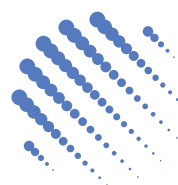


TPI State of Transition Report 2019



Simon Dietz, Rhoda Byrne, Dan Gardiner,
Valentin Jahn, Michal Nachmany,
Jolien Noels and Rory Sullivan



**Transition
Pathway
Initiative**

The Transition Pathway Initiative

The Transition Pathway Initiative (TPI) is a global initiative led by asset owners and supported by asset managers, established in January 2017. Aimed at investors, it assesses companies' progress on the transition to a low-carbon economy, supporting efforts to address climate change. Over 45 investors globally have already pledged support for the TPI; jointly they represent over US\$14 trillion combined Assets Under Management and Advice. Using companies' publicly disclosed data, TPI:

- Assesses the quality of companies' management of their carbon emissions and of risks and opportunities related to the low-carbon transition, in line with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD).
- Assesses how companies' planned or expected future Carbon Performance compares with international targets and national pledges made as part of the 2015 Paris Agreement on climate change.
- Publishes the results via an open-access online tool:
www.transitionpathwayinitiative.org.

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Research funding partners



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Foreword



*Adam C.T. Matthews and Faith Ward, Co-chairs,
Transition Pathway Initiative (TPI)*

Following last year's *Special Report on Global Warming of 1.5* degrees from the Intergovernmental Panel on Climate Change, which warned we have only 12 years left to avoid catastrophic climate change, a climate emergency has been declared by more than 600 jurisdictions in 13 countries.¹ Social, political and shareholder pressure is mounting for the corporate sector to align its activities with the Paris Agreement's ambitions to make greenhouse gas emissions 'net-zero' – that is, balancing emissions with removal – by 2050.²

But what is the progress of the corporate sector to date? How far is there to go?

These are the questions that this *State of Transition Report* from the Transition Pathway Initiative (TPI) seeks to answer. The report spotlights the actions, and inactions, of the most carbon-intensive companies in public markets.

Signs of progress

The report shows that 30 per cent of the companies assessed are, or will be, aligned with the Paris Pledges benchmark in 2030 – that is, 30 per cent have strategies consistent with the emissions reductions pledged by Paris Agreement signatories in the form of 'Nationally Determined Contributions'. This demonstrates that progress is being made, although those pledges alone are widely recognised as insufficient for putting the world on track to meet the overall Paris Agreement target of keeping temperature rise well below 2°C above pre-industrial levels and to pursue efforts to limit it to 1.5°C by the end of this century.

The report also clearly demonstrates that there can be huge differences within sectors in how companies are responding to the climate challenge. The emergence of clear leaders and laggards in each sector makes this an investment-relevant discussion for the global investors who must inject the trillions of dollars required for the transition to a low-carbon economy.

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A tool to equip investors

This report offers a significant new tool in TPI's mission to empower and equip investors to navigate the complexities of the transition to a low-carbon economy.

Cutting through the noise, TPI distils what corporates have actually *done*, and what they have *said* they will do. Perhaps most importantly it analyses what carbon performance outcome current corporate action leads to, and how sector peers compare.

The large majority of assessed companies now acknowledge climate change in their public disclosures. However, a small minority do not, and these tend to be 'large cap' companies in sectors significantly exposed to transition risk. There is a clear message for those companies from investors: it is not acceptable to be a listed company highly exposed to climate risk and to fail to provide this future business-critical information to investors.

Through our partnership with the Climate Action 100+ investors' initiative, TPI has directly supported asset owners and funds in their engagements with companies to help them meet the challenge of improving disclosure on climate. One example is the ground-breaking announcement by Royal Dutch Shell in 2018 that not only will it set long-term emissions reduction targets, including Scope 3 emissions (indirect emissions in the value chain), but also that it will link these to executive pay for over a thousand employees. Shell's disclosures, alongside those of Total, have completely shifted the debate in the oil and gas sector

and enabled TPI, in collaboration with the London School of Economics, to create peer comparisons and sector benchmarks for the oil and gas sector. TPI was also referenced within the Joint Statement between Shell and Climate Action 100+ investors.

We continue to develop our capacity to assess the forward-looking carbon performance of mining and other high-emitting sectors. TPI's Management Quality and Carbon Performance assessments are already used by many investors to inform action, whether that be adjusting the long-term investment case, seeking to engage, creating investment products or expressing dissatisfaction through the use of the vote at the next AGM.

We know TPI can do more and indeed there is demand for it to do so. We have developed a 2020–2025 Strategic Plan that will enable TPI to assess companies that together emit around 80 per cent of the emissions from listed markets, as well as looking to other investment areas such as sovereign bonds.

We know that companies can do more too. As this report sets out, the transition to a low-carbon economy in the private sector is happening, but we remain a long way from where we need to be. TPI is committed to play the role it can in bringing to the fore the academic insight of LSE's Grantham Research Institute together with FTSE Russell's data to equip asset owners to better inform decision-making and corresponding action.

July 2019

“Cutting through the noise, TPI distils what corporates have actually *done*, and what they have *said* they will do”

Summary

This report by the Transition Pathway Initiative (TPI) assesses the state of transition of the world's largest and highest-emitting public companies towards a low-carbon economy. To do this, we have analysed TPI's database of corporate climate action in its entirety. Currently this comprises 274 companies in 14 sectors of the economy, accounting for around 41 per cent of emissions from the universe of publicly listed companies worldwide.

TPI's assessment is divided into two parts:

1. **Management Quality** covers companies' management/governance of greenhouse gas emissions and the risks and opportunities arising from the low-carbon transition.
2. **Carbon Performance** involves quantitative benchmarking of companies' emissions pathways against the international targets and national pledges made as part of the 2015 UN Paris Agreement on climate change, for example limiting global warming to below 2°C.

The framework is aligned with the recommendations of the Financial Stability Board's Taskforce on Climate-related Financial Disclosures (TCFD), tracking companies in relation to TCFD's four recommendation areas: governance, strategy, risk management, and metrics and targets.

TPI publishes the results of its analysis through an open access online tool, available at: www.transitionpathwayinitiative.org.

This report synthesises those results to date.

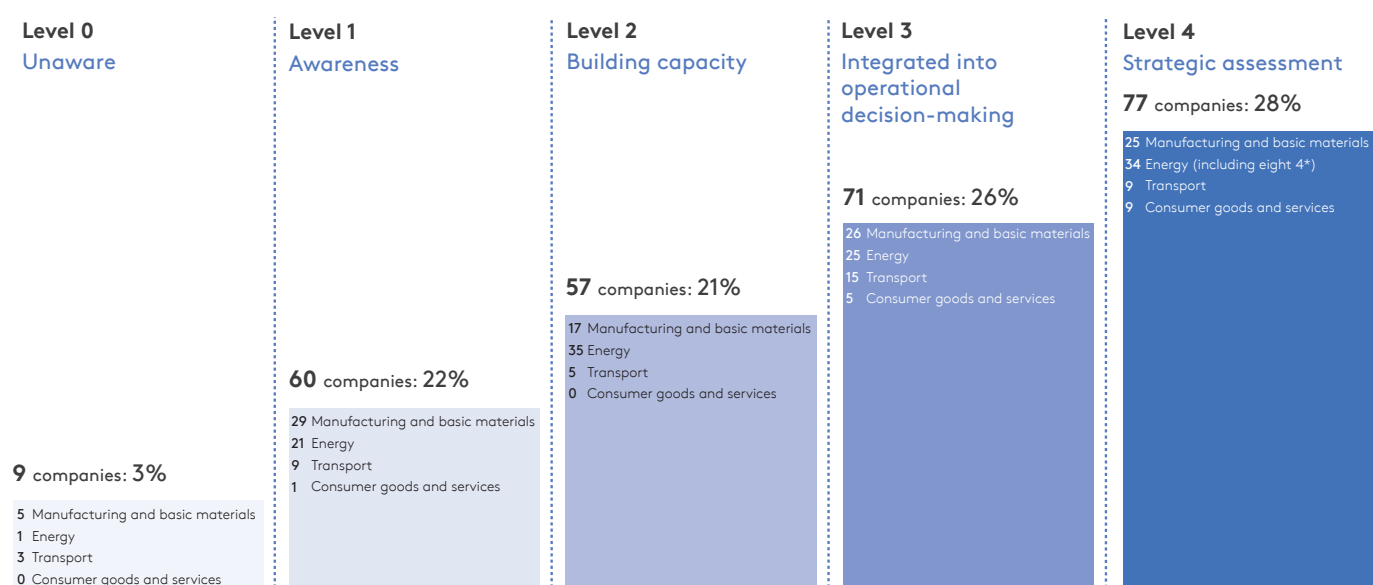
Most companies have built basic capacity to manage the low-carbon transition

As Figure S1 shows, only nine out of the 274 companies assessed on Management Quality (3 per cent) are unaware of (or are not acknowledging) climate change as a business issue (TPI Level 0), and we expect at least some of these to move off the bottom step of the staircase this year.

This means that the vast majority of companies now at least acknowledge climate change as a business issue (TPI Level 1 and above).

Further, the majority of companies are now integrating climate change into operational decision-making (Level 3) or, as well as this, making strategic assessment of climate change risk (Level 4). The average company is positioned roughly halfway between building capacity on climate change (Level 2), and Level 3. Thirty-five of the 130 companies (27 per cent) that were assessed more than once on Management Quality moved up at least one level between 2017 and 2018.

Figure S1. Management Quality level of all TPI companies





Too many big emitters are yet to integrate climate change into their operations, let alone take a strategic approach

In spite of this progress, no fewer than 126 companies remain on Levels 0–2. Such companies are yet to disclose that they have implemented at least one of the following basic practices:

- Explicitly recognising climate change as a relevant business risk or opportunity
- Having a policy commitment to act on climate change
- Disclosing operational emissions
- Setting a quantitative (or, if not, a qualitative) target to reduce emissions

These limitations are confirmed when we look into the specifics of company performance against the TCFD requirements. For example:

- On *strategy*, 84 per cent of companies do not disclose an internal carbon price, and 86 per cent are yet to undertake and disclose climate scenario planning.
- On *metrics and targets*, 55 per cent of companies do not have a long-term, quantified target to reduce their emissions, and 58 per cent of companies in the autos, coal, and oil and gas sectors fail to disclose their critical Scope 3 emissions (indirect emissions in the value chain) from use of sold products.

These findings reinforce the need for investor engagement to encourage greater climate disclosure.

Significant disclosure gaps remain on corporate emissions

There is limited availability of emissions data and availability falls markedly as we look to the future. Seventy-one of the 274 companies in the TPI database (26 per cent) do not provide any emissions disclosures at all.

About 20 per cent of the 160 companies assessed on Carbon Performance do not disclose their historical emissions or their activity in a form that enables us to make meaningful assessments of Carbon Performance, and this proportion rises steadily to 80 per cent in 2030. These data gaps mean

that investors cannot assess whether or not such companies are aligned with the goals of the Paris Agreement.

Few companies are aligned with the Paris Agreement but the leaders show what is possible

Figure S2 shows the results of our assessment of 160 of the 274 companies in the TPI database on Carbon Performance. Only 30 per cent of these 160 companies are, or will be, aligned with the Paris Pledges benchmark in 2030 – the benchmark that reflects the emissions reductions pledged in the Nationally Determined Contributions (NDCs) offered by countries as part of the Paris Agreement. These NDCs are widely regarded as insufficient to limit global warming to 2°C or below.

Just 16 per cent of companies will be aligned with the 2°C benchmark in 2030 and, when the benchmark is tightened to keeping temperature rise below 2°C, the share of companies aligned falls to 13 per cent. Nonetheless, the 20 companies that are aligned with below 2°C, or that will be on the basis of the emissions reduction targets they have set, show what is possible.

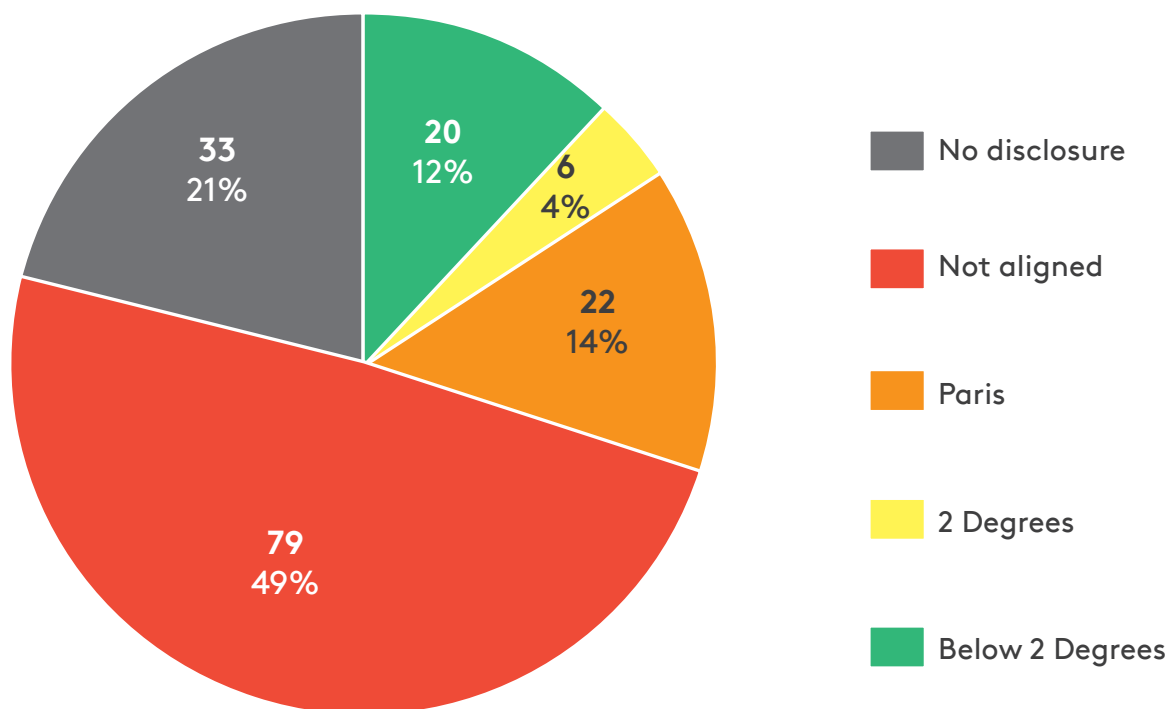
Management Quality and Carbon Performance are correlated, but investors need to engage directly on emissions targets

We find that companies doing well on Management Quality are also likely to be doing well on Carbon Performance. On average, companies that are aligned with the 2030 Paris Agreement benchmarks satisfy two-thirds of our Management Quality indicators, while those that are not aligned satisfy less than half.

Comparing these results with previous research suggests that this positive association is particularly true for *future* Carbon Performance as opposed to historical emissions.

Nonetheless, the correlation between Management Quality and Carbon Performance is far from perfect. Since what ultimately matters for the climate is emissions, it is extremely important that investors engage companies directly on their emissions and targets to reduce them. Management practices then provide the means to deliver.

Figure S2. Carbon Performance alignment with the Paris Agreement benchmarks (number and percentage of companies)



“The 20 companies that are aligned with below 2°C, or that will be on the basis of the emissions reduction targets they have set, show what is possible”



1 Introduction

This report surveys the progress that is being made by the world's largest, highest emitting public companies in the transition to a low-carbon economy.

The analysis draws on the entire database maintained by the Transition Pathway Initiative (TPI), a global initiative led by asset owners and supported by asset managers, which assesses the progress of large corporations on the transition to a low-carbon economy, supporting efforts to address climate change.³ Established in January 2017, TPI is now supported by more than 45 investors globally

with more than US\$14 trillion in Assets Under Management and Advice.

The TPI database currently covers 274 corporations worldwide in 14 business sectors of critical importance to climate change (see Table 1.1). In total, we estimate that these companies account for 41 per cent of the global greenhouse gas emissions from publicly listed companies.^a

In each sector, TPI selects the largest public companies globally, on the basis of market capitalisation. These companies usually constitute the largest holdings in investor

Table 1.1. TPI sectoral coverage and Carbon Performance measures

Sector	No. of companies currently assessed on Management Quality	No. of companies currently assessed on Carbon Performance	Carbon Performance measure
Oil and gas	45	10*	Carbon intensity of primary energy supply
Electricity utilities	46	37	Carbon intensity of electricity generation
Coal mining	19	-	-
Automobiles	21	21	New vehicle carbon emissions per kilometre
Airlines	20	20	Carbon emissions per passenger kilometre
Cement	22	22	Carbon intensity of cementitious product
Steel	23	23	Carbon intensity of crude steel production
Aluminium	12	8	Carbon intensity of aluminium production
Paper	19	19	Carbon intensity of pulp, paper and paperboard production
Oil and gas distribution	6	-	-
Services	7	-	-
Consumer goods	9	-	-
Other basic materials	9	-	-
Other industrials	18	-	-
Total	274	160	

*TPI published an assessment of oil and gas companies in November 2018.⁴ A wider assessment of the Carbon Performance of 50 oil and gas producers will be published later in summer 2019.

a. Based on cross-referencing TPI and S&P Global – Trucost data.⁵

portfolios, as well as usually being the highest emitters of greenhouse gases. We also cover a number of additional companies that have been selected for engagement by the Climate Action 100+ investors' initiative.⁶ These additional companies are large within their sector, often regional if not global, and have high lifecycle greenhouse gas emissions.

The majority of the data presented in this report are from 2017 and 2018. The whole TPI database will be updated during 2019.

Overview of methodology^b

Using public disclosures, TPI assesses companies on their Management Quality and Carbon Performance, two quite different elements of how companies are approaching the low-carbon transition. The former focuses on inputs and processes, the latter on outcomes. The assessments are intended to provide a holistic view of companies' progress, both backward and forward-looking.

Management Quality

TPI's Management Quality framework is currently based on 17 indicators, each of which tests if a company has implemented a particular carbon management practice (Yes/No), such as formalising a policy commitment to action on climate change, disclosing its emissions, or setting emissions targets. These 17 indicators (described in detail in the Appendix) are then used to map companies on to five levels, shown in Box 1.1. Companies need to be assessed as 'Yes' on all of the questions pertaining to a level before they can advance to the next, with the exception of Level 0. Companies that have been assessed

as 'Yes' on all Level 4 questions (and thus all questions in the framework) are described as '4* companies'. The data underpinning the indicators are provided by FTSE Russell on the basis of publicly available information.

Carbon Performance

TPI's Carbon Performance assessment translates emissions targets made at the international level under the 2015 UN Paris Agreement into benchmarks against which the performance of individual companies can be compared. We take a sector-by-sector approach, recognising that different sectors of the economy face different challenges arising from the low-carbon transition, including where emissions are concentrated in the value chain and how costly it is to reduce emissions. See Table 1.1 above for the Carbon Performance measures used in each sector we cover.

We benchmark emissions in most sectors against three scenarios, derived from modelling by the International Energy Agency:

- **Paris Pledges**, consistent with the emissions reductions pledged by countries as part of the Paris Agreement in the form of Nationally Determined Contributions (NDCs).
- **2 Degrees**, consistent with the overall aim of the Paris Agreement to hold "the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels", albeit at the low end of the range of ambition.
- **Below 2 Degrees**, consistent with a more ambitious interpretation of the Paris Agreement's overall aim.

Box 1.1. TPI levels of Management Quality

- **Level 0 – Unaware of (or not acknowledging) climate change as a business issue.**
- **Level 1 – Acknowledging climate change as a business issue:** The company acknowledges that climate change presents business risks and/or opportunities, and that the company has a responsibility to manage its greenhouse gas emissions. This is the point at which companies adopt a climate change policy.
- **Level 2 – Building capacity:** The company develops its basic capacity, its management systems and its processes, and starts to report on practice and performance.
- **Level 3 – Integrating into operational decision-making:** The company improves its operational practices, assigns senior management or board responsibility for climate change and provides comprehensive disclosures on its carbon practices and performance.
- **Level 4 – Strategic assessment:** The company develops a more strategic and holistic understanding of risks and opportunities related to the low-carbon transition and integrates this into its business strategy decisions.

^b. Further details of our methodology can be found on the TPI website at www.transitionpathwayinitiative.org/methodology/ and in Carbon Performance methodology notes for each sector, available from the Publications menu on the website. The Sectoral Decarbonization Approach (SDA) was created by CDP, WWF and WRI in 2015 (see <https://sciencebasedtargets.org/sda/>).

2 State of Transition 2019

In this section we summarise TPI's findings on Management Quality and Carbon Performance, based on company assessments since 2017.

For Management Quality, we outline the current state of affairs and the trends emerging from companies' practices in corporate climate governance. We also map the different TPI indicators onto the main themes in the TCFD recommendations.

On Carbon Performance, we evaluate companies' alignment with the Paris Agreement benchmarks.

Finally, we examine the relationship between the two assessment metrics, asking if Management Quality scores can predict a company's Carbon Performance.

Management Quality level

We begin by presenting the number of companies in the TPI database on each of the five Management Quality levels (Figure 2.1). The data are also broken down into four clusters of sectors (Figure 2.2):

- Consumer goods and services
- Energy (which comprises coal, electricity utilities, oil and gas distribution, and oil and gas production)
- Manufacturing and other basic materials (aluminium, cement, paper, steel, other basic materials, and other manufacturing)
- Transport (airlines and autos)

Only nine out of the 274 companies assessed (3 per cent) are on Level 0 and, based on an initial look at their latest disclosures, we expect at least some of these to move off the bottom step of the staircase this year. This means that the vast majority of companies now acknowledge climate change as a business issue, meaning that they are at least on Level 1. At a minimum, Level 1 companies explicitly recognise climate change as a business risk or opportunity, have a policy commitment to act on climate change, disclose their operational greenhouse gas emissions, or have set an emissions reduction target.

The average level-score of all companies in the database is currently 2.5, putting the average company assessed by TPI halfway

between building capacity on climate change (Level 2) and integrating it into operational decision-making (Level 3). More than half of all companies are now on either Level 3 or 4.

Reaching Level 3 requires both disclosure of operational greenhouse gas emissions and setting quantitative or qualitative emissions reduction targets. Reaching Level 4 requires the implementation of a variety of carbon management practices, including, among others, assigning board responsibility for climate change, disclosing some Scope 3 emissions,^c supporting domestic and international climate policy, and setting *quantified* emissions reduction targets.

High performance

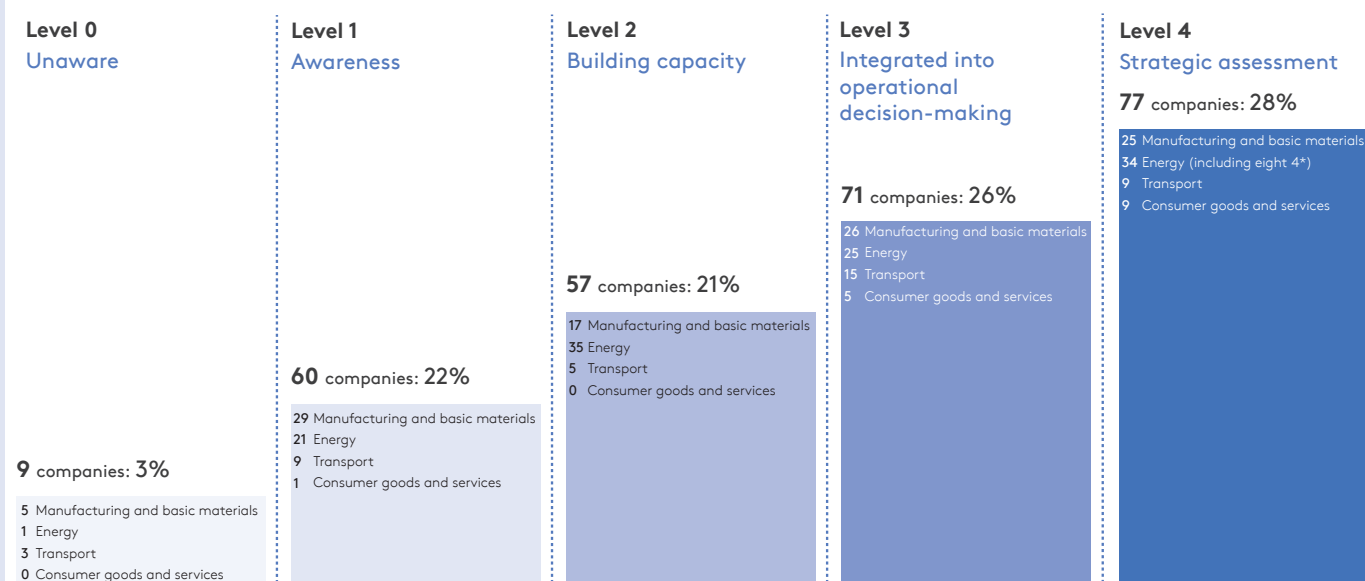
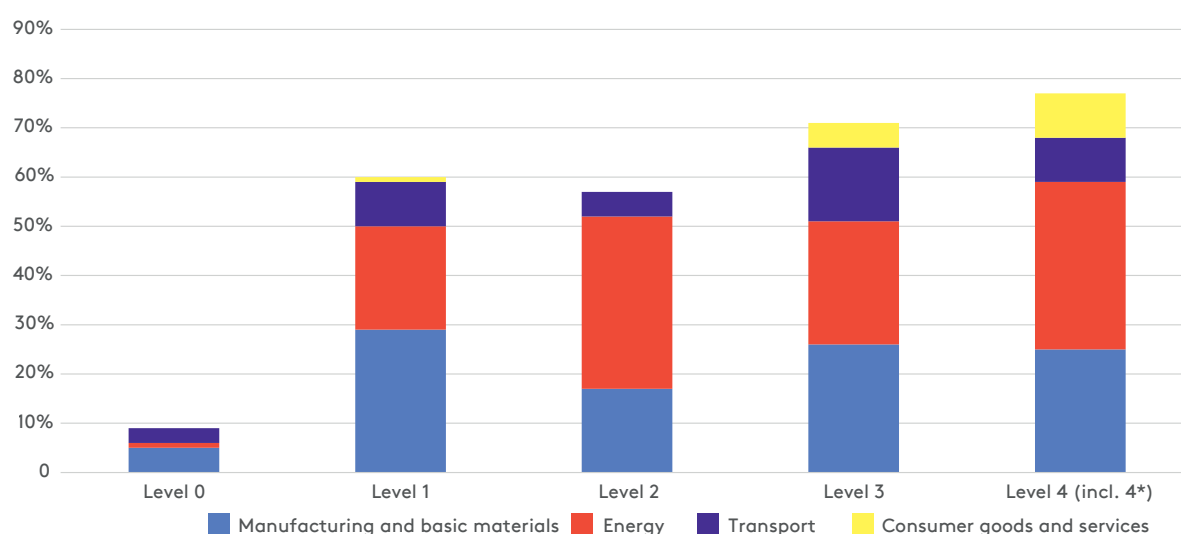
At present there are eight 4* companies: that is, companies that satisfy all of the TPI Management Quality criteria. These are all in the energy sector cluster – see Table 2.1.

Companies in the consumer goods and services sectors perform particularly well on Management Quality, with an average level-score of 3.5, but this is a small sector comprised of very large companies selected for inclusion in the Climate Action 100+ initiative. Two large sectors that perform relatively well on Management Quality are electricity utilities, with an average level-score of 2.9, and autos, with an average of 2.5.

Table 2.1. List of 4* companies (satisfying all TPI Management Quality criteria)

Company	TPI sector	Country
AGL Energy	Electricity	Australia
Anglo American	Coal mining (general mining)	UK
BHP Billiton	Coal mining (general mining)	UK
Centrica	Oil and gas distribution	UK
Equinor	Oil and gas	Norway
Gas Natural	Oil and gas distribution	Spain
National Grid	Electricity	UK
Repsol	Oil and gas	Spain

^c. Under the Greenhouse Gas Protocol, “Scope 1 emissions are direct emissions from owned or controlled sources. Scope 2 emissions are indirect emissions from the generation of purchased energy. Scope 3 emissions are all indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions.”⁷

Figure 2.1. Management Quality level of all TPI companies**Figure 2.2. Management Quality level by sector cluster**

Note: The data underpinning this assessment mostly date from 2018 and are not always reflective of the latest company disclosures. The TPI database is updated once a year for each company.

Room for improvement

There remains much room for improvement. No fewer than 126 companies remain on Levels 0–2. These companies are yet to implement at least one of the following four basic carbon management practices: explicitly recognising climate change as a relevant business risk or opportunity; having a policy commitment to act on climate change; disclosing operational emissions; having in place a target to reduce emissions (even a qualitative target).

Beneath the aggregates, we see significant differences at the sectoral level. Steel is currently the worst performing TPI sector on Management

Quality. The average level-score in the steel sector is fractionally below two, making it the only sector to fall below this mark.

In fact, four out of the five worst-performing sectors on Management Quality are in the manufacturing and other basic materials cluster. After steel, they are, in order of increasing average Management Quality: paper, cement and aluminium. Companies in these sectors tend to be especially weak at acknowledging climate change as a business risk/opportunity, at board oversight and responsibility, and at incorporating environmental, social and governance factors into executive remuneration.

Management Quality: indicator by indicator

As well as analysing companies' overall Management Quality, it is useful to break down the data indicator by indicator. Here we do this by organising the indicators according to the main themes in the **TCFD recommendations**:

1. **Governance** – "Companies' governance around climate-related risks and opportunities"
2. **Strategy** – "The actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning"
3. **Risk management** – "The processes used by the organization to identify, assess, and manage climate-related risks"
4. **Metrics and targets** – "The metrics and targets used to assess and manage relevant climate-related risks and opportunities"

This enables us to see the progress companies have made towards implementing the recommendations of the TCFD, bearing in mind that our Management Quality data are from 2018. This is likely to be a fast-changing area.

Governance

Figure 2.3 shows that TPI companies are relatively strong on *governance*, especially the basics. The vast majority of companies explicitly recognise climate change as a relevant business risk and/or opportunity, and have a policy (or equivalent) commitment to action on climate change. However, only 54 per cent of companies have nominated a board member or board committee with explicit responsibility for oversight of climate change policy, and only 55 per cent have incorporated environmental, social and governance issues into executive remuneration. For many companies, then, climate change is still not a c-suite issue.

Strategy and risk management

We see that companies are weak in the *strategy* area of the TCFD recommendations. Although 52 per cent of companies can demonstrate support for domestic and international efforts to mitigate climate change, very few companies disclose an

internal carbon price (16 per cent), and even fewer undertake and disclose climate scenario planning (only 14 per cent), one of the most distinctive recommendations of the TCFD.

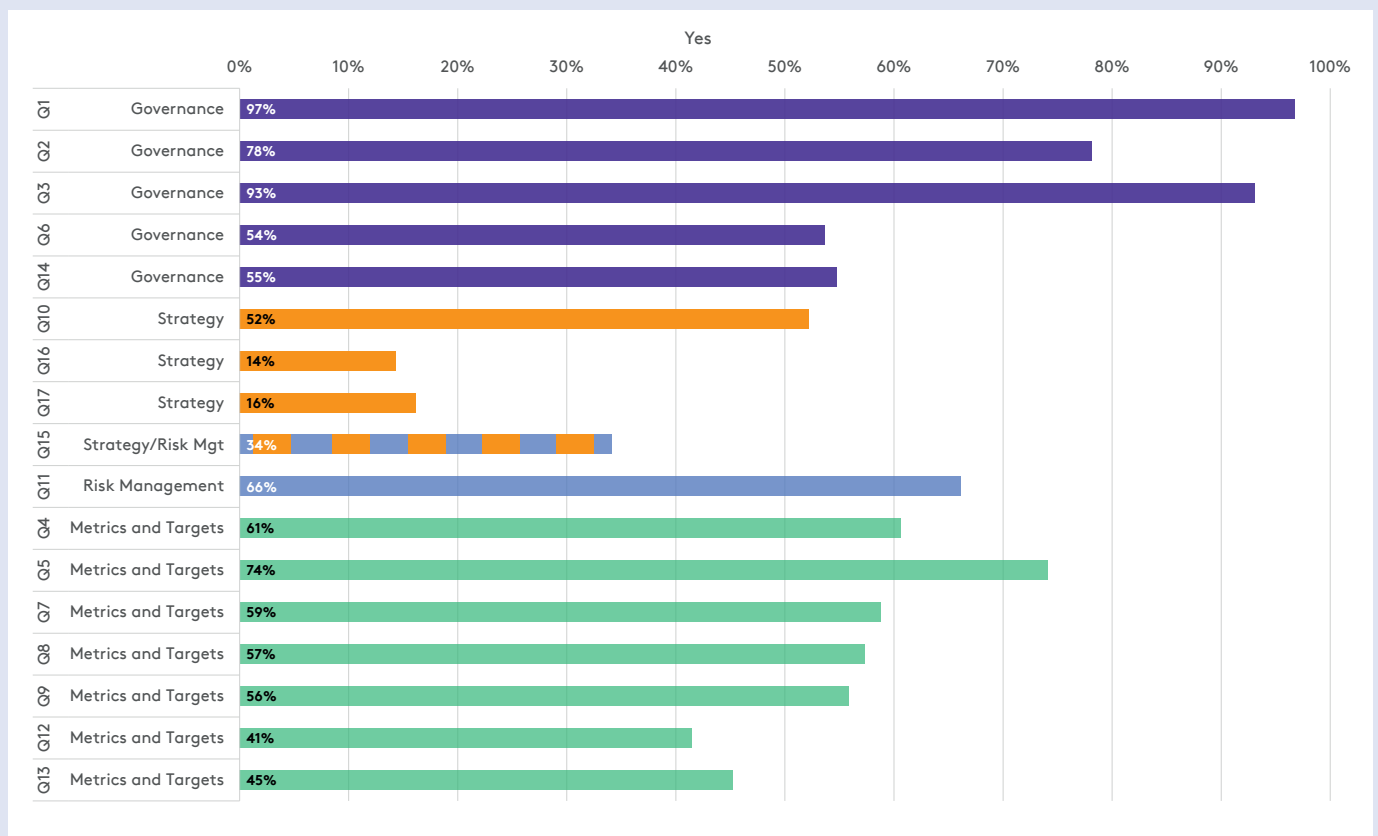
About one-third of companies incorporate climate change risks and opportunities in their strategy, an indicator that is relevant for both the *strategy* and *risk management* TCFD areas. On the other hand, two-thirds of companies have a process to manage climate-related risks.

Metrics and targets

Emissions measurement and targeting is relatively widespread among TPI companies. About three-quarters of companies publish information on their operational greenhouse gas emissions (Scope 1 and 2), and 61 per cent of companies have some form of emissions reduction target in place. But only 45 per cent of companies have a long-term quantified target – that is, of more than five years in duration – to reduce their emissions, and only 41 per cent of companies for whom Scope 3 emissions from use of sold products are significant (autos, coal, and oil and gas), disclose these emissions. Therefore there is still significant scope for companies to improve their disclosure of emissions and for more companies to target reducing their emissions, especially in the long term.

Disclosure

Finally, disclosure varies substantially across sectors, except for the governance theme, where it is broadly comparable. The energy sector cluster outperforms both manufacturing and basic materials, and transport, on strategy. Twenty-eight per cent of electricity utilities undertake climate scenario planning, and 24 per cent disclose an internal carbon price. The transport sector is particularly good at disclosing metrics and targets. For example, four out of five automobile manufacturers have set a quantified emissions reduction target. The manufacturing and other basic materials sector cluster consistently performs worst on every theme. In fact, steel makers are in the bottom 10 per cent for every Management Quality criterion.

Figure 2.3. Management Quality, indicator by indicator

“There is still significant scope for companies to improve their disclosure of emissions and for more companies to target reducing their emissions, especially in the long term”

Trends in Management Quality

When TPI was established in January 2017, it covered the top 20 electricity utilities and the top 20 oil and gas producers (in terms of market capitalisation). Two-and-a-half years on, we are now in a position to track progress on Management Quality for many of the companies in the TPI database: we now have trend data for 130 companies across the seven sectors of autos, cement, coal, electricity utilities, oil and gas production, paper, and steel.

Figure 2.4 shows the number of companies out of these 130 that had moved up, moved down or stayed at the same Management Quality level at the point at which we most recently updated our assessments. The remaining companies were introduced to the database during 2018 and have only been assessed once so far (thus we cannot yet track progress).

Out of the 130 companies for which we have trend data, 82 have stayed on the same level since their last assessment, 35 have moved up at least one level, but 13 have moved down at least one level. Thus, some progress is being made. However, in the majority of cases companies are standing still, and the progress being made by some is being partly offset by other companies falling back.

Of the 82 companies standing still, 25 are on Level 4 and so cannot move up a level as such. Nonetheless, those companies can still progress to achieve a 4* rating by satisfying all the TPI Management Quality criteria. Only two of the 25 companies that stood on Level 4 in their previous assessment have since met the 4* rating criteria.

Progress at all levels

As Figure 2.4 shows, the most commonly observed direction of movement is upwards, from Level 1 to Level 2 or 3. A total of 13 companies moved up from Level 1 to Level 2 or 3 in their last assessment; five of these are in the oil and gas sector.

To make the move from Level 1 to 2 or 3 a company must explicitly recognise climate change as a relevant business risk and/or

opportunity for the first time (70 per cent of the cases we assessed for progress), or introduce a policy commitment to action on climate change (15 per cent of cases), or do both of these things (15 per cent of cases). These can be regarded as basic steps.

Seven companies have moved up from Level 2 to Level 3 or 4. At a minimum this requires a company to begin disclosing its operational greenhouse gas emissions, or to introduce a target to reduce emissions (which can be qualitative). Four of these seven companies are in the oil and gas sector. Oil and gas producers were particularly apt to make progress between 2017 and 2018, which is reflected in a tangible improvement in the sector's average Management Quality level-score from 2 to 2.4.

Companies that jumped from Level 1 to 3 in their most recent assessments include auto maker Subaru and electricity utility FirstEnergy. Both companies were able to make this jump by satisfying multiple TPI indicators for the first time. Subaru not only explicitly recognised climate change as a relevant business risk/opportunity, but also assigned board responsibility for climate change. FirstEnergy is now only one indicator short of reaching Level 4, having explicitly recognised climate change as a relevant business risk/opportunity and disclosed its operational emissions. Oil and gas producer BP and Brazilian paper producer Fibria both advanced from Level 2 to 4 by setting quantitative emissions reduction targets.

Some companies have fallen backwards

Six companies dropped from Level 2 to Level 1 (for companies falling backwards, it was most commonly between these two levels). We assessed all six of these companies to have fallen backwards because they no longer explicitly recognise climate change as a relevant business risk or opportunity. We tightened the criteria for satisfying this indicator in 2018 – from explicit recognition of the issue to a specific risk framing in line with TCFD – which could be the main explanation for these backwards moves.

Figure 2.4. Company movements between Management Quality levels



“Out of the 130 companies for which we have trend data, 82 have stayed on the same level since their last assessment, 35 have moved up at least one level, but 13 have moved down at least one level. Thus, some progress is being made”

Carbon Performance: alignment with the Paris Agreement benchmarks

TPI's assessment of companies on their Carbon Performance consists of a quantitative benchmarking of companies' emissions pathways against the international targets and national pledges made as part of the 2015 UN Paris Agreement on climate change. The key question we ask is: are companies aligned with the Paris Agreement goals, and if not, will they be in the future?

Figures 2.5 and 2.6 summarise the TPI Carbon Performance data across all sectors by classifying whether a company is aligned with the Paris Pledges, with a pathway to limit global warming to 2°C, or with a more ambitious pathway to limit global warming to below 2°C.

To summarise these data, we compare a company's emissions intensity in the last year for which we have data with the benchmarks in 2030. The group of companies considered to be aligned by 2030 comprise:

- (a) Those with explicit 2030 emissions reduction targets that are below the relevant benchmark in 2030
- (b) Those with explicit targets expiring before 2030, but which would bring them below the 2030 benchmark
- (c) Those whose current performance is already below the 2030 benchmark

In cases (b) and (c), we therefore assume companies' carbon intensity does not increase after the last year for which we have data.

Carbon Performance results

To date we have assessed 160 companies on Carbon Performance in eight sectors: airlines; aluminium; autos; cement; electricity; oil and gas (top 10 companies only); paper; and steel.

Our assessment shows that in 2030:

- 48 companies would be aligned with the least ambitious Paris Pledges (NDCs) benchmark. This means they have either already achieved the 2030 Paris Pledges benchmark emissions intensity for their sector, or they will do so by 2030 based on emissions reduction targets they have set.

- Of these 48, 26 companies are aligned with the 2°C benchmark. Of those, 20 companies are aligned with the most ambitious below 2°C benchmark.
- 79 companies are not aligned with any of the benchmarks.
- 33 companies do not provide sufficient disclosure for TPI to calculate their Carbon Performance. Most companies are not aligned.

Alignment is most frequently seen in the electricity and paper sectors. In electricity, 54 per cent of utilities assessed are aligned with the Paris Pledges benchmark and almost one-third are aligned with the below 2°C benchmark. However, this partly reflects a comparison of European electricity utilities, which typically have a low emissions intensity and ambitious targets, with global benchmarks. In the paper sector, slightly under half of companies are aligned with the Paris Pledges benchmark.

There is, as yet, little alignment evident in the airlines, aluminium, cement, or oil and gas sectors. None of the top 10 oil and gas producers, in terms of the emissions intensity of primary energy supplied, is aligned with the benchmarks, reflecting the fundamental decarbonisation challenges facing the sector (see Section 3 below). If we extend the transition horizon to 2050, we find that two companies – Shell and Total – are eventually aligned with the Paris Pledges benchmark by 2040. However, neither is doing enough to align with TPI's 2°C benchmark.

Out of the 160 assessed companies, only 32 (20 per cent) have set a quantified emissions reduction target extending to 2030, which we could use to assess Carbon Performance. Of the 32 targets, 18 are aligned with the Paris Pledges, 11 are aligned with the 2°C benchmark and eight with the below 2°C benchmark. The share of companies with 2030 targets that align with the Paris goals is higher than we found in our analysis of the database in 2018.⁸ Fourteen companies have set a target for 2030 that is not aligned with the Paris Agreement.

Figure 2.5. Carbon Performance alignment with the Paris Agreement benchmarks (number and percentage of companies)

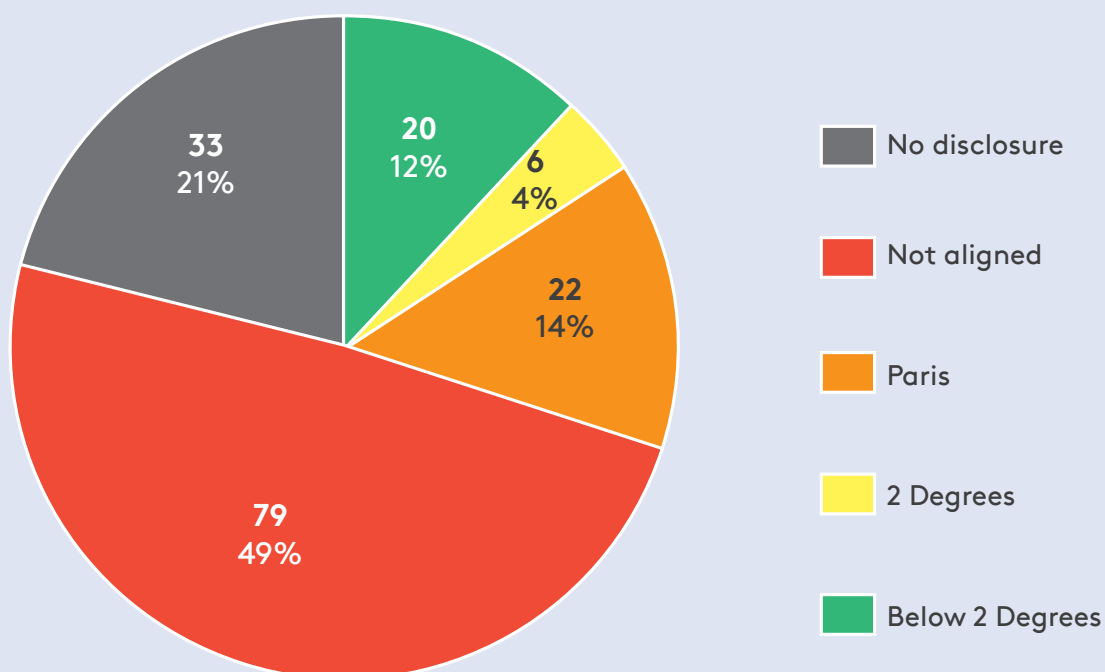
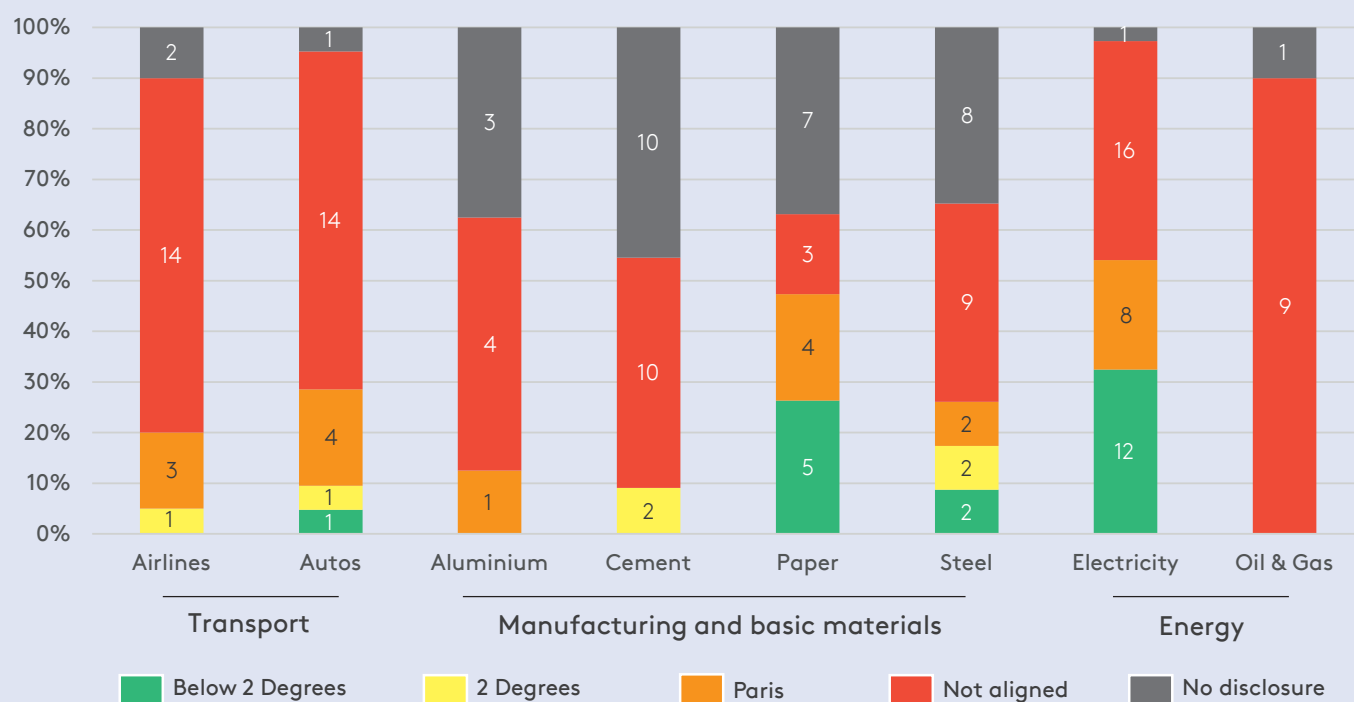


Figure 2.6. Carbon Performance alignment with the Paris Agreement benchmarks by sector and cluster (number and percentage of companies)



Does Management Quality predict Carbon Performance?

As we have seen, TPI assessments are divided into two elements: Management Quality and Carbon Performance. Management Quality describes companies' governance of greenhouse gas emissions and the risks and opportunities arising from the low-carbon transition. Carbon Performance describes what emissions pathway a company is on and how it compares to the international targets and national pledges made as part of the Paris Agreement on climate change. Therefore Management Quality focuses on processes, while Carbon Performance focuses on outcomes.

In this section we analyse the relationship between Management Quality and Carbon Performance across the full TPI database (see Figure 2.7). To do so, we compare the proportion of Management Quality criteria satisfied by companies aligned with any of the three Paris Agreement benchmarks in 2030, with the proportion satisfied by companies not aligned (either due to having an emissions intensity that is too high, or due to not disclosing the necessary information). We make this comparison for the full set of 17 Management Quality criteria, as well as when the criteria are grouped into each of the four TCFD areas.^d

Our principal measure of alignment is the same as in the previous section: that is, we compare a company's emissions intensity in the last year for which we have data with the benchmarks for 2030.

A positive association

We find that Management Quality and Carbon Performance are positively associated. On average, companies that are aligned with the Paris Agreement benchmarks satisfy two-thirds of Management Quality criteria, while those that are not aligned satisfy less

than half. Therefore, companies doing well on Management Quality are also likely to be companies doing well on Carbon Performance. This association is statistically significant and it is robust to controlling for any systematic differences between aligned and non-aligned companies in terms of industry, region of headquartering and market capitalisation.

Breaking down the Management Quality data into the four TCFD areas, we find that Carbon Performance is most strongly associated with Management Quality indicators in the area of *strategy*. Aligned companies perform almost twice as well on strategy as non-aligned companies. We might infer that strategic carbon management practices are a leading indicator of Carbon Performance.

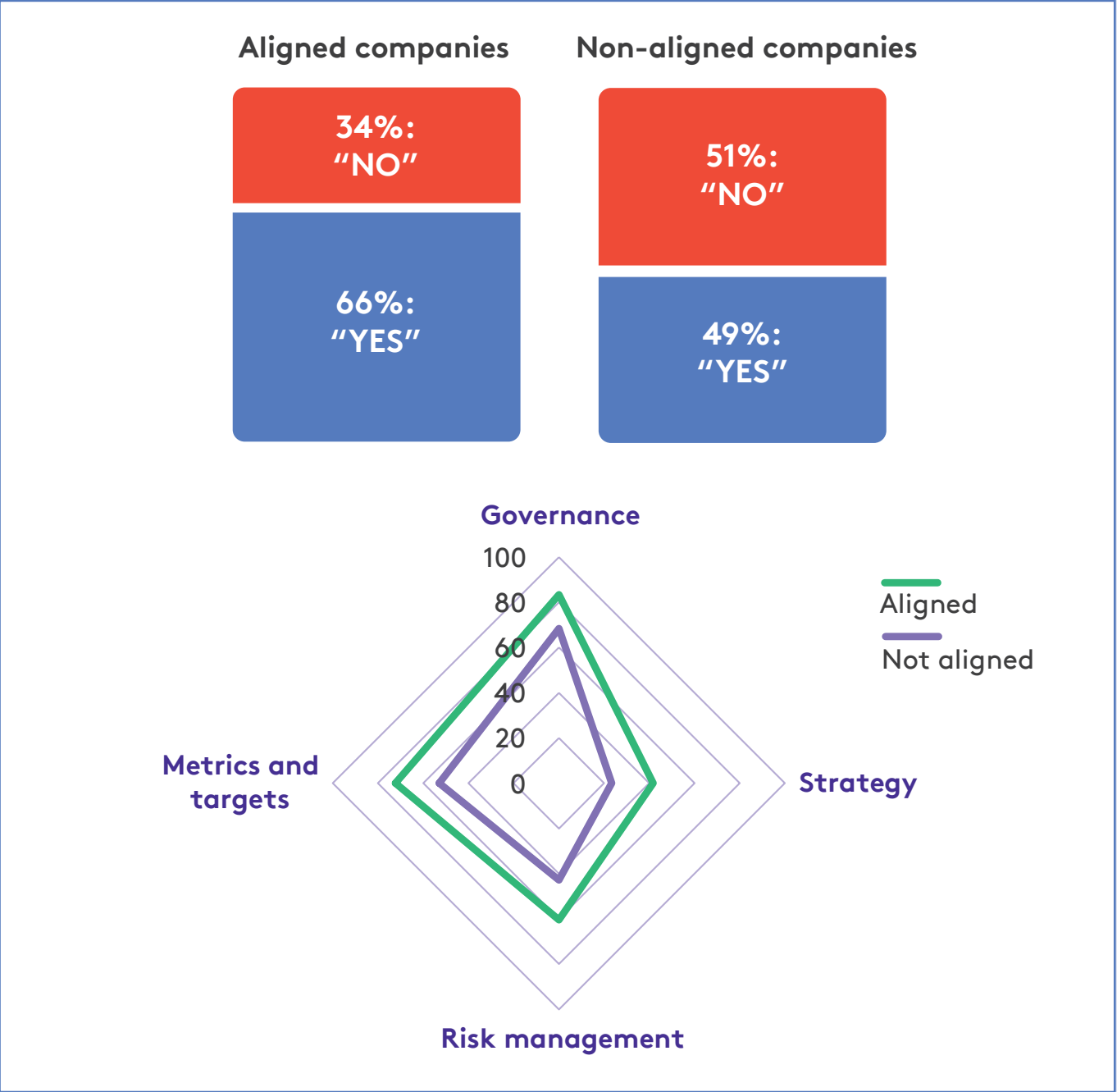
Indicators grouped into the other three TCFD categories – *governance*, *risk management*, and *metrics and targets* – have no statistically significant association with alignment, although it is true that in all three cases aligned companies score higher than non-aligned companies.

These results assume companies' carbon intensity does not increase or worsen after the last year for which we have data. To test the robustness of these findings if we relax this assumption, we repeat the analysis, this time only classifying as aligned those companies with a 2030 emissions target that would see their carbon intensity below the Paris Pledges benchmark. Companies without a 2030 emissions target are not aligned by default.

On this basis, we find that companies aligned with the Paris Pledges satisfy 75 per cent of Management Quality criteria, while companies not aligned only satisfy 51 per cent. This difference is also statistically significant and robust to controlling for industry, region of headquartering and market capitalisation.

^d. Some companies are not assessed on Management Quality question 12 "Does the company disclose materially important Scope 3 emissions?" Such companies can therefore only score on a maximum of 16 questions.

Figure 2.7. Proportion of Management Quality indicators satisfied by companies aligned or not aligned with any of the Paris Agreement benchmarks



Note: See Appendix for list of Management Quality indicators

3 Sector focus: Airlines

Long-term questions about offsetting and non-CO₂ effects

In March 2019 TPI published its first assessment of the airlines sector. The sector makes a significant contribution to climate change, currently accounting for 2 per cent of global carbon dioxide (CO₂) emissions and 12 per cent of transport-related CO₂ emissions.⁹ This contribution is likely to grow, as increasing air passenger traffic outpaces technological improvements in aviation, at the same time as other sectors such as electricity become increasingly decarbonised.^{10, 11}

The impact of aviation on climate change is not limited to its CO₂ emissions. Non-CO₂ impacts, such as the formation of contrails and clouds caused by aircraft flying at altitude, are also likely to be significant, although these effects are currently highly uncertain.¹²

Management Quality

Compared with other sectors in the TPI database, airlines are about mid-table on Management Quality, with an average level-score of 2.4. As in other sectors, most airlines do the basics, but fewer take the more advanced steps (see Figure 3.1). A notably large share of airlines has set quantified emissions reduction targets and still more have set fuel efficiency targets. However, a particularly small number of airlines have aligned executive remuneration with environmental, social and governance (ESG) issues, incorporated climate risks and opportunities in their strategy, or undertaken and disclosed climate scenario planning.

Carbon Performance

TPI assessed the Carbon Performance of airlines based on their CO₂ emissions intensity from flight operations: that is, the average amount of CO₂ emitted by an airline in transporting one passenger for one kilometre. We found that, while most of the airlines surveyed

have a carbon intensity that is aligned with the current sector benchmarks, no airline has a 2030 target that can be said to be aligned with the benchmarks. The sector is therefore falling short of the ambition required to meet the goal of the Paris Agreement to limit global warming to below 2°C.

Use of offsetting

One of the principal reasons why we judge that no airline has a 2030 target aligned with the benchmarks is that none of the 20 airlines in our database has set a target that clearly specifies how it will reduce its own flight emissions after 2025. Some airlines are yet to set any long-term target. Most others have formally adopted industry-wide targets, which are based on net emissions reductions. This approach includes the use of carbon offsets, purchased from other sectors, to augment emissions reductions within the airline sector itself.

In principle, offsetting can be a cost-effective method of reducing emissions. The problem is that it is unclear from such net targets how much the airlines plan to reduce their own flight emissions. Research by the International Energy Agency and others shows that the airline industry needs to reduce its own emissions significantly in order to limit warming to below 2°C, and should not be relying too heavily on offsets.^{10, 13}



“Most airlines do the basics but fewer take the more advanced steps”

Figure 3.1. Airlines' Carbon Performance versus the benchmarks

Company	Emissions intensity of flight operations (gCO ₂ /passenger kilometre)						
	2014	2015	2016	2017	2020	2022	2025
Air China	111	112	111	107	108		
Alaska Air	94	93	91	91	87		
American Airlines	119	116	116	115			
ANA Group	137	134	132	128	133		
China Southern	114	112	112	108			
Delta	118	116	115	113	104		
Easyjet	82	81	80	79	75	72	
IAG	125	119	116	112	112		
IndiGo	No data						
Japan Airlines	140	132	134	134	125		
Jetblue	101	101	100	101	98		
Korean Air	188	181	175	171	172		
LATAM	108	104	100	96	102		
Lufthansa	127	126	126	120	107		
Qantas	104	101	101	98	89		
Singapore Airlines	138	138	141	136			
Southwest	102	99	98	97	98		
Turkish Airlines		109	119	110	107	106	104
United	107	106	104	104	92		
Wizz Air	No data						
2°C (High efficiency)	129	125	121	118	106	99	88
2°C (Shift-improve)	129	126	123	120	111	105	96
International pledges	129	126	124	122	115	110	104
Key	Aligned with 2°C (High efficiency)		Aligned with 2°C (Shift-improve)		Aligned with international pledges		Not aligned

TPI conclusions on airlines

Our analysis concluded that there is a need for more ambitious target-setting at both an industry and airline level. Specifically, TPI is calling for:

- 1. Greater transparency in the use of offsetting.** There needs to be more visibility of airlines' intended reliance on offsetting compared with their own emissions reductions. This is an important piece of information investors need in order to evaluate companies' ambitions and the investment risks they present.
- 2. A credible level of offsetting.** The airline sector needs to demonstrate that the amount of emissions reductions to be delivered from offsetting is both realistic, in terms of the availability of offsets from other sectors in an increasingly carbon-constrained world, and reasonable, in terms of the role airlines need to play in meeting the Paris Agreement temperature goals.
- 3. Non-CO₂ impacts.** TPI's assessment does not yet include the non-CO₂ effects of aviation on climate change, notably via contrails and clouds. Due to the uncertainty in quantifying them, these effects are not currently incorporated in company disclosures, or in the models used to benchmark the sector. However, non-CO₂ effects are thought to be significant and therefore we are calling for further progress to be made in understanding airlines' overall impact on the climate. If these effects were taken into account, the TPI benchmarks would almost certainly be tighter.

Sector focus: Oil and gas

Making the energy transition

The oil and gas sector is pivotal in the transition to a low-carbon economy. Including downstream (i.e. Scope 3) emissions from burning oil and gas, it is estimated that the sector accounts for 33 per cent of global greenhouse gas emissions.^{14, 15} The International Energy Agency estimates that global oil production has to fall by around 30 per cent by 2040 in order to align with a below 2°C scenario.¹⁶

The sector is also of great significance to investors. Publicly listed oil and gas companies have a combined equity valuation of over US\$3.3 trillion, 5 per cent of global market capitalisation.⁹ By encouraging publicly listed oil and gas companies to reduce operational emissions and, where it makes sense, to produce low-carbon energy, investors can play a huge role in accelerating the transition to a low-carbon economy.

Management Quality

TPI has assessed the oil and gas sector on Management Quality since early 2017. On average, oil and gas producers' Management Quality level-score increased from 2.1 to 2.4 between 2017 and 2018, making it a notable improver. However, the sector still remains below the TPI average of 2.5.

Oil and gas companies tend to perform better than average on incorporating environmental, social and governance (ESG) issues into executive pay: 69 per cent of oil and gas companies do, which is 14 percentage points above the TPI average. However, just 36 per cent of companies have set quantified emissions reduction targets (25 percentage points below the TPI average), and only 42 per cent can demonstrate that they support domestic and international efforts to mitigate climate change (10 percentage points below the TPI average).

The companies scoring highest on Management Quality are predominantly European: six out of the eight oil and gas producers on Level 4, and four out of the five

companies that have set long-term emissions targets. By contrast, out of the 17 US oil and gas producers in our sample, none is on Level 4 and only three are on Level 3. There is much room for improvement, although we do indeed see US companies improving: out of the six US oil and gas companies that were still on Level 1 in 2017, for instance, five moved on to Level 2 in 2018.

Carbon Performance

In November 2018, TPI published a discussion paper⁴ setting out our proposed Carbon Performance methodology for the oil and gas sector and provided a provisional Carbon Performance assessment of the 10 largest companies in the sector: see Figure 3.2.

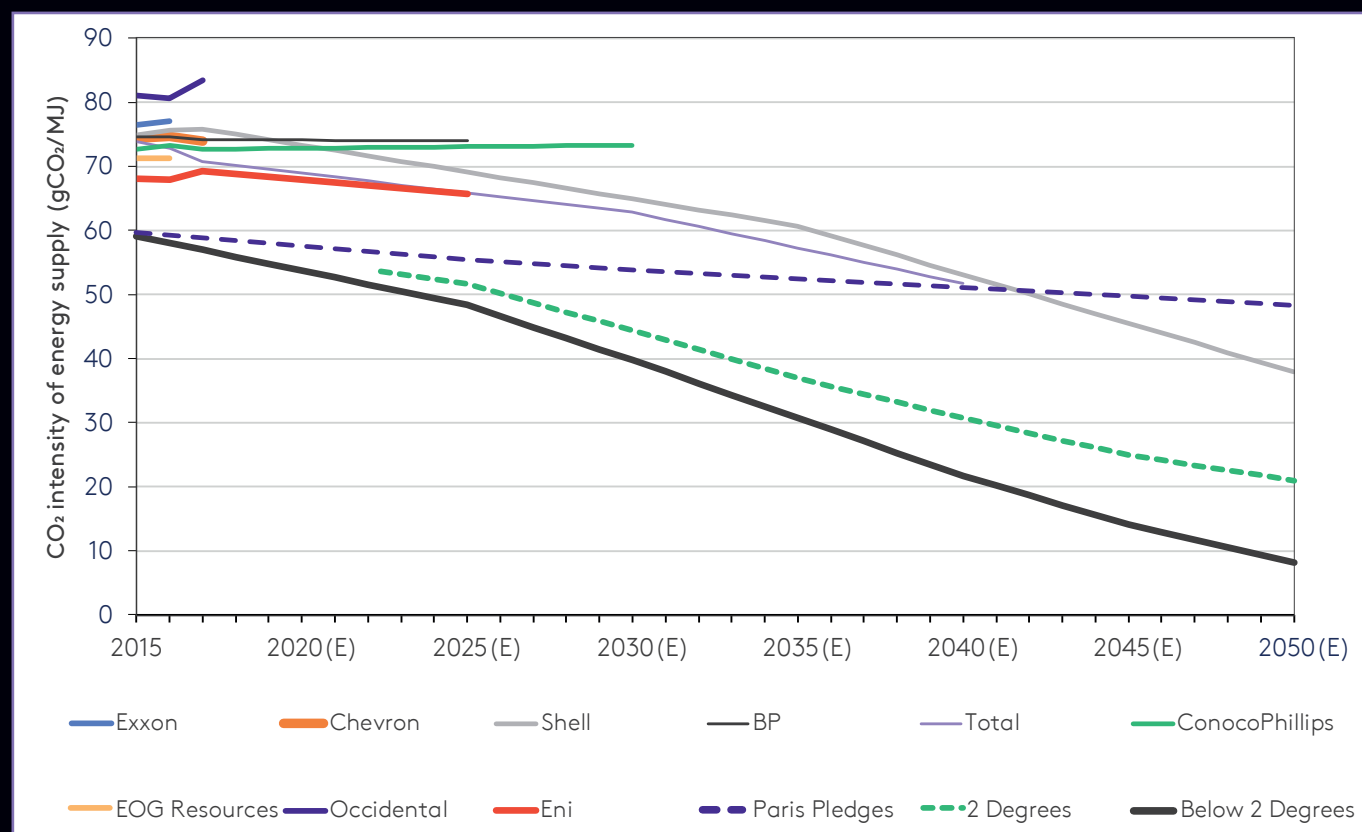
The results suggest that the emissions intensity of these 10 oil and gas majors is currently substantially above the sector's Paris Agreement benchmarks, defined in terms of the carbon intensity of energy supply. Significant reductions will be needed for any of these companies to align with the benchmarks in the future. Alignment ultimately means these companies making the transition from being oil and gas producers to low-carbon energy suppliers.

We found that only five companies had set long-term emissions reduction targets or ambitions, and only two of these targets/ambitions (from Royal Dutch Shell and Total) took into account the all-important Scope 3 emissions from use of sold products. These emissions typically account for 90 per cent of total emissions for an oil and gas company,¹⁴ and it is very difficult to significantly reduce emissions without addressing them.

Since publication of our discussion paper, Total has revised its long-term targets and Royal Dutch Shell, EOG Resources, Exxon Mobil and Eni have added new climate-related targets/ambitions in some form. Whether these changes will bring these companies into alignment with the benchmarks will be assessed by TPI later this year.

e. Calculated based on the 140 largest oil and gas companies by market cap in the FTSE Russell universe and World Bank data.¹⁷

Figure 3.2. Carbon intensity pathways* for nine of the largest 10 oil and gas companies, versus low-carbon benchmarks



Note: *Scope 1 and 2 emissions plus Scope 3 emissions from use of sold products





4 Implications for investors

In this section we offer some reflections on the data and analysis presented above. We focus in particular on the implications for investor engagement.

Disclosure

There is limited availability of comparable emissions data, and availability falls markedly as we look to the future. Seventy-one companies (or 26 per cent of the 274 companies covered by this report) do not provide any emissions disclosures at all. About 20 per cent of the 160 companies assessed on Carbon Performance do not disclose their historical emissions and/or their activity/production in a form that enables us to make meaningful assessments of Carbon Performance, rising to 80 per cent in 2030. These weaknesses in disclosure mean that investors cannot assess if such companies are aligned with the goals of the Paris Agreement.

Investor Action: Investors should require companies to disclose (a) greenhouse gas emissions for the current/most recent reporting year, and (b) short- and long-term emissions reduction targets, in both cases using the relevant TPI sector Carbon Performance metric.

Management Quality

Management Quality remains weak for many of the companies covered by this report. As discussed, 126 companies remain on TPI Levels 0–2, suggesting that they either: do not explicitly recognise climate change as a relevant business risk/opportunity; do not have a policy commitment to act on climate change; do not disclose their operational greenhouse gas emissions; or have not set a target to reduce their emissions (even a qualitative target). Given that these are some of the world's largest emitters, it suggests that few of these 126 companies are properly managing the risks or opportunities associated with the transition to a low-carbon economy.

Investor Action: Investors should require companies to (a) publish a policy commitment to act on climate change, (b) publish their operational greenhouse gas emissions on an annual basis, and (c) set short- and long-term emissions reduction targets.

However, it is important to acknowledge that there has been significant progress on the Management Quality measure. More than half of all companies are now on Level 3 or 4, meaning that they are integrating climate change into operational decision-making, or have gone beyond this and are now taking a strategic approach. Thirty-five companies (out of 130 companies in total that have been assessed twice) moved up at least one level between 2017 and 2018. There are likely to be various factors at play in this improvement, including the growing media attention on climate change, the fact that many companies have improved their disclosure (that is, they are getting better at talking about what they have already been doing), as well as pressure being applied by consumers, governments and other stakeholders.

It is likely that investor engagement (individual engagement and, notably, collective engagement through initiatives such as Climate Action 100+)^f has been an important driver of improved disclosure and of other corporate action, although as yet we do not have the right kind of data to demonstrate this. We note that Climate Action 100+ is establishing processes to track its activities (specifically the frequency and depth of its engagement with companies) and changes in companies' practices and performance.

^f. Climate Action 100+ is an initiative through which more than 320 investors with more than US\$33 trillion in assets are “engaging companies on improving governance, curbing emissions and strengthening climate-related financial disclosures”; the companies include 100 “systemically important emitters” – see www.climateaction100.org.

The logic of the TPI Management Quality staircase appears correct. Companies need to start by acknowledging climate change as an issue and then gather some basic information about their practices and performance (for example, developing emissions inventories), before they adopt more advanced management practices (for example, allocating management responsibilities). It is only once they have these advanced management practices in place that they will and can consider taking a more strategic approach. This is confirmed by the fact that we have very few companies that meet most or all of the Level 3 criteria without having first met most or all of the Level 1 and 2 criteria. Similarly, very few companies meet most or all of the Level 4 criteria without having first met most or all of the Level 3 criteria.

The TPI analysis identifies not only companies where Management Quality is lagging, but also areas where investors need to focus greatest attention. While companies are relatively strong on basic aspects of governance and metrics/targets, they are especially weak on strategy, in particular in terms of disclosing an internal carbon price, and undertaking and disclosing climate scenario planning.

Investor Action: Investors should encourage companies to take a strategic approach to climate change, for instance by disclosing the internal carbon price that informs their investment and capital expenditure decisions, and conducting and publishing the results of the climate scenario analysis that they have conducted.

Carbon Performance

Carbon Performance – that is, whether companies’ current and expected future greenhouse gas emissions align with the international targets and national pledges made as part of the 2015 Paris Agreement on climate change – is the central issue for investors concerned about climate change.

The overall picture is worrying. Just 48 out of the 160 companies assessed on Carbon Performance are aligned with the least ambitious Paris Pledges benchmark (in other words, they have either already achieved the 2030 Paris Pledges benchmark emissions intensity for their sector, or they will do so by 2030 based on emissions reduction targets they have set). Of this group of 48, 26 are further aligned with the 2°C benchmark, while 20 companies are aligned further still with the most ambitious below 2°C benchmark.

A more positive interpretation of these data is that they show even the most ambitious below 2°C benchmark is neither unattainable nor unrealistic. In most sectors, it is possible to identify leading companies with an emissions intensity that is already, or will soon be, lower than the below 2°C benchmark.

Investor Action: Investors should encourage companies that are not expected to be aligned with a 2°C benchmark by 2030 to set targets that would align, and to publish action plans explaining how they intend to deliver on these targets.

The relationship between Management Quality and Carbon Performance

Earlier work by TPI on the relationship between Management Quality and Carbon Performance has indicated that investors cannot assume that better management systems and processes inevitably lead to lower carbon emissions. Specifically, we found no relationship between a measure of Management Quality and historical Carbon Performance, but we did find a positive association between the same measure of Management Quality and future Carbon Performance.^{8, 18–22}

The data presented in this report reinforce the idea that Management Quality and Carbon Performance are associated, particularly when the measure of Carbon Performance is forward-looking. Our test of alignment in this report compares where a company is now, or where it will be in the future given the emissions targets it has set, with the Paris Agreement benchmarks in 2030. We find that companies that are aligned with the benchmarks have implemented more carbon management practices. When we break down the Management Quality data into the four TCFD areas, we find that there is a notably strong association between Carbon Performance and the implementation of management practices in the area of strategy, specifically disclosing an internal carbon price, and undertaking and disclosing climate scenario planning.

What does this finding mean? Our data alone do not lead to the conclusion that these practices, in and of themselves, deliver better Carbon Performance. However, we can speculate that using an internal carbon price and conducting scenario planning are indicative of – or a proxy for – a level of strategic engagement with, and understanding of, the risks and opportunities associated with climate change. It might then be assumed that such companies are more likely to set demanding objectives and targets for themselves. Expressing this hypothesis in another way, we are assuming that a well-considered analysis of the future risks, opportunities and impacts of climate change is more likely to lead to companies recognising that they need to take effective action to ensure the future success of their business. The correlation is not perfect and the causal pathways are, at best, speculative, so we should not assume that using an internal carbon price and conducting scenario planning inevitably leads to better Carbon Performance.

While we continue to emphasise the importance of focusing on future Carbon Performance as the key measure of corporate climate action, we are not suggesting that management practices and processes are unimportant. We acknowledge there is no guarantee that companies will actually deliver the targets they have set for themselves. There are, however, grounds for optimism on this point. Our previous research suggests that when companies provide a detailed description of how they intend to deliver their targets (for example, through management plans, actions and resources), when they can explain how they are able to reconcile the costs and benefits of taking action, and when they provide robust and regular updates on progress towards the delivery of these targets, it is possible to have a high degree of confidence that the targets will be met. This confidence is strengthened for companies that have previously set targets and have a track record of delivering on these targets, or of explaining why these targets have not been met.

Investor Action: Investors should focus their attention on Carbon Performance – that is, current and expected future emissions from companies and how these align with meeting the Paris Agreement targets. They should encourage all companies to improve their Management Quality as a necessary but insufficient condition for ensuring that future Carbon Performance is aligned with the Paris Agreement.

Concluding reflections

The data in this report enhance our understanding of current corporate practice and performance on climate change. They also provide important insights into the way in which investors need to think about engagement. Four conclusions follow from the analysis:

Significant gaps remain in the disclosures being provided by some of the largest, highest-emitting publicly listed companies globally. Without robust information on corporate carbon management practices and emissions, investors cannot ensure companies are effectively managing the risks and opportunities presented by climate change, nor can they determine whether companies are aligning with the targets set by national governments and the international community in the Paris Agreement.

Improving corporate carbon Management Quality is critical. This is needed both to ensure that companies have the basic competencies, systems and processes they need to manage climate-related risks and opportunities in their own businesses, and as a precursor to their engaging with climate change on a more strategic, long-term basis. Even those companies that have set ambitious long-term targets need to have the competencies, systems and processes in place to ensure that those targets are delivered.

Engaging with companies on practices such as setting an internal carbon price and conducting scenario analysis is important in ensuring that companies take a strategic approach. Our research also suggests that the implementation of strategic management practices such as these is a leading indicator of Carbon Performance.

Carbon Performance should be a key focus for investors – in particular, the objectives and targets that define future greenhouse gas emissions. Investors should ensure that these objectives and targets align with the goals of the Paris Agreement. Although there is some correlation between Management Quality and Carbon Performance, the correlation is far from perfect: investors cannot assume – as is demonstrated through this report – better Management Quality will lead to companies setting appropriate Carbon Performance targets.

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Appendix: TPI management quality indicators

Level 0: Unaware of (or Not Acknowledging) Climate Change as a Business Issue

Question 1	Does the company acknowledge climate change as a significant issue for the business? [If the company does not acknowledge climate change as a significant issue for the business, it is placed on Level 0]
Notes	Companies are assessed as Yes if they: • Explicitly recognise climate change as a relevant risk and/or opportunity for the business (Q2); or • Have a policy or an equivalent statement committing them to take action on climate change (Q3); or • Have set greenhouse gas emission reduction targets (Q4); or • Have published information on their operational greenhouse gas emissions (Q5).

Level 1: Awareness/Acknowledging Climate Change as a Business Issue

Question 2	Does the company explicitly recognise climate change as a relevant risk and/or opportunity for the business?
Notes	Companies are assessed as Yes if they demonstrate recognition of climate change as a relevant risk and/or opportunity to the business.
Question 3	Does the company have a policy (or equivalent) commitment to action on climate change?
Notes	Companies are assessed as Yes if they have a published policy or commitment statement on climate change that commits them to addressing the issue, or to reducing or avoiding their impact on climate change (e.g. to reduce emissions or improve their energy efficiency).

Level 2: Building Capacity

Question 4	Has the company set greenhouse gas emission reduction targets?
Notes	Companies are assessed as Yes if they have greenhouse gas emissions reduction targets. These targets may cover Scopes 1, 2 and/or 3, and they may be quantified or unquantified. This question is less demanding than Questions 7 and 13, which require companies to have set quantified targets and for those quantified targets to be long-term, respectively. Companies that are assessed as Yes on Question 7, or Yes on Questions 7 and 13, are automatically assessed as Yes on Question 4.
Question 5	Has the company published information on its operational (Scope 1 and 2) greenhouse gas emissions?
Notes	Companies are assessed as Yes if they report on their Scope 1 and 2, or their Scope 1, 2 and 3 emissions. Companies that only report Scope 1 emissions are assessed as No.

Level 3: Integrating into Operational Decision Making

Question 6 **Has the company nominated a board member or board committee with explicit responsibility for oversight of the climate change policy?**

Notes Companies are assessed as Yes if they provide evidence of clear board or board committee oversight of climate change, or if they have a named individual/position responsible for climate change at board level.

Question 7 **Has the company set quantitative targets for reducing its greenhouse gas emissions?**

Notes Companies are assessed as Yes if they have set quantified targets to reduce greenhouse emissions in relative or absolute terms (Scopes 1, 2 and/or 3).

This question is more demanding than Question 4, as companies must have set quantitative targets to reduce emissions. This question differs from Question 13, which asks whether companies have set quantified targets for reducing greenhouse gases over the long term (i.e. targets that are more than five years in duration). Companies that are assessed as Yes on Question 13 are automatically assessed as Yes on this question.

Question 8 **Does the company report on Scope 3 emissions?**

Notes Companies are assessed as Yes if they report on Scope 3 emissions separately, either in total or in one or more categories, or if they provide a total for Scope 1, 2 and 3 emissions.

Question 9 **Has the company had its operational (Scope 1 and/or 2) greenhouse gas emissions data verified?**

Notes Companies are assessed as Yes if their operational greenhouse gas emissions have been independently verified by a third party, or if they state the international assurance standard they have used and the level of assurance.

Question 10 **Does the company support domestic and international efforts to mitigate climate change?**

Notes Companies are assessed as Yes if they demonstrate support for mitigating climate change through membership of business associations that are supportive, and if they have a clear company position on public policy and regulation.

Question 11 **Does the company have a process to manage climate-related risks?**

Notes Companies are assessed as Yes if they have integrated climate change into multi-disciplinary company-wide risk management, or if they have a specific climate-related risk management process.

Question 12 **Does the company disclose materially important Scope 3 emissions? (Applicable to some sectors only)**

Notes Scope 3 emissions are diverse and many companies only disclose in a sub-set of categories. In some sectors, particular categories of Scope 3 emissions are materially important, in the sense of being a large share of lifecycle emissions. In these sectors, we require companies to specifically disclose emissions in the relevant category or categories.

For example, in automobile manufacturing, coal mining, and oil and gas production, we ask: does the company disclose Scope 3 emissions from use of sold products?

Level 4: Strategic Assessment

Question 13 Has the company set long-term quantitative targets for reducing its greenhouse gas emissions?

Notes Companies are assessed as Yes if they have set quantified, long-term targets (i.e. more than five years in duration) to reduce greenhouse emissions in relative or absolute terms (Scopes 1, 2 and/or 3).

This question is more demanding than Question 7, as the targets must not only be quantitative, they must also be long-term.

Question 14 Has the company incorporated environmental, social and governance issues into executive remuneration?

Notes Companies are assessed as Yes if executive remuneration incorporates environmental, social and governance performance.

Question 15 Does the company incorporate climate change risks and opportunities in their strategy?

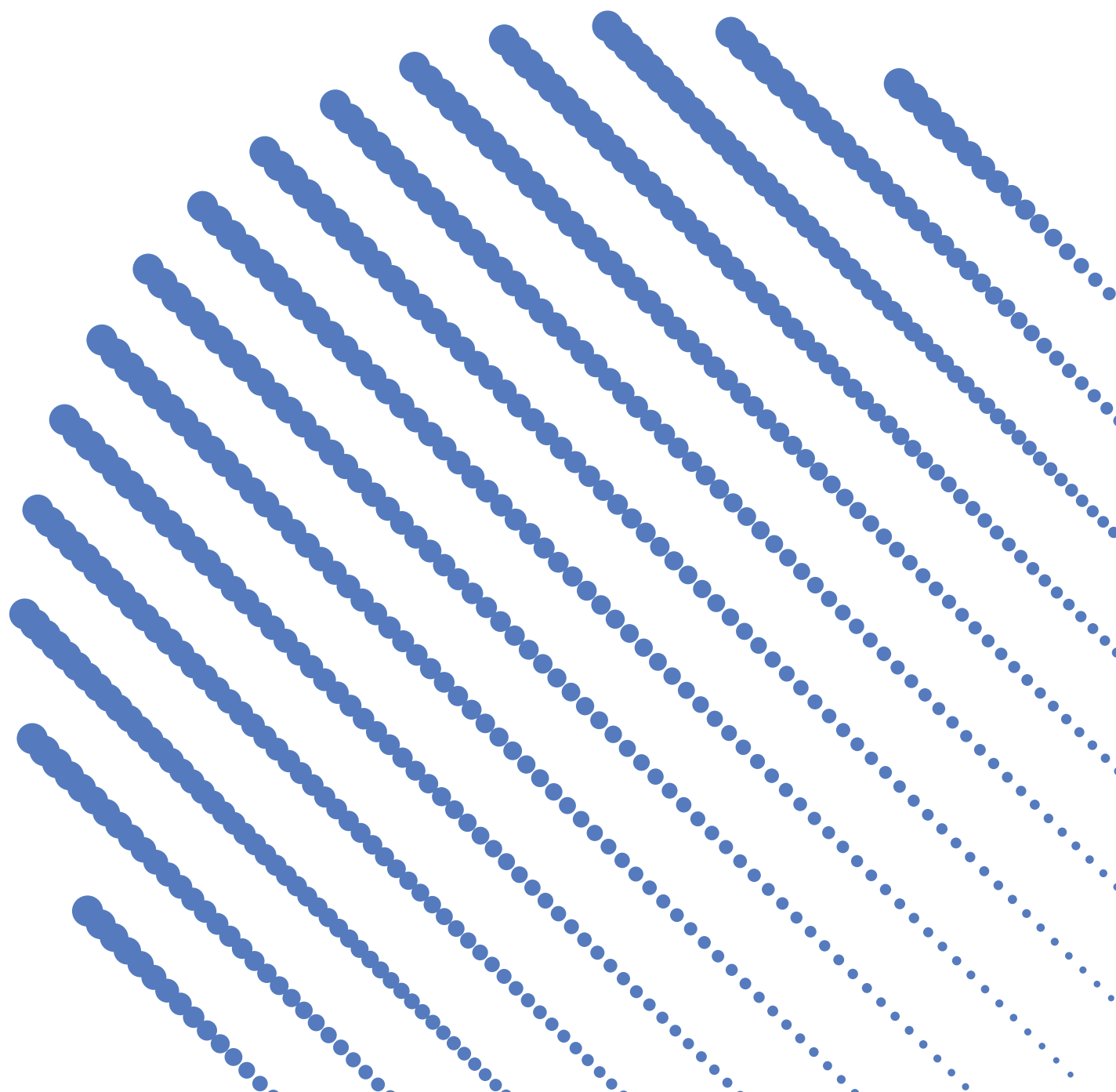
Notes Companies are assessed as Yes if they detail how they incorporate climate change risks and opportunities in their strategy (mitigation, new products, R&D, etc.), and if they disclose the impact of climate change risks and opportunities on financial planning (OPEX, CAPEX, M&A, debt).

Question 16 Does the company undertake climate scenario planning?

Notes Companies are assessed as Yes if they mention the 2 degrees scenario in relation to business planning or confirm they have conducted climate related scenario analysis, and if they describe the business impact of one or more climate scenario analysis.

Question 17 Does the company disclose an internal price of carbon?

Notes Companies are assessed as Yes if they have and disclose their internal carbon price.



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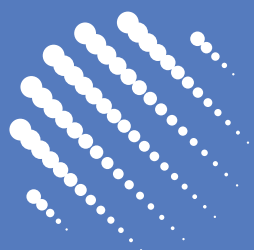
C/o UNPRI PRI Association
5th Floor, 25 Camperdown Street
London E1 8DZ, UK

T +44 (0)20 3714 3141

E tpi@unpri.org

transitionpathwayinitiative.org

[@tp_initiative](#)



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