up 70% of the universe's total inventory emissions. Oil and Gas, Utilities, and Automotive account for just over 60%.

Our universe is built on a vast database of clean and complete emissions data spanning the value chains of over 150,000 public and private corporate entities. Maximum cleanliness and coverage are achieved through our data hierarchy:

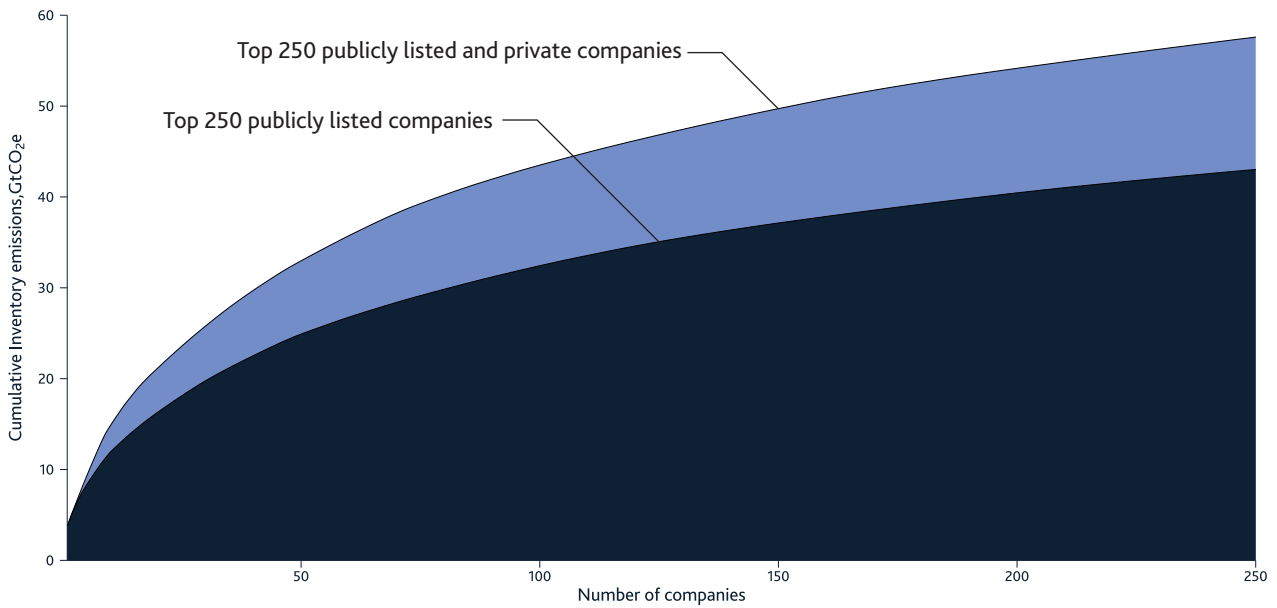
1. Directly collected from company reports
2. Obtained via the CDP Climate Change questionnaire
3. Obtained via Bloomberg
4. Bottom-up modelling
5. Statistical regression modelling

To score for transparency, we collected all target, emissions, and associated activity data available from over 550 company reports. Collection at different levels of granularity was achieved through our bottom-up analytical framework, on which our data entry templates are generated. Data was collected for 370 activities.



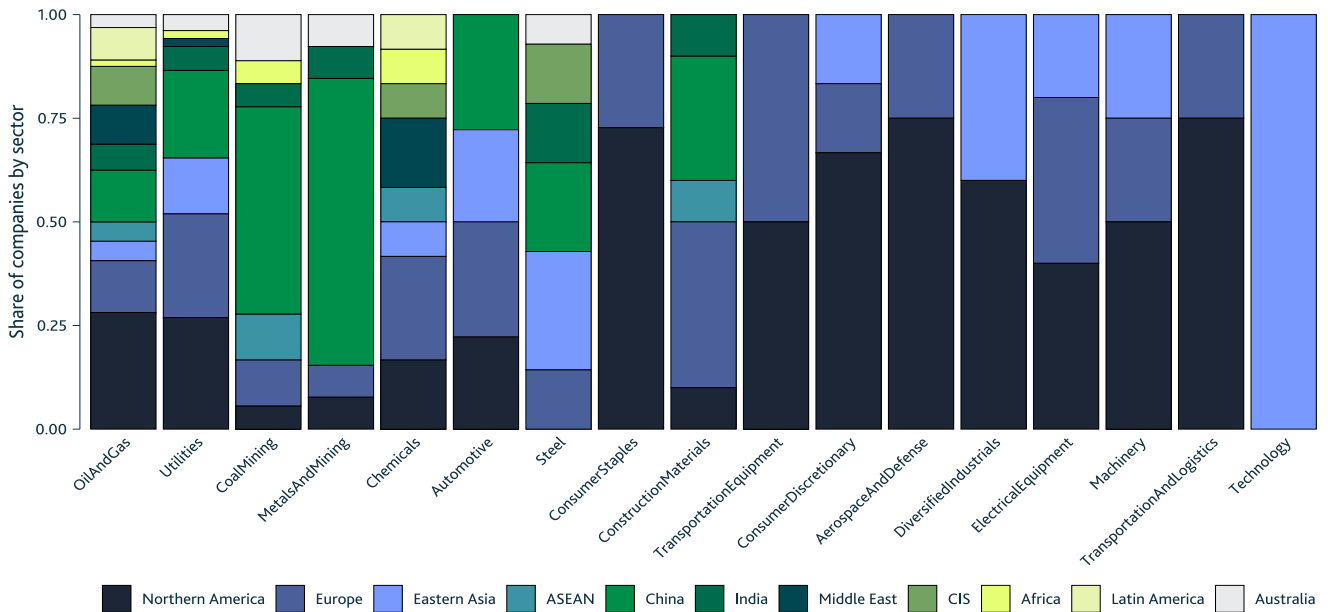
Source: Company reports, CDP, Signal Climate Analytics

Figure 8: Cumulative emissions of the Top 250 emitters list vs the top 250 publicly listed companies*



Source: Company reports, CDP, Signal Climate Analytics

Figure 9: Regional spread of by number of companies in each sector



Source: Signal Climate Analytics

*Note that double counting is expected to occur when scope 1, 2, and 3 emissions of multiple companies are added together. For example, the Scope 3 'use of sold products' emissions of an oil and gas company is also the scope 1 of the purchasers of those products, e.g., of electric utilities companies. The aggregated inventory emissions of the universe of about 55 GtCO_{2e} should not be compared with global emissions statistics.

Methodology

Transparency scoring

Effectively measuring emissions and managing decarbonisation strategies can often take a decade or more. The progression along this path may be reflected in the company's level of transparency over a number of steps. In this report, we score all 250 companies on their progression through a 5 steps process. To each step a weighting is assigned, as follows:

1. **Initial emissions reporting (10%).** The company starts measuring and discloses its Scope 1 and 2 emissions.
2. **Reporting standards and verification (5%).** The company demonstrates accounting transparency by subscribing to the GRI reporting standard, disclosing to CDP, and obtaining third-party verification.
3. **Complete emissions reporting (20%).** The company estimates and discloses relevant Scope 3 categories up and down the value chain.
4. **Keystone metric reporting (30%).** The company estimates and discloses the most important emissions performance metric for tracking its contribution to a net-zero emissions future. For heterogeneous sectors, this is represented by an absolute measure of dominant scope emissions.
5. **Target setting (35%).** The company provides complete near- and long-term target information with clarity over specific data points necessary to understand its pathway against net-zero.

Because there is so much variability in what and how companies self-report data, our scoring methodology captures many gradients of transparency within each step.

Emissions accounting

Emissions accounting is the first phase of the transparency path covering steps 1 to 3. Our scoring is built on the following:

1. **Data disclosure.** Simply the presence or absence of emissions data for Scopes 1, 2, and 3. Data should be available at the company-level and not restricted by geography.
2. **Inventory granularity.** The disaggregation of the emissions inventory to each scope and category of emission. For example, despite going through the trouble of calculating it, many companies bundle Scope 3 categories together or are ambiguous about what the categories are. Without this granularity, the dominant scope or category cannot be distinguished.
3. **Time-frame.** The period of emissions data reporting. Only one or two years of reported data is indicative of a company's reporting immaturity. Any useful trend must also cover enough time to alleviate the distorting effect of atypical years.
4. **Self-reporting.** Companies may disclose emissions data through CDP but not through their own reporting. We score down for data that is not self-reported.

Keystone metric

We score step 4 through the lens of relevancy and benchmarkability. The following is incorporated:

1. **Dominant scope.** The scope or category of largest impact as defined for each sector. For example, the dominant scope for automotive companies is Scope 3 category 11 (use of sold products).
2. **Structural granularity.** The disaggregation of data over the company's structure of activities and products. This is important because aggregation makes it difficult to assess performance on a sectoral basis, attribute the primary drivers affecting change, and compare peers of different levels of integration and configuration.
3. **Dimension.** The completion of the 'emissions triangle': emissions, output, and intensity. In order to benchmark between companies of different sizes, it is necessary to measure emissions intensity, which is emissions divided by output. But to fully appreciate the significance and dynamics of a company's trajectory, all three sides are required.

For a metric to be keystone, it must cover the dominant scope, have the necessary structural granularity, and come in the form of intensity, or absolute emissions for heterogeneous sectors.

Target setting

For step 5 we identify the data points necessary for a target's emissions trajectory to be understood. Our scoring looks at:

1. **Timeframe.** Clear base and target years provide a timeframe to understand the rate of emissions reductions. Base years from decades ago undermine credibility because much of the progress advertised has occurred before the target was set. Near-term (2023 – 2035) and long-term targets (post-2035) are assessed.
2. **Dominant scope.** As defined above, we identify the most relevant emissions covered by both near-term and long-term targets.
3. **Dimension.** We identify whether a target is of absolute emissions or emissions intensity.
4. **Long-term target definition.** Absolute or percentage emissions reductions should be defined for long-term ambitions.
5. **Carbon offsets.** The use of carbon offsets, sinks or similar should be made explicit.
6. **Validation.** Whether the target has been validated by the SBTi.

Transparency scores

The top

- ▶ Utilities make up 43% of the top 30. Seven out of the top ten Utilities are European, reflecting a policy and regulatory environment encouraging decarbonisation.
- ▶ A quarter of Consumer Staples companies in the universe make the top 30. Target, Nestle, and Danone, self-report their dominant Scope 3 emissions categories and accompany this with ambitious target setting.

The bottom

- ▶ There is virtually no transparency from the bottom 20 across emissions accounting, keystone metric and target setting.
- ▶ These laggards are dominated by SOEs and private companies, many of which are Chinese coal producers.

Figure 10: Top 30 and bottom 20 companies by transparency score

Rank	Ticker	Company	Headquarters	Sector	Transparency score
1	ENI IM	Eni SpA	Italy	Energy	97
2	ENGI FP	Engie SA	France	Utilities	96
3	EDF FP	Electricite de France SA	France	Utilities	96
4	NTGY SM	Naturgy Energy Group SA	Spain	Utilities	95
5	6302 JP	Sumitomo Heavy Industries Ltd	Japan	Machinery	95
6	TGT US	Target Corp	United States	ConsumerStaples	94
7	5938 JP	Lixil Corp	Japan	ConsumerDiscretionary	94
8	6502 JP	Toshiba Corp	Japan	ElectricalEquipment	94
9	UN01 GR	Uniper SE	Germany	Utilities	93
10	REP SM	Repsol SA	Spain	Energy	93
11	NESN SW	Nestle SA	Switzerland	ConsumerStaples	92
12	TTE FP	TotalEnergies SE	France	Energy	92
13	FORTUM FH	Fortum Oyj	Finland	Utilities	92
14	SHEL LN	Shell PLC	United Kingdom	Energy	91
15	6501 JP	Hitachi Ltd	Japan	DiversifiedIndustrials	91
16	OMV AV	OMV AG	Austria	Energy	91
17	EQNR NO	Equinor ASA	Norway	Energy	91
18	IBE SM	Iberdrola SA	Spain	Utilities	91
19	EXC US	Exelon Corp	United States	Utilities	90
20	2 HK	CLP Holdings Ltd	Hong Kong	Utilities	89
21	ENEL IM	Enel SpA	Italy	Utilities	88
22	ORG AU	Origin Energy Ltd	Australia	Utilities	88
23	BN FP	Danone SA	France	ConsumerStaples	87
24	RWE GR	RWE AG	Germany	Utilities	87
25	AGL AU	AGL Energy Ltd	Australia	Utilities	87
26	GM US	General Motors Co	United States	Automotive	86
27	DUK US	Duke Energy Corp	United States	Utilities	86
28	BMW GR	Bayerische Motoren Werke AG	Germany	Automotive	86
29	ULVR LN	Unilever PLC	United Kingdom	ConsumerStaples	86
30	AAL US	American Airlines Group Inc	United States	TransportationAndLogistics	85
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231	158443Z UH	Abu Dhabi National Oil Co	United Arab Emirates	Energy	0.4
232	CNBMGZ CH	China National Building Material Group Co Ltd	China	ConstructionMaterials	0.4
233	MTLR RM	Mechel PJSC	Russia	Steel	0.4
234	PBF US	PBF Energy Inc	United States	Energy	0.4
235	CPIZ CH	State Power Investment Corp Ltd	China	Utilities	0.2
236	600795 CH	GD Power Development Co Ltd	China	Utilities	0.2
237	001411 DMY	National Iranian Oil Co	Iran	Energy	0
238	022462 DMY	Valiant Resources	Australia	CoalMining	0
239	200625 CH	Chongqing Changan Automobile Co Ltd	China	Automotive	0
240	3097Z US	Koch Industries Inc	United States	DiversifiedIndustrials	0
241	58325Z NL	Nigerian National Petroleum Corp	Nigeria	Energy	0
242	601699 CH	Shanxi Lu'an Environmental Energy Development Co Ltd	China	CoalMining	0
243	CHXGAZ CH	Chiping Xinfa Huayu Alumina Co Ltd	China	MetalsAndMining	0
244	HBJNEZ CH	Jizhong Energy Group Co Ltd	China	CoalMining	0
245	NLC IN	NLC India Ltd	India	Utilities	0
246	PDVSA VC	Petroleos de Venezuela SA	Venezuela	Energy	0
247	PETROCH AB	National Petrochemical Co	Saudi Arabia	Chemicals	0
248	RPWR IN	Reliance Power Ltd	India	Utilities	0
249	SCCIGZ CH	Shaanxi Coal and Chemical Industry Group Co Ltd	China	CoalMining	0
250	YGCZ CH	Shandong Energy Co Ltd	China	CoalMining	0

Source: Signal Climate Analytics

Automotives

- ▶ Automotive companies score well on emissions accounting and target setting, but all except General Motors and BMW have poor performance on the keystone metric. These companies disclose global well-to-wheel vehicle emissions intensity data.
- ▶ Stellantis performs poorly as data has not been consolidated since the merger of Fiat Chrysler (FCA) and Peugeot (PSA).

- ▶ Honda stopped reporting global average vehicle emissions intensity in its latest ESG Report.

Utilities

- ▶ The transparency scores for Utilities companies shows significant leadership in quality of disclosure.
- ▶ The under-performers are mostly Chinese companies, which show little or no transparency across the board.

Figure 11: Automotive company scores

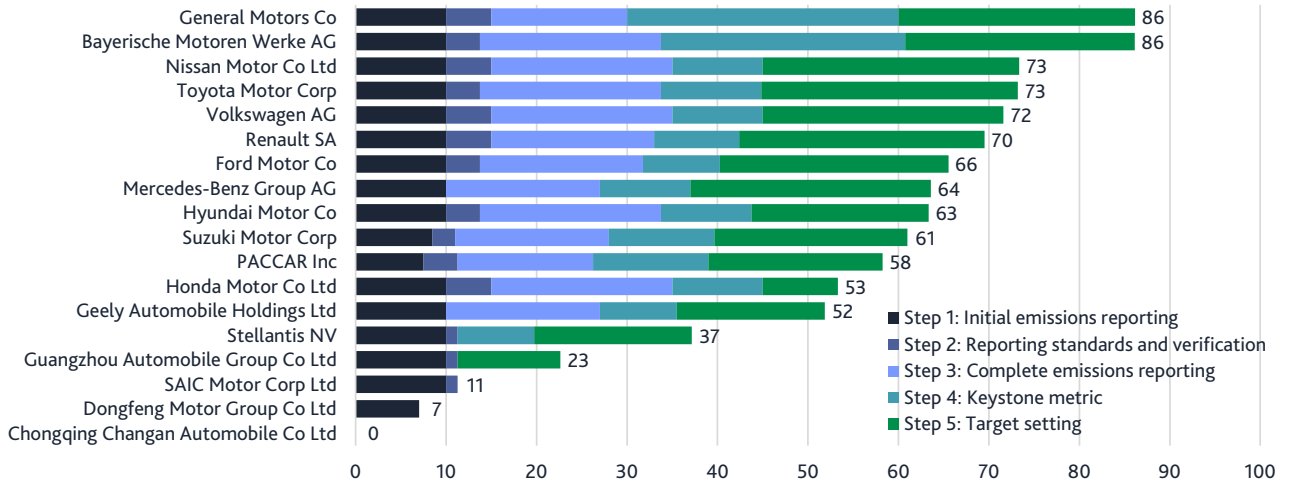
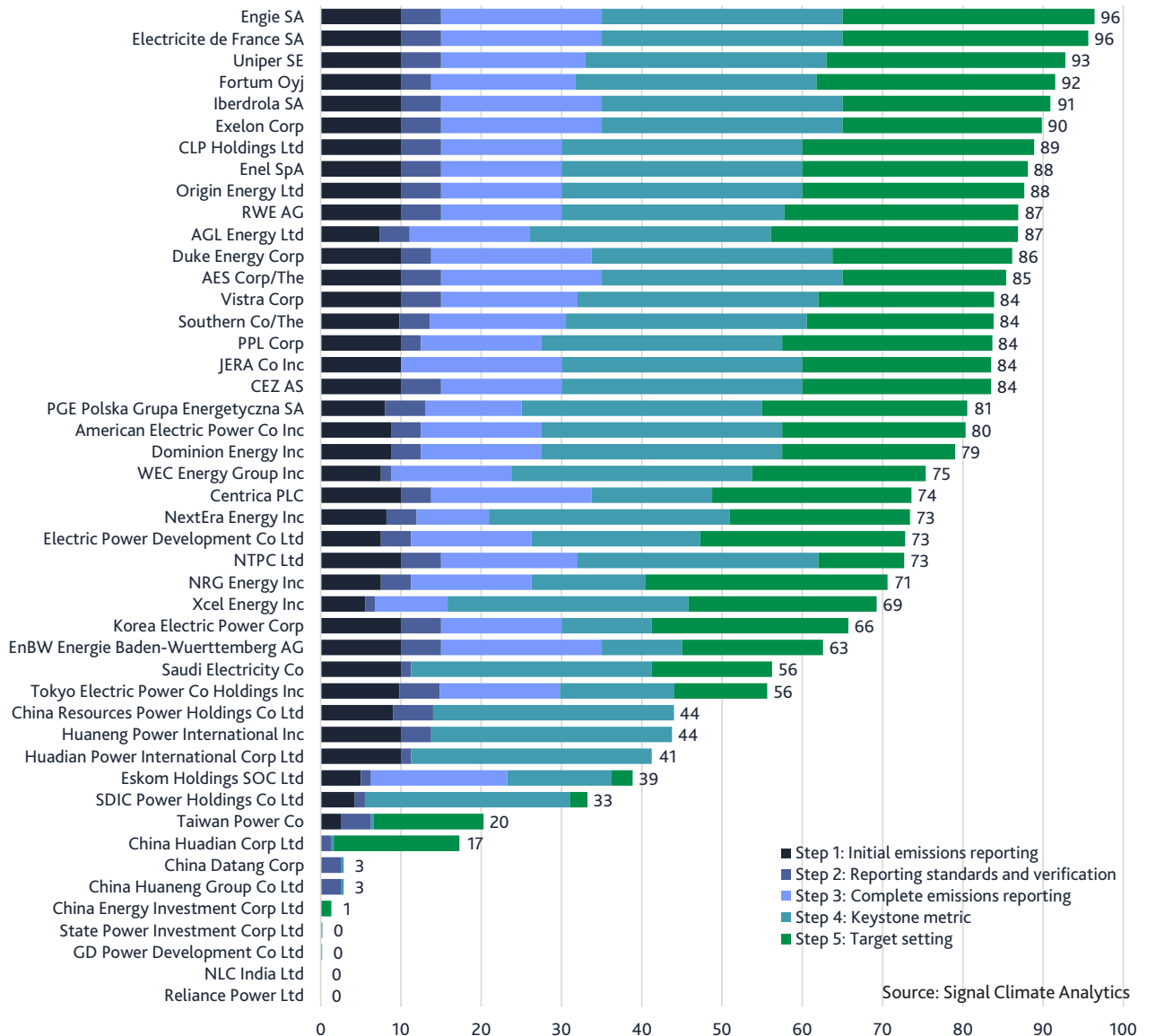


Figure 12: Utilities company scores

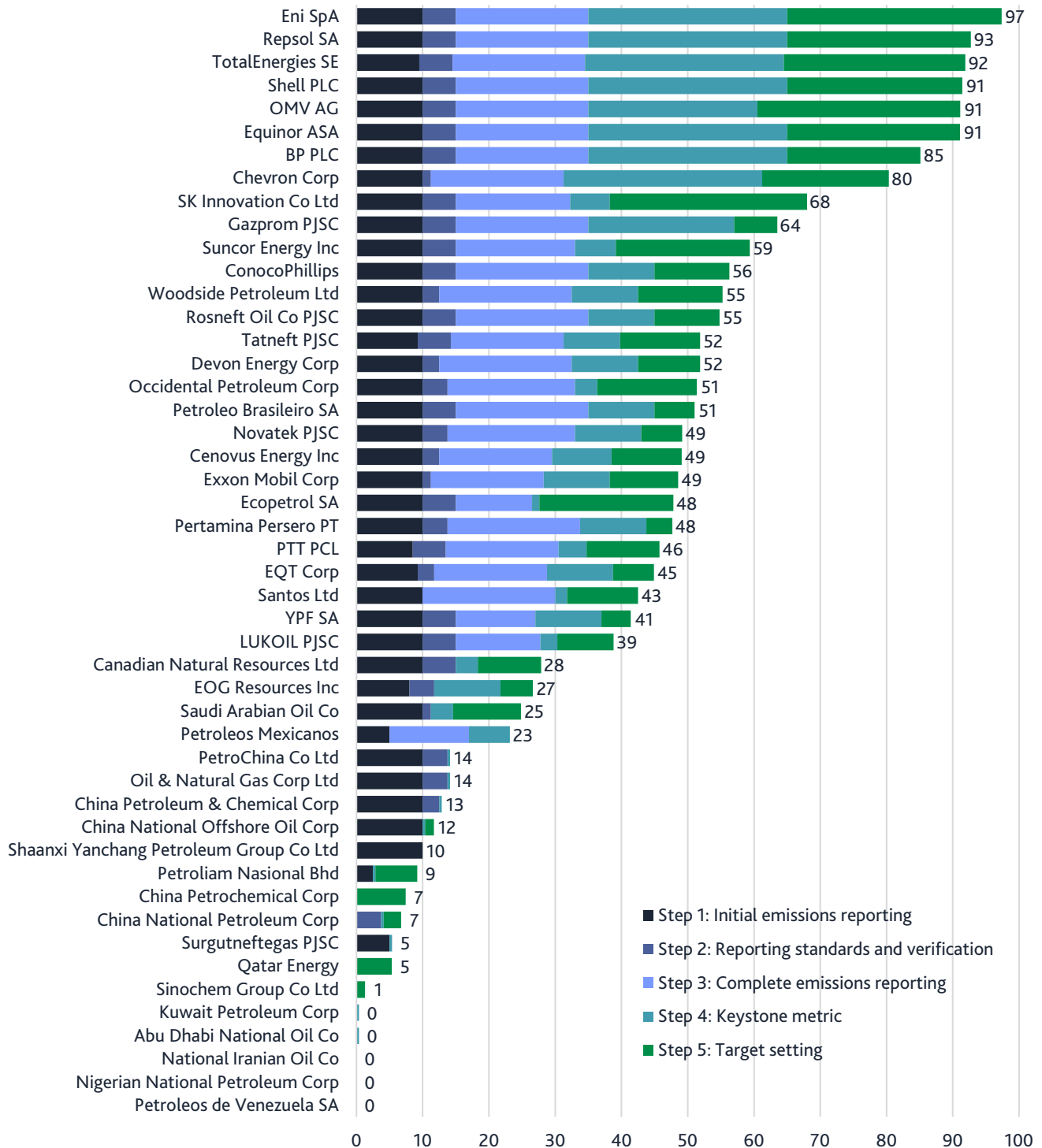


Source: Signal Climate Analytics

Oil and Gas

- ▶ On keystone metric, a breakaway group of 8 Oil and Gas companies lead the pack – Eni, Repsol, OMV, TotalEnergies, Shell, Equinor, BP, and Chevron. This is because they disclose an emissions intensity covering value chain emissions. These companies also score well on targets.
- ▶ On Scope 3 accounting, Tatneft, Cenovus Energy, and ExxonMobil missed top marks because only 2 years of data are available. With Occidental, Novatek, and Suncor, 3 years is compiled from a mix of self-reported and CDP data.
- ▶ The laggards are dominated by large National Oil Companies (NOCs). Unreported emissions in the sector are estimated at 11 GtCO₂e, of which 9.6 GtCO₂e come from SOEs.

Figure 13: Oil and Gas sector company scores



Source: Signal Climate Analytics

Case Study: Signs of transparency in Oil and Gas

Oil and gas is the most influential component of the primary energy supply sector - the energy gateway of the global economy. Primary energy also includes coal, nuclear, hydro, biomass, and other renewables such as wind and solar. Unfortunately, a chronic failure of Oil and Gas companies to report product emissions (Scope 3 Category 11) persists.

The main issue is the disincentive for Oil and Gas companies to associate themselves with emissions of such a large scale, even though omitting such disclosure is in direct contradiction to the GHG Protocol's relevance criterion 'size'. This problem is compounded by the large share of private companies, predominantly SOEs, where Scope 3 disclosure rate in our universe is 17%.

However, the rate among publicly listed companies has risen from 40% three years ago to nearly 60% today. Even ExxonMobil, who is advising shareholders to vote against Scope 3 targets⁸, began reporting Scope 3 Category 11 in 2020. But despite this, we found that just 7 Oil and Gas companies disclose a keystone metric.

In November 2017, Oil and Gas major Shell outlined an ambition to reduce its 'net carbon footprint' by half by 2050. The ambition has since improved but, of greater importance to transparency, Shell had introduced and published a methodology¹¹ for effectively tracking the emissions of primary energy producers on the path to net-zero. There are now eight Oil and Gas majors that publish product life-cycle emissions¹²: Eni, Repsol, OMV, TotalEnergies, Shell, Equinor, BP, and Chevron.

The basic principle of the net carbon approach is to sum impacts at each node of the product process chain. Figure 15 illustrates energy flows in the supply of crude oil and petroleum products. Based on this representation, Scope 1 and 2 emissions are linked to the activities of A and B. Upstream Scope 3 emissions are linked to C and D, and downstream Scope 3 emissions lead from E and F. This is repeated for all energy products sold by the company and then aggregated to represent the full energy product portfolio.

Aggregation is possible because all products are measured on an equal energy basis. The most commonly adopted metric is gCO₂e per MJ. The use of SI units here supplanting 'barrels of oil equivalent' (boe) and being indicative of a wider coverage of energy products.

Figure 14: Net carbon intensity of oil and gas

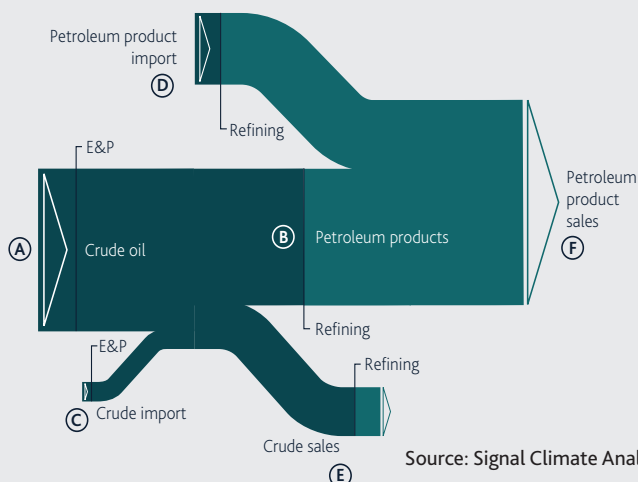


Source: Company reports, Signal Climate Analytics.

Now is the time for a consensus on the precise calculation of net carbon intensity. In other sectors, such as steel and cement⁹, consensus has been built through trade associations. Oil and Gas association IPIECA has not published anything on the subject and their review of Scope 3 estimation approaches¹⁰ is insufficient and outdated. Ultimately, a standard is required, tools for consistent application of methodology, and mechanisms to incentivise adoption or regulation to enforce it.

But transparency alone won't limit global temperature rise. Companies have to play a role in decarbonising the global energy system of which they are a part. Progress is presently slow, which is expected because it is not possible to reduce emissions from oil and gas combustion without a roll-out of CCS beyond what is economically viable. Rather, companies need to reduce the share of oil and gas in their primary energy product portfolio. This is the only way they can increase MJ of production without increasing gCO₂e of Scope 3 emissions.

Figure 15: Sankey diagram illustrating crude oil and petroleum product energy flows of an integrated Oil and Gas company



Source: Signal Climate Analytics

⁸ Upstream, 2022, ExxonMobil advises shareholders to vote against Scope 3 target proposal, Online Article, 11 April 2022

⁹ Shell, 2020, "The Net Carbon Footprint Model: Methodology" Rev 2, April 2020

¹⁰ OMV's metric excludes methane so is not considered keystone.

¹¹ WorldSteel, 2017, Life Cycle Inventory methodology report 2017 and GCCA, 2020, Internet Manual, Version 3.1

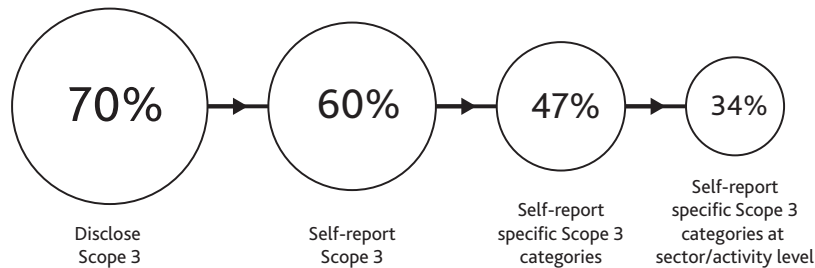
¹² IPIECA, 2016, Estimating petroleum industry value chain (Scope 3) greenhouse gas emissions. Overview of methodologies., June 2016

Key Findings

A low level of transparency beneath the surface

- ▶ A considerable 88% of companies disclose Scope 1 and 2 emissions and 70% disclose Scope 3 in some form. However, looking beneath the surface uncovers a significant reduction in real transparency. Self-reported Scope 3 disclosure of categories at the company activity-level is 34%.

Figure 16: The real transparency of Scope 3 accounting

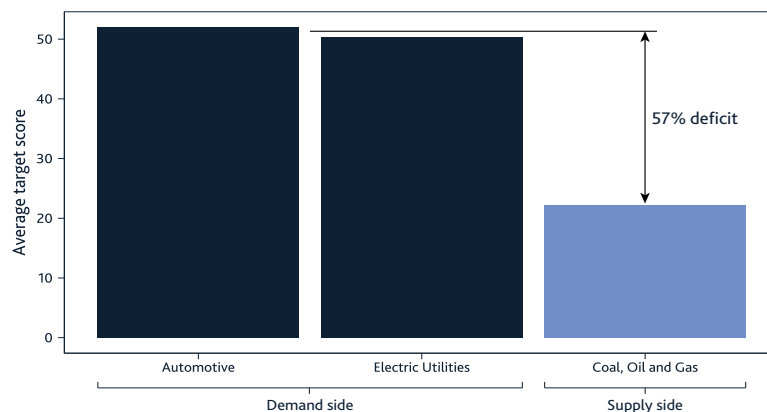


- ▶ In target setting, the quality of near-term targets is higher as they are built on specific emissions reduction data. This contrasts with long-term targets where only 31% of companies provide a figure, making it difficult to assess the strength of these ambitions.
- ▶ Carbon offsetting is prevalent. Half of companies with long-term targets disclose plans to use them but a mere 3% of companies explicitly disclose that they will not use carbon offsets. This raises questions about the real emissions cuts companies are planning to achieve.
- ▶ Automotive companies perform poorly with just 11% disclosing a global keystone metric, despite 72% disclosing an intensity of Scope 3 'use of sold products'. Companies often report only for certain markets, such as the US, the EU, and Japan, where they are already obliged to submit measures to the regulator (See case study on page 18).
- ▶ Sectors in which relevant emissions derive from directly owned assets or electricity purchases (Scopes 1 and 2) – Electric Utilities, Steel, Aluminium and Construction Materials (Cement) – find it easier to report dominant scope emissions. However, too strong a focus on these emissions can lead to complacency. For example, Scope 3 category 11 is by far the largest part of steel company Thyssenkrupp's emissions footprint.

A disconnect between supply and demand sides of the energy value chain

- ▶ A critical problem among the primary energy producers - Coal, Oil and Gas - persists in that many companies remain unwilling to publish the Scope 3 emissions that emerge from the use of their products. However, with an increase of 25% since 2019, Scope 3 disclosure in the Oil and Gas sector is on the rise.
- ▶ Over a quarter of emissions in our universe (14 GtCO₂) is unreported data from the primary energy sector, and not one coal mining company has a keystone metric.
- ▶ Primary producers significantly lag behind their principal demand-side sectors - Electric Utilities and Automotive - at including dominant scope emissions in their target setting. This indicates a disconnect between the supply and demand sides of the energy value chain.

Figure 17: Primary energy supply side ambition deficit

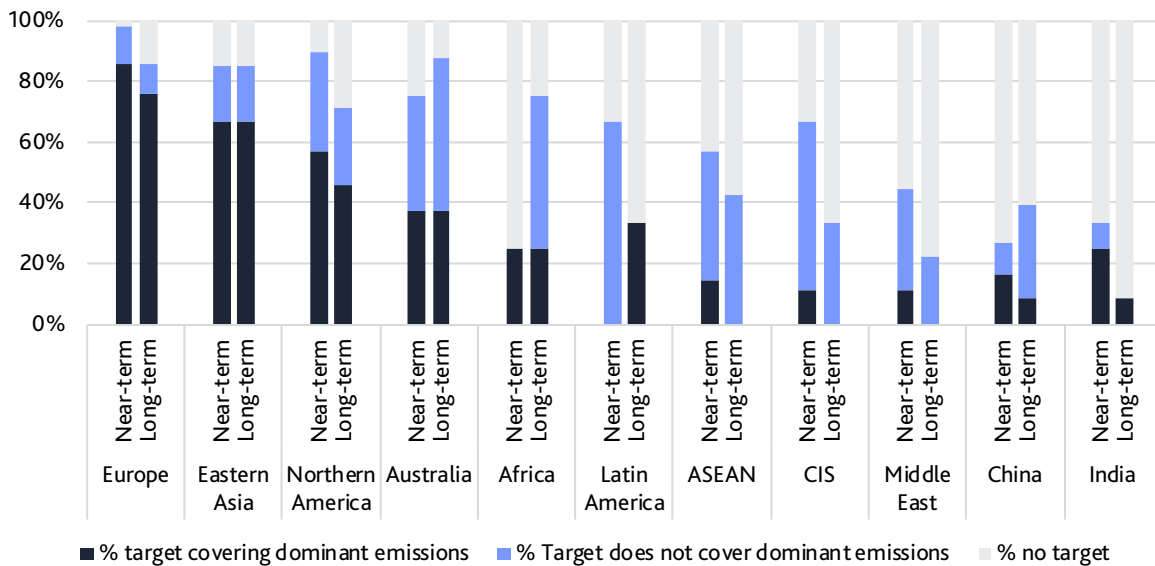


Source: Signal Climate Analytics

Regulation and public scrutiny make a difference to target setting transparency across different regions

- ▶ European companies outperform other regions in transparency as they are driven by a strong regulatory and policy environment. 98% of European companies disclose near-term targets and 88% cover their dominant scopes. Middle Eastern, Indian and Chinese companies lag behind.
- ▶ There is a sharp divide between publicly listed and private companies with 95% of public companies disclosing emissions data versus 32% for private. Publicly listed companies also perform best in terms of target setting with 83% setting targets near-term targets, 70% of which cover their dominant emissions' scopes.
- ▶ 82% of publicly listed State Owned Enterprises (SOEs) disclose emissions versus 27% of private SOEs. Listed SOEs also perform better on target setting with 50% setting near-term targets compared to 20% for unlisted SOEs.

Figure 18: Percentage of targets covering dominant emissions by region



Source: Signal Climate Analytics

Top performing transparency doesn't necessarily translate to decarbonisation

- ▶ Consumer Staples companies - such as Nestle, Danone, and Target - are leaders at Scope 3 disclosure, but nonetheless face significant challenges to decarbonise their value chains.
- ▶ By employing life-cycle principles in the calculation of Scope 3 emissions, Oil and Gas companies such as Shell and Eni have enhanced their ability to benchmark progress. But for the sector's emissions to decline, companies need to manage their methane and shift their energy product portfolios away from fossil fuels (See case study on page 15).

Case study: Automotive Disclosure but not Transparency

The Automotive sector is currently failing at transparency. On the surface, the situation looks reasonable: 89% Scope 1-2 disclosure rate and 78% dominant Scope 3 (Category 11) disclosure. However, keystone metric disclosure rate is a meagre 11%. Beneath the surface there are three elemental problems that require attention.

Forgetting something?

The keystone metric of the Automotive sector is 'well-to-wheel' gCO₂e per lifetime km. Well-to-wheel (WTW) incorporates the upstream supply chain emissions embodied by a vehicle, also known as 'well-to-tank' (WWT), in addition to the vehicles' use-phase emissions, referred to as 'tank-to-wheel' (TTW) or tailpipe emissions. It is important to include upstream emissions because this figure varies significantly between vehicle power-train.

It's not asking for the World

The keystone metric should also represent all of a company's sector activities. However, many manufacturers disclose data at the regional level only. Global companies are subject to different requirements on testing and calculating vehicle emissions for each regulatory jurisdiction. Manufacturers who feel their geographical distribution of vehicle sales puts them at a disadvantage compared with their peers, may be reluctant to consolidate their measurements. In addition to this, there is a lack of standardization over how the metric is calculated which can demotivate companies to report.

Our figures show a 72% disclosure rate for regional vehicle emissions intensity data yet only 11% for global vehicle emissions intensity. We recognise that regional data is still useful so companies receive a partial score for disclosing it.

No standard method

There is a failure in current methodology that prevents comparability between automakers. Outside of regulation, companies have full discretion over highly sensitive calculation variables, such as vehicle lifetime and annual mileage. This can prevent comparability and produce appreciably different results between similar companies.

Take BMW and Mercedes: two close competitors with very remote assumptions about their products. To calculate the keystone's denominator they estimate how many years their cars live and how far they're driven each year. Put in another way:

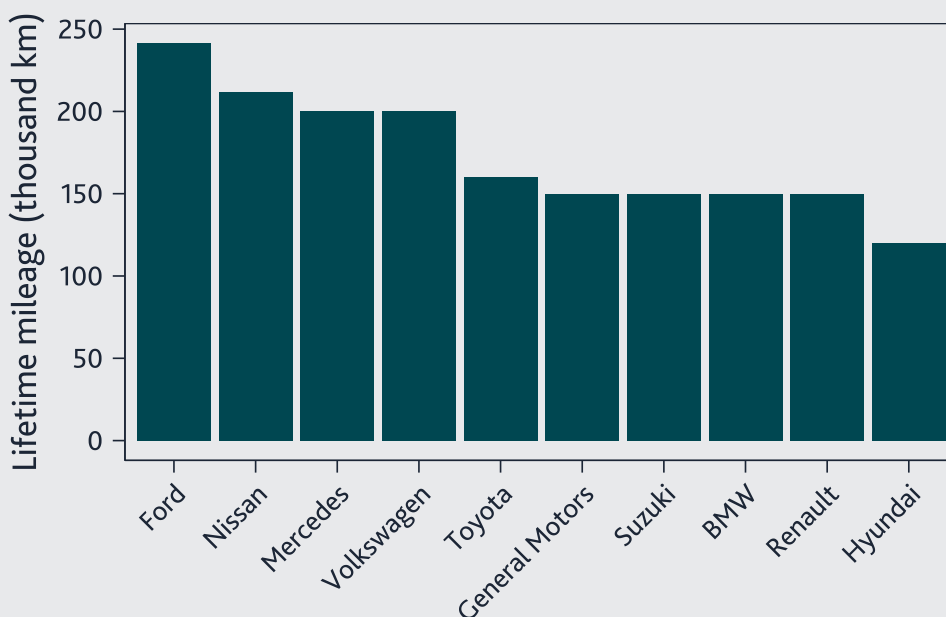
$$\text{Lifetime mileage} = \text{Lifetime in years} \times \text{Annual mileage}$$

According to CDP data, BMW assumes a lifetime of 15 years at 10,000 km per year whereas Mercedes flip this around and assume 10 years at 20,000 km per year. This gives a lifetime mileage of 150,000 to BMW and 200,000 km to Mercedes. Average vehicle emissions intensity in the EU is remarkably similar between the two: 116 gCO₂/km for BMW and 115 gCO₂/km for Mercedes. This means that for every car sold in the EU, Mercedes Scope 3 emission is 34% higher than that of BMW, despite having the same intensity.

With the final release in 2015 of the Worldwide Harmonised Light Vehicle Test Procedure (WLTP), progress at least for measuring tailpipe emissions has been made, and companies such as BMW and Volkswagen refer to the WLTP in their reporting. But without a similar standard for Scope 3 product lifetime emissions intensity, and mechanism for its adoption, companies are free to manipulate key variables in their favour.

While this example cannot confirm manipulation has taken place, it does confirm that crucial variables are treated crudely, based on highly inconsistent and manipulatable assumptions, and any serious attempt to estimate them has not been made.

Figure 19: Lifetime mileage disclosure of selected Automotives



Source: Signal Climate Analytics

Emissions accounting

General trends

- ▶ Most of the world's top 250 emitting companies are measuring emissions. A considerable 86% disclose emissions data.
- ▶ There is a deficiency in self-reported Scope 3 granularity. 25% of disclosers do not provide, or are ambiguous about, Scope 3 data at the category level. This is true even when the company does provide such detail to CDP, indicating that there is a lack of incentive for companies to self-report. For example, Thyssenkrupp's Scope 3 Category 11 is disclosed exclusively to CDP, despite it being by far the dominant category.
- ▶ Emissions intensity is computed and disclosed by 73% of companies, however in many cases this is a simple division of Scope 1-2 emissions by revenue. 58% of companies disclose emissions intensity on a physical output basis.

Ownership and geography

- ▶ There is a sharp divide in the rate of emissions reported between publicly listed and privately-owned companies. 95% of publicly listed companies disclose emissions data, compared to just 32% of private companies.
- ▶ Whether a company is listed is a more significant determinant of emissions reporting than whether the company is government-owned. 82% of publicly listed SOEs and 27% of private SOEs disclose emissions.
- ▶ Nearly all companies headquartered in developed economies disclose emissions. 100% of European, ASEAN, and Eastern Asian countries (Japan, South Korea, and Hong Kong), and 97% of US companies disclose.
- ▶ China performs relatively poorly, with 58% of companies disclosing emissions data, ahead only of the Middle East, where 33% of companies disclose. Lack of disclosure in China is mostly the problem of SOEs, 83% of publicly listed Chinese companies and 17% of Chinese SOEs disclose emissions.
- ▶ China is particularly bad at disclosing Scope 3 emissions. Just 17% of Chinese companies report it. Not a single Chinese SOE reports Scope 3 emissions.

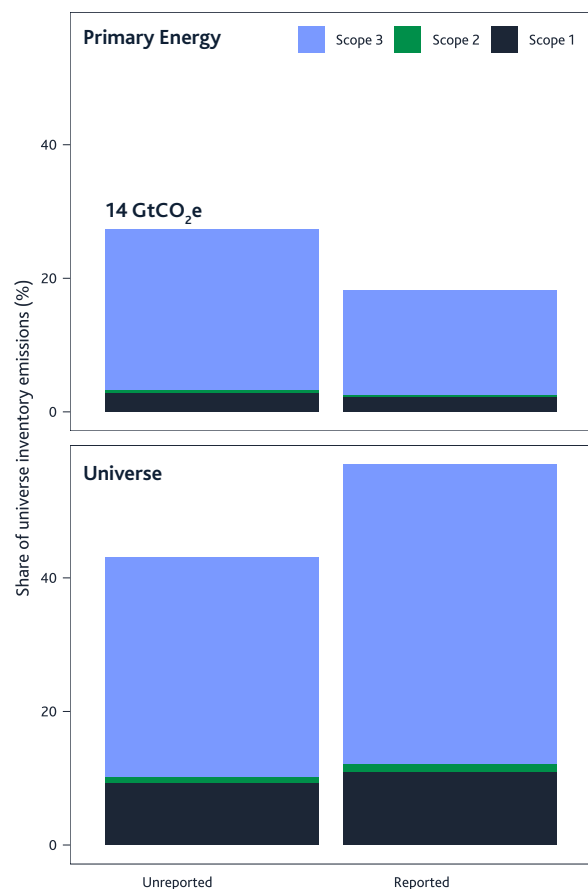
Sector trends

- ▶ Coal mining companies are the laggards of the sample, with 58% reporting Scopes 1-2, but only 9% reporting Scope 3 emissions Category 11 'use of sold products'.
- ▶ Oil and Gas companies are transparent with Scope 1-2 emissions, but fail with Scope 3. 83% disclosed on Scopes 1-2, compared with 35% on Scope 3 'use of sold products'. Emission from fossil fuel combustion is easy to calculate,

suggesting an unwillingness from companies to be associated with their downstream emissions (typically 90% of their total footprint). However, with an increase of 25% since 2019, Scope 3 disclosure in the Oil and Gas sector is on the rise.

- ▶ Over a quarter of emissions in our universe (14 GtCO₂e) is unreported data from Coal, Oil and Gas sectors (Figure 20).
- ▶ Electric Utility companies perform well, with a 90% disclosure rate in the sector for Scopes 1-2. This is a rise of just 3% over the past 3 years, indicating maturity.
- ▶ Automotive companies perform well, with 89% disclosing on Scopes 1-2, and 78% disclosing on Scope 3 'use of sold product' emissions, up from 72% and 67% in 2019 respectively.
- ▶ Consumer staples and Consumer discretionary perform excellently on emissions reporting. All 17 companies report on Scopes 1, 2, and 3 emissions. However, about a third of companies disclose their Scope 3 only through CDP.

Figure 20: Unreported (estimated) vs. reported emissions of the top 250 universe



Source: Company reports, CDP, Signal Climate Analytics

Keystone metric

General trends

- ▶ Most companies do not disclose a keystone metric, but the situation is steadily improving. 32% of companies report a keystone metric, up from 26% three years ago.
- ▶ Just 21% of *activities* were covered by a keystone metric. This is lower than at company-level because a company may not report on all of its activities, opting instead to focus on those that are easier to measure or less controversial. For example, integrated utilities company EPH has a keystone metric for power generation but not for its coal sales.
- ▶ About 60% of companies reporting a keystone metric report all three sides of the keystone triangle (emissions, intensity, and output), with this proportion unchanging in recent years.
- ▶ A significant 70% of companies disclose intensity in some form, but less than half of these metrics are keystone. Companies risk painting a false picture if they communicate performance with the wrong metric.

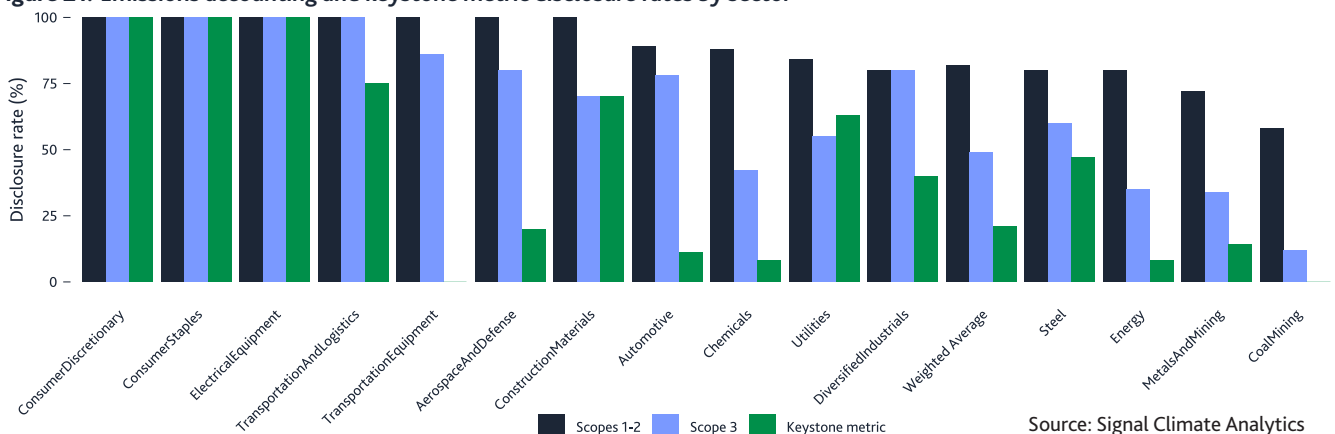
Geography

- ▶ Europe leads with 54% of companies headquartered there reporting a keystone metric. Eastern Asian (Japan, South Korea, and Hong Kong), ASEAN, and Australian companies also perform above the 33% average.
- ▶ Despite having a near 100% rate of Scope 1-2 disclosure and 90% rate of Scope 3 disclosure, only a third of United States companies report their keystone metric. This reflects the US sector mix, which is dominated by Oil and Gas and Automotive, both of which perform poorly for keystone metric transparency.
- ▶ Of the companies headquartered in China, the Middle East, and Latin America, only 14% report a keystone metric.

Sector trends

- ▶ There are no Coal Mining activities from the 250 companies that are covered by a keystone metric.
- ▶ Oil and Gas (Energy) performs poorly. Of upstream and downstream production activities, only 9% are covered by a keystone metric, and little has changed over the past 3 years. However, 27% of companies disclose both the numerator and denominator components, and this figure has risen by half, from 18%, since 2019.
- ▶ 68% of power generation activities are covered by a keystone metric, or 77% from Electric Utilities companies alone. The higher rate is a reflection of the sector's reporting maturity and relative ease of measuring Scope 1 emissions.
- ▶ Automotive companies perform poorly, with just 11% disclosing a keystone metric, despite 72% disclosing an intensity of Scope 3 'use of sold products'. One problem is that most of this data is regional. See case study (page 18).
- ▶ The highest reporting rates for keystone intensity are: Electric Utilities (68%), Steel (47%), Cement (70%), and Transport and Logistics (60%). These sectors do not need Scope 3 data to arrive at a keystone metric and Scopes 1-2 are easier to measure. Thus, higher keystone reporting rate is incidental to sectoral structure.
- ▶ All Consumer staples and Consumer discretionary (excluding Automotive) companies disclose their dominant category Scope 3 emissions (keystone numerator), although nearly half of this data was not self-reported but available only via CDP. Only 12% disclose a keystone intensity, which is expected as it is harder to track meaningful physical outputs in heterogeneous sectors.
- ▶ Transportation Equipment score poorly on keystone metric because, though they are reporting dominant Scope 3 Category 11 'use of sold product' emissions, they are not linking the data explicitly to their products. For example, Engine manufacturer Cummins does not disclose the number of engines produced nor use it as a denominator, and their emissions data also covers other less significant products and services.

Figure 21: Emissions accounting and keystone metric disclosure rates by sector



Source: Signal Climate Analytics

Case Study: Methane emissions are ripe for transparency

Why Methane is key

Methane is a critical lever for rapidly reducing emissions this decade because it is a much more potent greenhouse gas than CO₂ in terms of global warming potential. Mitigating it can flatten the GHG emissions curve, buying more time to tackle CO₂ emissions. Unfortunately, global atmospheric methane concentrations are rising fast. At COP26, 110 countries signed the Global Methane Pledge to cut emissions by 30% from 2020 levels by 2030. Methane emissions cuts in the Oil and Gas sector have high potential for immediate targeted mitigation.¹³

Recent total methane emissions have been attributed 60% to anthropogenic sources and 40% to natural sources. In a feasible worst case scenario, warming itself is increasing microbial biosphere methane emissions in a positive feedback effect. Such risks engender all the more urgency to implement effective mitigation strategies for human-derived methane sources that are under our control.

Coal mines, oil and gas operations currently account for approximately a third each of energy sector methane emissions (135 Mt/yr). Natural gas is widely touted as a bridge fuel to reduce greenhouse gas emissions relative to today's energy mix. However, US based studies have shown that within a 20 year timeframe this may only be true for operations with methane leakage rates below ~3%¹⁴. Above 3%, natural gas could contribute more to climate change than coal. Venting of methane – to reduce the need to flare or store excess gas – is the largest source of emissions from onshore oil and gas production.

Direct measurement offers a path to industry engagement

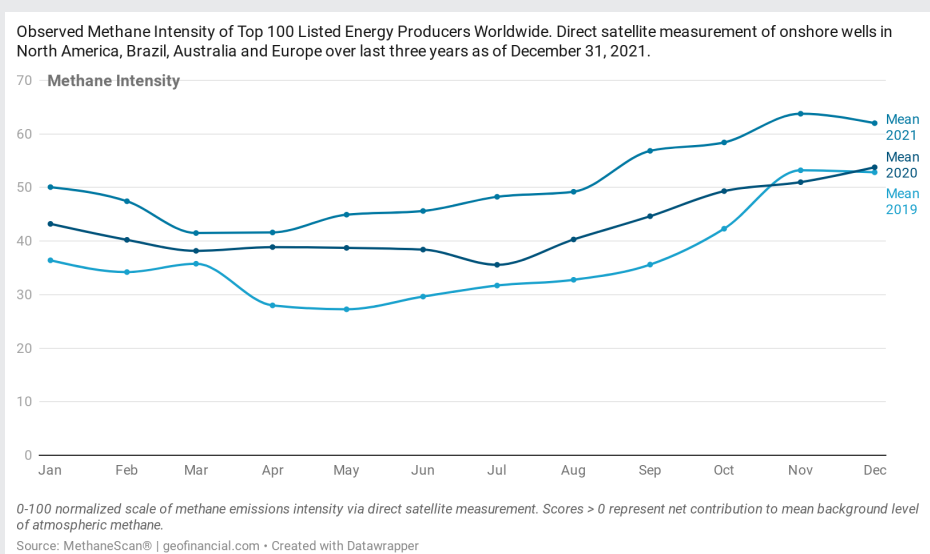
Recent advances in monitoring technologies are improving the ability to detect and attribute of methane emissions via satellites, aerial and ground-based shortwave infrared sensors.

As the spatial and temporal resolution of satellite data increases, it has become possible to narrow the gap between large area detection from space and pinpoint measurements on the ground for improved attribution of detected methane to parties responsible. Geofinancial Analytics has developed MethaneScan® for this purpose. MethaneScan® employs enhanced multi-scale satellite attribution to build a company-wide assessment of methane emissions, integrating mid-level data up to 1km² resolution with higher resolution (<25m) measurements.

By aggregating such observations over 6 million wellheads, Geofinancial Analytics has found that methane emissions intensity of the top 100 listed producers is rising - not declining - year on year.

Methane emissions intensity refers to the "leak rate" of gas production, or the ratio of methane emissions to natural gas produced.

Figure 22: Methane intensity of top 100 producers is increasing - not declining



¹³ I. B Ocko et al, 2021, Acting rapidly to deploy readily available methane mitigation measures by sector can immediately slow global warming, Environmental Research Letters

¹⁴ Howarth, R. W., 2014, A bridge to nowhere: methane emissions and the greenhouse gas footprint of natural gas, Energy Science & Engineering, Environmental Research Letters

The Methane Gap

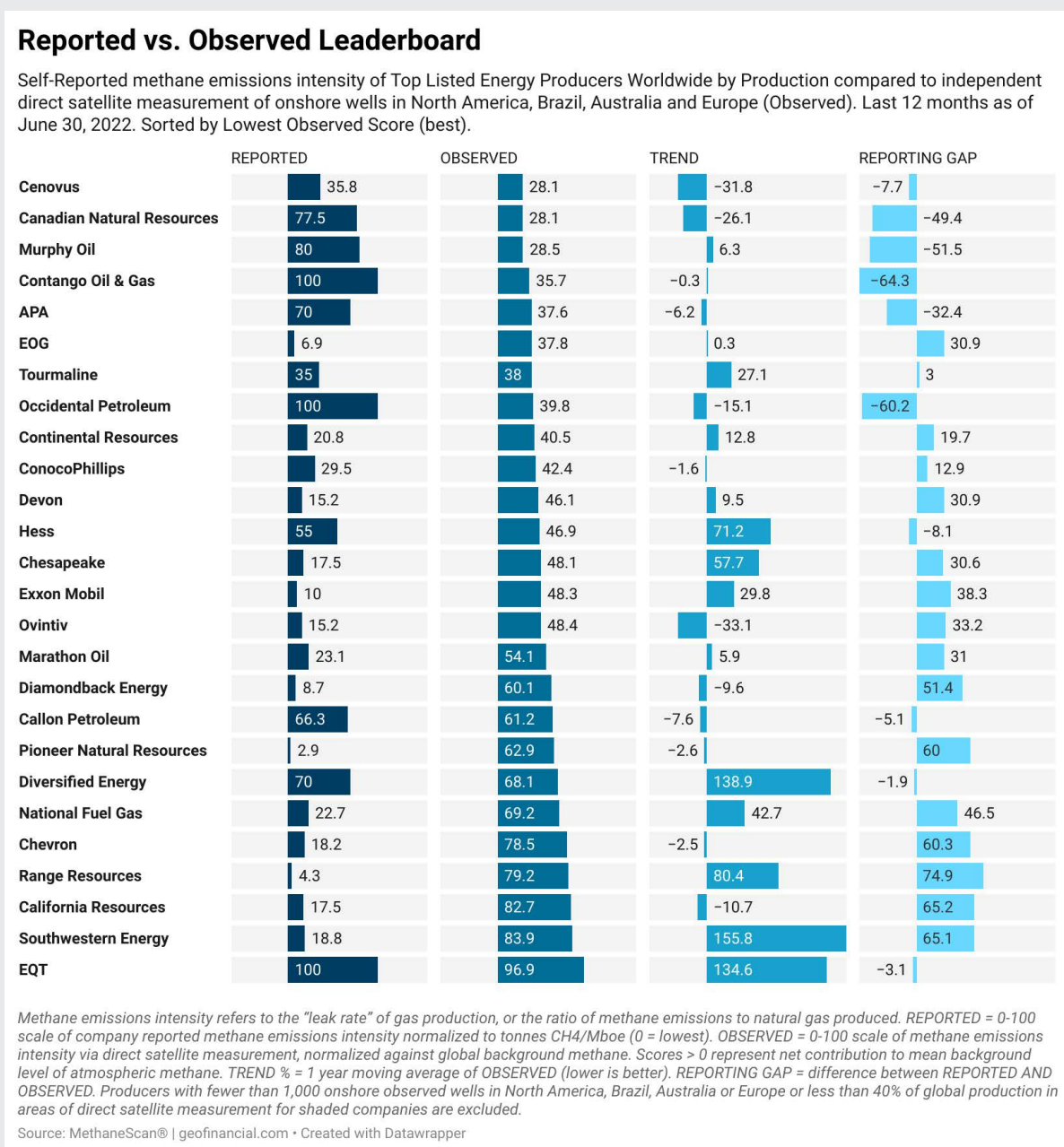
Studies show that methane emissions reporting methodology used by the SEC, EPA and industry is based on outdated assumptions.¹⁴ This results in a significant under-reporting of methane emissions.

Establishing the 'facts' via direct measurement is a necessary first step for companies to commit to meaningful action, and for external parties (both public and private) to create accountability. This has not been possible – until now via direct satellite measurement.

Direct satellite measurement reveals material weakness in emissions reporting. The figure below compares observed methane intensities (satellite data) to company reported values. This is a key measure of a company's transparency on the issue of methane management.

This disparity between companies' reported and observed methane intensity has been well-documented and confirmed with airborne studies. The cause has been attributed to a number of factors, including the lack of reporting regulations, widespread use of outdated "bottom-up" approaches to emission estimation, and findings that the top 5% of sources contribute over 50% of emissions and often occur during abnormal operating conditions that are likely to be missed by standard inventory procedure. As reporting regulations are implemented and direct, methane measurements become standard practice, we expect the gap between reported and observed intensities to narrow.

Figure 23: Reported vs. Observed Methane Intensity Scores



Revised: 7 Oct 2022

¹⁵ Geofinancial Analytics, 2022, Comment Letter on SEC's Proposed Climate-Related Disclosures for Investors

Target setting

Overview

Target setting is an important initial step in managing an organisation’s carbon emissions. Disclosure of clearly defined, measurable, time-bound targets that cover the majority of a company’s emissions footprint can indicate which companies are making a meaningful commitment to the low-carbon transition.

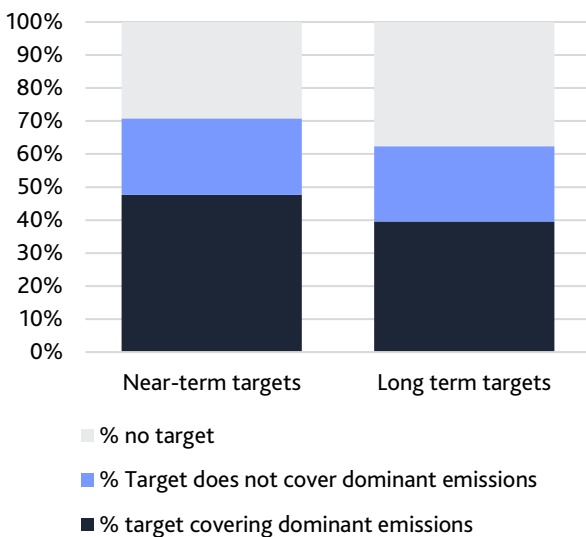
While target setting can provide a starting point for companies’ decarbonisation efforts, more advanced companies have begun to disclose robust strategies and sub-targets for sector-specific decarbonisation levers. This provides a much more detailed understanding of the low-carbon transition plans companies will need to implement to achieve emissions reduction targets.

General trends

- ▶ Most companies in the sample are setting near- and long-term targets, with 71% of companies assessed setting near-term targets and 62% setting long-term targets.
- ▶ The quality of targets varies greatly across the universe. Around two-thirds of companies that have set near- and long-term targets have set targets that cover their dominant scopes of emissions. However, companies from sectors with the most significant carbon footprint such as Oil and Gas and Coal Mining are failing to set targets.

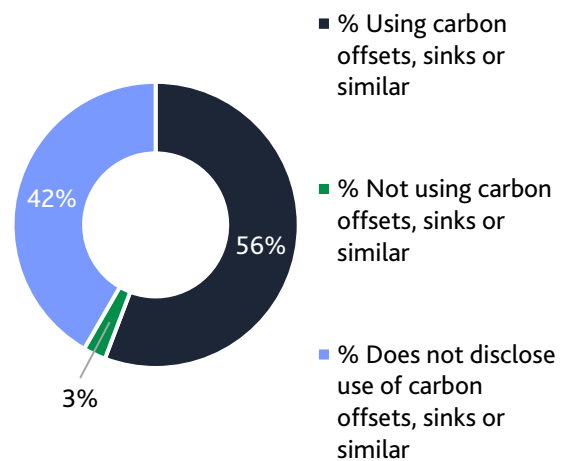
- ▶ 29% of companies that have set near-term targets have had these approved by the Science Based Targets Initiative. Generally, these companies are setting more comprehensive targets than their peers.
- ▶ Many long-term targets lack key details such as the scopes of emissions covered, the expected absolute or % emissions reduction and use of carbon offsets, sinks or similar. Companies will need to disclose more of this basic information to strengthen long-term decarbonisation commitments.
- ▶ Companies are using a wide range of terms to describe their long-term ambitions, such as net-zero, carbon neutral and climate neutral, but often fail to define what they mean. Only 31% of companies with long-term targets provide a figure for the expected emissions reduction they are set to achieve, making it difficult to assess the strength of these ambitions.
- ▶ 52% of companies with long-term targets disclose plans to use carbon offsets or similar, to some extent to achieve these goals. Only 3% of companies explicitly disclose that they will not use carbon offsets or similar, to achieve their long-term targets. This raises questions about the real emissions cuts companies are planning to achieve by decarbonising their business models and value chains.

Figure 24: % of companies setting targets covering dominant emissions



Source: Signal Climate Analytics

Figure 25: Companies’ use of carbon offsets, sinks or similar

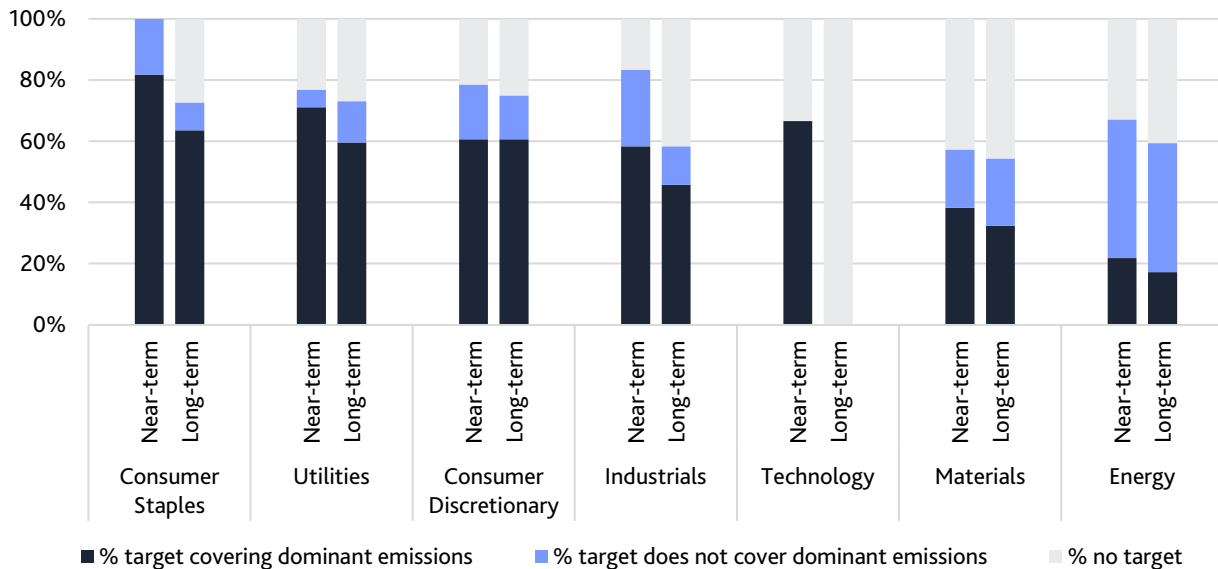


Source: Signal Climate Analytics

Sector trends

- ▶ The proportion of companies disclosing near- and long-term targets varies significantly by sector.
- ▶ Consumer Staples companies perform best overall for target disclosure. All disclose near-term targets, 82% of which cover dominant Scope 3 emissions from purchased goods and services and/or use of sold products. Companies such as Colgate-Palmolive and Nestlé lead the sector.
- ▶ Utilities sector companies perform well overall for target setting. 77% have near-term targets and 73% have long-term targets, nearly all of which cover their dominant scope of emissions. These stronger targets reflect the greater control these companies have over their emissions.
- ▶ European Utilities companies such as Engie and E.ON perform particularly well, reflecting a policy and regulatory environment encouraging decarbonisation. Conversely, only three of the 11 Chinese Utilities companies assessed have set targets.
- ▶ Three Utilities companies, National Grid, NextEra Energy and Fortis Inc, state that they do not plan to use carbon offsets or similar in achieving their long-term targets. Only one other company across the sample has disclosed the same intention.
- ▶ The Consumer Discretionary sector, comprising mainly of Automotive companies, also performs well for target setting - 77% of Automotive companies have disclosed near-term targets and 82% of these cover dominant Scope 3 'use of sold product' emissions. Toyota, Nissan, and Renault lead the sector.
- ▶ However, Automotive companies perform less well in terms of quality of emissions accounting, for example, failing to disclose global fleet emissions which makes it difficult to track the progress of the associated Scope 3 targets.
- ▶ Oil and Gas companies perform the worst overall. While 67% have set near-term targets, only a third of these targets cover their dominant Scope 3 emissions. A small number of Oil and Gas majors buck the trend: Eni, OMV, TotalEnergies, Shell, Equinor and Repsol.
- ▶ Long-term target setting is generally weak across Oil and Gas, with only 11 out of 64 companies disclosing long-term targets that cover their dominant scope 3 emissions. 74% of long-term targets will include use of carbon offsets in some form.

Figure 26: Percentage of targets covering dominant emissions by sector

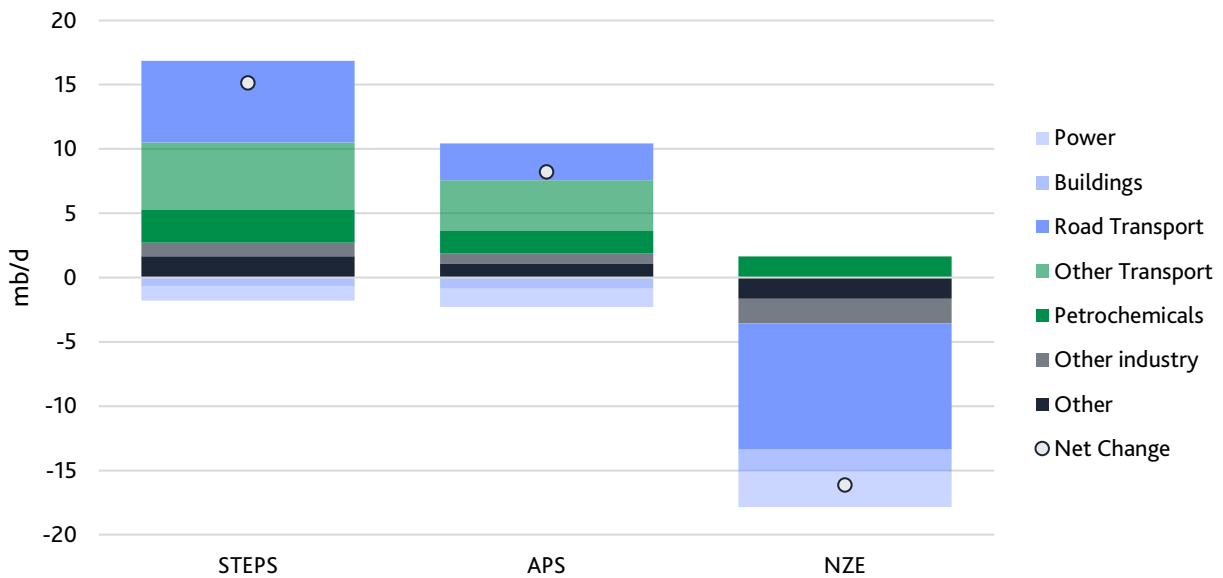


Source: Signal Climate Analytics

Sector trends along the value chain

- ▶ Target setting across value chains demonstrates opportunities for collaboration to transform carbon intensive materials such as steel (see Case Study below). Iron ore producers such as Fortescue and Vale have set targets covering their Scope 3 Category 10 processing of sold products into steel with explicit aims to work with steelmakers.
- ▶ 71% of the steelmakers assessed have set emissions reduction targets, and all of these cover their dominant Scope 1 and 2 emissions. At the same time, BMW has set a target covering Scope 3 purchased goods and services, alongside a purchase agreement with the new green steel manufacturer H2 steel.
- ▶ Energy value chains show a disconnect between target setting for upstream primary producers in Oil and Gas and Coal, versus downstream users in the Utilities and Automotive sectors.
- ▶ Utilities companies have committed to reduce Scope 1 emissions, requiring a shift to low-carbon power generation assets and Automotive companies have set targets to reduce Scope 3 fleet emissions.
- ▶ However, upstream in the value chain, relatively few Oil and Gas and Coal Mining companies are setting targets on their Scope 3 emissions from use of sold products. This highlights a major potential transition risk for Oil and Gas and Coal companies.
- ▶ Capital goods companies, from electrical goods manufacturers to consumer electronics have started setting Scope 3 use of sold products targets - Hitachi and Toshiba lead the way in their ambition, while Siemens, which is geared to the long cycle in capital goods has a less ambitious upstream and downstream target.

Figure 27: Change in oil demand by IEA scenario between 2020 and 2030



Definitions: STEPS (Stated Policy Scenario); APS (Announced Pledges Scenario) and NZE (Net Zero Emissions by 2050 Scenario)

Source: Adapted from IEA, 2021, World Energy Outlook 2021

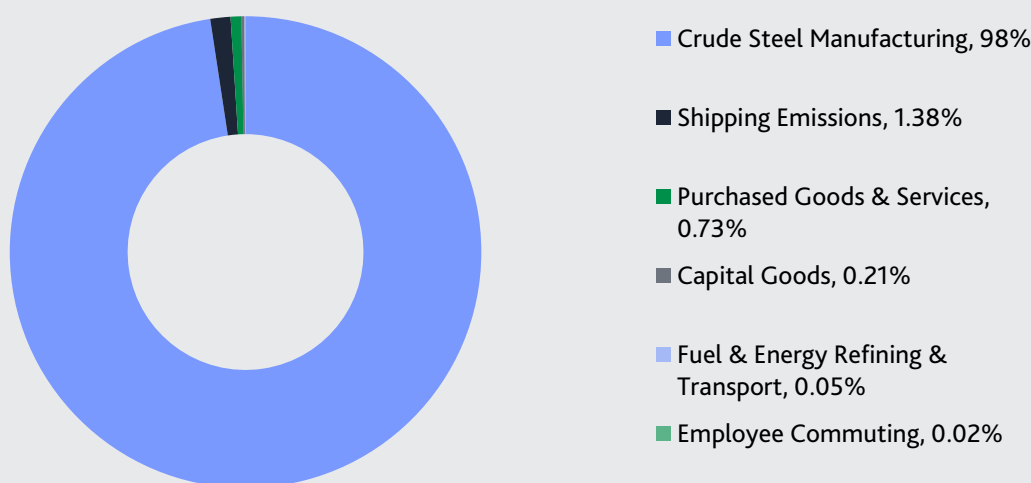
Case study: Catalysing Steel Pathways through Target Setting in the Value Chain

The steel pathway is an important component of the decarbonisation pathway for real economy sectors with 52% of steel used in building and infrastructure and 12% in the automotive sector. Steel companies face a significant decarbonisation challenge as they need to cut emissions by 95% to align with net-zero targets out to 2050.¹⁶ To be able to move away from current highly carbon intensive primary production routes using Blast Furnace-Basic Oxygen Furnace (BF-BOF) steel companies will need to invest in transformative technologies such as Hydrogen Direct Reduction using green hydrogen. The quantum of capital required to meet this investment cannot be supported by steel companies on their own and needs support through the value chain as well as through public financing directly or incentives that support investments into the sector.¹⁷

We are therefore encouraged to see that leading companies in the value chain are pushing ahead with target setting that would be supportive of strategic change towards decarbonising steel production. Fortescue which has a 9% share of the iron ore market¹⁸ with 227 Mt of production is leading the way from the supply side with its ambitions to achieve net-zero Scope 3 emissions by 2040. This includes Category 10 for products processed in crude steel manufacturing which is their dominant Scope of emissions accounting for 246 Mt and 98% of their Scope 3 emissions.

To support their ambition to work with downstream customers in the value chain, Fortescue through Fortescue Future Industries is developing a portfolio of renewable energy and green hydrogen projects expected to decarbonise hard-to-abate sectors such as metal processing, long-haul transport and industrial heating.¹⁹

Figure 28: Fortescue 2021 Scope 3 Emissions by Category



Source: Adapted from Fortescue

On the other side of the value chain, auto companies such as BMW are setting targets on Scope 3 Category 11 Purchased Goods and Services which would require them to reduce the intensity of materials used in their cars. BMW has a target approved by the SBTi (Science Based Target Initiative) and has committed to reducing their purchased goods & services and upstream transportation & distribution services intensity by 22% a year to 2030 from a 2019 baseline. To achieve this target BMW has announced plans to source steel from fossil-fuel-free methods from 2025 with an agreement with H2 green steel, a new steel manufacturer using Green Hydrogen DRI to produce steel targeting first production at its Boden site by 2024.

SSAB a leading European steel manufacturer with a target to become fossil-free by 2024, partnered with Volvo Group and Daimler Mercedes Benz in 2021 to produce fossil-free products and vehicles for the automotive industry. European automotive companies may be pre-empting regulation from the European Commission which is set to assess the possibility of a reporting framework for the full lifecycle of vehicle emissions by 2023.²⁰

¹⁶ IEA, 2021, Net Zero by 2050: A Roadmap for the Global Energy Sector

¹⁷ Industry Tracker, 2021, Steeling for Net Zero

¹⁸ Bloomberg, 2022

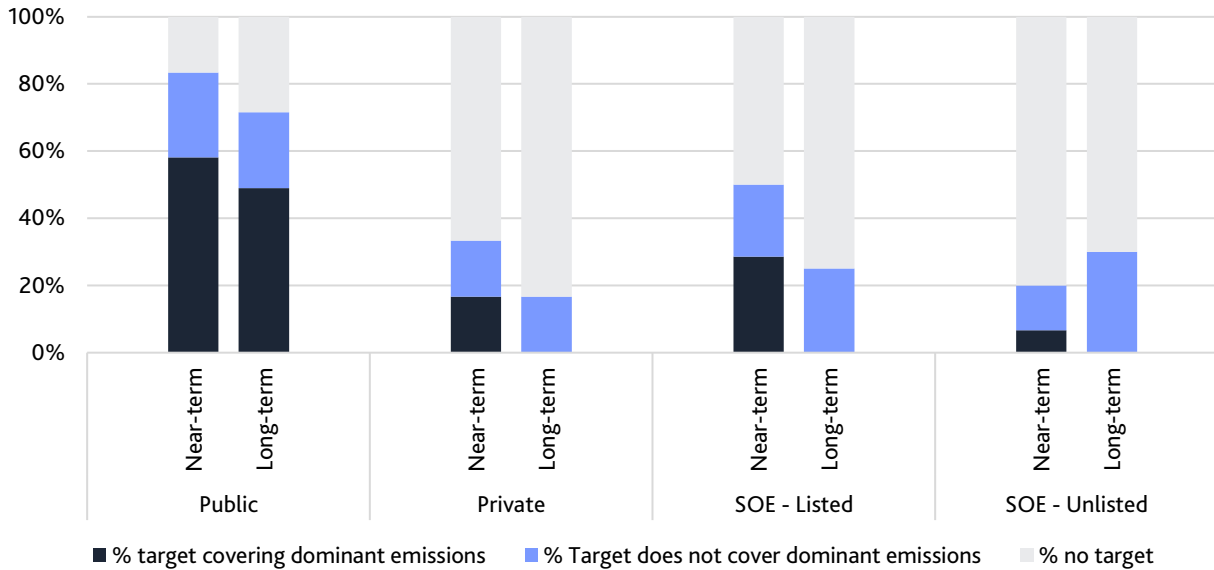
¹⁹ Fortescue, 2021, Climate Change Report FY21

²⁰ Mission Possible Partnership, 2021, Steeling Demand: Mobilising buyers to bring net-zero steel to market before 2030

Ownership and geography

- ▶ Publicly listed companies perform best in terms of target setting - 83% have set near-term targets and 72% have set long-term targets, 68% of which cover dominant emissions' scopes. This shows the influence of climate-related regulations on these companies.
- ▶ State-Owned Enterprises (SOE) lag overall in terms of target setting, but those that are publicly listed perform significantly better than unlisted SOEs. 50% of listed SOEs have disclosed near-term targets and 46% have long-term targets, compared to 20% and 30% for unlisted SOEs respectively.
- ▶ European companies lead with 98% disclosing near-term targets and 88% have long-term targets, 86% of which cover their dominant emissions' scopes. This partly reflects the regulatory and policy environment encouraging disclosure on climate across the region.
- ▶ East Asian and North American companies also perform well. 90% of North American and 80% of East Asian companies are setting near-term targets, and 85% and 64% have long-term targets respectively. 78% of East Asian companies cover their dominant scopes, versus 64% in North America.
- ▶ Indian companies perform poorly, with only 33% setting near-term targets and only one company - Tata Steel – disclosing a long-term target.
- ▶ Chinese companies also perform poorly overall for target setting. 40% of Chinese companies disclose a long-term target and almost half of these companies fail to back this up with any near-term targets. This reflects the Chinese government's policy of reaching peak emissions in 2030 and net-zero by 2060.

Figure 29: % of targets covering dominant emissions by ownership type

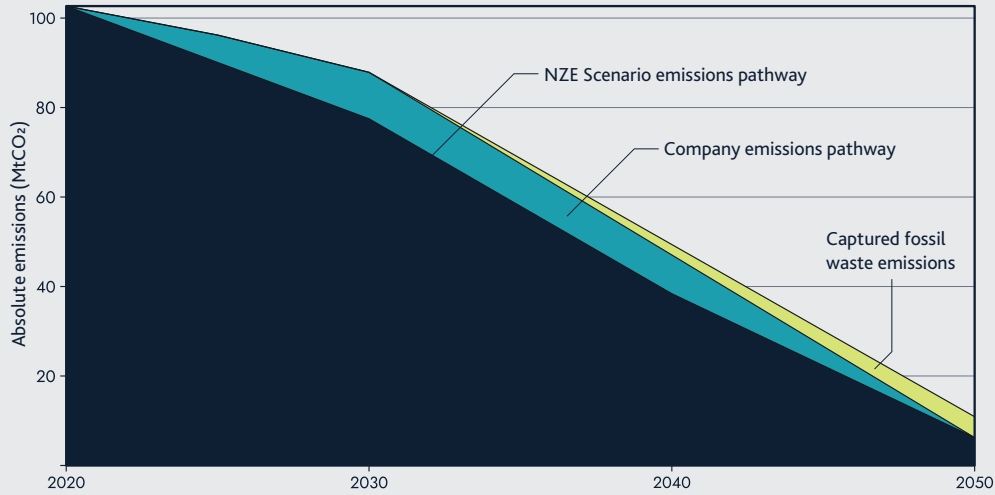


Source: Signal Climate Analytics

The next step in Transparency

The Glasgow Financial Alliance for Net Zero (GFANZ) will require science-aligned emissions targets to be submitted at the sector level. A critical challenge is in defining precisely what defines a science-aligned target. Ultimately, it is necessary for sectors to limit cumulative greenhouse gas emissions over time, as this is what raises global average temperature. Taking target setting transparency assessment one step further, we can leverage asset-level data to estimate the emissions budget leading from the company's published target data. In doing this, we can determine if the target is science aligned. In the cement sector, for example, a number of considerations should be borne in mind:

Figure 30: NZE Scenario and company emissions pathways in the cement sector



- ▶ A net-zero target is not an emissions cap. If a company has not stated its pathway to net-zero, it has not committed to doing anything until the target year is reached.
- ▶ An intensity target is not an emissions cap. Short of achieving zero emissions, an emissions intensity target only specifies the amount emitted per unit of output. Therefore, if a company increases output faster than it reduces intensity, its emissions will rise. Most cement companies do not report targets on an absolute emissions basis.
- ▶ A net-zero target in the cement sector is an emissions reduction of around 95% or less. The cement trade association GCCA attributes 6% of the industry's net-zero path in 2050 to passive recarbonation, which is the slow absorption of CO₂ from the atmosphere by concrete over its lifetime. This phenomenon is not included in the base year emissions reported by companies, so it should not be included in the target year.
- ▶ The cement sector does not account for all of Scope 1 emissions, as defined by the GHG Protocol¹⁸. Most targets are measured on a net emissions basis, which excludes CO₂ from the combustion of non-biogenic wastes, such as old tires and refuse plastics. This measure assumes that such wastes would otherwise be incinerated without energy recovery, and that using them avoids consumption of fossil fuels. This boundary is incompatible with transition plans in which biofuels, hydrogen, and direct electrification compete with waste fuels. It would also allow for a scenario in which fossil waste energy with CCS (FWECCS) is counted as a carbon sink. By accounting in this way, a net-zero target could equate to a 90% reduction in gross emissions.

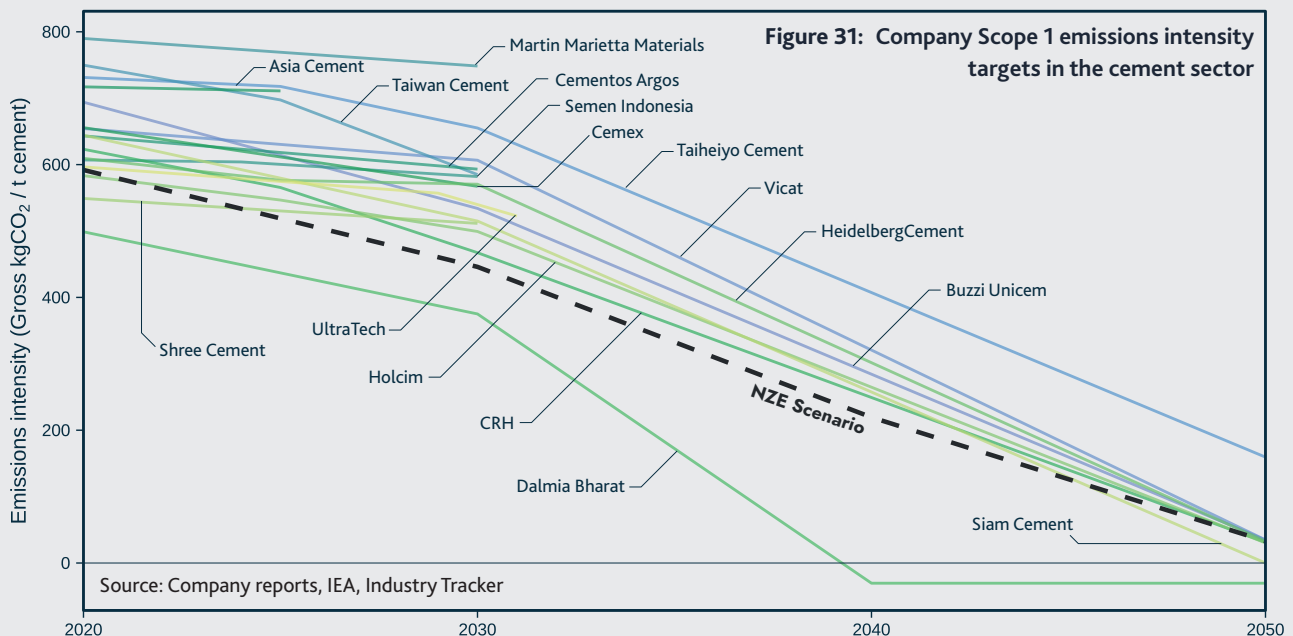


Figure 31: Company Scope 1 emissions intensity targets in the cement sector

Transparency and beyond

Towards full transparency

For net-zero targets to be meaningful, they should be based on the right emissions metric and provide transparency over the critical variables informing their emissions pathway. We've seen benchmark-able 'keystone' metrics, whether it's life-cycle net carbon footprint in the Oil and Gas sector, or well-to-wheel emissions intensity in the Automotive sector. Failures exist, such as methane reporting accuracy or the issues surrounding vehicle emissions methodologies. But what is encouraging is that some companies are contributing to the task of realising full transparency. To achieve full transparency on benchmarking and targets, each sector requires the following:

1. Consensus on the definition of the benchmark indicator(s) and its associated methodology
2. A standard around which methodology may be applied correctly and certification enabled
3. A platform and tools to aid consistency of application and scalability
4. A voluntary mechanism to strongly incentivise uptake and disclosure, or regulation to enforce it

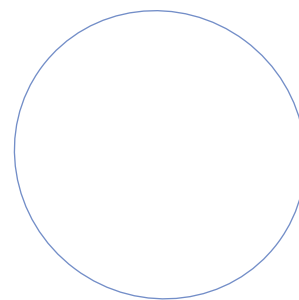
Before a consensus can be reached, companies with the technical expertise have a role to play in developing and defining the appropriate metric and how to calculate it. With transparency others can follow suit and consistency may be promoted, which can occur initially through trade associations. For example, the World Steel Association and Global Cement and Concrete Association (GCCA) both provide a methodology and tools to enable members to submit emissions intensity metrics for bench-marking purposes. Nonetheless, there is a long way to go before full transparency can be achieved.

From Transparency to Transition

In this report, we find that most companies are providing some form of accounting transparency but have not moved through all the steps to provide full clarity. The keystone metric is missing in most sectors with physical output to benchmark intensity. Emissions reduction targets are ambitious but there can be no confidence in long-term target setting if companies do not provide detail on how they are going to cut their emissions. The reliance on carbon offsetting is worrying, particularly for industries where technology options are now becoming available.

There are a number of companies particularly in the private space who are not providing transparency. This includes NOCs with a significant footprint who will ultimately have to align with country NDCs. Even when full transparency is provided, this does not mean companies will achieve transition – large consumer staples companies have been very good at reporting on their footprint but the challenges they face in engaging with supply chains and influencing consumer behaviour is particularly challenging.

Detailed forward-looking analysis is required to fill the gaps to understand transition pathways, looking at risks, opportunities, business models and financial/management capacity to switch to achieve net-zero goals.



Appendix: Transparency scores

Figure A1: Transparency scores of the 250 company universe

Rank	Ticker	Company	Headquarters	Sector	Transparency score
1	ENI IM	Eni SpA	Italy	Energy	97
2	ENGI FP	Engie SA	France	Utilities	96
3	EDF FP	Electricite de France SA	France	Utilities	96
4	NTGY SM	Naturgy Energy Group SA	Spain	Utilities	95
5	6302 JP	Sumitomo Heavy Industries Ltd	Japan	Machinery	95
6	TGT US	Target Corp	United States	ConsumerStaples	94
7	5938 JP	Lixil Corp	Japan	ConsumerDiscretionary	94
8	6502 JP	Toshiba Corp	Japan	ElectricalEquipment	94
9	UN01 GR	Uniper SE	Germany	Utilities	93
10	REP SM	Repsol SA	Spain	Energy	93
11	NESN SW	Nestle SA	Switzerland	ConsumerStaples	92
12	TTE FP	TotalEnergies SE	France	Energy	92
13	FORTUM FH	Fortum Oyj	Finland	Utilities	92
14	SHEL LN	Shell PLC	United Kingdom	Energy	91
15	6501 JP	Hitachi Ltd	Japan	DiversifiedIndustrials	91
16	OMV AV	OMV AG	Austria	Energy	91
17	EQNR NO	Equinor ASA	Norway	Energy	91
18	IBE SM	Iberdrola SA	Spain	Utilities	91
19	EXC US	Exelon Corp	United States	Utilities	90
20	2 HK	CLP Holdings Ltd	Hong Kong	Utilities	89
21	ENEL IM	Enel SpA	Italy	Utilities	88
22	ORG AU	Origin Energy Ltd	Australia	Utilities	88
23	BN FP	Danone SA	France	ConsumerStaples	87
24	RWE GR	RWE AG	Germany	Utilities	87
25	AGL AU	AGL Energy Ltd	Australia	Utilities	87
26	GM US	General Motors Co	United States	Automotive	86
27	DUK US	Duke Energy Corp	United States	Utilities	86
28	BMW GR	Bayerische Motoren Werke AG	Germany	Automotive	86
29	ULVR LN	Unilever PLC	United Kingdom	ConsumerStaples	86
30	AAL US	American Airlines Group Inc	United States	TransportationAndLogistics	85
31	AES US	AES Corp/The	United States	Utilities	85
32	BP/ LN	BP PLC	United Kingdom	Energy	85
33	MAERSKB DC	AP Moller - Maersk A/S	Denmark	TransportationAndLogistics	85
34	HEI GR	HeidelbergCement AG	Germany	ConstructionMaterials	85
35	HOLN SW	Holcim AG	Switzerland	ConstructionMaterials	85
36	CRH ID	CRH PLC	Ireland	ConstructionMaterials	84
37	BG US	Bunge Ltd	United States	ConsumerStaples	84
38	SCC TB	Siam Cement PCL/The	Thailand	ConstructionMaterials	84
39	VST US	Vistra Corp	United States	Utilities	84
40	AA US	Alcoa Corp	United States	MetalsAndMining	84
41	SO US	Southern Co/The	United States	Utilities	84
42	PPL US	PPL Corp	United States	Utilities	84
43	003779 DMY	JERA Co Inc	Japan	Utilities	84
44	CEZ CP	CEZ AS	Czech Republic	Utilities	84
45	PSX US	Phillips 66	United States	Energy	83
46	5401 JP	Nippon Steel Corp	Japan	Steel	83
47	6752 JP	Panasonic Holdings Corp	Japan	Technology	82
48	WHR US	Whirlpool Corp	United States	ConsumerDiscretionary	82
49	UAL US	United Airlines Holdings Inc	United States	TransportationAndLogistics	82
50	EOAN GR	E.ON SE	Germany	Utilities	81
51	PGE PW	PGE Polska Grupa Energetyczna SA	Poland	Utilities	81
52	CVX US	Chevron Corp	United States	Energy	80
53	AEP US	American Electric Power Co Inc	United States	Utilities	80
54	D US	Dominion Energy Inc	United States	Utilities	79
55	MT NA	ArcelorMittal SA	Luxembourg	Steel	78
56	CEMEXCPO MM	Cemex SAB de CV	Mexico	ConstructionMaterials	78
57	SGO FP	Cie de Saint-Gobain	France	ConstructionMaterials	78
58	6367 JP	Daikin Industries Ltd	Japan	ElectricalEquipment	78
59	8031 JP	Mitsui & Co Ltd	Japan	Steel	78
60	FTS CN	Fortis Inc/Canada	Canada	Utilities	78
61	066570 KS	LG Electronics Inc	South Korea	Technology	78
62	NG/ LN	National Grid PLC	United Kingdom	Utilities	77
63	CL US	Colgate-Palmolive Co	United States	ConsumerStaples	75
64	WEC US	WEC Energy Group Inc	United States	Utilities	75
65	TKA GR	thyssenkrupp AG	Germany	Steel	75
66	AI FP	Air Liquide SA	France	Chemicals	74
67	CHMF RM	Severstal PAO	Russia	Steel	74
68	ENB CN	Enbridge Inc	Canada	Energy	74
69	005490 KS	POSCO Holdings Inc	South Korea	Steel	74
70	ELUXB SS	Electrolux AB	Sweden	ConsumerDiscretionary	74

Rank	Ticker	Company	Headquarters	Sector	Transparency score
71	KO US	Coca-Cola Co/The	United States	ConsumerStaples	74
72	CNA LN	Centrica PLC	United Kingdom	Utilities	74
73	NEE US	NextEra Energy Inc	United States	Utilities	73
74	7201 JP	Nissan Motor Co Ltd	Japan	Automotive	73
75	7203 JP	Toyota Motor Corp	Japan	Automotive	73
76	9513 JP	Electric Power Development Co Ltd	Japan	Utilities	73
77	UTCEM IN	UltraTech Cement Ltd	India	ConstructionMaterials	73
78	NTPC IN	NTPC Ltd	India	Utilities	73
79	PEP US	PepsiCo Inc	United States	ConsumerStaples	72
80	2002 TT	China Steel Corp	Taiwan	Steel	72
81	VOW GR	Volkswagen AG	Germany	Automotive	72
82	WMT US	Walmart Inc	United States	ConsumerStaples	71
83	NRG US	NRG Energy Inc	United States	Utilities	71
84	SOL SJ	Sasol Ltd	South Africa	Chemicals	70
85	RNO FP	Renault SA	France	Automotive	70
86	AIR FP	Airbus SE	France	AerospaceAndDefense	69
87	XEL US	Xcel Energy Inc	United States	Utilities	69
88	CON GR	Continental AG	Germany	TransportationEquipment	69
89	CMI US	Cummins Inc	United States	TransportationEquipment	68
90	096770 KS	SK Innovation Co Ltd	South Korea	Energy	68
91	BSL AU	BlueScope Steel Ltd	Australia	Steel	68
92	FMG AU	Fortescue Metals Group Ltd	Australia	MetalsAndMining	67
93	GLEN LN	Glencore PLC	Switzerland	MetalsAndMining	67
94	7012 JP	Kawasaki Heavy Industries Ltd	Japan	DiversifiedIndustrials	67
95	ML FP	Cie Generale des Etablissements Michelin SCA	France	TransportationEquipment	66
96	YAR NO	Yara International ASA	Norway	Chemicals	66
97	ORBIA* MM	Orbia Advance Corp SAB de CV	Mexico	Chemicals	66
98	015760 KS	Korea Electric Power Corp	South Korea	Utilities	66
99	F US	Ford Motor Co	United States	Automotive	66
100	MBG GR	Mercedes-Benz Group AG	Germany	Automotive	64
101	GAZP RM	Gazprom PJSC	Russia	Energy	64
102	005380 KS	Hyundai Motor Co	South Korea	Automotive	63
103	DOW US	Dow Inc	United States	Chemicals	63
104	NEX FP	Nexans SA	France	ElectricalEquipment	63
105	AAL LN	Anglo American PLC	United Kingdom	MetalsAndMining	63
106	5019 JP	Idemitsu Kosan Co Ltd	Japan	Energy	63
107	EBK GR	EnBW Energie Baden-Wuerttemberg AG	Germany	Utilities	63
108	LII US	Lennox International Inc	United States	ElectricalEquipment	62
109	0991680D IJ	Pupuk Indonesia Holding Co PT	Indonesia	Chemicals	61
110	ABBN SW	ABB Ltd	Switzerland	ElectricalEquipment	61
111	7269 JP	Suzuki Motor Corp	Japan	Automotive	61
112	ADM US	Archer-Daniels-Midland Co	United States	ConsumerStaples	61
113	PG US	Procter & Gamble Co/The	United States	ConsumerStaples	61
114	SLB US	Schlumberger NV	United States	Energy	60
115	BHP AU	BHP Group Ltd	Australia	MetalsAndMining	60
116	SU CN	Suncor Energy Inc	Canada	Energy	59
117	AMZN US	Amazon.com Inc	United States	ConsumerDiscretionary	59
118	PCAR US	PACCAR Inc	United States	Automotive	58
119	RTX US	Raytheon Technologies Corp	United States	AerospaceAndDefense	58
120	TATA IN	Tata Steel Ltd	India	Steel	58
121	BAS GR	BASF SE	Germany	Chemicals	58
122	VALE3 BZ	Vale SA	Brazil	MetalsAndMining	57
123	GT US	Goodyear Tire & Rubber Co/The	United States	TransportationEquipment	57
124	MPC US	Marathon Petroleum Corp	United States	Energy	57
125	SIE GR	Siemens AG	Germany	DiversifiedIndustrials	56
126	COP US	ConocoPhillips	United States	Energy	56
127	SECO AB	Saudi Electricity Co	Saudi Arabia	Utilities	56
128	5411 JP	JFE Holdings Inc	Japan	Steel	56
129	HD US	Home Depot Inc/The	United States	ConsumerDiscretionary	56
130	4188 JP	Mitsubishi Chemical Holdings Corp	Japan	Chemicals	56
131	RBOS GR	Robert Bosch GmbH	Germany	TransportationEquipment	56
132	9501 JP	Tokyo Electric Power Co Holdings Inc	Japan	Utilities	56
133	WPL AU	Woodside Petroleum Ltd	Australia	Energy	55
134	ROSN RM	Rosneft Oil Co PJSC	Russia	Energy	55
135	036460 KS	Korea Gas Corp	South Korea	Utilities	54
136	7267 JP	Honda Motor Co Ltd	Japan	Automotive	53
137	RIO LN	Rio Tinto PLC	United Kingdom	MetalsAndMining	53
138	LOW US	Lowe's Cos Inc	United States	ConsumerDiscretionary	53
139	BA US	Boeing Co/The	United States	AerospaceAndDefense	52
140	TATN RM	Tatneft PJSC	Russia	Energy	52
141	175 HK	Geely Automobile Holdings Ltd	Hong Kong	Automotive	52
142	DVN US	Devon Energy Corp	United States	Energy	52
143	OXY US	Occidental Petroleum Corp	United States	Energy	51
144	LYB US	LyondellBasell Industries NV	United States	Chemicals	51
145	SABIC AB	Saudi Basic Industries Corp	Saudi Arabia	Chemicals	51
146	EXX SJ	Exxaro Resources Ltd	South Africa	CoalMining	51
147	PETR4 BZ	Petroleo Brasileiro SA	Brazil	Energy	51

Rank	Ticker	Company	Headquarters	Sector	Transparency score
148	LMT US	Lockheed Martin Corp	United States	AerospaceAndDefense	50
149	5020 JP	ENEOS Holdings Inc	Japan	Energy	50
150	NVTK RM	Novatek PJSC	Russia	Energy	49
151	CVE CN	Cenovus Energy Inc	Canada	Energy	49
152	XOM US	Exxon Mobil Corp	United States	Energy	49
153	DAL US	Delta Air Lines Inc	United States	TransportationAndLogistics	48
154	ECOPETL CB	Ecopetrol SA	Colombia	Energy	48
155	PERT IJ	Pertamina Persero PT	Indonesia	Energy	48
156	2688 HK	ENN Energy Holdings Ltd	China	Utilities	47
157	TECK/B CN	Teck Resources Ltd	Canada	MetalsAndMining	46
158	5079346Z CP	Energeticky a Prumyslovy Holding AS	Czech Republic	CoalMining	46
159	PTT TB	PTT PCL	Thailand	Energy	46
160	BANPU TB	Banpu PCL	Thailand	CoalMining	45
161	EQT US	EQT Corp	United States	Energy	45
162	GE US	General Electric Co	United States	DiversifiedIndustrials	44
163	IP US	International Paper Co	United States	Materials	44
164	836 HK	China Resources Power Holdings Co Ltd	Hong Kong	Utilities	44
165	005930 KS	Samsung Electronics Co Ltd	South Korea	Technology	44
166	2600 HK	Aluminum Corp of China Ltd	China	MetalsAndMining	44
167	902 HK	Huaneng Power International Inc	China	Utilities	44
168	STO AU	Santos Ltd	Australia	Energy	43
169	5108 JP	Bridgestone Corp	Japan	TransportationEquipment	42
170	FLS DC	FLSmidth & Co A/S	Denmark	Machinery	42
171	YPFD AR	YPF SA	Argentina	Energy	41
172	600027 CH	Huadian Power International Corp Ltd	China	Utilities	41
173	1001Z SJ	Eskom Holdings SOC Ltd	South Africa	Utilities	39
174	LKOH RM	LUKOIL PJSC	Russia	Energy	39
175	ARCH US	Arch Resources Inc	United States	CoalMining	37
176	STLA US	Stellantis NV	Netherlands	Automotive	37
177	S32 AU	South32 Ltd	Australia	MetalsAndMining	37
178	6505 TT	Formosa Petrochemical Corp	Taiwan	Energy	36
179	914 HK	Anhui Conch Cement Co Ltd	China	ConstructionMaterials	35
180	600886 CH	SDIC Power Holdings Co Ltd	China	Utilities	33
181	BPCL IN	Bharat Petroleum Corp Ltd	India	Energy	30
182	1088 HK	China Shenhua Energy Co Ltd	China	CoalMining	30
183	VEDL IN	Vedanta Ltd	India	MetalsAndMining	28
184	CNQ CN	Canadian Natural Resources Ltd	Canada	Energy	28
185	EOG US	EOG Resources Inc	United States	Energy	27
186	IOCL IN	Indian Oil Corp Ltd	India	Energy	27
187	ARAMCO AB	Saudi Arabian Oil Co	Saudi Arabia	Energy	25
188	1232Z MM	Petroleos Mexicanos	Mexico	Energy	23
189	2238 HK	Guangzhou Automobile Group Co Ltd	China	Automotive	23
190	VLO US	Valero Energy Corp	United States	Energy	21
191	9963 TT	Taiwan Power Co	Taiwan	Utilities	20
192	IR US	Ingersoll Rand Inc	United States	Machinery	20
193	SAIL IN	Steel Authority of India Ltd	India	Steel	19
194	CAT US	Caterpillar Inc	United States	Machinery	18
195	HUADIZ CH	China Huadian Corp Ltd	China	Utilities	17
196	PKN PW	Polski Koncern Naftowy ORLEN SA	Poland	Energy	15
197	857 HK	PetroChina Co Ltd	China	Energy	14
198	900948 CH	Inner Mongolia Yitai Coal Co Ltd	China	CoalMining	14
199	ONGC IN	Oil & Natural Gas Corp Ltd	India	Energy	14
200	RIL IN	Reliance Industries Ltd	India	Energy	14
201	BTU US	Peabody Energy Corp	United States	CoalMining	13
202	KMI US	Kinder Morgan Inc	United States	Energy	13
203	386 HK	China Petroleum & Chemical Corp	China	Energy	13
204	CNOZ CH	China National Offshore Oil Corp	China	Energy	12
205	BUMI IJ	Bumi Resources Tbk PT	Indonesia	CoalMining	12
206	600104 CH	SAIC Motor Corp Ltd	China	Automotive	11
207	PAGP US	Plains GP Holdings LP	United States	Energy	11
208	1053295D LX	Eurasian Resources Group	United Kingdom	CoalMining	10
209	1378 HK	China Hongqiao Group Ltd	China	MetalsAndMining	10
210	XXYCPZ CH	Shaanxi Yanchang Petroleum Group Co Ltd	China	Energy	10
211	PET MK	Petroliam Nasional Bhd	Malaysia	Energy	9.2
212	ADRO IJ	Adaro Energy Tbk PT	Indonesia	CoalMining	9.1
213	COAL IN	Coal India Ltd	India	CoalMining	8.9
214	SINZ CH	China Petrochemical Corp	China	Energy	7.4
215	489 HK	Dongfeng Motor Group Co Ltd	China	Automotive	7.0
216	CNPZ CH	China National Petroleum Corp	China	Energy	6.8
217	1733 HK	E-Commodities Holdings Ltd	China	CoalMining	5.5
218	SNGS RM	Surgutneftegas PJSC	Russia	Energy	5.4
219	16453Z QD	Qatar Energy	Qatar	Energy	5.3
220	CHDACZ CH	China Datang Corp	China	Utilities	2.9
221	HNGZ CH	China Huaneng Group Co Ltd	China	Utilities	2.9
222	2009 HK	BBMG Corp	China	ConstructionMaterials	2.1
223	SBSA CH	China Baowu Steel Group Corp Ltd	China	Steel	2.1
224	HEBEEZ CH	HBIS Group Co Ltd	China	Steel	1.9

Rank	Ticker	Company	Headquarters	Sector	Transparency score
225	1898 HK	China Coal Energy Co Ltd	China	CoalMining	1.6
226	1001Z CH	Sinochem Group Co Ltd	China	Energy	1.3
227	SHGCLZ CH	China Energy Investment Corp Ltd	China	Utilities	1.3
228	001678 DMY	Togliattiazot	Russia	Chemicals	1.3
229	022231 DMY	National Iranian Oil Refining and Distribution Co	Iran	Energy	0.4
230	134410Z KK	Kuwait Petroleum Corp	Kuwait	Energy	0.4
231	158443Z UH	Abu Dhabi National Oil Co	United Arab Emirates	Energy	0.4
232	CNBMGZ CH	China National Building Material Group Co Ltd	China	ConstructionMaterials	0.4
233	MTLR RM	Mechel PJSC	Russia	Steel	0.4
234	PBF US	PBF Energy Inc	United States	Energy	0.4
235	CPIZ CH	State Power Investment Corp Ltd	China	Utilities	0.2
236	600795 CH	GD Power Development Co Ltd	China	Utilities	0.2
237	001411 DMY	National Iranian Oil Co	Iran	Energy	0.0
238	022462 DMY	Valiant Resources	Australia	CoalMining	0.0
239	200625 CH	Chongqing Changan Automobile Co Ltd	China	Automotive	0.0
240	3097Z US	Koch Industries Inc	United States	DiversifiedIndustrials	0.0
241	58325Z NL	Nigerian National Petroleum Corp	Nigeria	Energy	0.0
242	601699 CH	Shanxi Lu'an Environmental Energy Development Co Ltd	China	CoalMining	0.0
243	CHXGAZ CH	Chiping Xinfu Huayu Alumina Co Ltd	China	MetalsAndMining	0.0
244	HBJNEZ CH	Jizhong Energy Group Co Ltd	China	CoalMining	0.0
245	NLC IN	NLC India Ltd	India	Utilities	0.0
246	PDVSA VC	Petroleos de Venezuela SA	Venezuela	Energy	0.0
247	PETROCH AB	National Petrochemical Co	Saudi Arabia	Chemicals	0.0
248	RPWR IN	Reliance Power Ltd	India	Utilities	0.0
249	SCCIGZ CH	Shaanxi Coal and Chemical Industry Group Co Ltd	China	CoalMining	0.0
250	YGCZ CH	Shandong Energy Co Ltd	China	CoalMining	0.0

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