Transition Pathway Initiative

# Management Quality and Carbon Performance of Industrials and Materials Companies: February 2021

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# Research Funding Partners

We would like to thank our Research Funding Partners for their ongoing support of TPI and their enabling the research behind this report and its publication

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# About TPI and this report

TPI is a global initiative led by Asset Owners and supported by Asset Managers. Established in January 2017, TPI now has over 90 supporters with over $23 trillion of combined Assets Under Management and Advice.*

Using publicly disclosed data, TPI assesses the progress that companies are making on the transition to a low-carbon economy, supporting efforts to mitigate climate change:

- In line with the recommendations of TCFD;
- Providing data for the CA100+ initiative.

All TPI data are published via an open-access online tool.

This slide set presents our latest assessment of the industrials and materials sector, including aluminium, cement, chemicals, diversified mining, paper, steel, and other industrials.

*February 2021

# Investor perspective

- Even if we successfully transition to a low-carbon economy, we will continue to rely heavily on products such as steel, aluminium, cement and chemicals. It is therefore essential that companies in these and other industrial sectors significantly reduce their greenhouse gas emissions in line with the goals of the Paris Agreement.
- This report suggests that companies in these sectors are not making enough progress. In fact, our data suggest that only 14% of the companies covered by this report are aligned with 2°C or Below 2°C benchmarks in 2050.
- Achieving these goals is not just about energy efficiency, although that is important. It requires us to think about reducing demand for products such as cement and steel (e.g. through designing and constructing longer-life buildings), increasing material recovery, reuse and recycling, and encouraging behaviour change among customers and end users (consumers).
- We and other investors will – individually and through initiatives such as CA100+ – continue to engage with these companies, encouraging them to improve their Management Quality and Carbon Performance. We will also press them to improve their disclosures.
- But we recognise that these measures are not enough. Transformation on the scale required means working with other actors – policymakers, industry bodies, companies in other sectors – to define how these sectors might transition and transform themselves into the low-carbon companies of the future, and to then work together to ensure that the incentives and solutions (e.g. finance, supportive regulation, technology) are available and can be deployed to enable this transition. We have started this process. In 2020, we – in partnership with IIGCC and other investor networks as part of Climate Action 100+ convened our first working groups to develop our understanding of this approach. We will be accelerating this work in 2021 under the umbrella of CA100+.

Faith Ward & Adam Matthews, Co-Chairs of TPI

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# Key messages

- This is TPI's latest assessment of the industrials/materials sector, comprising 169 companies in aluminium, cement, chemicals, diversified mining, paper, steel, and other industrials. We assess diversified mining companies' Carbon Performance for the first time.
- The **average Management Quality score of industrials/materials companies is 2.6**, fractionally up on 2.5 last year. The modest increase can be attributed to, firstly, improvements among existing TPI companies and, secondly, expanding the scope of this report to take in two high-performing sectors – diversified mining and other industrials. Note that TPI's other industrials sector comprises large companies covered by the CA100+ initiative, thus it is unlikely to be representative of the wider sector.
- **On Carbon Performance, only 14% of companies are aligned with the 2°C or Below 2°C benchmarks in 2050**. Over one third of companies are aligned with the Paris Pledges benchmark, but alignment with the 2015 Paris Pledges is not enough to limit global warming to 2°C or below. In future, benchmarking against the Paris Pledges will require companies to do more, with many countries set to strengthen their pledges this year. Compared with the energy and transport sectors, there are two distinctive features of the industrials and materials cluster: a low share of companies aligned with the benchmarks, and a lack of suitable disclosure.
- The **decarbonisation of industrial sectors, in particular steel, requires cooperation across sectors and up and down value chains** on circular economy measures such as material efficiency and industrial symbiosis.

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Appendix 5. Paper

Photo: Patrick Hendry

# 1. The state of transition in industrials/materials: overview of results

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# TPI coverage of the industrials and materials sector

This report covers 169 of the largest publicly traded companies in the industrials and materials sector, comprising: aluminium, cement, chemicals, diversified mining, paper, steel, and other industrials.

We have added 42 new companies in the aluminium, cement, chemicals, paper and steel sectors. We report on diversified mining and other industrials for the first time as part of this report.

We assess 111 out of 169 companies on Carbon Performance. Disclosure and methodological barriers continue to prevent us from assessing the Carbon Performance of chemicals and other industrials, while our Carbon Performance methodologies in aluminium and steel do not apply to some companies, due to their position in the value chain.

In this year's report, we have a special focus on the steel sector (section 2). Detailed analysis of the other sectors can be found in the appendices.

| Sector | Companies assessed on Management Quality | Companies assessed on Carbon Performance |
|---|---|---|
| Aluminium | 19 | 13 |
| Cement | 33 | 33 |
| Chemicals | 36 | 0 |
| Diversified mining | 13 | 13 |
| Paper | 23 | 23 |
| Steel | 32 | 29 |
| Other industrials | 18 | 0 |
| **Total** | **169*** | **111** |

* Five companies have businesses in two sectors (e.g. mining and aluminium) and are hence assessed twice.

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# Management Quality level

Companies' Management Quality ratings may not always reflect their most up-to-date disclosures. TPI updates its assessments once a year.

FTSE Russell

## Level 0
**Unaware**

**7** companies: **4%**

- **2** Aluminium
- **2** Cement
- **2** Paper
- **2** Steel

## Level 1
**Awareness**

**32** companies: **19%**

- **4** Aluminium
- **12** Cement
- **2** Chemicals
- **6** Paper
- **8** Steel

## Level 2
**Building capacity**

**26** companies: **15%**

- **2** Aluminium
- **4** Cement
- **4** Chemicals
- **4** Diversified mining
- **3** Paper
- **8** Steel
- **1** Other industrials

## Level 3
**Integrating into operational decision making**

**61** companies: **36%**

- **9** Aluminium
- **10** Cement
- **22** Chemicals
- **4** Diversified mining
- **3** Paper
- **8** Steel
- **8** Other industrials

## Level 4
**Strategic assessment**

**43** companies: **26%**

- **2** Aluminium
- **5** Cement
- **8** Chemicals (including one 4*)
- **5** Diversified mining (including three 4*)
- **9** Paper (including one 4*)
- **6** Steel
- **9** Other industrials (including one 4*)

Note: five companies appear in two sectors

# Management Quality level

The average Management Quality score of industrials and materials companies is 2.6 out of a maximum of 4, up from 2.5 last year. The modest increase can be attributed to, firstly, improvements among existing TPI companies and, secondly, expanding the scope of this report to take in two high-performing sectors.

Within industrials and materials, two types of sectors can be identified:

- Weak performers: cement at 2.1, aluminium at 2.3, steel at 2.3, and paper at 2.5;
- Strong performers: both chemicals and diversified mining at 3.0, and other industrials at 3.4. Note that other industrials comprises large companies covered by the CA100+ initiative, therefore this sample is unlikely to be representative of the universe of companies in this large, diverse sector.

Six companies have reached TPI's highest level, 4*: Air Liquide in chemicals; BHP, Vale and Anglo American in diversified mining; Klabin in paper; and Koninklijke Philips in other industrials.

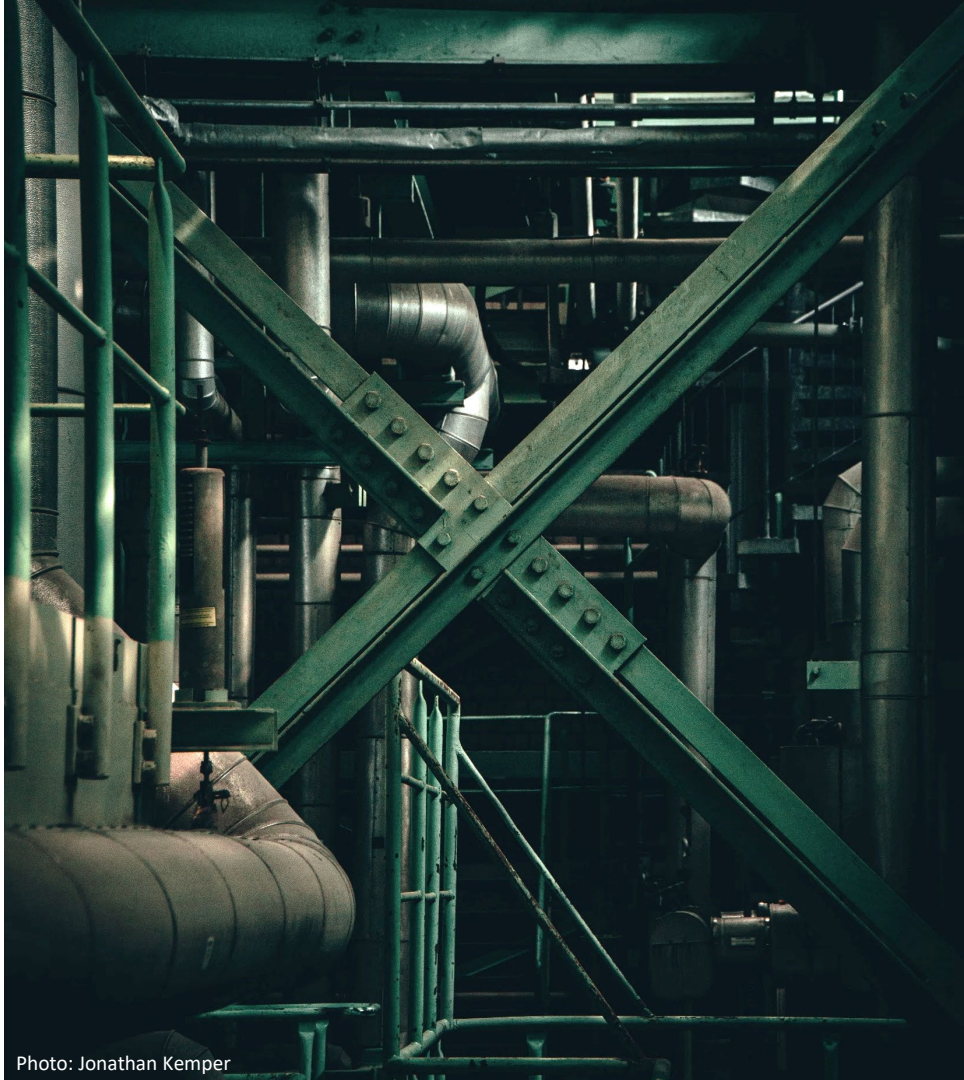


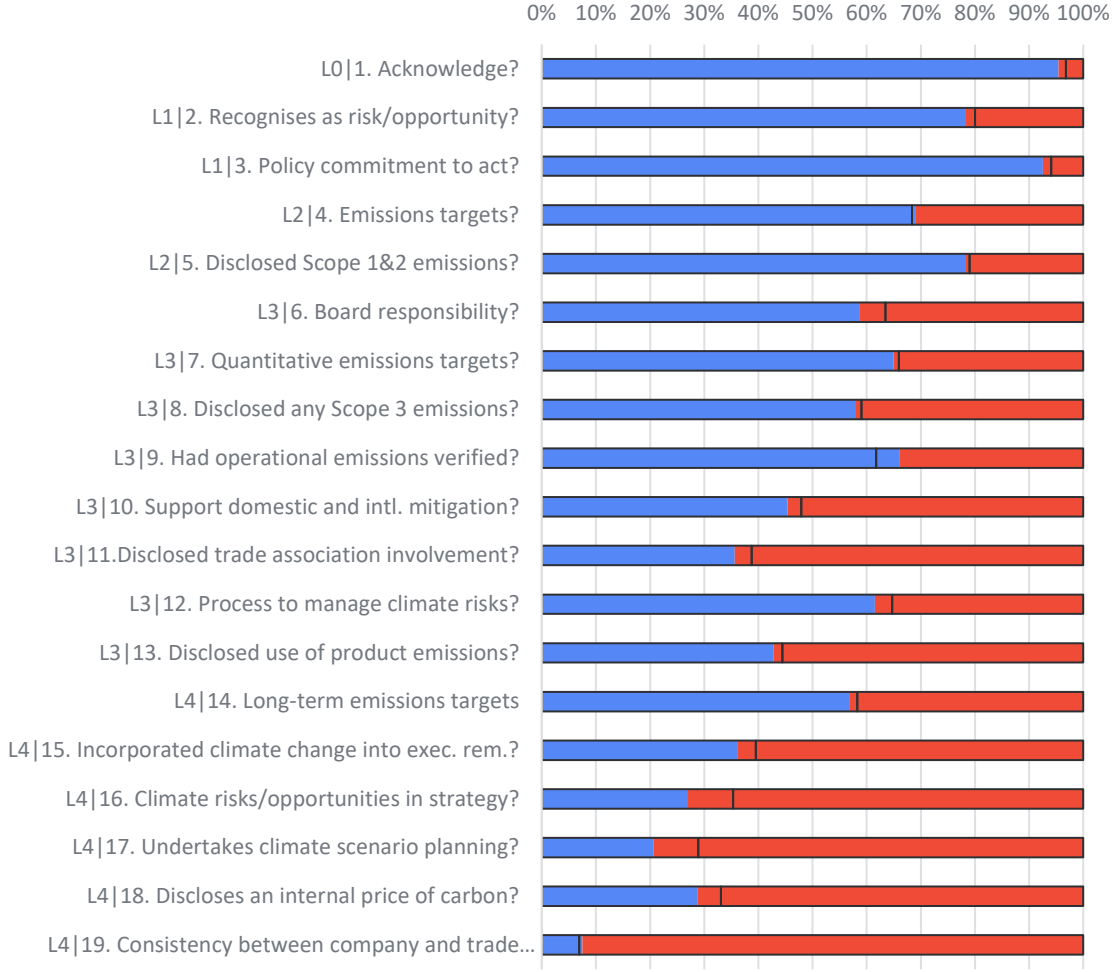
Photo: Jonathan Kemper

# Management Quality: indicator by indicator

The industrials and materials sector performs marginally worse than the TPI average on nearly all Management Quality indicators.

This sector performs particularly poorly on assigning board responsibility for climate change (Q6), incorporating climate risks and opportunities into corporate strategy (Q16), and undertaking climate scenario planning (Q17).

The sector out-performs the TPI average on just one indicator, verification of operational emissions (Q9), due to the large share of companies satisfying this indicator in chemicals, diversified mining and other industrials.



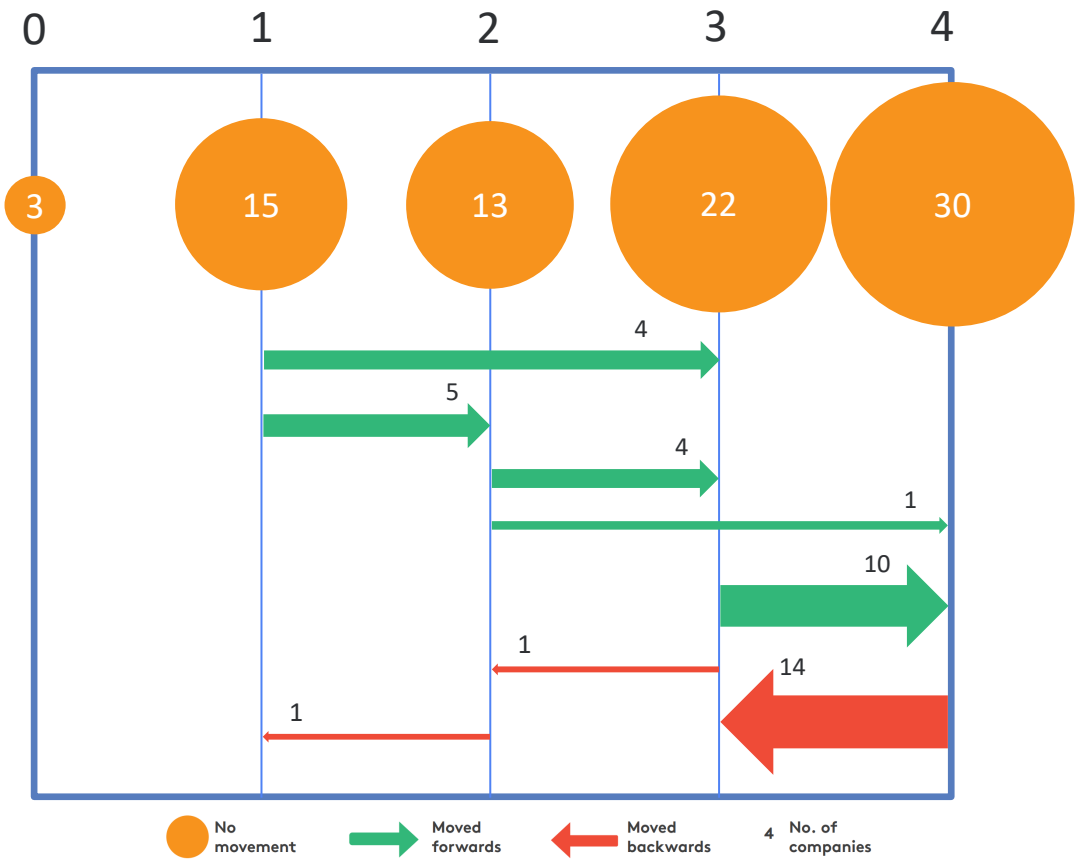

Key: blue = yes, red = no, black tick mark = TPI universe average

# Trends in Management Quality

We have trend data on 123 companies, which have now been assessed by TPI at least twice. For some companies, we have four years of Management Quality data, which can be downloaded from our online tool. 46 companies are assessed for the first time and therefore do not appear in this trend analysis.

83 companies (67%) stay on the same level. 24 companies (20%) have moved up at least one level, of which 11 have reached Level 4. Among those companies moving up, many satisfy our indicator on board responsibility for climate change (Q6) for the first time.

16 companies (13%) have moved down at least one level, of which 14 move from Level 4 to 3. The biggest explanatory factor is a failure to continue disclosing involvement in trade associations that are active in climate lobbying (Q11).

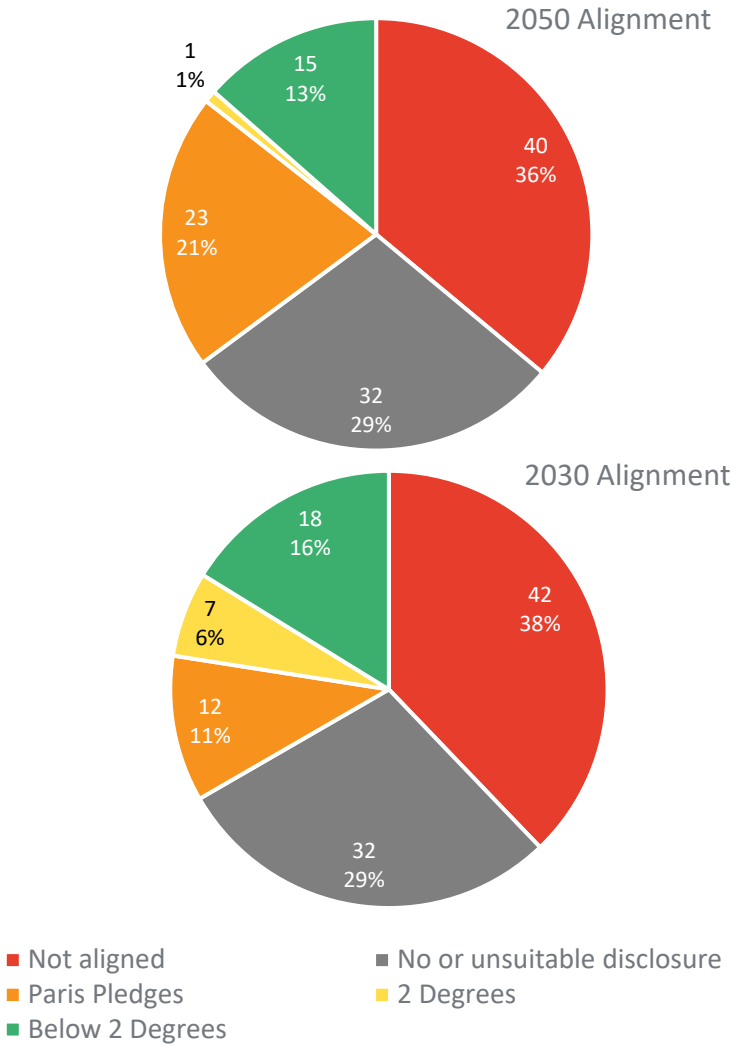


# Carbon Performance: alignment with the Paris Agreement benchmarks

The combined Carbon Performance of aluminium, cement, diversified mining, paper and steel is presented here. Only 22% of companies are aligned with the 2°C or Below 2°C benchmark scenarios in 2030. This is just a three percentage point improvement on last year.

Taking a longer-term perspective, only 14% of companies are aligned with the 2°C or Below 2°C benchmarks in 2050. The 2050 benchmarks are tighter: companies' carbon intensities must be lower, as global emissions are projected to fall drastically between 2030 and 2050 in the more ambitious scenarios that limit warming to 2°C or below. This is why fewer companies are aligned with the 2°C and Below 2°C benchmarks in 2050 than in 2030.

Compared with the energy and transport sectors, there are two distinctive features of the industrials and materials cluster: a low share of companies aligned with the benchmarks, and a lack of suitable disclosure.



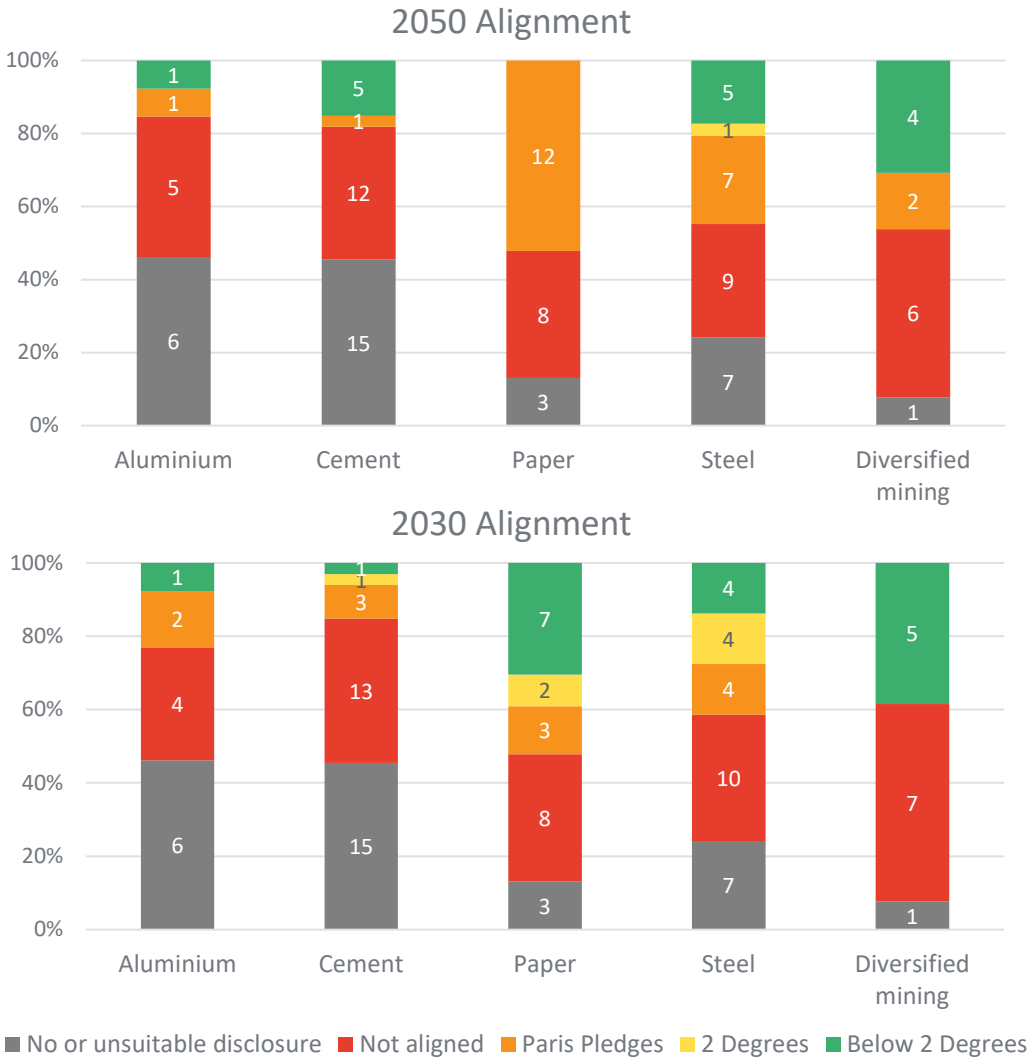
# Carbon Performance: sector breakdown

Here we disaggregate the industrials and materials cluster's Carbon Performance data into their component sectors.

On the basis of alignment with the 2015 Paris Pledges benchmark scenario, paper and steel perform best, aluminium and cement perform worst.

On the basis of alignment with the more ambitious 2°C and Below 2°C benchmarks, paper performs well only on a 2030 horizon, while diversified mining performs relatively better both in 2030 and 2050.

Companies should aim to align with the Paris goals as soon as possible and stay aligned, otherwise the 2°C or Below 2°C carbon budgets, which are absolute, risk being exceeded. It is insufficient to postpone alignment to 2050.



# Ratcheting up the Paris Pledges

When the Paris Agreement was signed in 2015, the Nationally Determined Contributions (NDCs) or 'pledges' to the Agreement were insufficient to deliver on the overall goal of holding warming to well below 2°C and pursuing efforts to limit it to 1.5°C. TPI's Paris Pledges benchmark is based on these NDCs and consequently lies well above the TPI 2°C and Below 2°C benchmarks.

However, the Paris process requires countries to increase the ambition of their pledges in pursuit of the Agreement's temperature goals and several governments have recently announced net zero goals, including the EU, UK and China. Estimates suggest that if these recent announcements are delivered upon, the gap to the Paris 2°C ceiling will be all but closed.[1]

Assuming these recent announcements are translated into NDCs in the run up to COP26 later this year, TPI's Paris Pledges scenario is likely to tighten in due course, so companies that just align with the existing Paris Pledges benchmark are at risk.

1 Climate Action Tracker (2020). 'Paris Agreement Turning Point'.

Photo: Annie Spratt

# Background: how a circular economy can contribute to the Paris goals

Circular economy is 'based on the principles of designing out waste and pollution, keeping products and materials in use, and regenerating natural systems'.[1] It has great potential to reduce $CO_2$ emissions in industrials and materials companies through strategies that involve intermediate manufacturers or end users, and by strengthening partnerships between sectors.

**Demand reduction:** longer building lifespans can reduce demand for cement and steel. According to the Energy Transitions Commission, China could reduce its total cement demand by 50% by 2050 through improved building design and material control.[2] Moreover, high-carbon construction materials could be replaced by low-carbon materials, such as cross-laminated timber, which have better opportunities for reuse and energy recovery.[3] Pioneering projects are emerging, for example the W350 project in Tokyo to build a skyscraper from 90% wooden material by 2041.

**Industrial management:** material efficiency can be improved by cutting losses in the manufacturing processes of corporate customers and increased pre-consumer recycling. There is also potential for industrial symbiosis, such as substituting clinker with steel blast-furnace slag and coal ash in cement production. It is estimated that these can replace 15-25% of clinker in Europe.[4]

**Post-consumer recycling:** increased recycling is an important decarbonisation tool. In the metals industry, steel and aluminium recycling reduces $CO_2$ emissions significantly. Remelting secondary aluminium requires only 5% of the energy used to produce primary aluminium.[5] Similarly, behaviour change among end users is needed to improve the end-of-life treatment of sold paper and plastic.

1 Ellen MacArthur Foundation (2021). 'What is the circular economy'.
2 Energy Transitions Commission (2018). 'China 2050: a fully developed rich zero-carbon economy'.
3 See Ramage et al. (2017), 'The wood from the trees: The use of timber in construction' for a summary of 're-use' and 'burn' options for wood products.
4 Material Economics (2018). 'The circular economy. A powerful force for climate mitigation'.
5 International Aluminium Institute (2020). 'Aluminium recycling'.

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# 2. Special sector focus: steel

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# Management Quality level

Companies' Management Quality ratings may not always reflect their most up-to-date disclosures. TPI updates its assessments once a year.

FTSE Russell

## Level 0
**Unaware**

2 company: 6%

- Magnitogorsk Iron & Steel Works
- Reliance Steel & Aluminium

## Level 1
**Awareness**

8 companies: 25%

- Daido Steel Co
- Erdemir
- Hitachi Metals
- Jindal Steel & Power
- Novolipetsk Steel
- Nucor
- Tenaris
- Yamato Kogyo

## Level 2
**Building capacity**

8 companies: 25%

- Carpenter Tech
- Commercial Metals
- Gerdau
- JFE Holdings
- Kobe Steel
- Severstal
- Steel Dynamics
- United States Steel

## Level 3
**Integrating into operational decision making**

8 Companies: 25%

- Bluescope Steel
- China Steel
- Evraz
- Hyundai Steel
- Nippon Steel
- Posco
- Sims Metal Management
- ThyssenKrupp

## Level 4
**Strategic assessment**

6 Companies: 19%

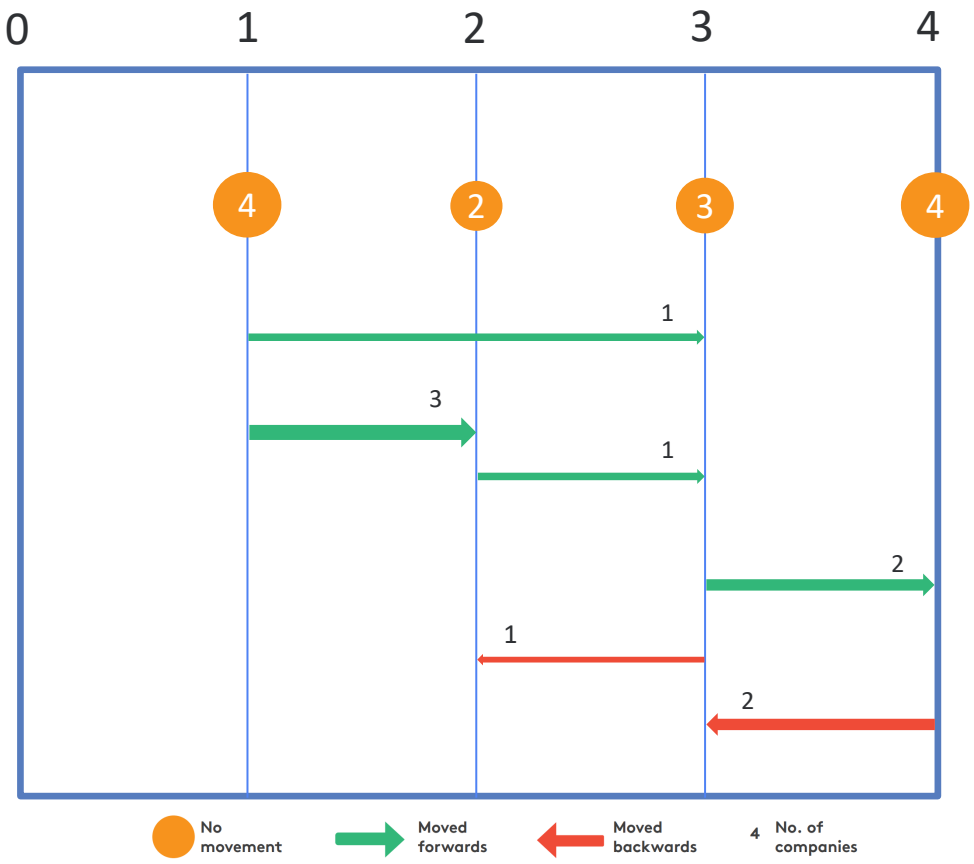
- Acerinox
- Arcelor Mittal
- JSW Steel
- SSAB
- Tata Steel
- Voestalpine

# Trends in Management Quality

The average Management Quality score of steel makers is 2.3, slightly lower than last year's average of 2.4.

This is due to the addition of nine new steel makers, almost all of which are at Level 0 or 1. As the diagram to the right shows, of the 23 steel companies that we also assessed last year, more have moved up (seven) than have moved down (three).

The four companies moving up from Level 1 have done so by explicitly recognising the business risks and opportunities of climate change in their disclosure (Q2). Evraz has also set an emissions target for the first time, allowing it to leap from Level 1 to 3. The two companies moving up from Level 3 to 4, Acerinox and Tata Steel, have done so by disclosing their membership of trade associations engaged in climate lobbying (Q11).

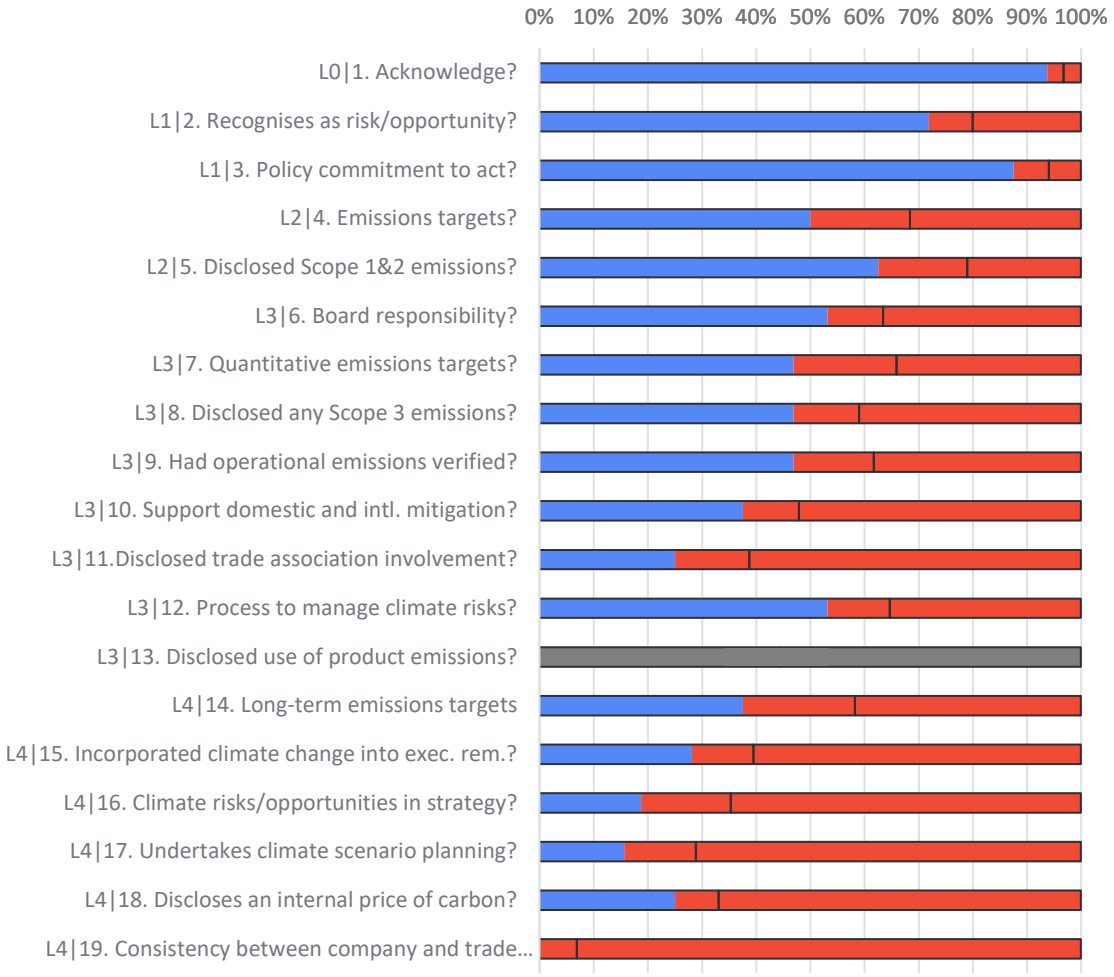


# Management Quality: indicator by indicator

Dragged down by the inclusion of nine new companies, the steel sector performs significantly worse than the TPI average on every single Management Quality indicator.

Among the indicators on which the sector underperforms most are disclosure of Scope 1 & 2 emissions (Q5) and setting emissions targets (Q7 and Q14), two fundamental elements of corporate climate action.

No steel company yet discloses how it ensures consistency between its position on climate change and that of the trade associations of which it is a member (Q19).



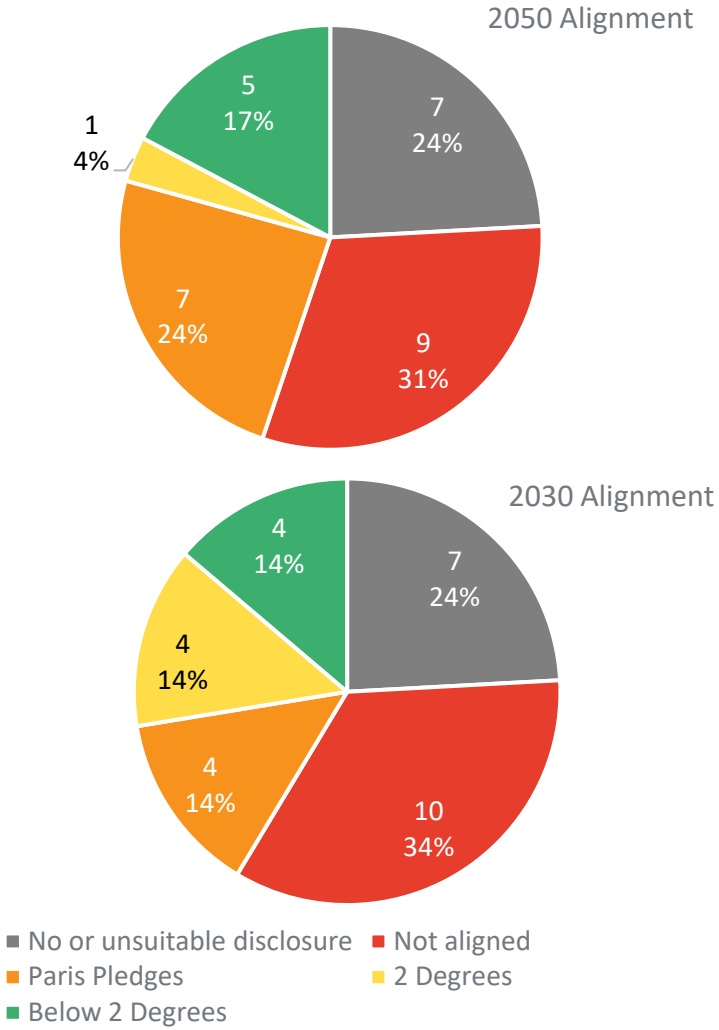

Key: blue = yes, red = no, black tick mark = TPI universe average

# Carbon Performance: alignment with the Paris Agreement benchmarks

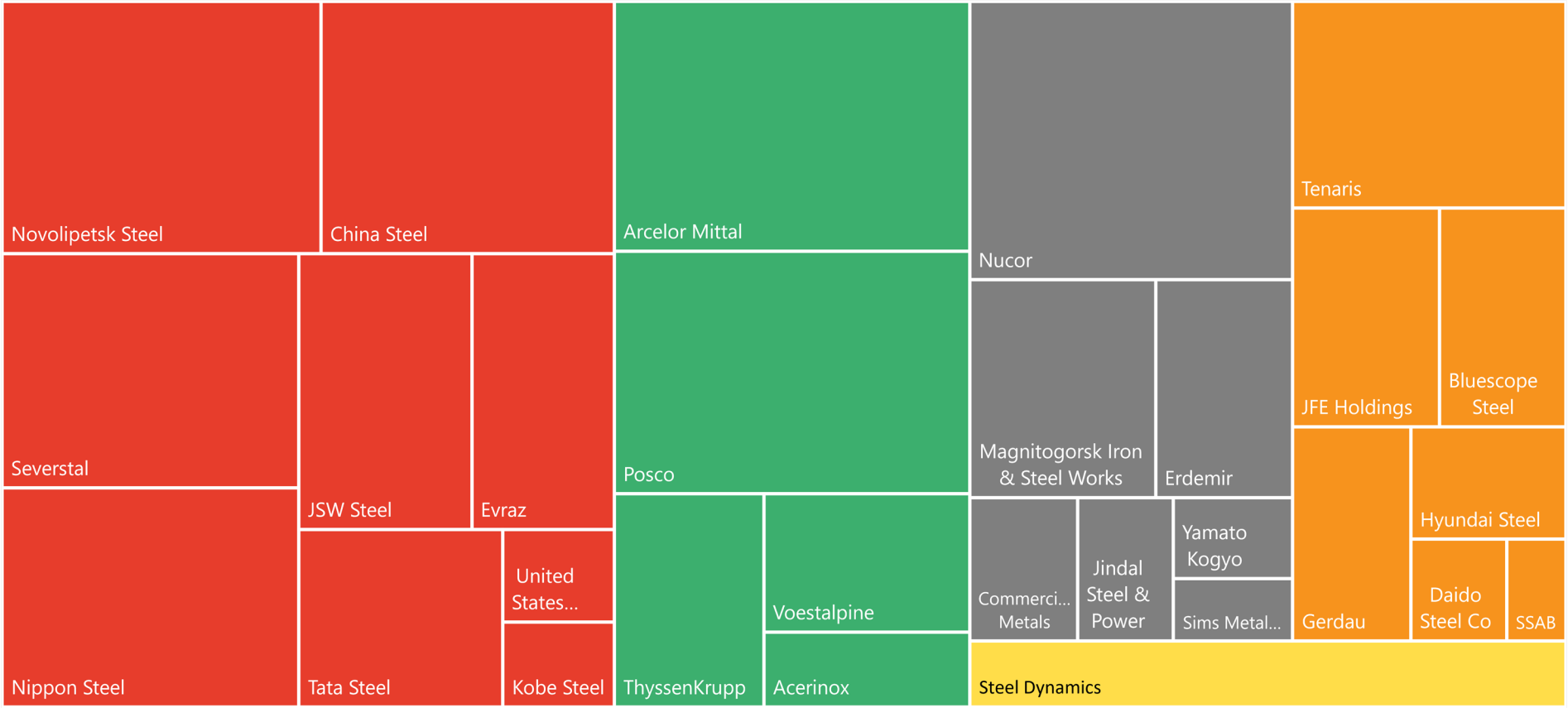
The number of steel makers aligned with the 2°C benchmark in 2030 has increased from five (21%) last year to eight (28%) this year. However, as was the case last year, more than half of the steel companies we assess are either not aligned with any TPI benchmark, or they fail to disclose suitable emissions data.

Acerinox, Arcelor Mittal, Posco, ThyssenKrupp, and Voestalpine are aligned with our Below 2°C benchmark in 2050. Except for Voestalpine, all the above companies have aligned by setting net zero targets. Arcelor Mittal is the world's largest steel producer, accounting for 5.2% of global steel production, so their alignment is particularly important. Steel Dynamics has an emissions intensity pathway that aligns with our 2°C benchmark in 2050.

Several companies, including Gerdau, Hyundai Steel, SSAB, and Tenaris, align at least with the 2°C benchmark in 2030, while failing to do so in 2050. These companies must increase the strength and duration of their targets.



# Alignment of steel makers in 2050, scaled by market cap.



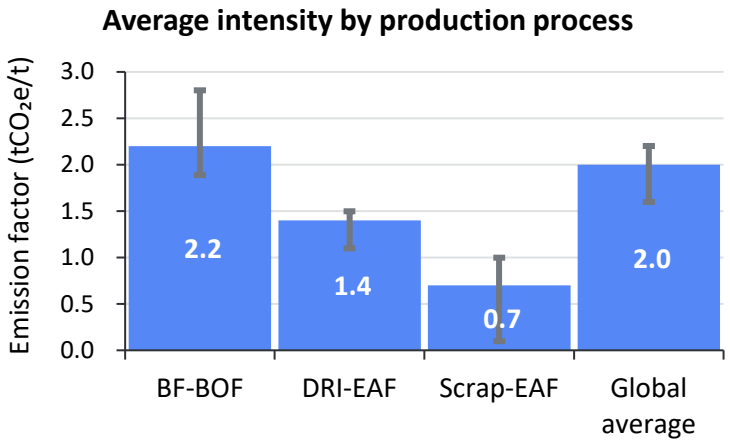

Below 2 Degrees | 2 Degrees | Paris Pledges | Not aligned | No or unsuitable disclosure

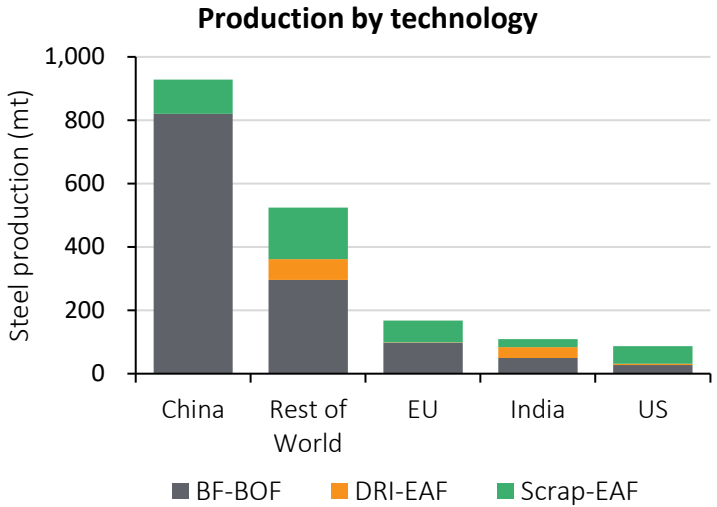
# Decarbonising steel: the fundamentals

Steel production emitted 3.7 $GtCO_2e$ in 2019, representing 10% of total global energy emissions. 1.9 billion tonnes of steel were made in 2019, with production growing at a rate of 2% per year between 2014 and 2019. Over half of steel production and consumption is in China, making its mitigation efforts in steel central to the sector's global decarbonisation. Most Chinese steel producers are not publicly traded and therefore not assessed by TPI.

There are three main ways to make steel:

1. **BF-BOF** (72% of global production): heating of mined iron ore in a blast furnace (BF) or basic oxygen furnace (BOF) using metallurgical coal to melt the iron and reduce its oxygen content to make primary steel.
2. **DRI-EAF** (6%): expose iron ore to hydrogen and other gases usually derived from coal or natural gas to lower its oxygen content and make direct reduced iron (DRI) that can be heated using an electric arc furnace (EAF) to make primary steel.
3. **Scrap-EAF** (23%): heating of recycled scrap steel, which can be done directly in an EAF, to melt it and make secondary steel.

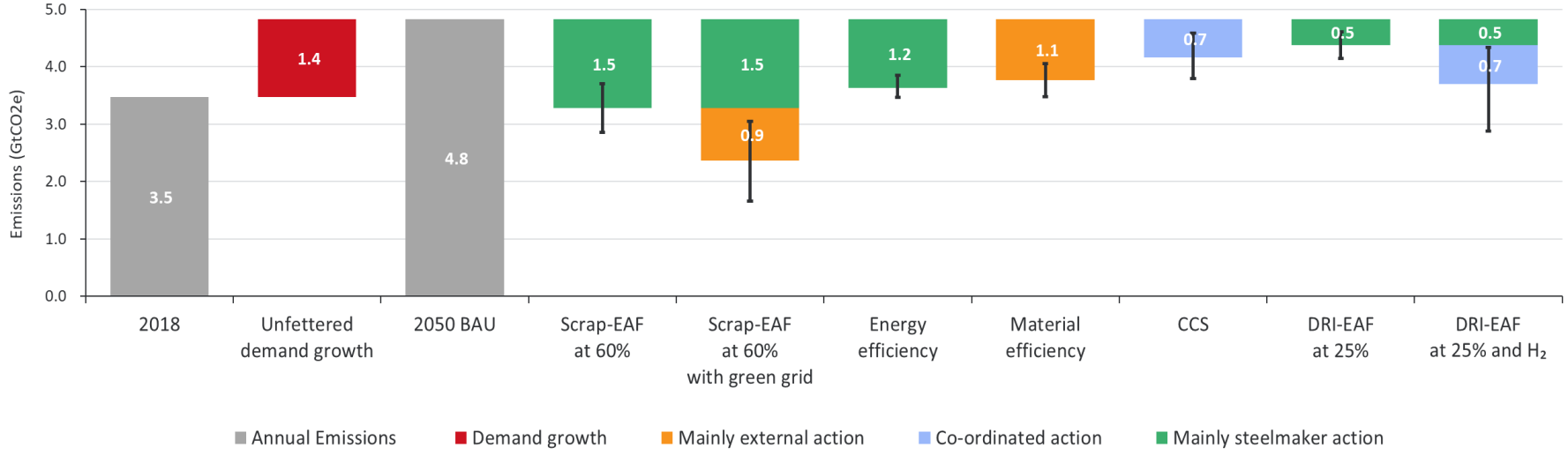


# Decarbonising steel: options

Our analysis highlights five key measures to reach net zero emissions in steel, tested against a 2050 business-as-usual (BAU) scenario. Their respective mitigation potentials are shown non-cumulatively in the diagram below.

1. Increase the proportion of steel produced from scrap-EAF, with even greater potential if paired with a green grid;
2. Further improve energy efficiency;
3. Enhance material efficiency to reduce demand;
4. Invest in carbon capture and storage (CCS);
5. Increase (low emission) DRI-EAF capacity, with even greater potential if paired with green hydrogen.



# Decarbonising steel: challenges

Of the measures presented above, greening the grid, material efficiency, CCS and green hydrogen depend on actors outside the current steel supply chain. Cooperation within and between sectors is therefore key to decarbonising steel.

Significant investments in hydrogen-based DRI and CCS are needed to lower emissions from primary steel production. The IEA estimates that the low-carbon steel production routes involving these technologies would cost 10-50% more than their commercially available counterparts.[1] The steel sector operates with tight margins, discouraging investments that raise production costs. A premium market for low-carbon steel could play a part in enabling these critical investments.

Other important issues to address include:

- Long asset lives (blast furnaces are typically depreciated over 30 years, but sometimes have significantly longer useful lives);
- The availability of scrap steel, which depends on past output and current demand;
- The feasibility of detailed coordination across the supply chain at scale;
- The readiness of green hydrogen technology.

1 IEA (2020). 'Iron and steel technology roadmap'.

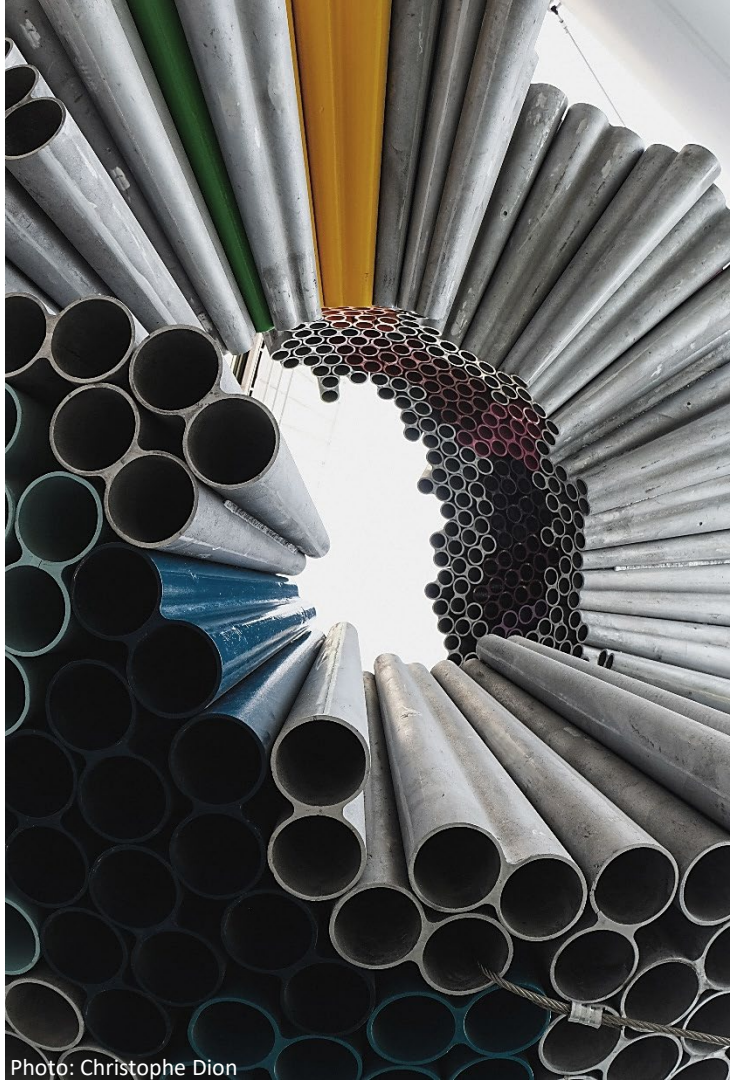


Photo: Christophe Dion

# 3. About TPI: further information about the initiative and methodology

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# TPI strategic relationships

The Grantham Research Institute on Climate Change and the Environment, a research centre at the London School of Economics and Political Science (LSE), is TPI's *academic partner*. It has developed the assessment framework, provides company assessments, and hosts the online tool.

FTSE Russell is TPI's *data partner*. FTSE Russell is a leading global provider of benchmarking, analytics solutions and indices.

The Principles for Responsible Investment (PRI) manages and provides supporter coordination to TPI. PRI is an international network of investors implementing the six Principles for Responsible Investment.

# TPI Governance

**TPI Co-Chairs:**

THE CHURCH OF ENGLAND PENSIONS BOARD

Environment Agency Pension Fund

**TPI Steering Committee:**

AP4 FJÄRDE AP-FONDEN

AP7

BRUNEL Pension Partnership

The Church Commissioners for England

HESTA

An Industry SuperFund

CCLA for the Church of England

LGPS Central Limited

NZSUPERFUND Te Kaitiaki Tahua Penihana Kaumātua o Aotearoa

LPP Local Pensions Partnership

NORGES BANK INVESTMENT MANAGEMENT

USS

Wespath BENEFITS | INVESTMENTS

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# Our Supporters

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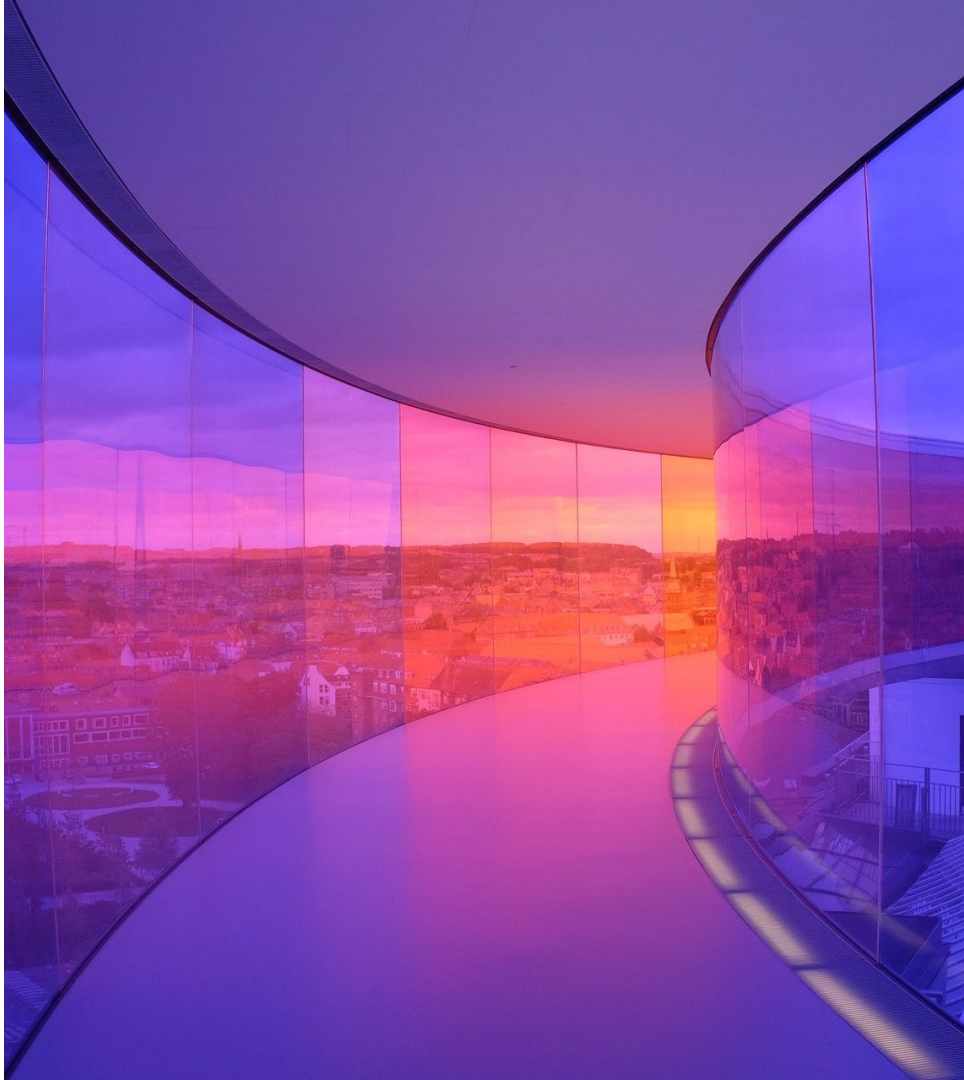
# TPI design principles

***Disclosure-based***: Company assessments are based only on publicly available information

***Accessible and easy to use****:* Outputs are designed to be useful to Asset Owners and Asset Managers, especially with limited resources to assess climate change

***Not seeking to add unnecessarily to the reporting burden****:* Aligned with existing initiatives and disclosure frameworks, such as CDP and TCFD

***Corporate level****:* Pitched at a high level of aggregation



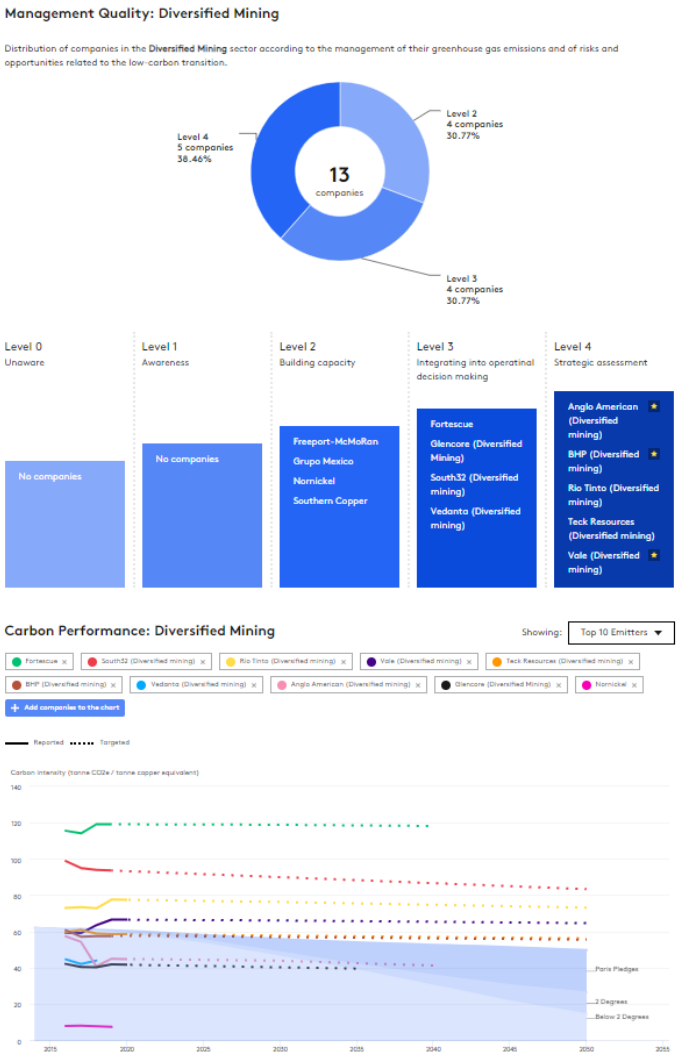
# Overview of the TPI Tool

TPI's company assessments are divided into 2 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* assessment involves quantitative benchmarking of companies' emissions pathways against the international targets and national pledges made as part of the 2015 UN Paris Agreement, for example limiting global warming to below 2°C.

Both of these assessments are based on company disclosures.



# Management Quality

FTSE Russell

TPI's Management Quality framework is based on 19 indicators, each of which tests whether a company has implemented a particular carbon management practice. These 19 indicators are used to map companies on to 5 levels/steps. The data are provided by FTSE Russell. See our latest *Methodology and Indicators Report, version 3.0*, for more detail.

| Level 0 | Level 1 | Level 2 | Level 3 | Level 4 |
|---|---|---|---|---|
| Unaware | Awareness | Building capacity | Integrating into operational decision making | Strategic assessment |
| | | | | Company has set long-term quantitative targets (>5 years) for reducing its GHG emissions |
| | | | Company has nominated a board member/committee with explicit responsibility for oversight of the climate change policy | Company has incorporated climate change performance into executive remuneration |
| | | | Company has set quantitative targets for reducing its GHG emissions | Company has incorporated climate change risks and opportunities in its strategy |
| | | Company has set GHG emission reduction targets | Company reports on its Scope 3 GHG emissions | Company undertakes climate scenario planning |
| | Company recognises climate change as a relevant risk/opportunity for the business | Company has published info. on its operational GHG emissions | Company has had its operational GHG emissions data verified | Company discloses an internal carbon price |
| Company does not recognise climate change as a significant issue for the business | Company has a policy (or equivalent) commitment to action on climate change | | Company supports domestic & international efforts to mitigate climate change | Company ensures consistency between its climate change policy and position of trade associations of which it is a member |
| | | | Company discloses membership and involvement in trade associations engaged on climate | |
| | | | Company has a process to manage climate-related risks | |
| | | | Company discloses Scope 3 GHG emissions from use of sold products (selected sectors only) | |

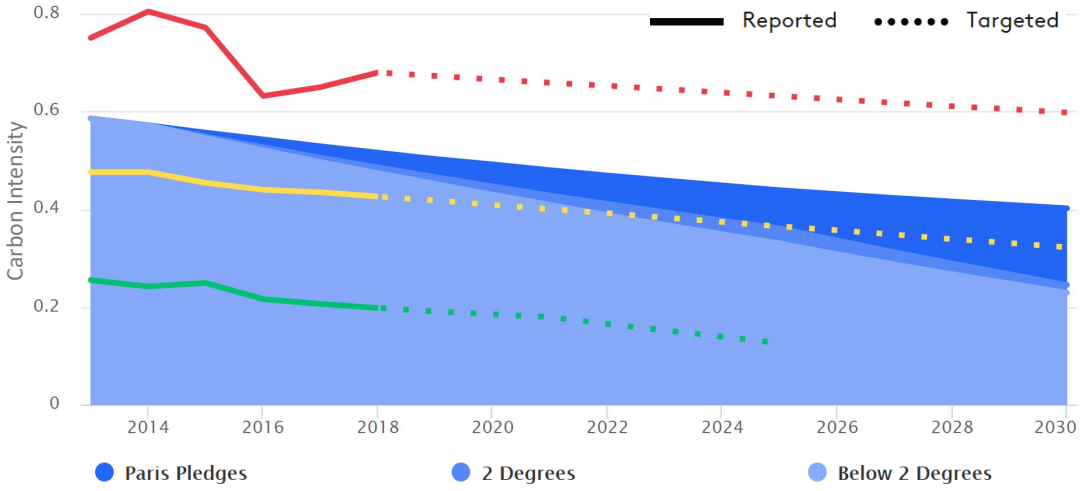
# Carbon Performance

TPI's Carbon Performance assessment tests the alignment of company targets with the UN Paris Agreement goals.*

We use 3 benchmark scenarios for each sector, which in the industrials/materials sector are:

1. *Paris Pledges*, consistent with emissions reductions pledged by countries as part of the 2015 Paris Agreement (i.e. NDCs; note these are insufficient to limit global warming to 2°C or below);
2. *2 Degrees,* consistent with the overall aim of the Paris Agreement, albeit at the low end of the range of ambition;
3. *Below 2 Degrees*, consistent with a more ambitious interpretation of the Paris Agreement's overall aim.

Benchmarking is sector-specific and based on emissions intensity (e.g. tonnes of $CO_2$ per tonne of steel). See TPI website for further details.




Company A is not aligned with any of the benchmarks

Company B is eventually aligned with the Paris Pledges, but neither 2C/ nor Below 2C

Company C is aligned with all Paris benchmarks, including Below 2C

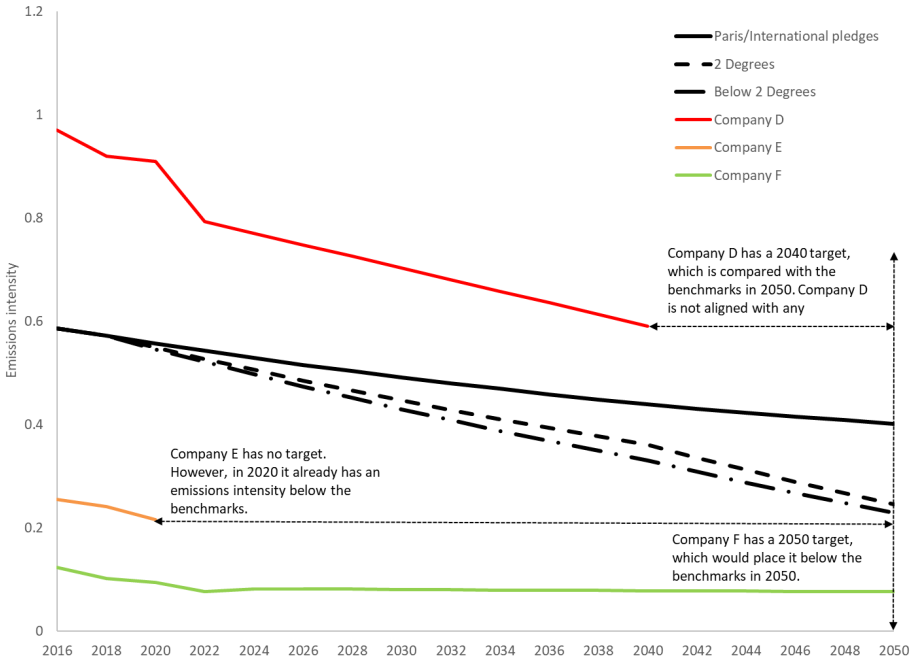
*We use the Sectoral Decarbonization approach (SDA), which was created by CDP, WWF & WRI in 2015 & is also used by the Science Based Targets Initiative.

# Reducing TPI's Carbon Performance data to a single indicator of alignment with the Paris Agreement

Our Carbon Performance data cover multiple years. How can they be used to answer the simple question: is a company aligned with the Paris goals?

To do this, we compare a company's emissions intensity in the last year for which we have data with the benchmarks at the end of the horizon. We look out as far as 2050, so for example:

- Company with a 2050 target – the company's projected 2050 emissions intensity is compared with the benchmark emissions intensities in 2050;
- Company with no target – the company's historical emissions intensity is compared with the benchmark emissions intensities in 2050 (i.e. a comparison of where the company is now with where it would need to be in 2050).




Transition Pathway Initiative

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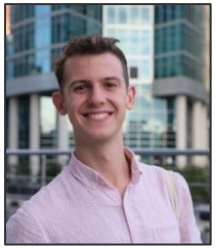

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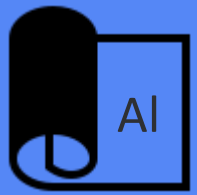
Transition
Pathway
Initiative

# Appendix 1. Aluminium




Transition Pathway Initiative

# Management Quality level

Companies' Management Quality ratings may not always reflect their most up-to-date disclosures. TPI updates its assessments once a year.

FTSE Russell

## Level 0
**Unaware**

2 companies: 11%

QAMCO
Reliance Steel & Aluminium

## Level 1
**Awareness**

4 companies: 21%

Chalco
China Hongqiao Group
China Zhongwang
Press Metal

## Level 2
**Building capacity**

2 companies: 11%

Mitsui & Co
UACJ

## Level 3
**Integrating into operational decision making**

9 Companies: 47%

Alcoa
Alumina
Glencore
Marubeni Corp
Nippon Light Metal
Norsk Hydro
Showa Denko
South32
Vedanta

## Level 4
**Strategic assessment**

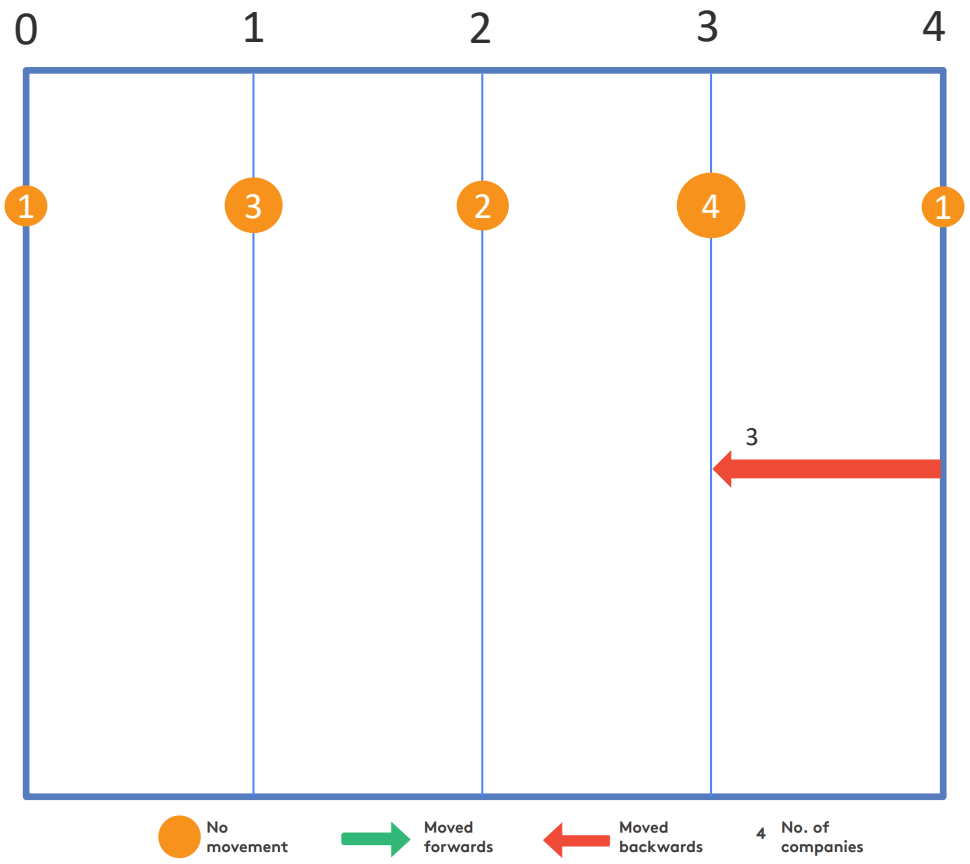
2 Companies: 11%

Rio Tinto
Sumitomo Chemical

# Trends in Management Quality

The average Management Quality score of aluminium producers has dropped for a third year in a row, from 2.8 in 2019, through 2.5 in 2020 to 2.3 this year.

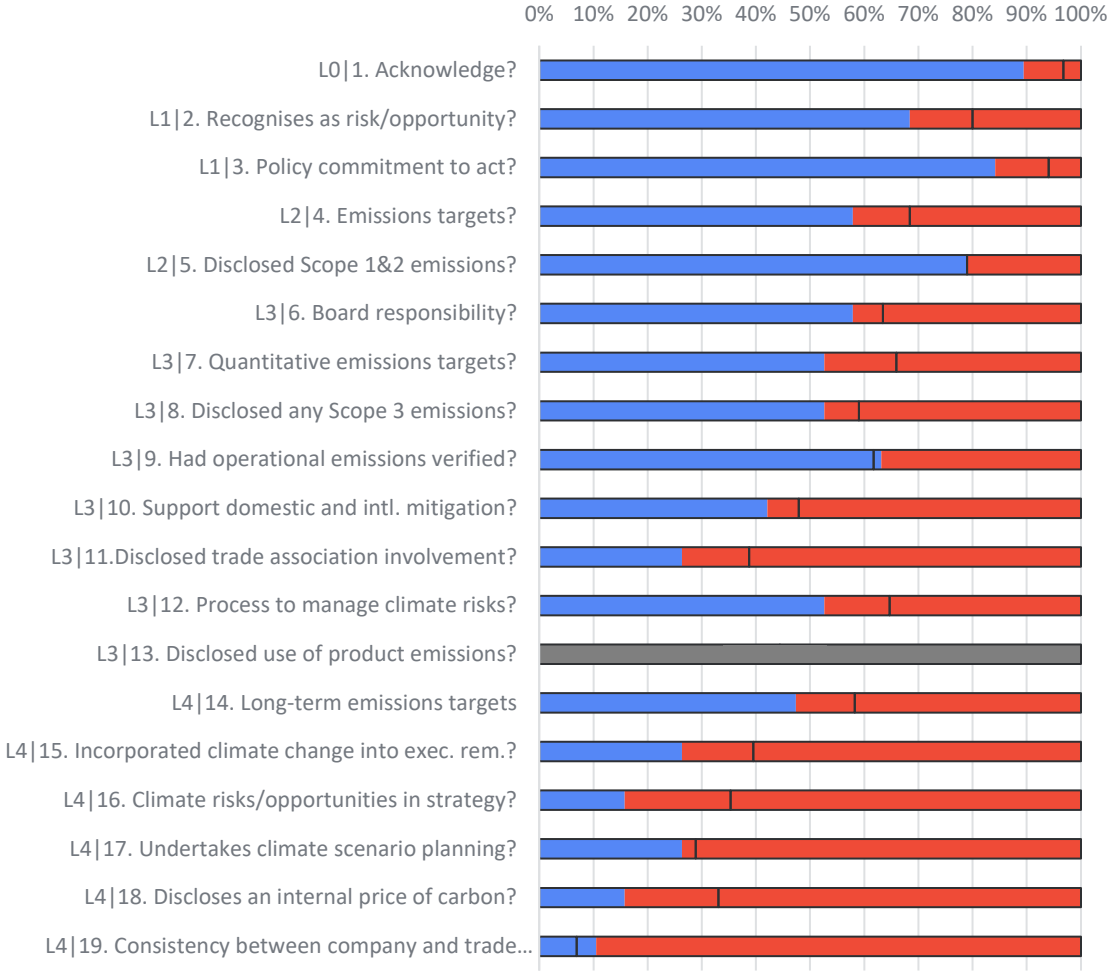
Whilst this largely reflects the addition of new, smaller companies that tend to perform worse, we also see some existing companies regressing. Of the 14 companies for which we have trend data, three have dropped from Level 4 last year to Level 3 this year. Two companies have regressed on Q16 (incorporating climate change risks and/or opportunities in company strategy). Other reasons for dropping a level vary across firms.



# Management Quality: indicator by indicator

Aluminum companies perform worse than the average TPI company on almost all indicators, except when it comes to disclosing Scope 1 and 2 emissions (Q5), verifying emissions data (Q9) and ensuring consistency between the company's own position on climate change issues and those taken by trade associations of which it is a member (Q19).

Aluminum companies are notably weak on incorporating climate change risks and/or opportunities in their strategy (Q16).



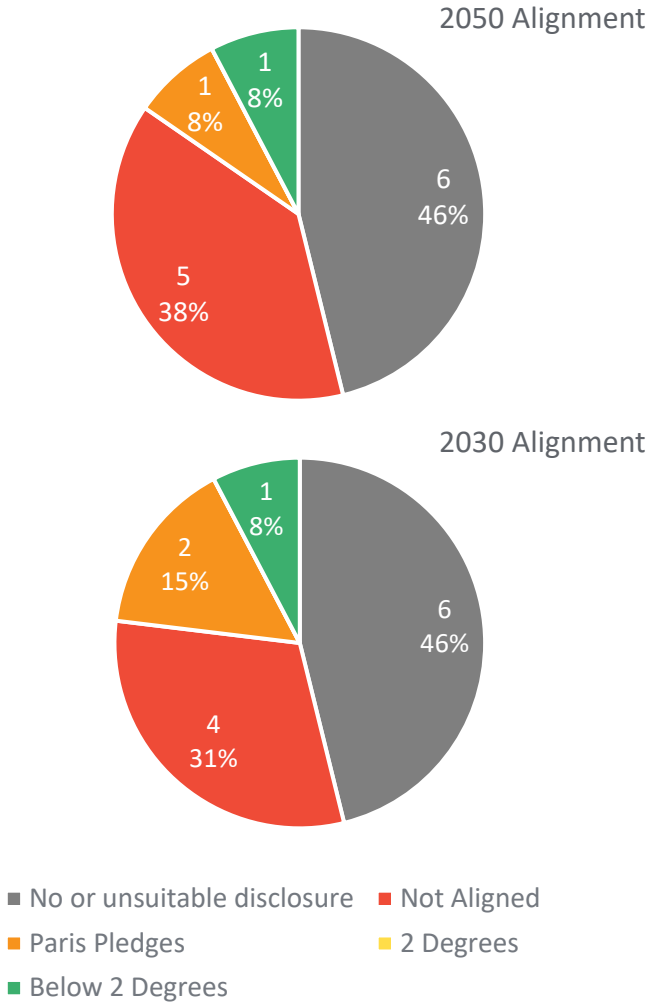

Key: blue = yes, red = no, black tick mark = TPI universe average

# Carbon Performance: alignment with the Paris Agreement benchmarks

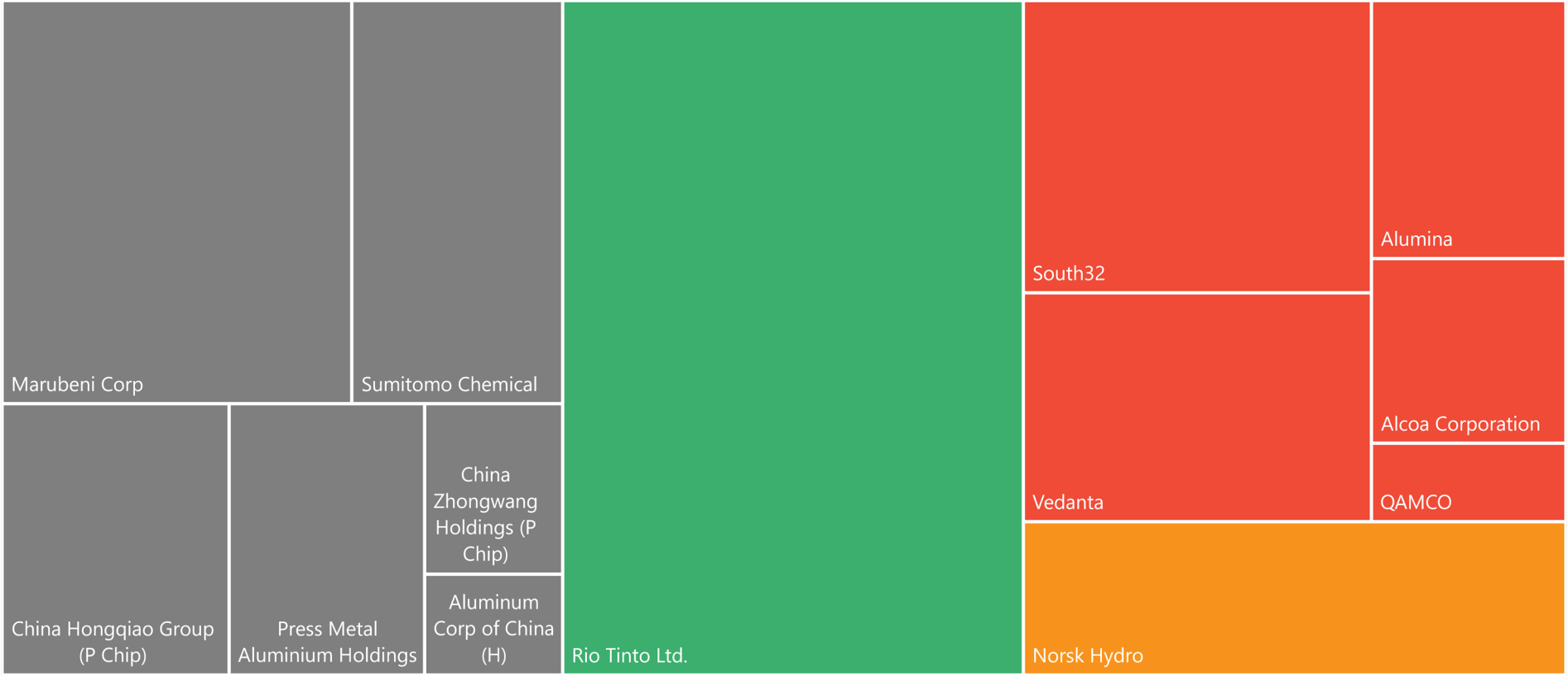
Of the 20 aluminium companies included in this report, 13 are assessed on Carbon Performance. We only include companies for which it is possible to estimate both their refining as well as smelting emissions intensity.

Thanks to its recent net zero target (Scope 1 and 2), Rio Tinto is now the only company aligned with our Below 2°C benchmark by 2050, whereas Norsk Hydro's 2030 target and low emissions today mean it is aligned with Below 2°C until 2037. No other company's target is aligned with 2°C or below, including industry giant Alcoa. Aluminium companies that have only set Scope 1 targets usually do not align with our benchmarks, because Scope 2 emissions are highly significant.

The share of companies with missing or unsuitable disclosure is higher in aluminium than in any other TPI sector except cement. This is mostly driven by smaller companies. Of the five aluminium companies TPI added this year, three provided insufficient information on their aluminium activities and/or related emissions. None of the three Chinese aluminium companies we assess provided sufficient information.



# Alignment of aluminium producers in 2050, scaled by market cap.




Below 2 Degrees | No or unsuitable disclosure | Not aligned | Paris Pledges

# Appendix 2. Cement

Transition Pathway Initiative

# Management Quality level

Companies' Management Quality ratings may not always reflect their most up-to-date disclosures. TPI updates its assessments once a year.

FTSE Russell

## Level 0
**Unaware**

2 company: 6%

Saudi Cement
Yanbu Cement

## Level 1
**Awareness**

12 companies: 36%

Anhui Conch Cement
BBMG
Buzzi Unicem
China National Building Materials
China Resources Cement Holdings
Dalmia Bharat
Eagle Materials
Indocement Tunggal Prakarsa
Qassim Cement
Semen Indonesia
Siam City Cement
SsangYong Cement Industrial

## Level 2
**Building capacity**

4 companies: 12%

ADBRI
Dangote Cement
Martin Marietta Materials
Sumitomo Osaka Cement

## Level 3
**Integrating into operational decision making**

10 Companies: 30%

ACC
Asia Cement
Boral
Fletcher Building
Grupo Argos
HeidelbergCement
Siam Cement
Taiheiyo Cement
Taiwan Cement
UltraTech Cement

## Level 4
**Strategic assessment**

5 Companies: 15%

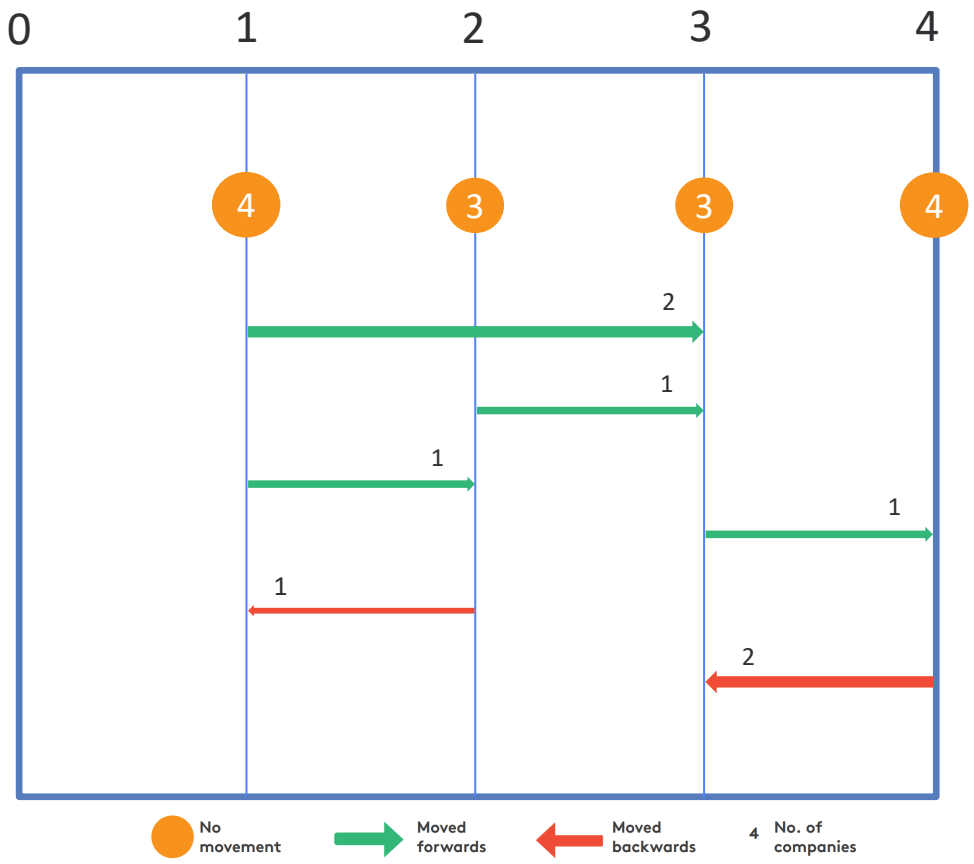
Ambuja Cements
Cemex
CRH
LafargeHolcim
Shree Cements

# Trends in Management Quality

The average Management Quality score of cement companies is 2.1, making cement the worst performing sector in the industrials and materials cluster. The score has dropped by 0.3 compared to last year, mostly due to the inclusion of nine new companies on Level 0 or 1.

Overall, five companies are now on Level 4, meaning that these companies are taking a strategic approach to climate change. As in the previous year, there is no 4* cement producer.

There has been limited movement among the 22 cement companies for which we have trend data. 14 have stayed on the same level. Five companies have moved up at least one level, of which Taiheiyo Cement and Taiwan Cement moved from Level 1 to level 3 by recognising climate change as a relevant risk and/or opportunity. Three companies have moved down one level.

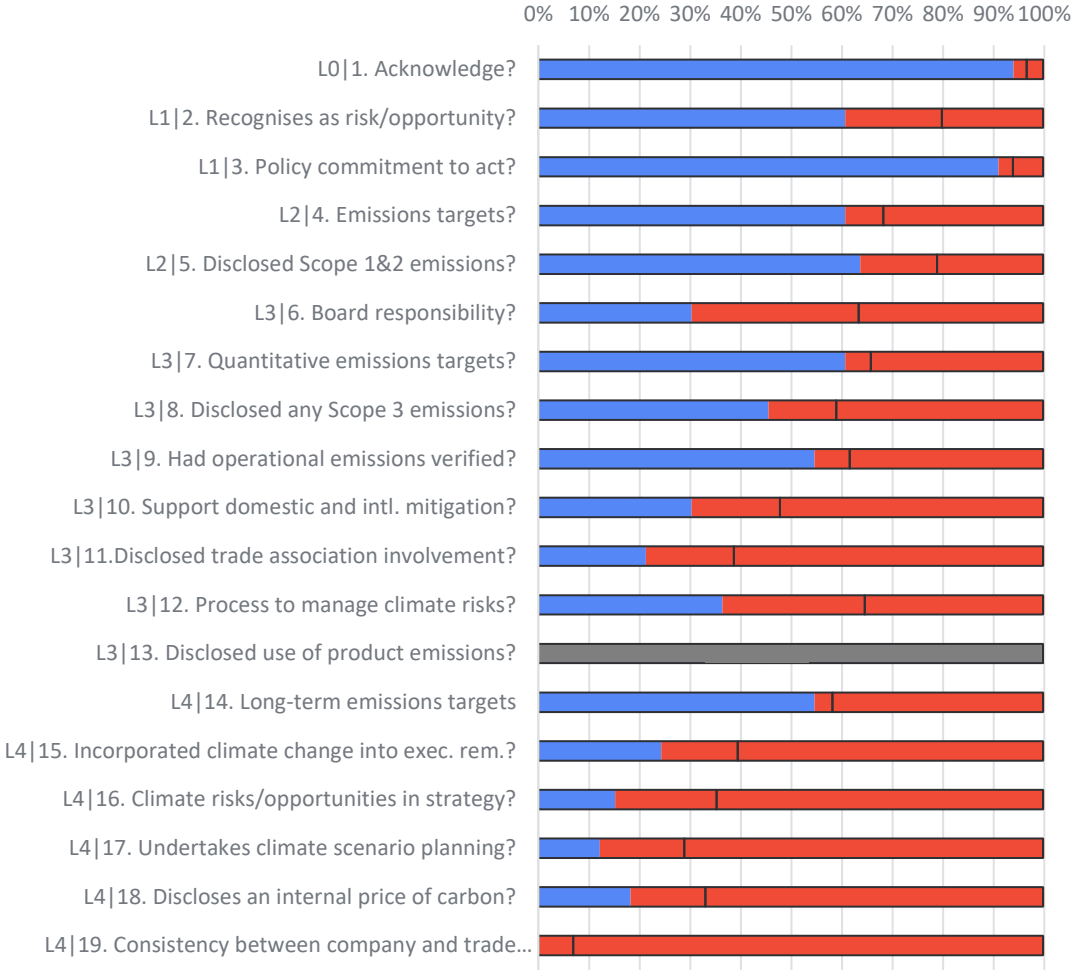


# Management Quality: indicator by indicator

While all the cement companies we assessed last year acknowledged climate change as a significant issue for their business (Q1) and had a policy commitment to act (Q3), only 94% and 95% satisfy these respective indicators this year. Again, it is the inclusion of new companies that is bringing down the sector averages.

Overall, cement producers perform worse than the average TPI company on all indicators, but particularly on board responsibility for climate change (Q6) and processes to manage climate-related risks (Q12).

No cement company currently ensures consistency between its climate change policy and the positions taken by those trade associations of which it is a member (Q19).



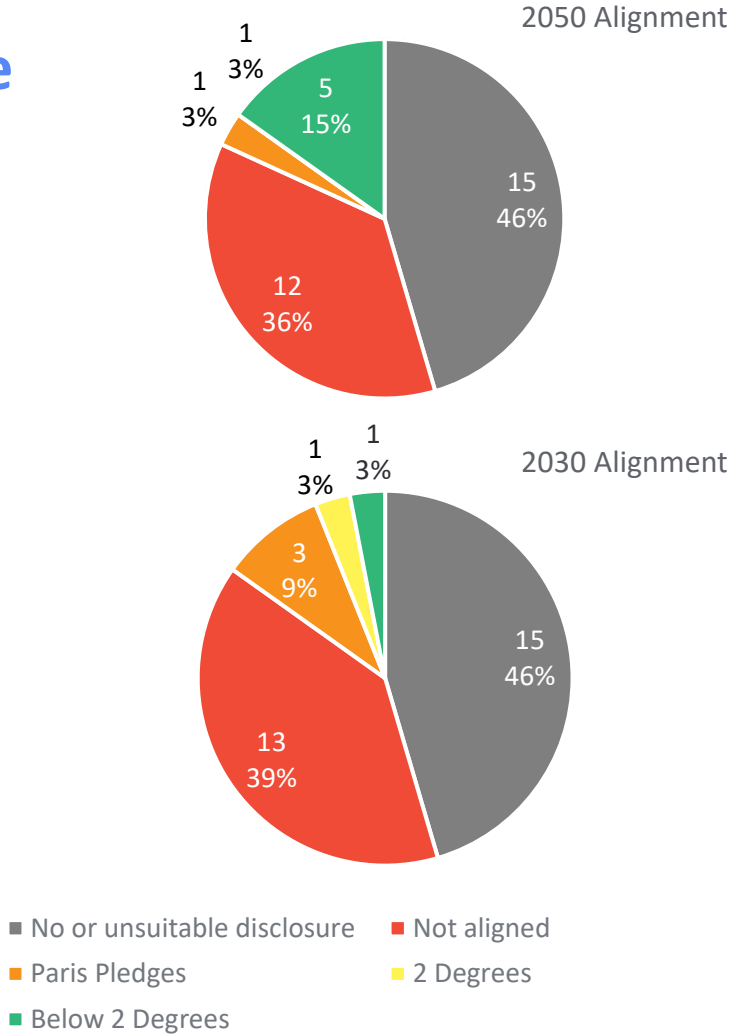

Key: blue = yes, red = no, black tick mark = TPI universe average

# Carbon Performance: alignment with the Paris Agreement benchmarks

This year, we cover 33 cement companies on Carbon Performance, up from 22 last year. The number of companies we cannot assess has risen from eight (36%) to 15 (46%), indicating that disclosure remains a problem and may even be a growing problem as TPI goes deeper into the sector. A feature of the cement sector is that emissions intensity needs to be disclosed in a particular form defined by the Global Cement and Concrete Association (see our Cement Methodology Note for further details).

The number of companies aligned with at least the 2°C scenario by 2030 has gone down from three (14%) to two (6%). Among the 18 companies with suitable disclosure, 13 (39% of the entire sector) are not aligned with any TPI benchmark by 2030.

Taking a longer-term perspective, we find that five cement manufacturers are aligned with Below 2°C by 2050: Taiheiyo Cement, which has an ambitious 2050 target, Cemex, CRH and HeidelbergCement, which have 2050 net zero pledges, and Dalmia Bharat, which leads the way with a 2040 net negative commitment (see next page).



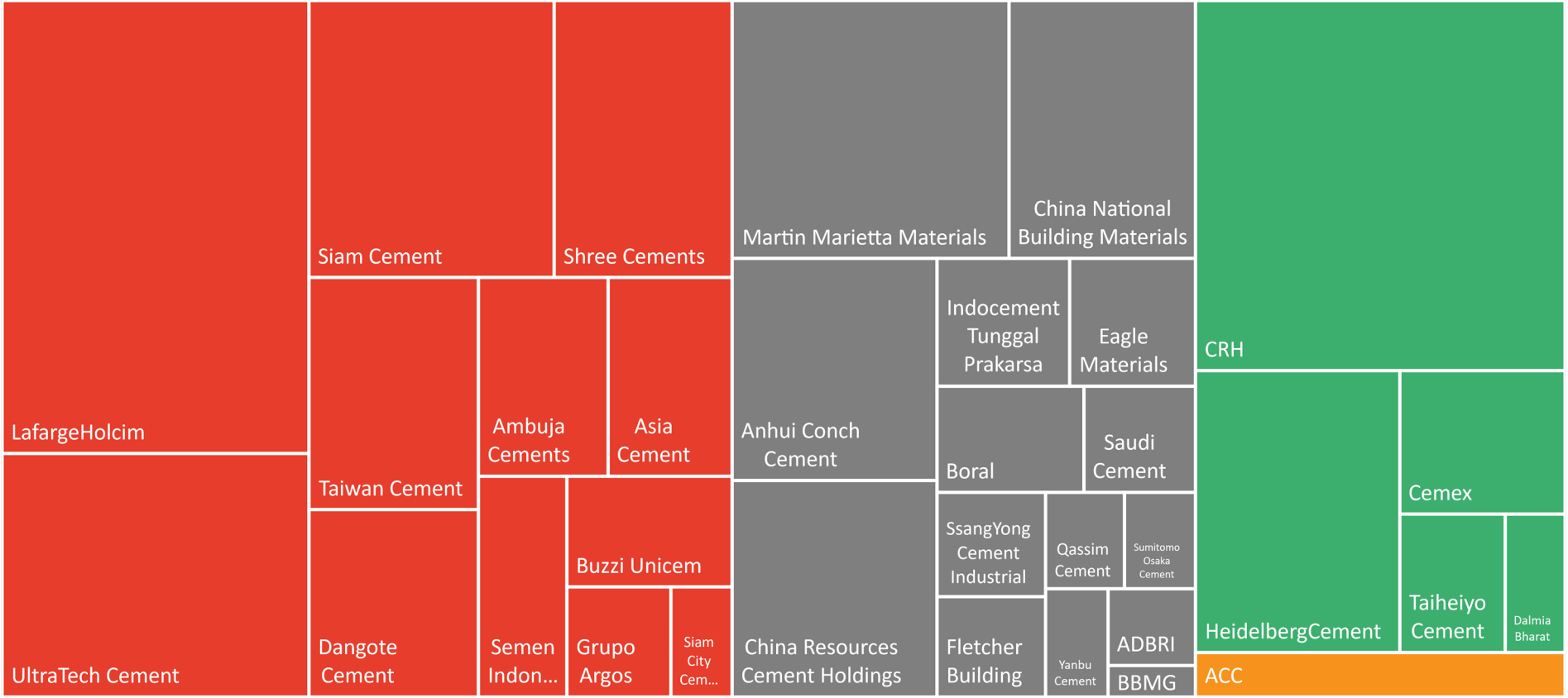
# Net negative emissions targets

Net negative emissions targets indicate that a company plans to absorb more $CO_2$ from the atmosphere than it will emit. Negative emissions are an important feature of many low-carbon scenarios. There are three main ways to achieve negative emissions: Bio Energy with Carbon Capture and Storage (BECCS), Direct Air Capture (DAC), and increasing the size of natural carbon sinks e.g. through afforestation. They will often will be implemented outside a company's boundaries and may be associated with offsetting.

Because many negative emissions technologies are immature, in low-carbon scenarios they tend to be deployed only after 2040, and in richer regions first. As TPI has extended its time horizon to 2050, negative emissions have thus started playing a role in our benchmarks. For example, the emissions intensity of global electricity generation needs to fall to -8 $kgCO_2/MWh$ by 2050 in the Below 2°C scenario. However, the first explicit net negative emissions target in our database does not come from a western electricity utility, but from an Indian cement company. Dalmia Bharat published a net negative target in Summer 2019. According to this target, the company aims to absorb 30 $kgCO_2e$ per tonne of cement by 2040. This is all the more striking given that around 60% of cement-related carbon emissions do not come from energy use, but from the chemical reactions necessary to make clinker, so the scope for BECCS technology is smaller than in other industries.

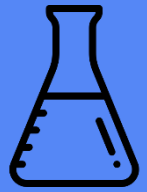
Achieving its target boils down to four main technology levers according to company disclosures: 1) reducing the need for limestone through substitution with other materials; 2) moving to 100% renewables, including bioenergy, in 2030; 3) carbon capture and utilisation (the company plans to capture and use carbon in its own products as well as selling $CO_2$ to third parties); and 4) doubling energy productivity by 2030, chiefly through improving waste heat recovery.

# Alignment of cement manufacturers in 2050, scaled by market cap.




Below 2 Degrees · No or unsuitable disclosure · Not aligned · Paris Pledges

# Appendix 3. Chemicals



Transition Pathway Initiative

# Management Quality level

Companies' Management Quality ratings may not always reflect their most up-to-date disclosures. TPI updates its assessments once a year.

FTSE Russell

## Level 0
**Unaware**

0 company: 0%

## Level 1
**Awareness**

2 companies: 6%

- Brenntag AG
- RPM Inc

## Level 2
**Building capacity**

4 companies: 11%

- CF Industries
- Formosa Chemicals & Fibre
- Nutrien
- Umicore

## Level 3
**Integrating into operational decision making**

22 Companies: 61%

- Air Products And Chemcom
- Akzo Nobel
- Asahi Kasei
- BASF
- Celanese
- Covestro
- Croda International
- Dow Inc
- DuPont de Nemours
- Eastman Chemical
- Ecolab
- FMC
- Formosa Plastics
- Linde
- LyondellBasell Industries
- Mitsubishi Chemical
- Nan Ya Plastics
- Nippon Paint
- Nitto Denko
- PPG Industries
- Saudi Basic Industries Corp
- Symrise

## Level 4
**Strategic assessment**

8 Companies: 22%

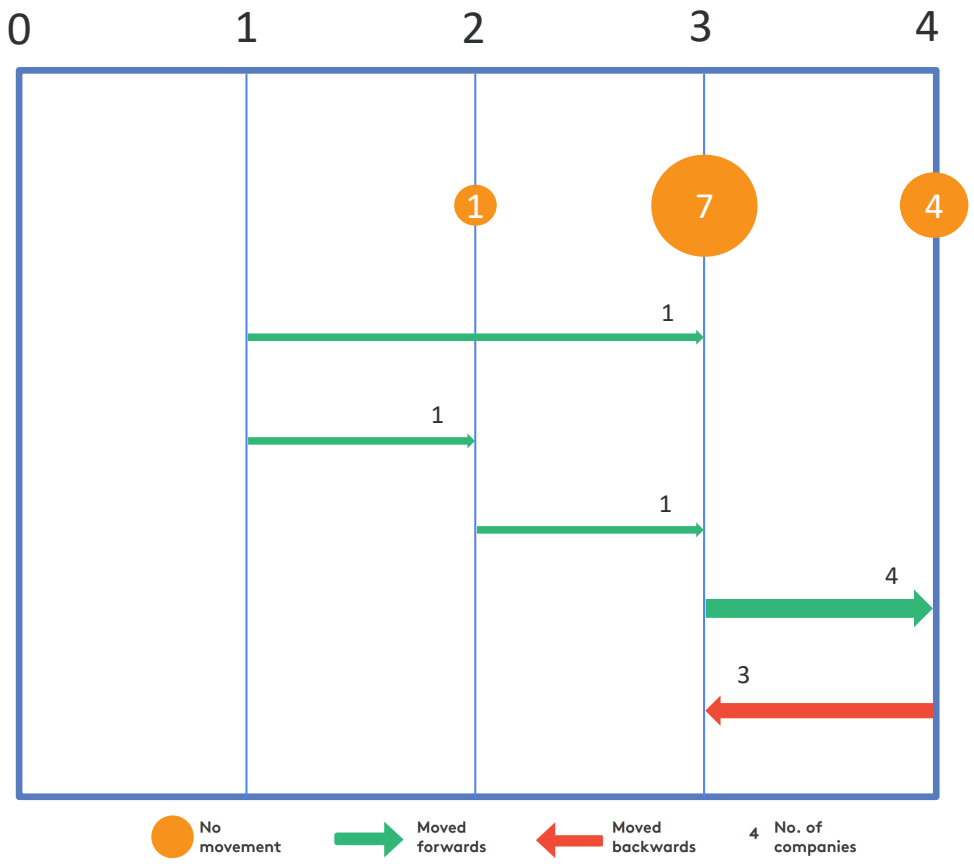
- **Air Liquide** ★
- Givaudan
- Intl Flavours & Fragrances
- LG Chemical
- Royal DSM
- Sasol
- Shin-Etsu Chemical
- Toray Industries

# Trends in Management Quality

The average Management Quality score of chemicals companies is 3.0, among the highest average scores of TPI sectors. An impressive 83% of chemicals producers are at Level 3 or 4.

TPI now assesses 36 chemicals companies; 22 of these were also assessed last year. While most chemicals companies have not changed levels, seven have moved up at least one level and only three have dropped a level. Two of those dropping from Level 4 failed to re-disclose their membership of trade associations engaged in climate-related lobbying (Q11). Several companies moved up to Level 4 at least partly due to assigning board responsibility for climate change (Q6).

DowDuPont, formerly at Level 1 and the largest chemicals company by market cap that we cover, split into Dow and Dupont de Nemours, which are both currently at Level 3.

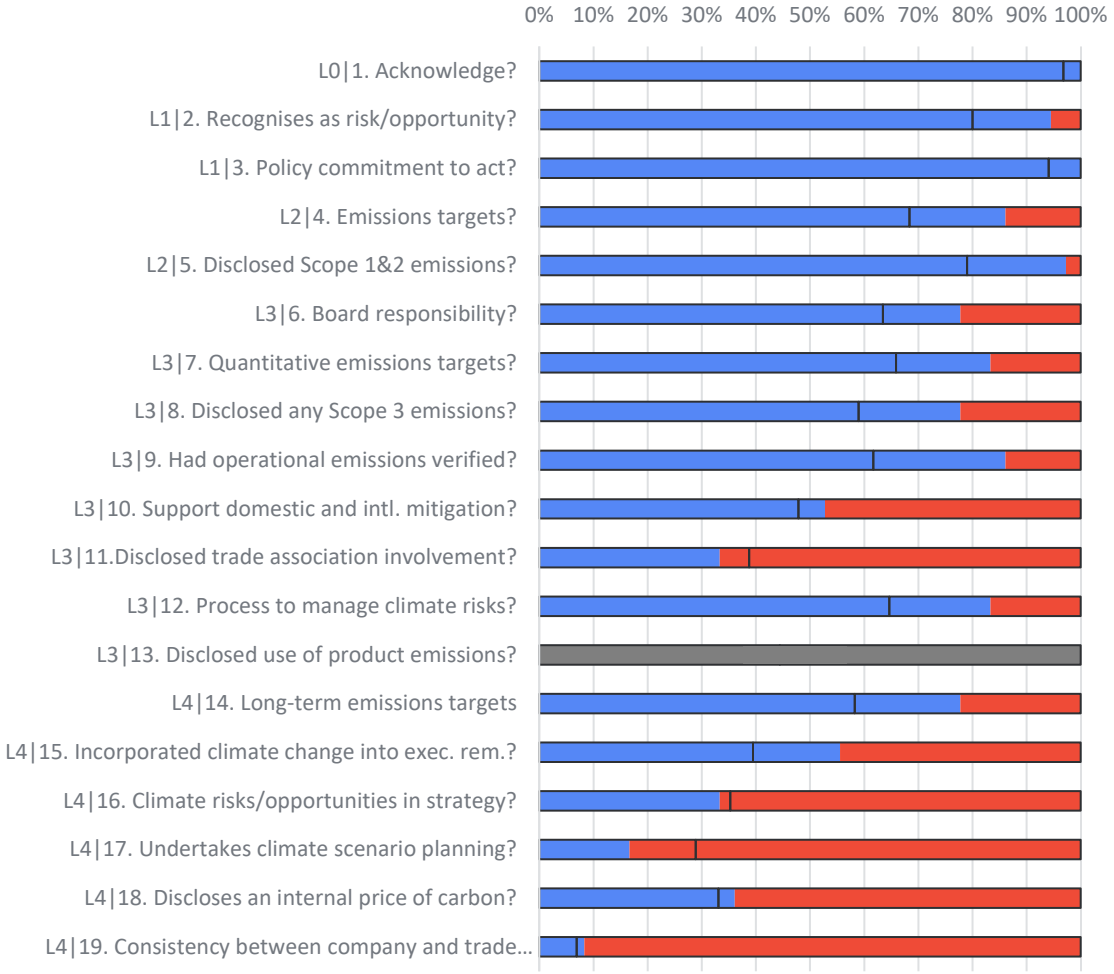


# Management Quality: indicator by indicator

The chemicals sector performs well above average on almost every indicator. Companies in this sector are especially strong on disclosure of Scope 1 & 2 emissions (Q5), setting emissions targets (Q5, Q7 and Q14), having their operational emissions verified (Q9), and climate risk management (Q12).

The sector performs slightly worse than the TPI average on only three indicators: disclosing trade association involvement (Q11), incorporating climate risks and opportunities in corporate strategy (Q16), and undertaking climate scenario planning (Q17).

Air Liquide has become the first 4* chemicals company this year, fulfilling all 18 applicable indicators.




Key: blue = yes, red = no, black tick mark = TPI universe average

# Appendix 4. Diversified mining

Transition Pathway Initiative

# Management Quality level

Companies' Management Quality ratings may not always reflect their most up-to-date disclosures. TPI updates its assessments once a year.

FTSE Russell

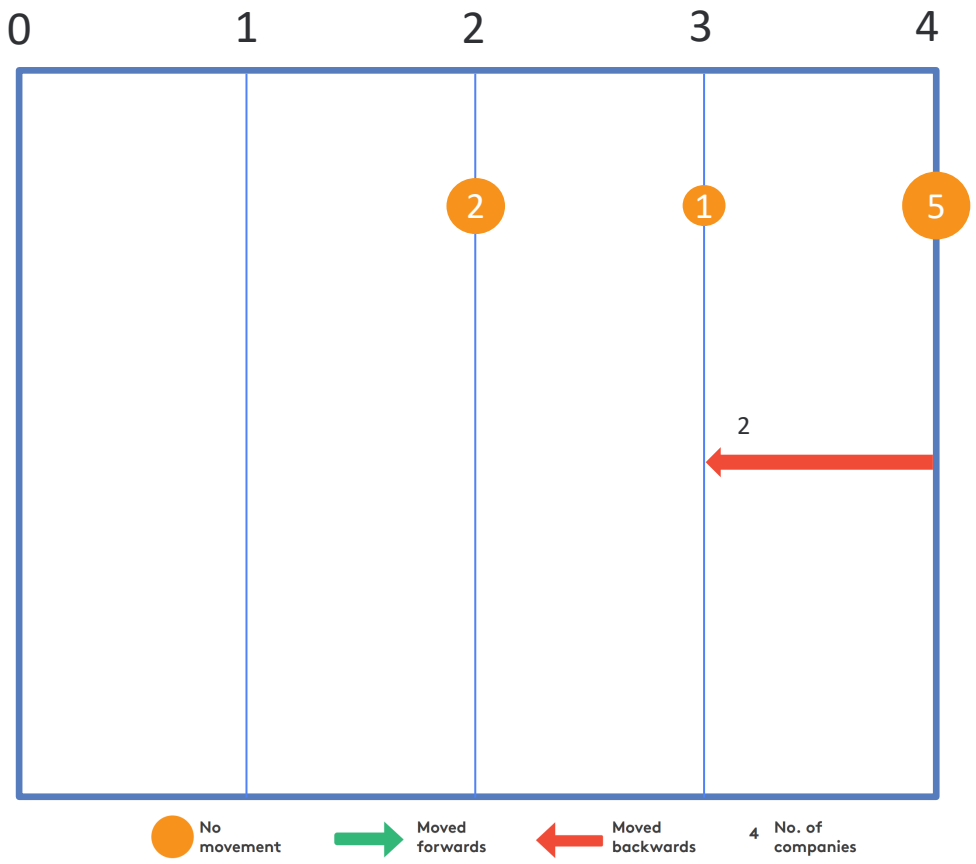
| Level 0 | Level 1 | Level 2 | Level 3 | Level 4 |
|---|---|---|---|---|
| Unaware | Awareness | Building capacity | Integrating into operational decision making | Strategic assessment |
| 0 company: 0% | 0 companies: 0% | 4 companies: 31% | 4 Companies: 31% | 5 Companies: 38% |
| | | Nornickel | Fortescue | Anglo American ★ |
| | | Freeport-McMoRan | Glencore | BHP ★ |
| | | Grupo Mexico | South32 | Vale ★ |
| | | Southern Copper | Vedanta | Rio Tinto |
| | | | | Teck Resources |

# Trends in Management Quality

The average Management Quality score of diversified mining companies is 3.

Nine companies out of 13 (69%) are on Level 3 or 4, and there are no Level 0 or 1 companies. Anglo American, BHP Billiton and Vale achieve the highest score of 4*.

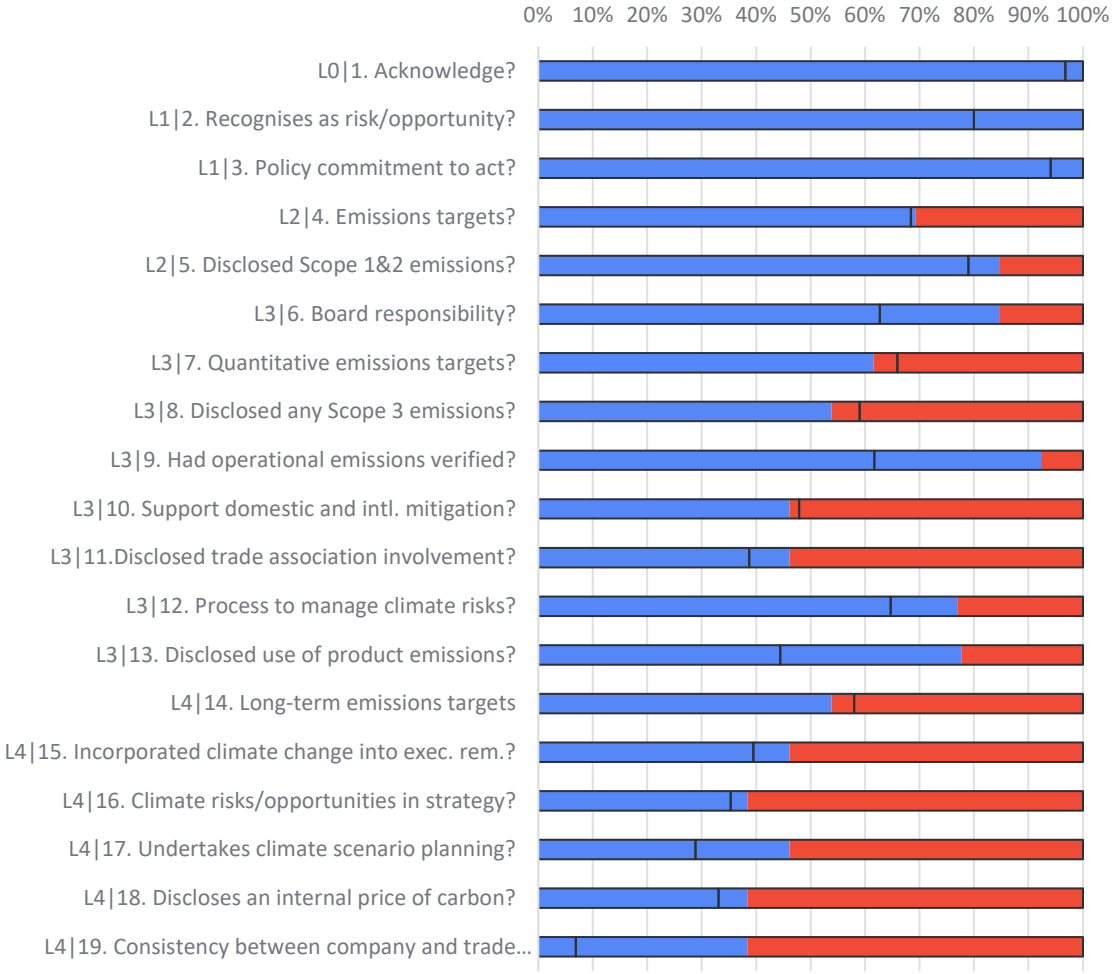
Trend data is available for 10 companies, while three companies were added to the Management Quality assessment for the first time. Two companies have been downgraded from Level 4 last year to Level 3 this year (Glencore and South 32). The reasons for this drop vary across firms, and no common factor has been identified.



# Management Quality: indicator by indicator

Diversified miners perform better than the average TPI company on most Management Quality indicators, particularly on verification of operational emissions (Q9) and disclosure of emissions from use of sold products (Q13). Diversified mining is the only TPI sector where all companies satisfy Q1-Q3, hence all companies are on at least Level 2.

The sector performs worse than the TPI average on only four indicators: setting quantitative and long-term quantitative emissions targets (Q7 and Q14), disclosing Scope 3 emissions (Q8) and supporting domestic and international efforts to mitigate climate change (Q10). However, the differences on these indicators are small.




Key: blue = yes, red = no, black tick mark = TPI universe average

* Only those diversified miners selling fossil fuels are assessed on Q13

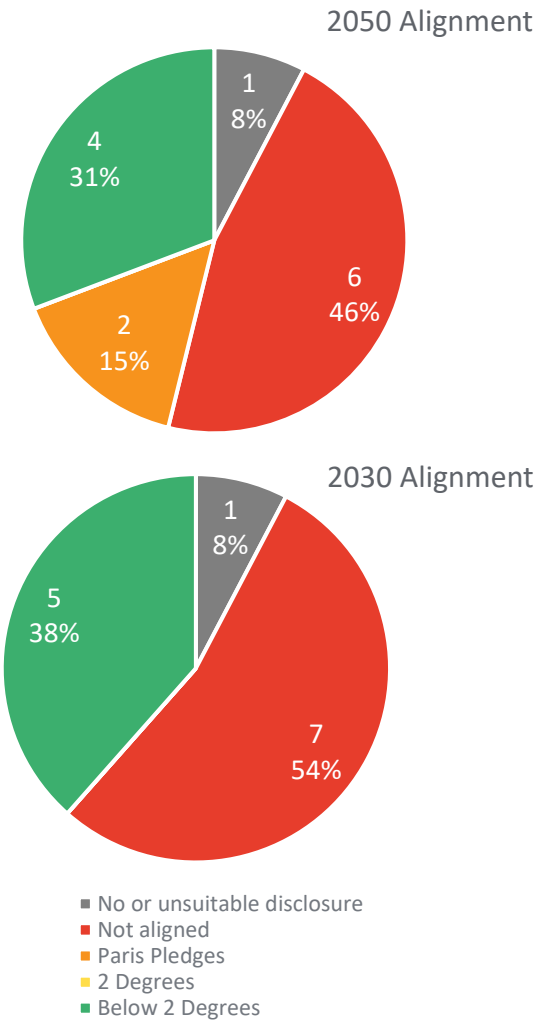
# Carbon Performance: alignment with the Paris Agreement benchmarks

We assess the Carbon Performance of the diversified mining sector for the first time, building on our 2020 Discussion Paper.

Four companies (31%) are aligned with Below 2°C in 2050: Freeport-McMoRan, Glencore, Grupo Mexico and Nornickel. Glencore is the only diversified mining company with a 2050 net zero emissions target, covering all scopes of emissions. In 2030, five companies (38%) are aligned with Below 2°C.

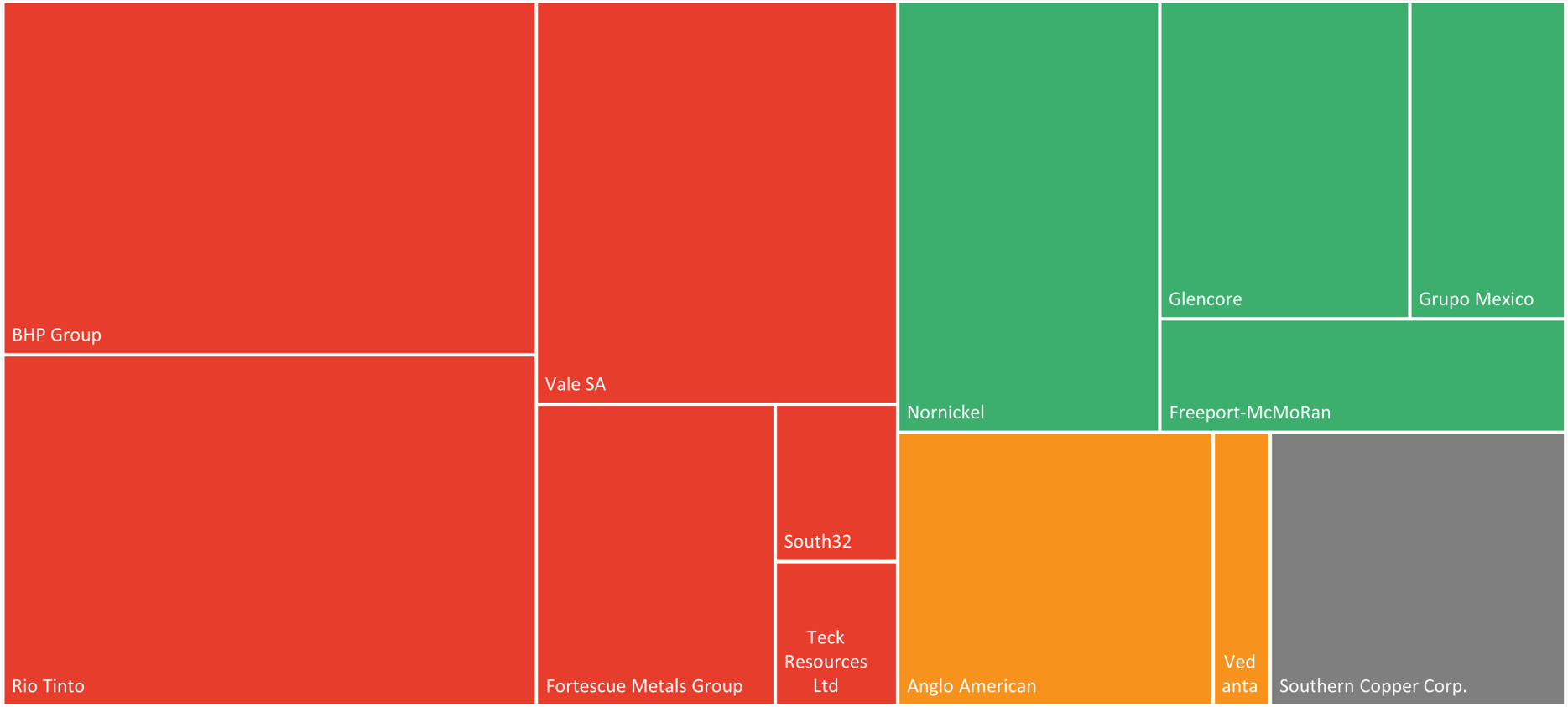
Overall, a higher share of diversified mining companies is aligned with Below 2°C in 2050 than any other industrials/materials sector (31%) and a lower share has no or unsuitable disclosure (only Southern Copper has).

Downstream emissions from processing and use of sold products are particularly important in the diversified mining sector. This creates an opportunity for cross-sectoral engagement, e.g. with metals manufacturers, to reduce lifecycle carbon intensities.[1]




1 See p17 for a broader discussion on circular economy and industrial cooperation

# Alignment of diversified miners in 2050, scaled by market cap.




Below 2 Degrees | No or unsuitable disclosure | Not aligned | Paris Pledges

# Appendix 5. Paper

Transition Pathway Initiative

# Management Quality level

Companies' Management Quality ratings may not always reflect their most up-to-date disclosures. TPI updates its assessments once a year.

FTSE Russell

## Level 0
**Unaware**

2 company: 9%

Muda Holdings
Nine Dragons Paper Industries

## Level 1
**Awareness**

6 companies: 26%

Daio Paper
Hokuetsu
Indah Kiat Pulp & Paper
Lee & Man Paper Manufacturing
Shandong Chenming
Tokushu Tokai Paper

## Level 2
**Building capacity**

3 companies: 13%

Nippon Paper Industries
Suzano
YFY

## Level 3
**Integrating into operational decision making**

3 Companies: 13%

Cascades
Ence Energia y Celulosa
International Paper

## Level 4
**Strategic assessment**

9 Companies: 39%

Klabin ★

CMPC
Domtar
DS Smith
Mondi
Oji Holdings
Sappi
Stora Enso
UPM-Kymmene

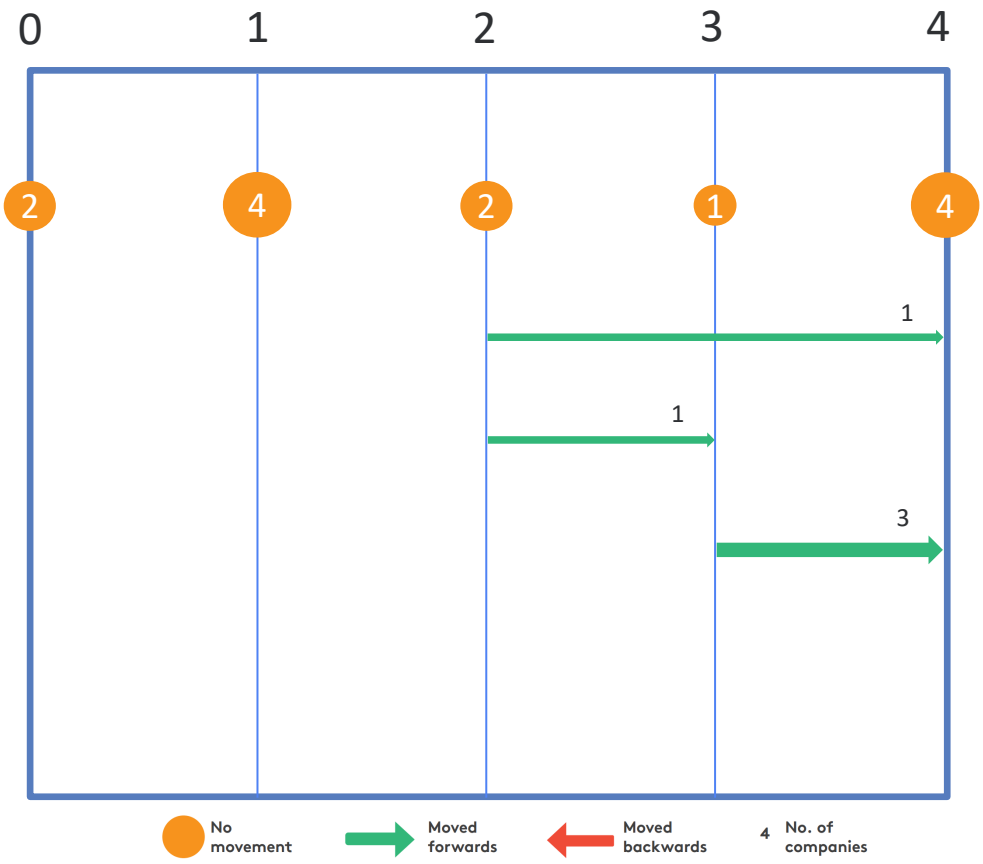
# Trends in Management Quality

The average Management Quality score of paper companies is 2.5, marginally higher than the 2.4 average of the whole materials and industrials cluster. Trend data are available on 18 of the 23 companies assessed this year.

Five companies, representing 27% of the sector, have moved up at least one level. No companies have had their Management Quality level downgraded.

Nine companies (37%) have attained Level 4, with one company, Klabin, attaining a 4* rating – the highest possible in TPI's assessment.

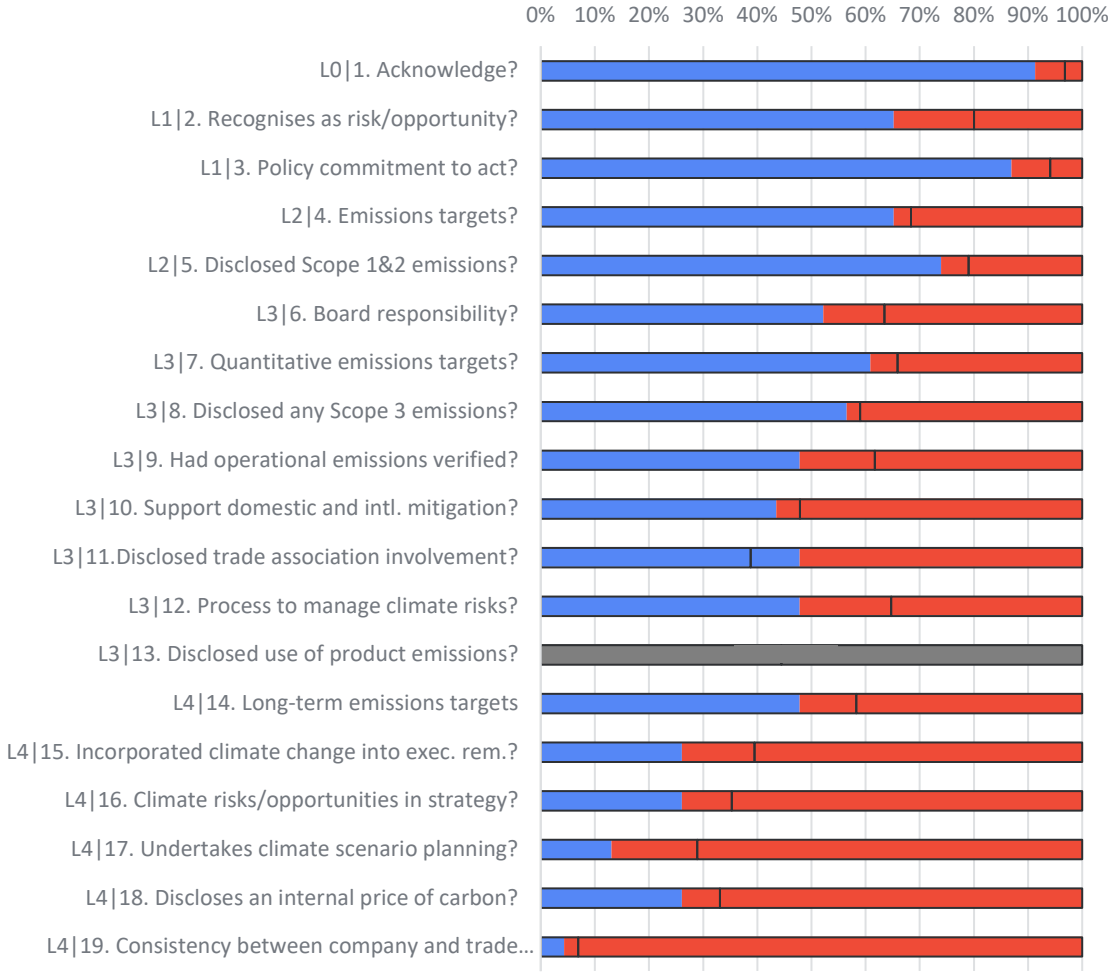
Two of the four companies that have moved up to Level 4 do so by beginning to disclose Scope 3 emissions (Q8). Other indicators on which companies have made improvements include setting quantitative emissions targets (Q7) and having operational emissions verified (Q9).



# Management Quality: indicator by indicator

Like aluminium, cement and steel, the paper sector performs worse than the TPI average on almost every single indicator. Paper companies underperform especially on explicitly recognising the business risks and opportunities of climate change (Q2), establishing a process to manage climate risks (Q12), and undertaking climate scenario planning (Q17).

Paper companies perform better than average on one indicator: disclosure of trade association involvement (Q11). Only Klabin, a newly assessed paper company, goes further by ensuring consistency between its climate change policy and the positions taken by the trade associations of which it is a member (Q19).

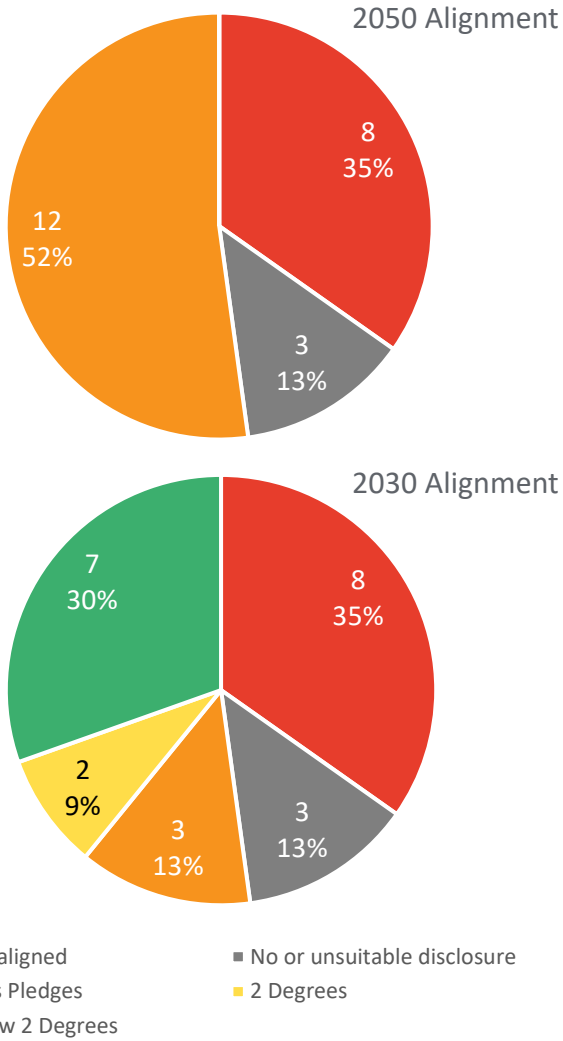



Key: blue = yes, red = no, black tick mark = TPI universe average

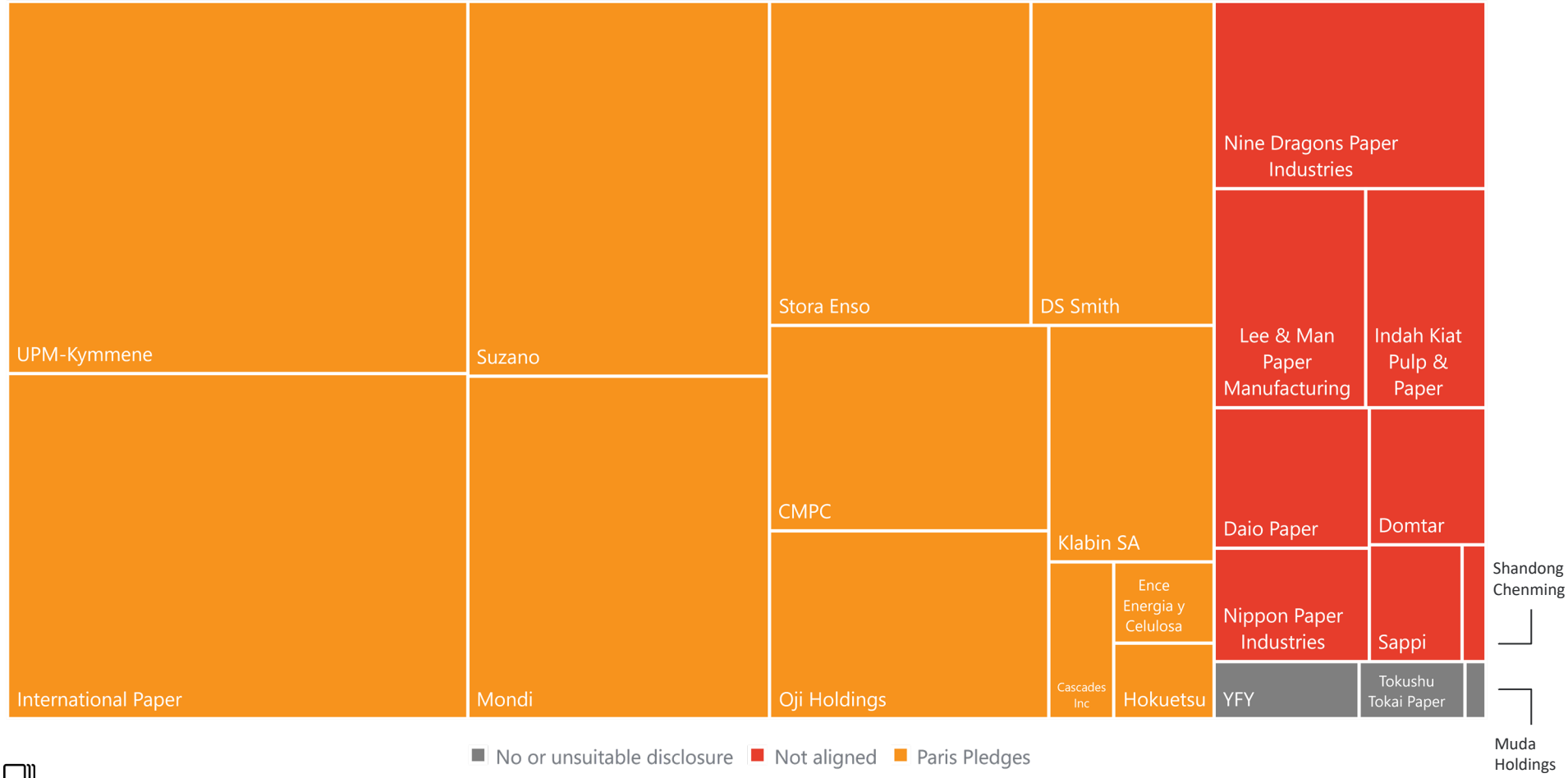
# Carbon Performance: alignment with the Paris Agreement benchmarks

The number of paper companies aligned with the 2°C and Below 2°C benchmarks in 2030 has increased from five (28%) in last year's assessment to nine (39%) this year. In terms of its 2030 alignment, the paper sector is among the best performing sectors assessed by TPI, along with electricity utilities, shipping companies, and diversified miners. However, looking out to 2050 significantly changes the picture. No paper company meets the 2°C benchmark in 2050, although over half of companies are aligned with the Paris Pledges benchmark.

DS Smith, Suzano, and Klabin are closest to being aligned with the 2°C benchmark in 2050. By strengthening their targets and decarbonisation efforts, these companies could lead the paper sector towards improved alignment.



# Alignment of paper makers in 2050, scaled by market cap.



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